

BEGG (NOMINEES) LTD.

**FINAL REPORT
on
SITE INVESTIGATION
at
HARTS FARM WAY
HAVANT**

**AUGUST 2013
REPORT NO: 727927**

UPTON MCGOUGAN LTD
Partnership House
Moorside Road
Winchester
Hampshire
SO23 7RX

Tel: 01962 834 400
Fax: 01962 834 411
Email: win@uptonmcgougan.com
www.uptonmcgougan.com

STRUCTURAL SOILS LIMITED
The Old School
Stillhouse Lane
Bedminster
BRISTOL
BS3 4EB

Tel: 0117 947 1000
Fax: 0117 947 1004
Email: ask@soils.co.uk
www.soils.co.uk

DOCUMENT ISSUE RECORD

Contract No: 727927

Client: Begg (Nominees) Ltd

Contract: Harts Farm Way, Havant

Document: Interpretive Report on Site Investigation

Prepared by:



J Southern/ S Pond

Approved by:



A Cattell

Date:

August 2013

REVISION RECORD

Revision	Date	Description	Prepared by
0	2/7/13	Draft	JS/SP
1	20/8/13	Final report with further water monitoring	SP
2	21/08/13	Minor correction to paragraphs 7.10 and 7.11	AML

STRUCTURAL SOILS LIMITED
The Old School
Stillhouse Lane
Bedminster
BRISTOL
BS3 4EB

Tel: 0117 947 1000
Fax: 0117 947 1004

Table of Contents

1	INTRODUCTION	5
2	SITE DESCRIPTION	7
	2.1 Location and Topography	
	2.2 Geology	
	2.3 Hydrogeology	
	2.4 Hydrology	
	2.5 Preliminary Risk Assessment (Desk Study)	
	2.6 Summary of Previous Investigations Findings and Comments by the EHO	
	2.7 Outline Conceptual Model and Risk Assessment	
	2.8 Recommendations	
3	FIELDWORK	20
4	LABORATORY TESTING	25
5	GROUND CONDITIONS	27
	5.1 General	
	5.2 Made Ground/Possible Made Ground/Topsoil	
	5.3 Alluvium	
	5.4 Head Gravel	
	5.5 Upper Chalk	
	5.6 Groundwater	
	5.7 Indications of Contamination	
6	DISCUSSION AND RECOMMENDATIONS	30
	6.1 Proposed Development / Purpose of Investigation	
	6.2 Site Preparation and Excavation	
	6.3 Shrinkage and Swelling	
	6.4 Foundations	
	6.5 Floor Slabs	
	6.6 Soakaway	
	6.7 Pavement Design	
	6.8 Protection of Buried Concrete	
	6.9 Radon	
	6.10 Contamination - Soil	
	6.11 Ground Gases	
	6.12 Contamination Conclusion	
	6.13 Generic Quantitative Risk Assessment (GQRA) and Final Conceptual Site Model	
	6.14 Remediation and Risk Reduction Recommendations	
	6.15 Off-site Disposal of Surplus Soil	
7	SUMMARY	41
8	REFERENCES	44

Table of Contents

APPENDIX A	i
(i) Site Location Plan	
(ii) Exploratory Hole Location Plan	
(iii) Proposed Development Plan	
APPENDIX B	ii
(i) Key to Exploratory Hole Logs	
(ii) Borehole Logs	
(iii) Trial Pit Logs	
(iv) Window Sample Logs	
APPENDIX C	iii
(i) Standard Penetration Test (SPT) Summary Sheet	
(ii) SPT Hammer Calibration Records	
(iii) SPT N value versus Depth Plot	
(iv) SPT $N_{(60)}$ Value versus Depth Plot	
(v) California Bearing Ratio (CBR) Test Results	
(vi) Permeability Test Results	
APPENDIX D	iv
(i) Geotechnical Laboratory Test Verification Sheet	
(ii) Geotechnical Laboratory Test Results	
APPENDIX E	v
(i) Contamination Laboratory Test Results	
(ii) Initial Waste Characterisation (Haswaste)	
(iii) Laboratory UKAS Accreditation Certificate	
APPENDIX F	vi
(i) Soil Guideline Value Derivation	
(ii) UKWIR Guidelines	
(iii) Risk Assessment Methodology	
(iv) RSK Group Generic Assessment Criteria (GAC)	
APPENDIX G	vii
(i) Gas/Groundwater Monitoring Results	
APPENDIX H	viii
(i) Tank Search Records	
(ii) GroundSure GeoInsight Report	
(iii) GroundSure EnviroInsight Report	
(iv) Historical Mapping	



1 INTRODUCTION

This investigation was carried out on the instructions of Upton McGougan Limited on behalf of Begg (Nominees) Ltd.

The purpose of the work was to investigate ground conditions, assess the contamination status of the site and provide information for the design of foundations for new industrial units. The work included a Preliminary Risk Assessment, intrusive investigation, laboratory testing, a quantitative risk assessment and the preparation of this report.

This report details the work carried out both on site and in the geotechnical and chemical testing laboratories; it contains a description of the site and the works undertaken, the exploratory hole logs and laboratory testing results, and it gives recommendations relating to foundation design, settlement, etc. It presents an appraisal of geoenvironmental aspects such as soil contamination and gives recommendations on risk reduction. It should not be assumed that these would meet the requirements of the local authority, whose advice should be sought regarding planning permission. This report does not consider ecological impacts (e.g. bats) or botanical risks (e.g. Japanese Knotweed). It is recommended that these be considered as part of the assessment of development constraints for the site.

The following reports prepared by others relating to this site have been made available to Structural Soils Limited, and have been referred to in the preparation of this report (see References). Our remit was to assume that the client was not able to rely on these reports, but we have referenced them to assist with our hole locations, etc. The Local Authority EHO also has passed comments on the RPS report and such comments have been addressed as part of our investigation.

- Harts Farm Way Depot, Harts Farm Way, Havant, Phase 1 desk Study and Phase 2 Site Investigation report September 2007, RPS.
- *Harts Farm Depot, Havant, Factual Report on Ground Investigation* for Robert West Consulting, dated 5 July 2002.

The ground investigation has been carried out using cable percussion, trial pitting and window sampling techniques, in general accordance with the recommendations of BS5930: 1999 *Code of Practice for Site Investigations*. Whilst every attempt is made to record full details of the strata encountered in the exploratory holes, techniques of hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks. The investigation has also



been carried out in accordance with BS10175 *Investigation of Potentially Contaminated Sites: Code of Practice* (2011).

All information, comments and opinions given in this report are based on the ground conditions encountered during the site work, and on the results of laboratory and field tests performed during the investigation. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations, and water conditions between or below exploratory holes. It should be noted that groundwater levels usually vary due to seasonal and/or other effects and may at times differ to those measured during the investigation.

All information, comments and opinions given in the desk study in this report are based on the information obtained. The information search cannot be exhaustive and there may be records that have not come to light. There may also be circumstances at the site that are not documented.

This report was prepared by Structural Soils Limited for the sole and exclusive use of Begg (Nominees) Ltd, the funding partner, tenants and two successors in title in response to particular instructions. However no liability will be accepted after a period of 6 years from the date of the report. Any other parties using the information contained in this report do so at their own risk and a duty of care to those parties is excluded.



2 SITE DESCRIPTION

2.1 Location and Topography

The site is located in south Havant, Portsmouth (see Site Location Plan in Appendix A). The British National Grid Reference of the site is SU 707 058.

The site of investigation was a former council depot located in an industrial area of Havant and approximately 260m by 140m in size. The area was bound by Harts Farm Way to the south, the A27 to the north, an access road to the east and at the time of writing, a building site to the west.

Brockhampton Stream crossed the site flowing from east to west and divided the site in two. A pond in the east of the site, roughly 30m in diameter, fed into the stream. Its course had been altered in the west where it had been placed in a culvert and then covered to form a car park.

The site was predominantly level apart from areas around the perimeter where demolition rubble had been heaped, most notably to the east and south. As a former depot, the majority of the area was covered in macadam and concrete associated with access roads and car parking. There were areas of bare ground where the demolished buildings had been removed. The site was particularly overgrown with a number of mature trees to the western perimeter and also lining the length of the stream.

Overhead electricity transfer lines were present in the western corner of the site trending from southeast to northwest. An underground electricity cable crossed the centre of the site from north to south.

Before our site works an underground fuel storage tank was believed to exist at the main site entrance to the south with an above ground fuel storage tank to the north of the river. Evidence of a substation to the south of the river was apparent.

At present, the site is used by a shipping container refurbishment company who utilise the area in the north east of the site to store around 40no. containers.

2.2 Geology

The British Geological Survey map (sheet 316, scale 1:50,000, published 1998) shows the site to be underlain by Alluvium which is in turn underlain by River Terrace Deposits and Head Gravel Deposits, all of Quaternary age. These deposits lie above undifferentiated rocks of the Chalk Group comprising Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and



Portsdown Chalk Members, all of Upper Cretaceous age. A fold axis runs across the site, approximately southeast to northwest, representing the axial plane of the Portsdown Anticline.

Alluvium is described as *'clay, silt and sand, locally organic with gravel'*. Head Gravel deposits are described as *'clayey gravel'*. The Members within the Chalk Group are all described as *'white chalk with flints'*. The Portsdown and Newhaven Chalk Members are additionally described as *'...with many thin marl beds'*.

The GeoInsight Report obtained as part of this study and the BGS Lexicon of Formation names now refer to the 'Members' within the Chalk Group as 'Formations' with the same individual names.

2.3 Hydrogeology

The Environment Agency (EA) website has classified the site's Drift Deposits (Alluvium and head deposits) as a Secondary 'A' Aquifer (variably permeable). The Environment Agency (EA) website has classified the site's solid geology (Chalk Group) as a Principal Aquifer (highly permeable).

'Principal' Aquifers are layers of rock or drift deposits that have high inter-granular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifers.

'Secondary' aquifers include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary 'A' Aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

2.4 Hydrology

The nearest surface water is Harts Farm Stream on site, running approximately east to west across the centre of the site, and flowing in the same direction. The Environment Agency classed this as a Secondary River. A pond lies in the east of the site.

The Normal Tidal Limit flows to within approximately 111m of the southern boundary of the site. This may impact on groundwater levels and flow within this area.



Groundwater flow directions were established from the previous RPS and FES monitoring. Those holes had coordinates and levels recorded. From three visits on 18 February 2002, and 8 and 15 August 2007 the wells zoned into the gravels showed flow directions to vary between the west and south-west. Those wells zoned into the underlying chalk showed similar elevations of water level and similar flow directions.

For our investigation we thus placed new wells along the western and south-western edges of the site to intercept water flow as it left the site (the main source of contamination appearing to be from the RPS report as the area of the suspected underground fuel tank. Later we established that a number of tanks had actually existed at that location).

2.5 Preliminary Risk Assessment (Desk Study)

2.5.1 Site History from Ordnance Survey Maps

A search of Ordnance Survey maps was undertaken to establish the land-use history of the site and surroundings. Extracts of the maps that are discussed below can be found in Appendix H of this report. Unless otherwise stated, all quoted distances are measured from the site boundary that is marked on the maps.

TABLE 1: SUMMARY OF HISTORICAL MAP DATA			
Dates	Scale	Significant features, changes and developments:	
		On site	In surroundings [distance(m)]
1866-1869	1:10,560 & 1:2,500	The site comprises sections of several fields with occasional trees and <i>Harts Farm Stream</i> running E-W across and down towards the SW corner of the site. <i>Harts Farm</i> is located in the SE corner of the site, with 4 no. farm buildings on the site and a <i>Well</i> shown next to the farm buildings	The area is rural and predominantly fields with <i>Brockhampton Stream</i> 13m E and S, <i>Broad Water</i> marsh 18m E and <i>Brockhampton Mill</i> 101m S. The area to the SW of the site is marshes and labelled as ' <i>Liable to floods</i> '
1896-1909	1:10,560 & 1:2,500	<i>Well</i> shown within farmyard and <i>Watercress beds</i> adjacent to <i>Harts Farm</i> stream in the NE of the site. Farm buildings extended slightly.	Embankments have been built 88m SW
1914-1938	1:10,560 & 1:2,500	<i>Wells</i> no longer shown	<i>Orchards</i> 42m N and 23m SE, <i>Mill</i> no longer shown
1938-1963	1:10,560 & 1:2,500	No change	No significant change



TABLE 1: SUMMARY OF HISTORICAL MAP DATA

Dates	Scale	Significant features, changes and developments:	
		On site	In surroundings [distance(m)]
1963-1968	1:10,000 & 1:2,500	No change	A27 built 10m N of site original <i>Brockhampton Road</i> blocked off, <i>Engineering works</i> and <i>Joinery works</i> built 13m E. Embankment and drain constructed 116m W of site and electricity sub stations 35m SE and 20m SW. <i>Sewage Works</i> 165m S. West shown as marsh, South shown as rough pasture.
1970-1973	1:10,000 & 1:2,500	Site is now a <i>Council Depot</i> with 5 no. buildings, and paved area with access from the south centre of the site. <i>Harts Farm Cottages</i> are shown to the E of the site. 2 no. bridges cross stream.	<i>Harts Farm Way</i> built for access along S boundary of site
1984-2002	1:10,000 & 1:2,500	No significant change - 6 no. buildings plus cottages now shown on site	<i>Incinerator</i> built 86m E of the site, connected to the substation to the SW of the site by overhead electricity pylons
2012-present	1:10,000 & 1:2,500	<i>Council Depot</i> no longer shown, all buildings on site demolished electricity transmission lines crossing the site approximately NS	Incinerator no longer shown

2.5.2 Site History from Other Sources

Information available from Hampshire County Council indicates that the site has previously been licensed to Veolia Environmental Services for use as a Haulage Vehicle depot, including refuelling areas and fuel storage areas (fuel tanks). The most recent documentation relating to this is dated 2007.

A tank search was undertaken by SSL and the records are contained in Appendix H. These show all tanks were single skin steel, that there were 4 fuel pumps and associated vent pipes, that the total capacity was 63,000 litres, plus the following:

Tank No.	Contents	Date Installed	Date Made Safe (applies to petrol tanks only)
1	Petrol then Diesel after 2000	1972	2000 (by conversion to diesel)
2	Diesel	Unknown	N/A. Unknown
3	Diesel	Unknown	N/A. Unknown
4	Petrol then Diesel after August 1994	1972	N/A. Unknown



5	Petrol then Diesel after August 1994	1972	N/A. Unknown
6	Petrol then Diesel after August 1994	1972	N/A. Unknown

Information was obtained from the local EHO. Most drawings showed applications for fuel tanks, wash-down areas and interceptors which were superseded, withdrawn, or refused (by the planners). Only one drawing appeared useful. The drawing shows 2no. sets of *Garages* in the north, plus a *Fitters Shop*. In the west of the site a building is shown to contain a *Paint Bay, Lub' Bay and Wash Bay*, as well as a nearby interceptor (and vent pipe) serving such.

The topographic drawings were also noted to show an electric sub-station and an above-ground oil tank abutting it. The same drawing shows the covers for the underground fuel tanks, plus adjacent fuel pump islands and a 3-stage interceptor to the south.

2.5.3 Summary of Site History

From 1866 to 1970 the site was predominantly rural farmland with *Harts Farm* in the south eastern corner. Harts Farm stream crossed the site east to west and a Well was present next to the farm buildings. The surrounding area was similar, with marshland liable to flooding. Brockhampton Stream passed to the east and south of the site with a mill located on the stream to the south. After 1909 a small extension was added to the farm and a further well was shown for a short period. Both wells were no longer shown by 1938. There was little significant change in the surrounding area until 1963 when major development took place with the construction of the A27 bypass along the northern boundary of the site. At the same time Brockhampton Road along the east boundary of the site was blocked off and moved to accommodate a junction on the bypass. Works were built 13m to the east of the site, with an embankment and drains 116m west. Electricity substations were positioned 20m southwest and 35m southeast and sewage works 165m to the south. Between the 1970 and 1973 the maps indicate the site was developed into a council depot with 5 no. buildings and a paved area, an access road Harts Farm Way was constructed along the southern boundary of the site. From 1984 to 2002 the maps indicate a further building was added to the site, but more significantly and incinerator was built approximately 83m to the west. Over this period the site appears to have been used as a haulage yard. On the 2012 map the council depot and buildings are no longer shown and the area appears derelict. The incinerator to the west has also been demolished.

The site has contained (it is assumed that they have been removed) 6no. petrol/diesel tanks of a total capacity of 63,000 litres and with associated 4no. fuel pumps and vent pipes.



Topographic drawings and drawings from the council show: 2no. sets of *Garages* in the north; a *Fitters Shop*, a building containing a Paint Bay, Lub' Bay and Wash Bay, plus a nearby interceptor (and vent pipe) serving such; an electric sub-station and an above-ground oil tank abutting it; covers for the underground fuel tanks, plus adjacent fuel pump islands and a further (3-stage) interceptor.

2.5.4 Environmental Data

Environmental features such as landfills, groundwater abstraction points, etc, are detailed in the GroundSure EnviroInsight report that can be found in Appendix H of this report. 'Notable' features in these data sets are listed below.

TABLE 2: SUMMARY OF SIGNIFICANT ENVIRONMENTAL DATA					
Data Types Showing <u>Notable</u> Issues	No. of <u>Notable</u> Listings (or Yes/No) and Distance (m) from Site				Details of <u>Notable</u> Listings
	On site	0-250	250-500	>500	
ENVIRONMENTAL PERMITS, INCIDENTS & REGISTER					
Historic IPC Authorisations and Authorised IPPC and Part A(1) Activities	-	3	4	-	Nearest IPC – 91.0m W Onyx Hampshire Ltd Brockhampton Incinerator Nearest IPPC – 301.0m Budds Farm Wastewater Treatment Works
Red List Discharge Consents	-	1	-	-	Nearest – 163.0m S Southern water Services Ltd - sewage disposal
Part A(2) & Part B Activities & Enforcements	-	2	1	-	Nearest – 207.0m SW Concrete & crushing process
Radioactive Substances Authorisations	-	4	2	-	Nearest - 193.0m E Apollo Fire Detectors Ltd Disposal of radioactive waste
Licensed Discharge Consents	1	26	11	-	On site – Brockhampton Incinerator miscellaneous discharges
EA Recorded Pollution Incidents	-	11	-	-	Nearest – 55.0m S Oils and Fuel 2/6/2003
LANDFILL					
EA & Landfill Data Registered Landfills	-	-	2	-	Nearest – 302.0m N Bedhampton Waterworks non-biodegradable wastes
EA & Landfill Data Historic and Non-Operational landfills	-	1	2	1	Nearest – 234m S Land south of Budds Farm Sewage Works household waste 276m SW Harts Farm Way household waste
BGS/DoE Landfill Site Survey	-	-	-	1	503.0m W Storhouse Lake Tip
OTHER WASTE SITES					
Operational, Transfer and Disposal Sites	-	3	1	-	Nearest – 71.0m W Harts Farm Way, difficult waste



TABLE 2: SUMMARY OF SIGNIFICANT ENVIRONMENTAL DATA

Data Types Showing <u>Notable</u> Issues	No. of <u>Notable</u> Listings (or Yes/No) and Distance (m) from Site				Details of <u>Notable</u> Listings
	On site	0-250	250-500	>500	
Non-Operational, Transfer and Disposal Sites	-	2	1	-	Nearest – 26.0m W Recycling Storage Bays
EA Licensed Waste Sites	-	17	7	1	Nearest – 25.0m SE Havant Waste Transfer Facility, household, commercial and industrial waste
GEOLOGY					
Superficial Geology	Yes	-	-	-	See section 2.2
Bedrock and Solid geology	Yes	-	-	-	See section 2.2
Radon Affected Area	Yes	-	-	-	The property is in a radon affected area, as 3-5% of properties are above the action level. Basic radon protection measures are required for new homes.
GROUND WORKINGS					
Historical Surface and Underground Workings	-	16	-	-	Nearest – 6.0m E Ponds
Current Ground Workings	-	1	-	2	Nearest – 210.0m SW Bedhampton Wharf Marine sand and gravel
MINING, EXTRACTION & NATURAL CAVITIES					
Non-Coal Mining and Natural Cavities	2	2	10	20	On site – Chalk, highly unlikely, small scale localised possible
NATURAL GROUND SUBSIDENCE					
Shrink-Swell Clay	Yes	-	-	-	Low hazard rating – ground conditions predominantly medium plasticity
Compressible and Collapsible Deposits	Yes	-	-	-	Moderate hazard rating - significant potential for compressibility problems
Running Sand	Yes	-	-	-	Low hazard rating – possibility of problems after major changes in ground conditions
BOREHOLE RECORDS					
BGS Recorded Boreholes	1	33	-	-	On site – Crookhorn Farm BH85
HYDROGEOLOGY & HYDROLOGY					
Groundwater Abstraction Licences	-	-	3	-	Nearest - 328.0m N Potable Water Supply – Havant PS
Potable Water Abstraction Licences	-	-	3	-	Nearest – 328.0m N Potable Water Supply – Havant PS
SPZ	-	1	-	-	173.0m NE Inner catchment
River Quality	-	-	1	1	Nearest – 264.0m W
Surface Water Features	Yes	-	-	-	Harts Farm Way Stream
FLOODING					
EA Zone 2 or 3 Floodplains	Yes	-	-	-	On site – Zone 2 (Fluvial Models) annual probability of flooding from rivers greater than 0.1% less than 1.0% Zone 3 (Fluvial Models) annual probability of flooding from rivers greater than 1.0%
Flood Defences	No	-	-	-	



TABLE 2: SUMMARY OF SIGNIFICANT ENVIRONMENTAL DATA					
Data Types Showing <u>Notable</u> Issues	No. of <u>Notable</u> Listings (or Yes/No) and Distance (m) from Site				Details of <u>Notable</u> Listings
	On site	0-250	250-500	>500	
Max BGS Groundwater Flooding Susceptibility	Very High	-	-	-	There is a high confidence rating in this value
DESIGNATED ENVIRONMENTALLY SENSITIVE SITES					
Sites of Special Scientific Interest (SSSI)	-	-	1	3	Nearest – 444.0m S Langstone Harbour
National and Local Nature Reserves	-	-	-	3	1636.0m W Farlington Marshes
Special Areas of Conservation and Protection	-	-	2	5	Nearest – 444.0m S Solent Maritime/Chichester and Langstone Harbours
Areas of Outstanding Natural Beauty	-	-	-	1	1106.0m SE Chichester Harbour
Nitrate Sensitive Areas & Vulnerable Zones	1	-	-	2	On site – DEFRA nitrate vulnerable zone
CURRENT LAND USE					
Industrial Site Data	-	46	-	-	Nearest – 18.0m S Electricity sub station
Petrol and Fuel Sites	-	1	1	-	Nearest – 175.0m SE Havant Lorry park (obsolete)

2.5.5 Summary of Environmental Data

The EnviroInsight report obtained for this study indicates that the site may experience issues with flooding, as it has a very high groundwater flooding susceptibility, accompanied by a high confidence rating in this value. The site is also designated as a nitrate vulnerable zone. There are also numerous present and historical surface water features both on site and nearby although the only licensed discharge consent of concern is that from the now defunct Brockhampton Incinerator.

No record of made ground at the site has been found, although as this is a Brownfield site, it is very likely that there is made ground present, presenting a potential source of contamination. Again, although there is no record of petrol or fuel sites within the boundaries of the site, data from Hampshire County Council details that the site was previously used as a haulage vehicle depot complete with refuelling areas, once again, presenting a further possible source of contamination.

There are landfills 234m south and 276m south west of the site.



2.6 Summary of Previous Investigations Findings and Comments by the EHO

2 no. previous investigations of the site have been undertaken, one factual one by FES and one interpretive one by RPS.

Significant contamination findings were:

1. Surface water sample SW2 had elevated PAH concentrations.
2. A water sample taken from TP1 near to the underground fuel tanks had elevated TPH and PAH.
3. A water sample from BH2 had elevated TPH concentrations.
4. PAH Concentrations in TP4 were considered to potentially pose a risk to groundwater.

The EHO raised the following comments about the RPS report which have been addressed by our investigation:

1. Further gas monitoring was required
2. A detailed/site-specific risk assessment with respect to hydrocarbon risk to groundwater from the vicinity of TP1 and TP12 (assume location of underground fuel tank).
3. Further trial pitting in the area of TP10 (above-ground fuel tank area) and in area of BH2 and TP4 to determine if previous concentrations were hotspots or widespread.

2.7 Outline Conceptual Model and Risk Assessment

2.7.1 General

This section of the report aims to identify land which could potentially be affected by contamination, such that it could affect the value or re-use of the land, or such that mitigation would be required for certain proposed end uses of the land.

The assessment also aims to identify land which would be regarded as ‘contaminated land’ under the terms of the Environmental Protection Act 1990, Part IIa. This act includes a stricter test for contaminated land than that outlined above. Land is considered to be contaminated if either:

- the land is causing significant harm to people, ecosystems or infrastructure; or
- there is a significant possibility that such harm could be caused; or



- pollution of controlled waters is being, or is likely to be, caused.

The following situations are defined as being where harm is to be regarded as significant:

- chronic or quite toxic effect, serious injury or death to humans;
- irreversible or other adverse harm to the ecological system;
- substantial damage to or failure of buildings;
- death of, or disease or other physical damage affecting, livestock or crops;
- pollution of controlled waters.

2.7.2 Risk Assessment Methodology

CLR11 outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. Under CLR11, three stages of risk assessment exist: Preliminary, Generic Quantitative and Detailed Quantitative. An Outline Conceptual Model should be formed at the preliminary risk assessment stage. This identifies potentially complete (termed *possible*) pollutant linkages (source–pathway–receptor) and is used as the basis for design of the site investigation. The Outline Conceptual Model is updated as further information becomes available, for example as a result of the site investigation.

2.7.3 Potential Sources and Contaminants

The potential primary contaminants associated with the sources identified in the desk study are discussed in more detail below:

TABLE 3: POTENTIAL SOURCES AND CONTAMINANTS	
Potential Sources: On site	Likely contaminants
Made Ground	Heavy metals, asbestos, hydrocarbons
6no. petrol/diesel tanks, plus associated fuel pipes, vent pipes and interceptor.	Hydrocarbons
1no. above-ground fuel tank	Hydrocarbons
2no. Garages and a Fitters Shop	Hydrocarbons and solvents
A building containing a Paint Bay, Lub' Bay and Wash Bay, plus a nearby interceptor and vent pipe.	Hydrocarbons and solvents
An electric sub-station and adjacent above-ground oil	PCBs and hydrocarbons



tank.	
Potential Sources: Off site	Likely contaminants
Engineering Works (upstream of site)	Hydrocarbons and solvents
Landfills to S and SW	Domestic waste and thus landfill gases

2.7.4 Outline Conceptual Site Model

The information presented in previous sections has been used to compile an Outline Conceptual Model. The identified potential contaminants and potential receptors have been considered, along with any possible pathways that may link them.

The resulting pollutant linkages are considered in the table below:

TABLE 4: OUTLINE CONCEPTUAL MODEL				
Potential Source	Potential Pathway	Potential Receptor	Potential Complete Linkage?	Comments (e.g. regarding pathways, impermeable strata, site upstream of source, etc)
Soil contaminants (i.e. Hydrocarbons, PAH, heavy metals, asbestos) (including naturally occurring arsenic, lead, etc)	Ingestion/ Dermal Contact	Future on-site users (commercial)	Yes	
		Maintenance workers	Yes	
		Adjacent commercial land users	Yes	
	Permeation	Subsurface plastic water pipes	Yes	
	Leaching	Groundwater in Principal Aquifer	Yes	
		Groundwater in Secondary A Aquifer/ surface watercourse		
	Root uptake	Soft landscaping on-site (e.g. phytotoxicity)	Yes	

**TABLE 4: OUTLINE CONCEPTUAL MODEL**

Potential Source	Potential Pathway	Potential Receptor	Potential Complete Linkage?	Comments (e.g. regarding pathways, impermeable strata, site upstream of source, etc)
Groundwater contaminants (i.e. Hydrocarbons, heavy metals)	Ingestion/ Dermal Contact	Future on-site users (commercial)	Yes	
		Adjacent commercial land users	Yes	
		Maintenance workers	Yes	
	Permeation	Subsurface plastic water pipes	Yes	
	Lateral Groundwater migration	Groundwater in Principal Aquifer Groundwater in Secondary A Aquifer/ surface watercourse	Yes	
Vapours associated with soil and groundwater contaminants and/or bulk ground gases (e.g. asphyxiation, toxicity, explosion and fire)	Migration along backfill around services, more permeable strata inhalation/explosion	Future on-site users (commercial)	Yes	
		Maintenance workers	Yes	

Please note that construction workers have not been identified in the conceptual model as receptors because risks are considered to be managed through health and safety procedures, such as the use of appropriate PPE, and application of the CDM Regulations.

2.7.5 Outline Risk Assessment Conclusions

The review of information and the construction of the Outline Conceptual Model highlights potential pollutant linkages. In order to investigate any unacceptable risk presented by these, intrusive investigation is recommended. An intrusive investigation will be able to provide further information on actual contaminants present and viable pathways to sensitive receptors.

2.8 Recommendations

Intrusive investigation is required to assess any significant contaminant sources, pathways and receptors. The redevelopment of the site will require consideration of the former use of the site in terms of any potentially contaminative processes that may have caused contamination of the ground and/or groundwater.



The objectives of an investigation are to:

- Clarify the ‘Outline Contamination Conceptual Model’
- Clarify the Outline Risk Assessment
- Provide data for the design of any remedial works that may be required
- Benchmark the contamination status of the site

To achieve these objectives, an investigation was undertaken comprising cable percussion and window sampling holes and trial pits. Where possible the exploratory holes passed through all made ground and into underlying natural soils. Also where possible, the holes extended beyond the base of any obvious soil contamination and where groundwater could be at risk, the holes attempted to reach groundwater level (alternatively the leachability of any soil contamination could be considered).



3 FIELDWORK

3.1 Scope of Works

The previous investigations undertaken by others comprised the following;

FES Investigation – six cable percussion boreholes (BH1-BH6) and eight trial pits (TP1-TP8)

RPS investigation - six cable percussion boreholes (BH1-BH6) and 14 trial pits (TP1-TP14)

The locations of these are shown on the Exploratory Hole Location Plan in Appendix A.

For the current phase of investigation 4 no. cable percussion boreholes (BH7 to BH14), 10 no. window percussive dynamic windowless sample exploratory holes (WS1 to WS7, WS17, WS25 and WS27) and 13 no. machine dug trial pits (TP12 to TP16 and TP18 to TP24) were completed between 17 and 26 June 2013 at locations shown on the Exploratory Hole Location Plan in Appendix A.

In-situ testing comprising California Bearing Ratio (CAR) tests and variable head permeability tests were also undertaken. In addition, 5 no. surface water samples (SS1, SS2, SS2 (upstream), SW1 and SW2) were collected from the stream that crosses the site.

The scope of investigation and choice of investigation equipment was decided by Structural Soils Limited. Sampling and in-situ testing details were specified by Structural Soils Limited.

The positions were selected by Structural Soils Limited, and adjusted where necessary to take account of buried or overhead services, or other restrictions. The positions of the exploratory holes were selected to target features of the proposed new development.

Hole Ref	Reason(s) for Hole Location
BH7	Located at position of proposed industrial unit.
BH8	As BH7
BH9	As BH7
BH10	As BH7
TP12	To recheck for hydrocarbons coming from the former u/g tanks area
TP13	As TP12
TP14	To recheck for hydrocarbons coming from the interceptor area
TP15	To identify the backfill to the former stream alignment
TP16	To target the former garages area
WS17	General coverage (replaced TP17)
TP18	To target a mound/stockpile
TP19	General coverage
TP20	To target the above-ground oil tank and electric sub-station
TP21	To target the approximate location of a former above-ground tank.



TP22	As TP21
TP23	To target the interceptor that served the Paint, Lub' and Wash Bays building
TP24	To determine the eastern extent of any hydrocarbons from the underground fuel tanks
TP25	Cancelled
TP26	To define western extent of hydrocarbon contamination from u/g fuel tanks
TP27	As TP26
WS1	At site boundary to intercept possible hydrocarbon contamination flow paths. Also to assess possible gases from nearby landfills
WS2	As WS1
WS3	As WS1
WS4	As WS1
WS5	As WS1
WS6	At site boundary to assess possible gases from nearby landfills
WS7	To permit a shallow well into the gravels (for hydrocarbon flow paths) to accompany BH10.

The far east of the site had always been occupied by cottages and associated land and thus given the lower risks there then no new exploratory holes were placed there

Permeability tests were undertaken in the boreholes at various depths to establish the permeability of various strata for possible groundwater DQRA (if our investigation found that such was required).

The exploratory holes were logged by an engineer in general accordance with the recommendations of BS5930: 1999 (2010 Amendment 2, which incorporates the requirements of BS EN ISO 14688-1, 14688-2 and 14689-1) and CIRIA Report C574 *Engineering in Chalk*. Detailed descriptions, together with relevant comments, are given in the logs included in Appendix B.

Prior to the commencement of any exploratory hole or intrusive test a cable avoidance scan was carried out using a cable avoidance tool (CAT) and signal generator ('genny'). Inspection pits were hand dug at exploratory locations where noted on the relevant exploratory hole logs or in-situ test results.

3.2 Cable Percussion Boreholes

The boreholes were drilled using a cable tool percussion drilling rig and were 150mm diameter. The depths of the boreholes were 20.00m and they encountered Made Ground and Gravel over the Chalk.

100mm diameter undisturbed samples were recovered from the cohesive strata in the boreholes and returned to the laboratory for testing. Small disturbed and bulk soil samples were taken from the boreholes at regular intervals. Water samples were taken at each water strike.



Standard Penetration Tests (SPT) were carried out at regular intervals in the boreholes (see Section 3.7, In-Situ Testing and Surveying).

3.3 Window Sampling

The window sample exploratory holes were drilled using a tracked rig with chain driven drop weight. Steel sample tubes containing a plastic sample liner were used, and were 87mm diameter at the surface reducing in diameter with depth. The exploratory holes were up to 3.00m deep and encountered Made Ground over Gravel.

Small disturbed and bulk soil samples were subsampled from the window samples at regular intervals.

3.4 Trial Pits

The trial pits were excavated using a mechanical excavator and were approximately 2.50m x 0.50m in plan area and up to 3.80m deep. The trial pits encountered Made Ground over gravel. Hand vane and/or pocket penetrometer tests were carried out in the cohesive strata in the trial pits. Small disturbed and bulk soil samples were taken from the trial pits at regular intervals. Measurements were also taken using a PID meter at regular intervals during excavation.

3.5 Chemical Contamination Sampling

Samples for contamination testing were taken from the exploratory holes and were placed in appropriate contamination sample containers that were supplied by the laboratory. Containers for volatiles testing of soil samples were filled to capacity. Any water sample containers (with preservatives where required) were filled to capacity to minimise volatilisation. All samples were then kept in cool boxes with ice packs and were transported to the laboratories under Chain of Custody documentation, as promptly as possible to maintain sample integrity.

3.6 Backfill, Monitoring Wells and Installations

On completion gas/groundwater monitoring wells were installed in all the boreholes and the majority of the window sample holes the design having been decided by Structural Soils. The installation details are shown on the exploratory hole logs in Appendix B.

The well details are also summarised below:

**TABLE 5: SUMMARY OF MONITORING WELL INSTALLATIONS**

Location	Well Diameter (mm)	Well Depth (m bgl)	Well Response Zone (m bgl)	Type of Cover	Notes
BH7	50	10.00	1.00-10.00	Stopcock	
BH8	50	10.00	1.00-10.00	Stopcock	
BH9	50	10.00	1.00-10.00	Stopcock	
BH10	50	10.00	2.50-10.00	Stopcock	
BH10	50	15.00	13.00-15.00	Stopcock	
WS1	40	3.00	1.00-3.00	Stopcock	
WS2	40	2.90	1.00-2.90	Stopcock	
WS3	40	3.00	0.50-3.00	Stopcock	
WS4	40	2.00	0.50-2.00	Stopcock	
WS5	40	3.00	0.50-3.00	Stopcock	
WS6	40	1.50	0.50-1.50	Stopcock	
WS7	40	2.60	1.00-2.60	Stopcock	
WS27	40	2.00	0.50-2.00	Stopcock	

The remaining window sample holes were backfilled with arisings. The trial pits were backfilled with arisings, compacted in layers by the excavator bucket.

3.7 In-Situ Testing and Surveying

Standard Penetration Tests (SPT) were carried out in the exploratory holes, where noted in the preceding sections, in accordance with BS EN ISO 22476-3 using a hammer which had been calibrated for efficiency. The calibration certificate is included in Appendix C.

The SPT N-values are reported on the exploratory hole logs, on which the serial number of the hammer used is recorded. . The full results are presented in tabular format on the Summary of Standard Penetration Tests in Appendix C, on which the normalised N_{60} values are also reported (equivalent N-value for a hammer delivering 60% of the theoretical drop energy). Plots showing both N and N_{60} values versus depth are also included.

7 no. in-situ CBR tests were undertaken using conventional test equipment mounted on a 4 wheel drive vehicle in accordance with BS1377 Part 4: 1990. The results are contained in Appendix C.

8 no. falling head permeability tests were undertaken in the boreholes in accordance with BS5930: part 4 (1999). The test results are present in tabular and graphical format in Appendix C.



3.8 Monitoring and Post Fieldwork Environmental Sampling

Gas concentrations and gas and groundwater levels were recorded in the monitoring wells on 3 and 17 July 2013 and 2 August. The results together with the temporal (weather) conditions are tabulated in Appendix G. At the time of writing 2no. further gas monitoring visits are still to be undertaken.



4 LABORATORY TESTING

Samples for potential geotechnical testing were returned to the company's laboratory in Bristol and those for potential contamination testing were sent to an accredited chemical testing laboratory. Geotechnical and contamination tests were scheduled by Structural Soils Ltd.

Geotechnical laboratory testing was generally carried out in accordance with BS1377: 1990, *Methods of Test for Soils for Civil Engineering Purposes*, Parts 1 to 8, unless indicated otherwise. Where non-standard procedures have been undertaken, this is recorded on the report sheet. The results are reported in tabular and/or graphical form and included as Appendix D of this report.

Contamination testing was carried out in accordance with MCERTs/UKAS standards. The results are reported in Appendix E of this report, along with the accreditation certificate for the laboratory.

4.1 Moisture Content

8no. moisture content tests were undertaken using the oven-drying method in accordance with BS1377: Part 2: 1990. The results are tabulated in the Summary of Soil Classification Tests and below the Plasticity Chart (see Section 4.2, below).

4.2 Liquid Limit, Plastic Limit and Plasticity Index

8no. liquid and plastic limit tests were performed in accordance with BS1377: Part 2: 1990. The results are plotted on the Plasticity Chart (in accordance with BS5930: 1999 Amendment 2) and tabulated below the chart, and in the Summary of Soil Classification Tests.

4.3 Saturation Moisture Content of Chalk

5no. saturation moisture contents were undertaken on representative samples of intact Chalk, in accordance with BS1377: Part 2: 1990. The results are tabulated in the Summary of Chalk Tests.

4.4 Particle Size Distribution

5no. particle size distribution tests were undertaken by sieving and were extended by sedimentation analysis using the hydrometer method. All tests were in accordance with BS1377: Part 2: 1990. The results are represented graphically as particle size distribution curves and in tabular format.



4.5 Chemical Analyses

2no. soil samples were tested to determine their pH values, water soluble sulphate, total acid soluble sulphate and total sulphur contents.

4.6 Contamination

8no. groundwater samples were obtained from the wells during the first return visit to site and were sent for testing. 2no. wells, BH10 and WS7 exhibited hydrocarbon contamination and so on the second site visit further samples were obtained from those wells using low-flow techniques. On this second visit no hydrocarbon indications were noted.

2no. surface water samples were taken from the stream (SS1 and SS2) and tested for W4 suite. The downstream sample was found to have elevated contaminants and these could be related to an outfall into the stream somewhere nearby which dealt with water from the “Paint Bay”, “Lub’ Bay” and “Wash Bay” in a nearby building. Re-sampling was thus undertaken on the second visit, at the original SS1 location as well up just upstream of where the outfall was believed to be (“SS2 upstream”).

SSL1 and SSL3 soil analysis suites and asbestos screens were spread across the site to provide site coverage. No potential ACM were noted in the holes.

The speciated PAH, TPHCWG/banded TPH and SOM tests were used to target known sources such as the above-ground oil tank, underground fuel tanks and 2no. interceptors. Samples were tested at ground level or at about groundwater level to check for migration of hydrocarbons.

The speciated PAH and total TPH tests on groundwater were to check for hydrocarbon migration. WS4 had insufficient sample and thus just VOCs were tested for.

The VOC test was undertaken on TP13 where we noted an acetone type odour.



5 GROUND CONDITIONS

5.1 General

The exploratory holes were logged by an engineer and the ground conditions encountered are detailed on the logs contained in Appendix B and are summarised below. In general they encountered Made Ground over a descending sequence of Alluvium, Head Gravel and Chalk.

5.2 Made Ground/Possible Made Ground/Topsoil

The made ground and Possible made ground varied in depth from 0.30m to greater than 2.60m, with a typical thickness of between about 1.00m and 1.50m. There does not appear to be any particular pattern to the thickness of made ground, it was generally thinnest in the south east and thickest in the central southern part of the site. It typically consisted of clayey or silty sands and gravels of chalk and flint, with minor amounts of anthropogenic material. Anthropogenic components of the made ground included brick, concrete, asphalt, clay pipe, tile, plastic and clinker. In addition chalk fill was found in several of the exploratory holes. The thickness and composition of the made ground found in the previous investigations was similar.

No suspected asbestos was encountered.

TP18 terminated at 1.45m on asphalt and concrete.

5.3 Alluvium

A relatively thin layer of clay was found directly beneath the made ground in TP20, TP22 and TP23. This was soft or firm, slightly sandy and slightly gravelly, and is taken to be Alluvium. It extended to a maximum depth of 1.80m (TP23) had a maximum thickness of 0.50m. A similar layer was found in several of the exploratory holes from the previous investigations. There appears to be no particular pattern to its distribution or thickness across the site.

5.4 Head Gravel

Below the made ground or Alluvium where present was a succession of clayey or silty sandy to very sandy gravels with varying cobble content. The gravel was predominantly flint, but included some chalk. The boreholes showed this material to extend to depths of between 9.00m (BH7) and 13.00m (BH9). Although extending to considerable depth, the whole of this stratum is assumed to be Head Gravel. SPT-N values show the gravels to be generally medium dense.



Previous boreholes showed the gravel to extend to broadly similar depths although in places its base was shallower. There does not appear to be any particular pattern to the variation in thickness of this stratum.

5.5 Upper Chalk

The Upper Chalk was encountered beneath the Head Gravel in all the boreholes from both this investigation and the previous investigations, and was proven to a maximum depth of 20.00m. SPT-N values ranged between 14 and 32, with a general increase with depth. Laboratory testing has shown the chalk to be of high density according to CIRIA C574.

5.6 Groundwater

The boreholes had water added to them to aid drilling and so no definitive groundwater strikes were noted. In the trial pits and window sample holes, groundwater was generally encountered at depths of between 1.50m and 2.30m. During the monitoring period, standing water levels were recorded in the standpipes at depths of between 1.41m and 2.07m.

5.7 Indications of Contamination

Previous investigations found the following indications:

TABLE 6: OLFACTORY OR VISUAL INDICATIONS OF CONTAMINATION			
Location of contamination:	Hole(s) noted in:	Depth (m) (range):	Comments (e.g. staining, odours (inc strength), sheens, free product, etc):
Made Ground	TP12	1.30-2.50	Hydrocarbon odour
	-	-	-
Possible made ground	-	-	-
	-	-	-
Alluvium/Head Gravel	-	-	-
	-	-	-
Chalk	-	-	-
	-	-	-
Groundwater	-	-	-



Our investigation found the following:

TABLE 7: OLFATORY OR VISUAL INDICATIONS OF CONTAMINATION			
Location of contamination:	Hole(s) noted in:	Depth (m) (range):	Comments (e.g. staining, odours (inc strength), sheens, free product, etc):
Made Ground	TP13	0.15-0.35	Acetone odour
	WS3	0.20-0.90	Light organic odour
Possible made ground	WS7	1.90-2.60	Strong hydrocarbon odour
	WS25	1.60-2.90	Strong hydrocarbon odour
Alluvium/Head Gravel	TP14	1.40	Strong hydrocarbon odour
	TP26	1.60-3.00	Strong hydrocarbon odour
Chalk			
Groundwater			
3 July monitoring visit	WS7	2.02	Cloudy to clear, light hydrocarbon odour
	BH10 (10m, Head Gravel)	2.01	Oily odour
17 July monitoring visit	WS7	2.07	Clear and odourless
	BH10 (15m, Chalk)	2.04	Clear and odourless



6 DISCUSSION AND RECOMMENDATIONS

6.1 Proposed Development / Purpose of Investigation

The proposed development will, it is understood, comprise industrial units including offices and parking areas.

6.2 Site Preparation and Excavation

The soils encountered at the site are considered suitable for excavation by standard mechanical plant such as a wheeled backhoe excavator. A hydraulic breaker may be required to break out any hard cover or buried foundations that remain following demolition.

Where trees are removed to facilitate construction, the root boles should be grubbed out to prevent re-growth. Any resulting voids from this operation should be backfilled with an acceptable, adequately compacted fill.

Our site works indicate that groundwater ingress into excavations to the recommended founding depths (or into services excavations, etc) is likely. Inflows are likely to be controllable by sump pumping. Advice on suitable dewatering techniques is given in CIRIA Report C515 *Groundwater Control – design and practice*.

Also, our site works revealed that unsupported excavations to the recommended founding depths (or services excavations, etc) are likely to be unstable in the short term. All excavations should be planned and due consideration should be given to providing temporary support or suitable battering. Excavations should be regularly inspected by a competent person to ensure continued safety. Further advice on the safety of excavations is given in *Health and Safety in Construction*.

Excavations or below ground voids should be checked for the presence of harmful gases and vapours (e.g. hydrocarbons and solvents) prior to personnel entry.

6.3 Shrinkage and Swelling

Atterberg Limits tests performed on samples taken from the made ground and Alluvium showed them to be of groups CL to MH as defined in BS 5930:1999. After correction where necessary for their >0.425mm fraction, the samples of made ground show non to low volume change potentials and the samples of Alluvial clay show low to medium volume change potentials with changes in moisture content, according to the criteria of NHBC Standards, Chapter 4.2 *Building Near Trees*.



Based on these results, it is recommended that a low volume change potential be assumed for the made ground clay and a medium volume change potential for the Alluvial clay for design purposes. The chalk fill and granular soils are non shrinkable.

6.4 Foundations

The made ground is variable in thickness and is considered unsuitable for supporting major foundation loads, due to its potential unreliable bearing capacity and settlement characteristics. The Alluvial clay is typically of low strength, likely to be of high compressibility and patchy in its distribution so is also considered unsuitable for supporting major foundation loads.

Conventional shallow strip or pad foundations may be constructed upon the Head Gravel that was typically encountered at depths of between about 1.00m and 2.00m. This formation should offer a net allowable bearing capacity of about 200kN/m² for strip foundations up to 1.00m wide, and a net allowable bearing capacity of 285kN/m² for pad foundations up to 2.00m wide, placed at a depth of 1.00m.

Foundations should be designed in accordance with the NHBC Standards. If foundations are taken through the made ground and Alluvial clay, then no particular precautions should be necessary against shrinkage and swelling.

During excavation of the trial pits and window sample holes, groundwater was generally observed below the top of the gravel (although not in every case). However, subsequent monitoring of the standpipes in many instances recorded groundwater levels above the top of the gravel. If strip and pad foundations are being considered then de-watering and shoring of excavations would be required. For this reason strip and pad foundations are not generally recommended.

As an alternative, consideration could be given to using piled foundations. Given the thickness of gravel, the most appropriate pile type would be driven piles. The following ultimate values for skin friction and end bearing may be used to carry out a preliminary design for driven piles. The strata depths are based on those encountered in BH10, whereas the SPT-N values are averaged over all four boreholes. It should be borne in mind that the thickness of gravel varies between boreholes, with its base being recorded at a maximum of 13.00m (BH9) and a minimum of 6.60m (BH1(FES)).

**TABLE 8: PRELIMINARY DESIGN VALUES FOR PILE DESIGN**

Depth (m bgl)	Ultimate Unit Skin Friction (kN/m ²)	Ultimate Unit End Bearing (kN/m ²)	Description
0.00-2.50	Ignore	Not recommended	Made Ground (and possible Alluvial Clay)
2.50-5.50	30 ¹	2300 ²	GRAVEL - N=23
5.50-10.50	45 ¹	3400 ²	GRAVEL - N=20
10.50-15.00	30	6000	CHALK – N=20
15.00-20.00	30	8400	CHALK – N=28

Notes:

1. Coefficient of horizontal soil stress, K_s , of 1, and angle of pile/soil friction, δ , of $0.75 \times \phi'$ used to derive this value.
2. Bearing capacity factor, N_q , of 35-40 used to derive these values.
3. Values in chalk based on methods given in CIRIA C574.

When calculating the allowable working load of piles, a factor of safety of 2.5 should be applied to the above ultimate values for skin friction and end bearing. It should be noted that CIRIA C574 gives limits on allowable end bearing.

As the capacity of piles can vary depending on the type and method of installation, we recommend that the advice of specialist piling contractors be sought with regard to the final design of piles. Consideration should also be given to undertaking loading tests on selected piles.

6.5 Floor Slabs

Because the made ground is predominantly granular and the Alluvial clay is of limited thickness and extent, lightly loaded ground bearing floors slabs could be used at this site provided that the formation is proof-rolled and any soft spots are excavated out and replaced with suitably compacted granular fill.

6.6 Soakaway

Given the shallow depth of the groundwater, it is considered that the site is generally unsuitable for the use of soakaways.

6.7 Pavement Design

In-situ CBR tests were carried out using conventional vehicle mounted equipment, at a depth of 0.30m in chalk, clay and gravel fill. Tests carried out on the gravel and compact chalk fill gave results of between 16% and >32% and based on these test results we recommend using a CBR value of 15% for pavement design. Lower test results were obtained on the clay fill and poorly compacted chalk fill. Given that these soils are of limited extent, it is recommended that where



present they are treated as soft spots and are removed and replaced with suitably compacted granular fill.

It should be noted that Atterberg Limit Tests (undertaken on the near-surface clay soils) indicate that the soils encountered are likely to be frost susceptible. The chalk fill will also be frost susceptible. It is therefore recommended that at least 450mm cover should be provided above the sub-grade, or 350mm if the Mean Annual Frost Index (MAFI) of the site is less than 50.

6.8 Protection of Buried Concrete

The site is classed as brownfield and groundwater is assumed to be mobile. Soil pH values varying from 7.71 to 11.13 were recorded. Groundwater pH results ranged from 6.95 to 7.78. From these results a 'Characteristic Value' of 7.34 is derived.

The water-soluble sulphate results range from 10mg/l to 210mg/l. The 'Characteristic Value' is therefore 170mg/l and this falls into Design Sulphate Class DS-1 in Table C2 of BRE Special Digest 1 (SD1). The groundwater sulphate results range from 16mg/l to 152mg/l and the maximum result falls into Class DS-1.

As the Alluvium at the site may be potentially pyritic, and assuming that the concrete (e.g. foundations, drainage pipes, etc) may be exposed to disturbed ground in which pyrite may oxidize to sulphate, the oxidisable sulphide content of the soils must be calculated, using the total sulphur and acid soluble sulphate results. None of the oxidisable sulphide contents exceed the 0.3% level given in the Digest and thus pyrite is probably not present.

Therefore according to Table C2 the Aggressive Chemical Environment for Concrete (ACEC) class is AC-1. The designer should utilise this class in order to produce the concrete specification.

6.9 Radon

BRE Report 211 is the current guidance to the building industry and is referred to in the Building Regulations. The report applies to residential development. New residential buildings in certain areas may require basic or full radon protection. Basic protection consists of a radon-proof barrier across the ground floor. Full radon protection consists of a radon proof barrier across the ground floor supplemented by either a radon sump or a ventilated subfloor void.

There is no guidance for the construction of commercial buildings. The Ionising Radiation Regulations require that radon levels in the workplace are maintained below 400Bq/m³, but clearly this cannot be checked until after construction.



6.10 Contamination - Soil

6.10.1 Risk to Human Health

General

To determine whether contaminants are present at levels that may be deemed to pose a significant hazard to human health, measured contamination levels in soil at the site are compared against derived guideline values ('Tier 2' soil screening), either directly or following statistical analysis. Where contaminants are present above the screening values it is probable that site-specific information will be required to further examine the potential risk of harm arising from such contamination.

The background to the assessment is contained in Appendix F and the findings are summarised in the following pages.

Results

Olfactory or visual indications of contamination are detailed in Section 5.

Contaminants assessed against the GACs are: arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, Polycyclic Aromatic Hydrocarbons (PAH) & Total Petroleum Hydrocarbons (TPH).

All the results were below the human health guidelines for commercial use.

No PCB or VOC were found.

Conclusions

The investigation has shown contaminant levels in the soil to be below the assessment criteria, which indicates that no risks to human health have been identified.

6.10.2 Risks to Water Supply Pipes (Brownfield)

General

Some of the TPH results in soil exceed the guidelines for polythene water pipes (TP26, WS7, WS1, TP14, TP23, TP21, TP16, TP18 and WS25).



6.10.3 Risks to Groundwater

General

The site lies over Principal and Secondary 'A' Aquifers. It does not lie in a Source Protection Zone. The respective GAC are presented in Appendix F. In line with the Environment Agency's Remedial Targets Methodology, the GAC for controlled waters are termed 'Target Concentrations' (TC).

Results

The results exceeding the Target Concentrations are summarised below:

Samples taken 21 June 2013 (Surface Water)

Location	Contaminant	Result	Drinking Water Std	Freshwater EQS	Notes
SS2	Copper	34	(2000)	28	
	Lead	74	10	7.2	
	Zinc	148	(5000)	125	
	Fluoranthene	1.37	-	0.1	
	Pyrene	0.99	-	0.04	
	Benzo(a)anthracene	0.15	-	0.018	
	Chrysene	0.37	-	0.01	
	Benzo(b)fluoranthene	0.57	0.1	0.03	
	Benzo(k)fluoranthene	0.29	0.1	0.03	
	Benzo(a)pyrene	0.3	0.01	0.05	
	Indeno(123cd)pyrene	0.16	0.1	0.002	
	Benzo(ghi)perylene	0.18	0.1	0.002	

Units are ug/l

These samples were taken using a bailer and the PAH results in particular suggest that sediment may have been disturbed and included in the sample.

Samples taken 3 July 2013 (Borehole Water)

Location	Contaminant	Result	Drinking Water Std	Freshwater EQS	Notes
BH8	Chromium	24	50	4.7	
WS5	Arsenic	12	10	50	
WS3	Chromium	16	50	4.7	
WS3	TPH (C5-8)	39	10	10	
WS1	Pyrene	0.1	-	0.04	
	Benzo(a)anthracene	0.02	-	0.018	
	Chrysene	0.06	-	0.01	

Units are ug/l



Samples taken 17 July 2013 (Borehole Water and Surface Water)

Location	Contaminant	Result	Drinking Water Std	Freshwater EQS	Notes
SS2 SS2 upstream WS7 BH10 (15m)	No exceedances				

Units are ug/l

Samples taken 12 August 2013 (Borehole Water, low flow)

Location	Contaminant	Result	Drinking Water Std	Freshwater EQS	Notes
WS1	Chromium	6	50	4.7	
BH10 (10m)	Chromium	8	50	4.7	
WS5	Mercury	0.2	1	0.05	
BH10 (10m)	Mercury	0.5	1	0.05	
WS1	Benzo(g,h,i)perylene	0.02	0.1	0.002	

Units are ug/l

Conclusions

The use of the low-flow water sampling technique (as opposed to samples taken using a bailer) has indicated that there is no significant hydrocarbon contamination. There are no metal or semi-metal contaminants which exceed drinking water standards, although there are slight exceedances of freshwater EQS for chromium and mercury. However these exceedances are not impacting the critical receptor: the Harts Farm Stream which flows through the site, and therefore they are not considered significant.

6.11 Ground Gases

General

In order to assess the significance of ground gases at the site, measured concentrations (by volume in air) and flow rates have been used to generate Gas Screening Values (GSVs). These have then been compared to the Revised Wilson and Card Classification presented within CIRIA Report 665.

It is recommended that the gas risk should be assessed by the consideration of pathways to human receptors as follows:

- Gas entering the building through the substructure and building up to hazardous levels.



Results

The following ground gas parameters have been recorded over the 2 no. gas monitoring rounds (to date):

- A maximum ‘initial’ methane concentration of 0.1%;
- A maximum ‘steady state’ carbon dioxide concentration of 15.3%;
- A maximum ‘initial’ flow rate of 0.9l/hr; and
- A maximum ‘steady state’ flow rate of 0.5l/hr.

The worst case Gas Screening Values (GSV) for both methane and carbon dioxide have been calculated. In accordance with NHBC guidance for methane the GSV is calculated using the peak concentration and flow and for carbon dioxide the residual concentrations and flow rates are used.

Three further monitoring visits are planned.

Conclusion

GSVs for methane and carbon dioxide have been calculated to be 0.00 l/hr and 0.08 l/hr respectively.

Therefore the site falls just into ‘Characteristic Situation’ 2 in Table 8.5 of CIRIA 665. Therefore Table 8.6 of CIRIA 665 indicates that special protection measures may be required in the new buildings. These would comprise an underfloor vented void, a gas resistant membrane, and sealing around service entries.

6.12 Contamination Conclusion

Soil/Groundwater/Ground Gas contamination has been recorded at the site resulting in complete pollutant linkages.

The linkages are summarised below:

- The soil results show several exceedances of the UKWIR water pipes guidelines for TPH.
- The gas monitoring to date shows some elevated carbon dioxide levels indicating that passive gas protection may be required.



The soil test results were all below the human health guidelines for commercial development.

Therefore the following Generic Quantitative Risk Assessment (GQRA) has been carried out in order to assess the risk to the future end users and the environment.

6.13 Generic Quantitative Risk Assessment (GQRA) and Final Conceptual Site Model

6.13.1 General

This section of the report aims to refine the ‘Initial Contamination Conceptual Model’, in the light of the findings of the ground investigation. The methodology used to assess the risk is presented in Appendix F.

6.13.2 Final Conceptual Site Model

The complete linkages and current resulting risks have been identified and are presented in the table below:

FINAL CONCEPTUAL MODEL				
Source - Soil	Pathway	Receptor	Probability & Consequence	Risk
	Permeation	Subsurface water pipes	Low likelihood, Medium	Moderate/low
Source - Ground Gas	Pathway	Receptor	Probability & Consequence	Risk
	Migration along backfill around services, more permeable strata inhalation/ explosion	Future on-site users (commercial)	Unlikely, Severe	Moderate/low
		Maintenance workers	Unlikely, Severe	Moderate/low

Please note that construction workers have not been identified in the conceptual model as receptors because risks are considered to be managed through health and safety procedures, such as the use of appropriate PPE, and application of the CDM Regulations.

6.14 Remediation and Risk Reduction Recommendations

The Local Environmental Health Officer (and the NHBC if involved) will usually require a ‘Validation Report’ to confirm that all risk reduction strategies recommended below, and any others subsequently required, have been undertaken.

6.14.1 Water Pipes

The soil TPH results show several exceedances of the UKWIR water pipes guidelines for polythene pipes. Therefore PVC or other alternative pipes may be required and the water company should be contacted in this respect.



6.14.2 Ground Gas and Vapours

The gas monitoring to date shows some elevated carbon dioxide levels indicating that passive gas protection may be required. These would comprise an underfloor vented void, a gas resistant membrane, and sealing around service entries.

These measures would also be likely to protect the buildings against any residual hydrocarbon vapours or odours from the ground.

6.14.3 Underground Structures

We recommend that all of the underground tanks, their vent pipes, filling pipes, etc, be properly removed in line with recognised procedures, using a specialist contractor having sufficient and suitable experience in such work. It is possible that soil or water contaminated by leakages from the tanks could be found and this should also be removed and disposed of appropriately.

It will be necessary to take further samples for testing from the soils around the tanks at that stage and the resulting excavations must not backfilled until results are available and have been assessed.

6.14.4 Unforeseen Risks During Development

Given the existence of made ground on the site it would be prudent to maintain vigilance during site clearance and construction, in case any further areas of suspected contamination are encountered. If areas are found then a suitably qualified person should undertake appropriate sampling, testing and further risk assessment.

6.14.5 Site Worker Safety

Site, landscape and maintenance workers should wear gloves, boots and overalls and wash their hands before eating, drinking and smoking. Excessive dust generation should be avoided.

6.15 Off-site Disposal of Surplus Soil

6.15.1 General

All excavated material and excess spoil must be classified for waste disposal purposes prior to disposal at landfill. Under the Landfill (England and Wales) Regulations 2002 (as amended), prior to disposal all wastes must be classified as:

- ‘inert’, or
- ‘non-hazardous’, or



- ‘hazardous’.

The Environment Agency’s *Hazardous Waste (Technical Guidance WM2)* document outlines the methodology for classifying wastes.

Currently all wastes may require pre-treatment prior to disposal at landfill.

6.15.2 Initial Waste Characterisation

EnviroLab have produced an assessment tool that characterises contaminated waste soil by following the guidance within WM2. The ‘total solid testing’ results from this investigation have been run through this assessment tool to aid potential future off-site disposal of materials. This assessment produces an ‘initial’ characterisation of the waste which determines if it is hazardous or not (if it is ‘not’ hazardous, then it may be either inert (insoluble and inorganic) or non-hazardous. However, due to complications with the terminology of ‘inert waste’ it is best not to refer to it as such until after Waste Acceptance Criteria testing).

Any samples that are classed as hazardous will have light cells with bold text, in the respective sample columns (assuming results are in black & white, otherwise yellow cells on a colour copy). The results are summarised as follows:

The initial waste characterisation shows that generally the samples tested are not classed as hazardous for disposal. There were two exceptions: WS1 at 0.5m and WS2 at 1.6m which are classed as hazardous (both due to TPH C25+ and PAH).

It is important to note that whilst we believe our in-house assessment tool to be an accurate interpretation of the requirements of WM2, thereby producing initial classifications in accordance with it, landfill operators often have their own assessment tools and can often come to a different conclusion. As a result, some landfill operators could even refuse to take apparently suitable waste.



7 SUMMARY

- 7.1** It is understood the site is to be developed for new industrial units including offices and parking areas.
- 7.2** This investigation has revealed predominantly granular made ground (with some clay and chalk fill), typically to depths of between 1.00m and 1.50 m (although deeper in places) over medium dense gravel (Head Gravel). Locally a thin layer of Alluvial clay is present on top of the gravel. The gravel extends to between 9.00m and 13.00m, beneath which is the Chalk.
- 7.3** Standing water levels were recorded in the standpipes at depths of between 1.41m and 2.07m.
- 7.4** The soils encountered at the site are considered suitable for excavation by standard mechanical plant such as a wheeled backhoe excavator. A hydraulic breaker may be required to break out any hard cover or buried foundations that remain following demolition. Unsupported excavations to the recommended founding depths (or services excavations, etc) are likely to be unstable in the short term.
- 7.5** Excavations or below ground voids should be checked for the presence of harmful gases and vapours (e.g. hydrocarbons and solvents) prior to personnel entry.
- 7.6** A low volume change potential should be assumed for the made ground clay and a medium volume change potential for the Alluvial clay for design purposes. The chalk fill and granular soils are non shrinkable.
- 7.7** Conventional shallow strip or pad foundations may be constructed upon the Head Gravel that was typically encountered at depths of between about 1.00m and 2.00m. This formation should offer a net allowable bearing capacity of about 200kN/m² for strip foundations up to 1.00m wide, and a net allowable bearing capacity of 285kN/m² for pad foundations up to 2.00m wide, placed at a depth of 1.00m. If such foundations are being considered then de-watering and shoring of excavations would be required. For this reason strip and pad foundations are not generally recommended.
- 7.8** Preliminary design values for piles are given in section 6.4.
- 7.9** Because the made ground is predominantly granular and the Alluvial clay is of limited thickness and extent, lightly loaded ground bearing floors slabs could be used at this site



provided that the formation is proof-rolled and any soft spots are excavated out and replaced with suitably compacted granular fill.

- 7.10** Given the shallow depth of the groundwater, it is considered that the site is generally unsuitable for the use of soakaways.
- 7.11** A CBR value of 15% is recommended for pavement design. The soils are likely to be frost susceptible.
- 7.12** The Aggressive Chemical Environment for Concrete (ACEC) class is AC-1.
- 7.13** The soil TPH results show several exceedances of the UKWIR water pipes guidelines for polythene pipes. Therefore PVC or other alternative pipes may be required and the water company should be contacted in this respect.
- 7.14** The groundwater analysis undertaken has not identified any significant risk to water resources.
- 7.15** The gas monitoring to date shows some elevated carbon dioxide levels indicating that passive gas protection may be required. These would comprise an underfloor vented void, a gas resistant membrane, and sealing around service entries. These measures would also be likely to protect the buildings against any residual hydrocarbon vapours or odours from the ground.
- 7.16** We recommend that all of the underground tanks, their vent pipes, filling pipes, etc, be properly removed in line with recognised procedures, using a specialist contractor having sufficient and suitable experience in such work. It is possible that soil or water contaminated by leakages from the tanks could be found and this should also be removed and disposed of appropriately. It will be necessary to take further samples for testing from the soils around the tanks at that stage and the resulting excavations must not backfilled until results are available and have been assessed.
- 7.17** Given the existence of made ground on the site it would be prudent to maintain vigilance during site clearance and construction, in case any further areas of suspected contamination are encountered. If areas are found then a suitably qualified person should undertake appropriate sampling, testing and further risk assessment.



- 7.18** Site, landscape and maintenance workers should wear gloves, boots and overalls and wash their hands before eating, drinking and smoking. Excessive dust generation should be avoided.
- 7.19** The initial waste characterisation shows that generally the samples tested are not classed as hazardous for disposal. There were two exceptions: WS1 at 0.5m and WS2 at 1.6m which are classed as hazardous (both due to TPH C25+ and PAH).

STRUCTURAL SOILS LIMITED

J Southern BSc (Hons) MSc FGS

S Pond BSc CChem MRSC

A Cattell BSc PhD CGeol FGS



8 REFERENCES

- 8.1 BS 5930:1999 *Code of Practice for Site Investigation*, including amendment A2 (2010)
- 8.2 BS 10175: 2011 *Investigation of potentially contaminated sites: Code of practice*
- 8.3 *Harts Farm Way depot, Harts Farm Way, Havant, Phase 1 desk Study and Phase 2 Site Investigation report*, for Edgmond Holding Limited, dated September 2007, ref JER3835, by RPS Ltd
- 8.4 *Harts Farm Depot, Havant, Factual Report on Ground Investigation* for Robert West Consulting, dated 5 July 2002, ref B01429, by Foundation & Exploration Services Ltd
- 8.5 British Geological Survey sheet Fareham 316 scale 1:50,000, published 1998
- 8.6 Environment Agency website, www.environment-agency.gov.uk
- 8.7 Hampshire Country Council website, www.hants.gov.uk
- 8.8 BS EN 1997-1:2004 *Eurocode 7 — Geotechnical design — Part 1: General rules*
- 8.9 BS EN 1997-2:2007 *Eurocode 7 — Geotechnical design — Part 2: Ground Investigation and testing*
- 8.10 BS EN ISO 22475-1:2006 *Geotechnical investigation and testing — Sampling by drilling and excavation and groundwater measurements — Part 1: Technical principles of execution*
- 8.11 BS EN ISO 14688-1:2002 *Geotechnical investigation and testing – Identification and classification of soil: Part 1: Identification and description*
- 8.12 BS EN ISO 14688-1:2004 *Geotechnical investigation and testing – Identification and classification of soil: Part 2: Principles for a classification*
- 8.13 BS EN ISO 22476-3:2005 (updated February 2007) *Geotechnical Investigation and Testing – Field Testing Part 3: Standard Penetration Test*, including Amendment A1 (2011)
- 8.14 BS 1377:1990 *Methods of Test for Soils for Civil Engineering Purposes*
- 8.15 CIRIA Report C574 *Engineering In Chalk* (2002) *Health and Safety in Construction*, HSG150, HSE, 1996



- 8.16** CIRIA Report C515 (2000) *Groundwater Control – design and practice*
- 8.17** NHBC Standards, Chapter 5.1, 2012 *Substructure and ground bearing floors*
- 8.18** NHBC Standards, Chapter 4.2, 2012 *Building Near Trees*
- 8.19** BRE Special Digest 1 (SD1)(2005) *Concrete in Aggressive Ground Part 1: Assessing the aggressive chemical environment*. Third Edition
- 8.20** BRE Report 211 (2007) *Radon: Guidance on Protective Measures for New Dwellings*
- 8.21** Environment Agency Policy. Part IIA – *Detailed Quantitative Assessment of Chronic Risks to Human Health from Contaminated Soils*. Policy Number 199_04, dated 9 March 2004
- 8.22** Environment Agency Science Report SR2: *Human health toxicological assessment of contaminants in soil* (Final SC050021/SR2).
- 8.23** Environment Agency Science Report SR3: *Updated technical background to the CLEA model* (Final SC050021/SR3).
- 8.24** R & D Publication CLR 11 (September 2004). *Model Procedures for the Management of Contaminated Land*. Contaminated Land. Environment Agency
- 8.25** The Water Supply (Water Quality) Regulations 2000, DoE
- 8.26** UK Water Industry Research (2010) UKWIR Report 10/WM/03/21. *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (London: UKWIR).
- 8.27** CIRIA C552, *Contaminated Land Risk Management; A Guide to Good Practice*, 2001
- 8.28** CIRIA Report C665 *Assessing risks posed by hazardous ground gases to buildings*, London, 2007
- 8.29** *Hazardous Waste: Interpretation of the Definition and Classification of Hazardous Waste*, Environment Agency, WM2 Version 1.0, June 2003 *Landfill (England & Wales) Regulations 2002*

APPENDIX A

- (i) Site Location Plan
- (ii) Exploratory Hole Location Plan
- (iii) Proposed Development Plan



Contains Ordnance Survey data © Crown copyright and database right 2013

STRUCTURAL SOILS LIMITED



The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Tel: 0117 947 1000
Fax: 0117 947 1004
ask@soils.co.uk
www.soils.co.uk

CLIENT

Begg (Nominees) Ltd

PROJECT

Harts Farm Way, Havant

TITLE

SITE LOCATION MAP

00	23.07.2013	-	JAH	JS	-
REV.	DATE	DESCRIPTION	BY	CHD.	APR.
DIMENSION		SCALE	DRAWING STATUS		
m		1:25,000	-		

CONTRACT No	GRID REFERENCE	SCALE BAR	ORIGIN SIZE	FIGURE No
727927	SU 707 058		A4	1

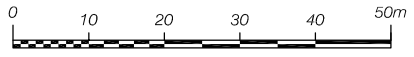


LEGEND (Historic Investigations)

- ☒ Trial Pit Location
- ⊙ Borehole Location

LEGEND (Current Investigation)

- ☒ Trial Pit Location
- ⊙ Window Sample Location
- ⊗ Borehole Location
- ✕ Surface Water Samples
- ▲ Insitu CBR Test

00	23.07.2013	-	JAH	AP	JS
REV.	DATE	DESCRIPTION	BY	CHD.	APR.
DIMENSION		SCALE	ORIGIN SIZE		
m		1:1000	A3		
STRUCTURAL SOILS LIMITED					
					
The Old School Stillhouse Lane Bedminster Bristol BS3 4EB					
Tel: 0117 947 1000 Fax: 0117 947 1004 ask@soils.co.uk www.soils.co.uk					
CLIENT					
Begg (Nominees) Ltd					
PROJECT					
Harts Farm Way, Havant					
TITLE					
EXPLORATORY HOLE LOCATION PLAN					
JOB NO.		FIGURE			
727927		2			
DRAWING STATUS					REV.
-					00
					

APPENDIX B

- (i) Key to Exploratory Hole Logs
- (ii) Borehole Logs
- (iii) Trial Pit Logs
- (iv) Window Sample Logs



KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF ABBREVIATIONS

SAMPLING

Sample type codes

B	=	Bulk disturbed sample.
D	=	Small Disturbed sample.
DSPT	=	
ES	=	Soil sample for environmental testing.
U	=	Undisturbed driven tube sample - Number of blows indicated. % recovery reported.
W	=	Water sample.

IN-SITU TESTING

SPT ^(c)	=	Standard Penetration Test using a solid 60 degree cone.
SPT	=	Standard Penetration Test using split spoon sampler. (SPT _(NR) indicates 'No Sample Recovery').
	=	* denotes extrapolated N value. NP denotes 'No Penetration'.
PID	=	Photo Ionisation Detector Results, in ppm.

ADDITIONAL NOTES

1. All soil and rock descriptions and legends in general accordance with BS EN ISO 14688-1, 14688-2, 14689-1, and BS5930:1999 including Amendment 2 (2010).
2. Material types divided by a broken line (- - -) indicates an unclear boundary.
3. The data on any sheet within the report showing the AGS icon is available in the AGS format.



KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF GRAPHIC SYMBOLS

WATER COLUMN SYMBOLS



First water strike, second water strike etc.

Standing water level following first strike, standing water level following second strike etc.

Seepage.

Standing water level recorded at documented date.

MATERIAL GRAPHIC LEGENDS



Chalk



Clayey
SAND



Clayey
sandy
GRAVEL



Clayey
sandy
GRAVEL
with
COBBLES



GRAVEL



MADE
GROUND



Possible
MADE
GROUND



Sandy
GRAVEL
with
COBBLES



Sandy
gravelly
CLAY



Sandy
gravelly
CLAY
with
COBBLES



Silty
gravelly
SAND



Silty sandy
GRAVEL



Silty sandy
GRAVEL
with
COBBLES

INSTRUMENTATION SYMBOLS



Backfill



Bentonite
seal



Concrete



Gravel
filter



Stopcock
cover



Plain pipe



Slotted
pipe



STRUCTURAL SOILS

BOREHOLE LOG

Contract: Harts Farm Way, Havant		Client: Upton McGougan		Borehole: BH7
Contract Ref: 727927	Start: 19.06.13 End: 21.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 3

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.70	1	B				MADE GROUND: Macadam.	0.10	
						MADE GROUND: Light brown clayey very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of chalk, flint, brick, concrete. Low cobble content of concrete.	(0.90)	
1.00	2	D				MADE GROUND: Dark grey very clayey sandy angular to subrounded fine to coarse GRAVEL of chalk, flint.	1.00	
1.20-1.65	3	SPT	N=13				1.20	
1.20	3	DSPT				Medium dense creamish brown silty SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint, chert and quartzite.		
1.20-1.80	4	B				(HEAD GRAVEL)		
2.00-2.45	5	SPT	N=22					
2.00	5	DSPT						
							(2.80)	
2.60	6	D						
3.00-3.95	7	U	45 blows					
3.00-3.50	8	B						
							4.00	
4.00-4.45	10	SPT	N=22			Medium dense multicoloured silty very sandy angular to subangular fine to coarse GRAVEL of flint, chert and quartzite. Sand is fine to coarse. Low cobble content of flint.		
4.50	11	D				(HEAD GRAVEL)		
5.00-5.40	12	U	50 blows					
5.00-5.50	13	B						
							(5.00)	
6.00-6.45	14	SPT	N=27					
6.00	14	DSPT						
6.50	15	D						
7.00	16	D						
7.50-7.95	17	SPT	N=15					
7.50	17	DSPT						
8.00	18	D						
8.50	19	D						
							9.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
20/06/13	17:00	9.00	9.00	200	4.00				
21/06/13	17:00	20.00	19.50	150	4.00				
All dimensions in metres									Scale: 1:50
Method Used: Cable percussion			Plant Used: Dando 2000			Drilled By: AR		Logged By: APope	Checked By: JS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Borehole: BH7	
Contract Ref: 727927	Start: 19.06.13 End: 21.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 3	

Samples and In-situ Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
Depth	No	Type	Results				
9.00-9.45 9.00 9.00-9.50	20 20 21	SPT DSPT B	N=14		Medium strong medium density creamish white CHALK recovered as silty slightly sandy subangular to subrounded fine to coarse gravel with medium cobble content. rare rinded flint. (UPPER CHALK FORMATION)	(3.00)	
10.00	22	D					
10.50-10.95	23	U	24 blows				
11.00	24	D					
11.50	25	D					
12.00-12.45 12.00 12.50	26 26 27	SPT DSPT D	N=14		Medium strong high density creamish white CHALK recovered as coarse gravel with medium cobble content. Frequent rinded flint. (UPPER CHALK FORMATION)	12.00	
13.00	28	D					
13.50-14.00 13.50-14.00	29 30	U B	29 blows				
15.00-15.45 15.00	31 31	SPT DSPT	N=24				
15.50	32	D					
16.00	33	D					
16.50-16.90 16.90	34 35	U D	29 blows				
17.50	36	D					

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Borehole: BH7
Contract Ref: 727927	Start: 19.06.13 End: 21.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 3 of 3

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
18.00-18.45	37	SPT	N=30			Medium strong high density creamish white CHALK recovered as coarse gravel with medium cobble content. Frequent rinded flint. (UPPER CHALK FORMATION) <i>(stratum text copied from layer at 12.00m depth from previous sheet)</i>		
18.00	37	DSPT						
18.50	38	D						
19.00	39	D						
19.50-19.95	40	U	45 blows					
19.50-20.00	41	B						
							20.00	
Borehole terminated at 20.00m depth.								

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
All dimensions in metres									Scale: 1:50
Method Used: Cable percussion	Plant Used: Dando 2000		Drilled By: AR		Logged By: APope		Checked By: JS		AGS



Contract:	Harts Farm Way, Havant		Client:	Upton McGougan		Borehole:	BH8	
Contract Ref:	727927		Start:	17.06.13	Ground Level	Co-ordinates:	Sheet:	1 of 3
			End:	18.06.13	---	---		

Samples and In-situ Tests				Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results				
0.10-0.60	1	B			MADE GROUND: Tarmacadam.	0.10	
0.50	1a	ES			MADE GROUND: Orangish yellow silty SAND and GRAVEL with low cobble content of rinded flint. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint, chert, macadam and concrete.	(0.50)	
0.60-1.10	2	B			MADE GROUND: Chalk fill. Creamish white silty slightly sandy subangular to subrounded fine to coarse GRAVEL of chalk with low cobble content of the same.	0.60	
1.00	2a	ES			Loose light orangish yellow clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of rinded flint and chert.	(0.50)	
1.20-1.65	4	SPT	N=6		(HEAD GRAVEL)	1.10	
1.70	30a	W				(1.50)	
1.70	5	D					
1.70	5a	ES					
2.00-2.45	6	SPT	N=8			2.60	
2.60	7	D					
3.00-3.45	8	SPT(c)	N=21		Medium dense light yellow silty sandy angular to subrounded fine to coarse GRAVEL of flint and chalk with medium cobble content of chalk.		
3.70	9	D			(HEAD GRAVEL)		
4.00-4.45	10	SPT(c)	N=19				
4.70	11	D					
5.00-5.45	12	SPT(c)	N=20			(4.90)	
5.70	13	D					
6.00-6.50	14a	B					
6.00-6.45	14	SPT(c)	N=15				
6.70	15	D					
7.30	16	D					
7.50-7.95	17	SPT(c)	N=19		Medium dense creamish white and reddish brown silty very sandy angular to subrounded GRAVEL of flint, chert, chalk with low cobble content of chalk.	7.50	
8.20	18	D			(HEAD GRAVEL)		
8.80	19	D				(2.50)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
17/06/13	12:00	9.75	9.75	200	2.00				
17/06/13	16:00	13.50	13.50	150	2.00				
18/06/13	16:00	20.00	19.50	150	2.00				
All dimensions in metres									Scale: 1:50
Method Used: Cable percussion			Plant Used: Dando 2000			Drilled By: AR		Logged By: APope	Checked By: JS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Borehole: BH8
Contract Ref: 727927	Start: 17.06.13 End: 18.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 3

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thick-ness)	Material Graphic Legend
Depth	No	Type	Results					
9.00-9.45 9.00-9.50	20 21	SPT(c) B	N=21			Medium dense creamish white and reddish brown silty very sandy angular to subrounded GRAVEL of flint, chert, chalk with low cobble content of chalk. (HEAD GRAVEL) <i>(stratum text copied from layer at 7.50m depth from previous sheet)</i>		
9.80 10.00-10.50	22 23	D B				Weak medium density CHALK recovered as very silty slightly sandy subangular to subrounded fine to coarse gravel with flint. Low cobble content of chalk and flint. (UPPER CHALK FORMATION)	10.00	
10.50-10.95	24	SPT(c)	N=24				(2.00)	
11.00	25	D						
11.50	26	D						
12.00	27	U	25 blows			Weak high density CHALK recovered as silty subangular to subrounded fine to coarse gravel with medium cobble content. (UPPER CHALK FORMATION)	12.00	
12.60 12.60-13.00	28 29	D B						
13.30 13.50-13.95	30 31	D SPT	N=22					
14.00	32	D						
14.50	33	D						
15.00 15.00-15.50	34 35	U B	30 blows					
16.00	36	D					(8.00)	
16.50-16.95	37	SPT	N=28					
17.00	38	D						
17.50	39	D						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									to aid drilling. 5. On completion 50mm standpipe installed to 10.00m. Response zone from 1.00m to 10.00m. 6. SPT hammer RD02-2012 ($E_r = 71.70\%$) used.	
All dimensions in metres									Scale: 1:50	
Method Used: Cable percussion			Plant Used: Dando 2000			Drilled By: AR		Logged By: APope	Checked By: VS	AGS



Contract:		Client:		Borehole:
Harts Farm Way, Havant		Upton McGougan		BH8
Contract Ref:	Start: 17.06.13	Ground Level	Co-ordinates:	Sheet:
727927	End: 18.06.13	---	---	3 of 3

Samples and In-situ Tests				Water	Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
Depth	No	Type	Results					
18.00-30.00	40	U	N=30			Weak high density CHALK recovered as silty subangular to subrounded fine to coarse gravel with medium cobble content. (UPPER CHALK FORMATION) <i>(stratum text copied from layer at 12.00m depth from previous sheet)</i>	20.00	
18.30	41	D						
18.30-19.00	42	B						
19.50-19.95	43	SPT						
20.00	44	D						
						Borehole terminated at 20.00m depth.		

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
									All dimensions in metres Scale: 1:50		
Method Used: Cable percussion			Plant Used: Dando 2000			Drilled By: AR		Logged By: APope			Checked By: 



STRUCTURAL SOILS

BOREHOLE LOG

Contract: Harts Farm Way, Havant		Client: Upton McGougan		Borehole: BH9
Contract Ref: 727927	Start: 18.06.13 End: 19.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 3

Samples and In-situ Tests				Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results				
0.00-0.60	1	B			MADE GROUND: Creamish white silty slightly sandy angular to subangular fine to coarse GRAVEL of chalk and brick with medium cobble content of chalk.		
0.50	1a	ES				(1.20)	
1.00	2	D				1.20	
1.00	2a	ES			POSSIBLE MADE GROUND: Firm dark brown mottled cream slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint.		
1.20-1.65	3	SPT	N=13			(0.80)	
1.70	4	D					
1.70	4a	ES			Loose becoming medium dense with depth light orangish yellow clayey slightly sandy angular to subrounded fine to coarse GRAVEL of flint and chert with low cobble content. Rare decaying organic matter. (HEAD GRAVEL)		
2.00	18a	W				2.00	
2.00-2.45	5	SPT	N=7				
2.50-3.00	6	B					
3.00-3.45	7	SPT(c)	N=15				
3.50	8	D				(3.00)	
4.00-4.45	9	SPT(c)	N=23				
4.50	10	D					
5.00-5.45	11	SPT(c)	N=25			5.00	
5.50	12	D			Medium dense multi-coloured silty sandy to very sandy angular to subrounded fine to coarse GRAVEL of chalk, flint, and chert with medium cobble content of chalk and flint. (HEAD GRAVEL)		
6.00-6.45	13	SPT	N=21				
6.00-6.50	14	B				(3.50)	
7.00	15	D					
7.50-7.95	16	SPT _(NR)	N=11				
7.50-8.00	17	B					
8.50	18	D			Description on next sheet	8.50	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
18/06/13	17:00	9.00	9.00	200	2.00				
19/06/13		9.75	9.75	150	Dry				
19/06/13	14:00	20.00	19.50	150	2.00				
Method Used: Cable percussion						Plant Used: Dando 2000			All dimensions in metres Scale: 1:50
						Drilled By: AR			
						Logged By: APope			Checked By:

GINT LIBRARY V8.04 GLBILog CABLE PERCUSSION LOG | 727927 FORMER COUNCIL DEPOT, HAVANT GP1 v8.04 | 02/08/13 - 08:00 | JS. Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email: ask@soils.co.uk.



Contract: Harts Farm Way, Havant			Client: Upton McGougan		Borehole: BH9
Contract Ref: 727927	Start: 18.06.13	Ground Level	Co-ordinates:	Sheet: 2 of 3	
	End: 19.06.13	---	---		

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
9.00-9.45	19	SPT	N=13			Medium dense orangish brown very clayey sandy subangular to subrounded fine to coarse GRAVEL of chert and flint. Low cobble content of flint and chalk. (HEAD GRAVEL) <i>(stratum text copied from layer at 8.50m depth from previous sheet)</i>		
9.50	20	D						
10.00-10.50	21	B						
10.50-10.95	22	SPT	N=11				(4.50)	
11.00	23	D						
11.50	24	D						
12.00-12.45	25	U	28 blows					
12.50	26	D						
13.00-13.50	27	B				Weak high density CHALK recovered as silty fine to coarse gravel with medium cobble content. Rare rinded flint. (UPPER CHALK FORMATION)	13.00	
13.50-13.95	28	SPT	N=15					
14.00	29	D						
14.50	30	D						
15.00-15.45	31	U	30 blows					
15.40	32	D						
16.00-16.50	33	B						
16.50-16.95	34	SPT	N=17				(7.00)	
17.00	35	D						
17.50	36	D						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
									10.00m. Response zone from 1.00m to 10.00m. 5. SPT hammer RD02-2012 ($E_r = 71.70\%$) used.
									All dimensions in metres Scale: 1:50
Method Used: Cable percussion			Plant Used: Dando 2000		Drilled By: AR		Logged By: APope		Checked By: JS



STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Harts Farm Way, Havant		Client:	Upton McGougan		Borehole:	BH10	
Contract Ref:	727927		Start:	24.06.13	Ground Level	Co-ordinates:	Sheet:	1 of 3
			End:	25.06.13	---	---		

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.50	1	B				MADE GROUND: Macadam.	0.10	
0.50	2	ES				MADE GROUND: Creamish brown very clayey sandy angular to subrounded fine to coarse GRAVEL of flint, chert, chalk, brick with low cobble content of brick and concrete. Sand is fine to coarse.	(0.80)	
0.90	3	D				MADE GROUND: Chalk fill. Greyish white very silty angular to subrounded fine to coarse GRAVEL of chalk and flint.	0.90	
1.00	4	ES					1.20	
1.20-1.65	5	SPT	N=8			POSSIBLE MADE GROUND: Loose creamish brown very clayey sandy angular to subrounded fine to coarse GRAVEL of flint, chert. Sand is fine to coarse. Organic odour noted.		
1.20	5	DSPT						
1.50	6	ES					(1.30)	
1.80	7	D						
2.00	8	ES						
2.00-2.45	9	SPT _(NR)	N=6				2.50	
2.50	10	D				Medium dense to dense multicoloured silty very sandy angular to subangular fine to coarse GRAVEL of chert, flint. Sand is fine to coarse. Low cobble content of flint. (HEAD GRAVEL)		
3.00-3.45	11	SPT	N=22					
3.00	11	DSPT						
3.50	12	D						
3.50-4.00	13	B						
4.00-4.45	14	SPT	N=31				(4.00)	
4.00	14	DSPT						
4.50	15	D						
5.00-5.45	16	SPT _(NR)	N=35					
5.50	17	D						
6.00-6.45	18	SPT	N=28					
6.00	18	DSPT						
6.00-6.50	19	B				Very dense multicoloured silty sandy angular to subangular fine to coarse GRAVEL of chert and flint. Medium cobble content of flint. (HEAD GRAVEL)	6.50	
7.00	20	D						
7.50-7.95	21	SPT	N=30					
7.50	21	DSPT						
8.00	22	D					(4.00)	
8.50	23	D						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
24/06/13	17:00	14.00	13.50	200	5.00				1. Hand excavated inspection pit from ground level to 1.20m depth. 2. Cable percussive boring from 1.20m to 20.00m depth. 3. Water added to assist boring from 2.50m to 13.50m. 4. Falling head permeability tests undertaken at
25/06/13	17:00	20.00	19.50	150	5.00				
Method Used: Cable percussion						Drilled By: AR			All dimensions in metres Scale: 1:50 Checked By: APope
Plant Used: Dando 2000			Logged By: APope			Checked By: TS			AGS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Borehole: BH10
Contract Ref: 727927	Start: 24.06.13 End: 25.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 3

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
9.00-9.45	24	SPT	N=29			Very dense multicoloured silty sandy angular to subangular fine to coarse GRAVEL of chert and flint. Medium cobble content of flint. (HEAD GRAVEL) <i>(stratum text copied from layer at 6.50m depth from previous sheet)</i>		
9.00	24	DSPT						
9.00-9.50	25	B						
10.00	26	D					10.50	
10.50-10.95	27	SPT	N=20			Medium strong medium dense creamish white CHALK recovered silty slightly sandy subangular to subrounded fine to coarse gravel with medium cobble content. (UPPER CHALK FORMATION)		
10.50	27	DSPT						
11.00	28	D						
11.50-12.00	29	B						
12.00-12.45	30	SPT	N=21				(3.50)	
12.00	30	D						
12.50	31	D						
13.00	32	D						
13.50	33	U					14.00	
14.00	34	D				Medium strong high density white CHALK recovered as coarse black speckled gravel with medium cobble content. Frequent rinded flint. (UPPER CHALK FORMATION)		
14.50	35	D						
15.00-15.45	36	SPT	N=25					
15.00	36	DSPT						
15.50	37	D						
16.00	38	D						
16.50	39	U					(6.00)	
16.50	39	D						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
									2.50m and 8.00m. 5. On completion 50mm standpipes installed to 15.00m and 10.00m. Response zones from 13.00m to 15.00m and 2.50m to 10.00m. 6. SPT hammer RD02-2012 ($E_r = 71.70\%$) used.
									All dimensions in metres Scale: 1:50
Method Used: Cable percussion			Plant Used: Dando 2000			Drilled By: AR		Logged By: APope	Checked By: AGS



Contract:		Client:		Borehole:
Harts Farm Way, Havant		Upton McGougan		BH10
Contract Ref:	Start: 24.06.13	Ground Level	Co-ordinates:	Sheet:
727927	End: 25.06.13	---	---	3 of 3

Samples and In-situ Tests				Water	Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
Depth	No	Type	Results					
18.00-18.45 18.00	41 41	SPT D	N=32			Medium strong high density white CHALK recovered as coarse black speckled gravel with medium cobble content. Frequent rinded flint. (UPPER CHALK FORMATION) <i>(stratum text copied from layer at 14.00m depth from previous sheet)</i>		
19.00	42	D						
19.50 19.50	43 43	U D						
20.00	44	D						
Borehole terminated at 20.00m depth.							20.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP12	
Contract Ref: 727927	Start: 18.06.13 End: 18.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.30	1	B				MADE GROUND: Light brown silty very sandy subangular to subrounded fine to coarse GRAVEL of concrete and flint.	(0.30)	
0.20	2	ES					0.30	
0.30-0.70	3	B	0.0ppm			MADE GROUND: Orangish brown silty very gravelly fine to coarse SAND with medium cobble content of sandstone. Gravel is subangular to subrounded fine to coarse of sandstone.	(0.40)	
0.30		PID					0.70	
0.50	4	ES	0.0ppm					
0.50		PID						
0.70-1.20	5	B				MADE GROUND: SILT of white chalk.		
1.00	6	ES					(0.70)	
1.00		PID	0.0ppm				1.40	
1.40-1.90	7	B				Light grey very silty sandy angular to subrounded fine to coarse GRAVEL of flint with low cobble content. (HEAD GRAVEL)	(0.60)	
1.50	8	ES	0.0ppm				2.00	
1.50		PID						
2.00-2.50	9	B				Light orangish brown silty very sandy subangular to subrounded fine to coarse GRAVEL of flint with low cobble content. (HEAD GRAVEL)	(0.90)	
2.20		PID	0.0ppm					
2.40	10	W					2.90	
Trial pit terminated at 2.90m depth.								

Plan (Not to Scale)		General Remarks			
		1. Groundwater strike at 2.40m depth. 2. Pit unstable below 2.00m depth and collapsed. 3. Backfilled with arisings on completion.			
		All dimensions in metres		Scale: 1:25	
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: APope	Checked By: JS		



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP13	
Contract Ref: 727927		Start: 17.06.13 End: 17.06.13		Ground Level: --- Co-ordinates: ---	
				Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.15-0.35 0.15	1	B PID	0.0ppm			MADE GROUND: Tarmacadam.	0.15	
0.35-0.65 0.35	2	B PID	0.0ppm			MADE GROUND: Light orangish brown slightly silty SAND and GRAVEL. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of chert and flint. Acetone odour.	0.35	
0.40	3	ES	0.0ppm			MADE GROUND: Dark orangish brown clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone and flint. Medium cobble content of the same.	(0.30) 0.65	
0.65-1.30 0.65	4	B PID	0.0ppm			MADE GROUND: White silty sandy angular to subangular fine to coarse GRAVEL of chalk and flint. Sand is fine to coarse rare brick fragments.	(0.65)	
1.20	5	ES					1.30	
1.30-1.85 1.30	6	B PID	0.0ppm			Multicoloured silty sandy angular to rounded fine to coarse GRAVEL of chert and flint. Sand is fine to coarse. (HEAD GRAVEL)	(0.70)	
2.00	7	W				Trial pit terminated at 2.00m depth.	2.00	

Plan (Not to Scale) 		General Remarks 1. Pit unstable below 1.30m depth and collapsed from 2.00m to 1.50m depth. 2. Groundwater strike at 1.80m depth. 3. Backfilled with arisings on completion.	
Method Used: Machine dug		Plant Used: JCB-3CX	
Logged By: APope		Checked By: JS	
Scale: 1:25		AGS	



Contract:	Harts Farm Way, Havant		Client:	Upton McGougan		Trial Pit:	TP14	
Contract Ref:	727927		Start:	17.06.13	Ground Level	Co-ordinates:	Sheet:	1 of 1
			End:	17.06.13	---	---		

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20-0.60 0.30	1	B PID	0.0ppm			MADE GROUND: Tarmacadam.	0.20	
						MADE GROUND: Light cream and reddish brown silty sandy subrounded fine to coarse GRAVEL of chalk, flint, mudstone, chert, brick and concrete. Medium cobble content of the same. Sand is fine to coarse. Also 1300 x 700 x 150mm lump of concrete slab.	(0.40)	
0.60-1.10	2	B				MADE GROUND: Dark white and dark brown slightly clayey slightly sandy subangular to subrounded fine to coarse GRAVEL of chalk and flint.	0.60	
							(0.80)	
1.10		PID	0.0ppm				1.40	
1.40 1.40-1.90 1.40 1.60	3 4 5	ES B PID ES	2.2ppm			Creamy grey silty sandy subangular to rounded fine to coarse GRAVEL of flint and chalk. High cobble content of the same. (HEAD GRAVEL) ... at 1.40m depth strong hydrocarbon odour noted.	(1.00)	
2.10	6	W					2.40	
Trial pit terminated at 2.40m depth.								

Plan (Not to Scale)		General Remarks	
		1. Pit unstable below 2.00m depth. 2. Groundwater strike at 2.10m depth. 3. Backfilled with arisings on completion.	
All dimensions in metres		Scale: 1:25	
Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	APope	JS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP15	
Contract Ref: 727927		Start: 17.06.13 End: 17.06.13		Ground Level: --- Co-ordinates: ---	
				Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.60	1	B				MADE GROUND: Tarmacadam.	0.10	
0.50		PID	0.0ppm			MADE GROUND: Light orangish yellow clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone, flint, chalk, concrete, brick. Medium cobble content of the same.		
0.70	2	ES					(1.30)	
1.00		PID	0.0ppm					
1.40-1.90	4	B				Dark grey clayey sandy angular to subangular fine to coarse GRAVEL of flint and chert. Medium cobble content of the same. Frequent roots at 1.40m depth and many rootlets. (HEAD GRAVEL)	1.40	
1.50	3	ES					(0.60)	
2.00-2.50	5	B				Light grey very silty sandy subangular to subrounded fine to coarse GRAVEL of flint. Medium cobble content of the same. (HEAD GRAVEL)	2.00	
							(1.00)	
3.00-3.20	6	B				Greenish white silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse flint. Frequent shell fragments. (HEAD GRAVEL)	3.00	
3.00	7	W					3.20	
						Trial pit terminated at 3.20m depth.		

Plan (Not to Scale)



General Remarks

1. Pit collapse at 2.50m depth. Fast groundwater inflow.
2. Groundwater seepage at 2.10m depth.
3. Backfilled with arisings on completion.

All dimensions in metres

Scale:

1:25

Method

Used: **Machine dug**

Plant

Used: **JCB-3CX**

Logged

By: **APope**

Checked

By: **VS**



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP16	
Contract Ref: 727927		Start: 17.06.13 End: 17.06.13		Ground Level: --- Co-ordinates: ---	
				Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results					
0.20-0.70	1	B				MADE GROUND: Brownish white silty sandy subangular to subrounded fine to coarse GRAVEL of chalk, flint and concrete. Sand is fine to coarse.		
0.50		PID	0.0ppm				(1.10)	
0.60	2	ES						
1.00		PID	0.0ppm			Dark brown clayey sandy subangular to subrounded fine to coarse GRAVEL of flint and chalk with medium cobble content of the same. (HEAD GRAVEL)	1.10	
1.10-1.30	3	B						
1.20	4	ES					1.30	
1.30-1.80	5	B				Light yellowish brown clayey sandy subrounded to rounded fine to coarse GRAVEL of flint and chert. (HEAD GRAVEL)		
1.50		PID	0.0ppm					
2.00		PID	0.0ppm				(1.90)	
2.70-3.20	6	B				Trial pit terminated at 3.20m depth.		
3.00	7	W						
3.00		PID	0.0ppm				3.20	

Plan (Not to Scale) 		General Remarks 1. Pit collapse from 2.60m depth whilst being terminated at 3.20m depth. 2. Groundwater at 3.00m depth. 3. Backfilled with arisings on completion.	
Method Used: Machine dug Plant Used: JCB-3CX		Logged By: APope Checked By: JS	
All dimensions in metres		Scale: 1:25	



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP18	
Contract Ref: 727927		Start: 18.06.13 End: 18.06.13		Ground Level: --- Co-ordinates: ---	
				Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.60-1.10	1	PID B	0.0ppm			MADE GROUND: Tarmacadam.	(0.60) 0.60	
1.00 1.00	2	ES PID	0.0ppm			MADE GROUND: Brown clayey sandy angular to rounded fine to coarse GRAVEL of tarmac, limestone, brick, clinker and concrete. With high cobble content of brick and concrete.	(0.80) 1.40	
						MADE GROUND: Asphalt and concrete. Trial pit terminated at 1.45m depth due to refusal on concrete.	1.45	

Plan (Not to Scale) 		General Remarks 1. JCB refusal at 1.45m depth on concrete. 2. Pit excavated into spoil heap 1.40m depth above ground level. 3. Backfilled with arisings on completion.	
All dimensions in metres		Scale: 1:25	
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: APope	Checked By: JS



STRUCTURAL SOILS

TRIAL PIT LOG

Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP19	
Contract Ref: 727927		Start: 18.06.13 End: 18.06.13		Ground Level: --- Co-ordinates: ---	
				Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.30	1	B				MADE GROUND: Light brown clayey sandy subangular to subrounded fine to coarse GRAVEL of flint, limestone and brick.	(0.30)	
0.20	2	ES					0.30	
0.20		PID	0.0ppm					
0.30-0.80	3	B				Brown clayey sandy angular to subrounded fine to coarse GRAVEL of flint and chert. Occasional rootlets. (HEAD GRAVEL)		
0.50	4	ES					(0.80)	
0.50		PID	0.0ppm					
1.00		PID	0.0ppm				1.10	
1.10-1.60	5	B				Light orangish cream silty sandy angular to subrounded fine to coarse GRAVEL of flint. Sand is fine to coarse. (HEAD GRAVEL)		
							(1.10)	
2.00	6	W					2.20	
2.00		PID	0.0ppm					
						Trial pit terminated at 2.20m depth.		

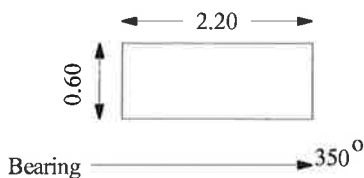
Plan (Not to Scale)		General Remarks	
		1. Groundwater seepage at 2.00m depth. 2. Pit unstable from 1.10m depth and collapsed. 3. Backfilled with arisings on completion.	
All dimensions in metres		Scale: 1:25	
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: APope	Checked By: VS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP20	
Contract Ref: 727927	Start: 17.06.13 End: 17.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.55 0.20	1	B PID	0.0ppm			MADE GROUND: Tarmacadam. MADE GROUND: Light yellow silty sandy subangular to subrounded fine to coarse GRAVEL of chert, concrete and tarmac.	0.10 (0.45)	
0.55-0.90 0.60	2	B PID	0.0ppm			MADE GROUND: Cream silty sandy subangular to subrounded fine to coarse GRAVEL of chalk. Low cobble content of flint.	0.55 (0.35)	
0.80 0.90-1.40 0.90 1.00	3 4 PID 5 ES	ES B PID ES	0.0ppm			Firm dark brown slightly sandy slightly gravelly CLAY. Gravel is angular to rounded fine to medium of chert and chalk. Occasional rootlets. (ALLUVIUM)	0.90 (0.50)	
1.40		PID	0.0ppm			Cream and light grey slightly silty sandy angular to rounded fine to coarse GRAVEL of chert and flint. Frequent pockets (cobble sized) of light grey fine to coarse sand. (HEAD GRAVEL)	1.40	
1.80-2.30 2.00 2.00	6 7	B W PID	0.0ppm	↓		Trial pit terminated at 2.30m depth.	(0.90) 2.30	

Plan (Not to Scale)



General Remarks

1. Pit collapsed from 1.40m depth.
2. Groundwater at 2.00m depth.
3. Backfilled with arisings on completion.

All dimensions in metres

Scale: **1:25**

Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: APope	Checked By: JS	AGS
---------------------------------	----------------------------	-------------------------	-----------------------	------------



STRUCTURAL SOILS

TRIAL PIT LOG

Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP21	
Contract Ref: 727927		Start: 18.06.13 End: 18.06.13		Ground Level: --- Co-ordinates: ---	
				Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.50	1	B				MADE GROUND: Light brown clayey sandy angular to subrounded fine to coarse GRAVEL of chalk, flint, concrete, clinker and tarmac. Frequent cobbles of concrete and tarmac. Rare rootlets.		
0.20		PID	0.0ppm				(0.80)	
0.50	2	ES					0.80	
0.50		PID	0.0ppm					
0.80-1.50	3	B				Greenish grey very sandy silty subrounded to rounded fine to coarse GRAVEL of flint. Medium cobble content of flint. (HEAD GRAVEL)		
1.00	4	ES					(0.70)	
1.00		PID	0.0ppm				1.50	
1.50	5	B				Light orangish cream very sandy silty angular to subrounded fine to coarse GRAVEL of flint, chert. High cobble content of flint. (HEAD GRAVEL)		
1.50		PID	0.0ppm					
1.60	6	ES						
2.00		PID	0.0ppm					
2.30	7	W					(1.90)	
3.00		PID	0.0ppm					
							3.40	
						Trial pit terminated at 3.40m depth.		

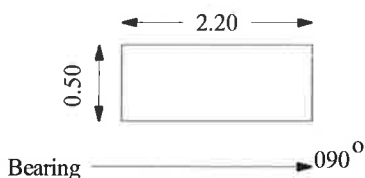
Plan (Not to Scale)		General Remarks	
		- Pit placed near above ground tank location, tank removed with no evidence on the ground of exact location. - Pit collapse from 1.30m depth. - Groundwater at 2.30, fast inflow, north east to south west direction. - Backfilled with arisings on completion.	
All dimensions in metres		Scale: 1:25	
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: APope	Checked By: JS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP22	
Contract Ref: 727927		Start: 18.06.13 End: 18.06.13		Ground Level: --- Co-ordinates: ---	
				Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.50	1	B				MADE GROUND: Dark brown and white clayey very sandy subangular to subrounded fine to coarse GRAVEL of tarmac, chalk, brick and concrete. Wood fragments noted. Occasional rootlets.		
0.40 0.50	2	PID ES	0.0ppm				(0.80) 0.80	
0.80-1.30	4	B				Firm very dark brown slightly sandy slightly gravelly friable silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone, chalk and flint. (ALLUVIUM)		
0.80 0.90 1.00	3	PID ES PID	0.0ppm 0.0ppm				(0.50) 1.30	
1.30-1.80	6	B				Light grey very silty sandy angular to subangular fine to coarse GRAVEL of flint and chert. Sand is fine to coarse. Low cobble content of flint. (HEAD GRAVEL)		
1.50 1.50	5	ES PID	0.0ppm				(1.50) 2.80	
2.00		PID	0.0ppm					
2.80-3.30	7	B				Orangish yellow silty sandy angular to subangular fine to coarse GRAVEL of flint and chert. Medium cobble content of flint. (HEAD GRAVEL)		
2.80 3.00	8	PID W	0.0ppm				(1.00) 3.80	
Trial pit terminated at 3.80m depth.								

Plan (Not to Scale)



General Remarks

1. Pit collapse at 1.80m depth whilst being terminated at 3.20m depth.
2. Groundwater strike at 3.10m depth.
3. Backfilled with arisings on completion.

All dimensions in metres

Scale:

1:25

Method

Used: **Machine dug**

Plant

Used: **JCB-3CX**

Logged

By: **APope**

Checked

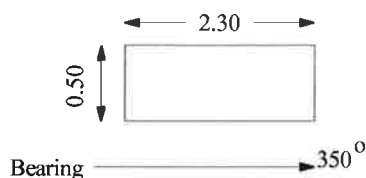
By: **JS**



Contract:	Harts Farm Way, Havant		Client:	Upton McGougan		Trial Pit:	TP23	
Contract Ref:	727927		Start: 18.06.13	Ground Level	Co-ordinates:	Sheet:	1 of 1	
			End: 18.06.13	---	---			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.60	1	B	0.0ppm			MADE GROUND: Asphalt.	0.10	
						MADE GROUND: Light orangish brown slightly silty SAND and GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of flint and chert.	(0.60)	
0.50 0.50	2	ES PID					0.70	
0.70-1.20	3	B	0.0ppm			MADE GROUND: Chalk		
							(0.70)	
1.00 1.00	4	ES PID					1.40	
1.40-1.80	5	B	0.0ppm			Soft dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded fine to coarse of chert. Low cobble content of chert. Occasional rootlets, (ALLUVIUM)	(0.40)	
1.50 1.50	6	ES PID					1.80	
1.80-2.10	7	B				Light grey silty sandy angular to subangular fine to coarse GRAVEL of flint. Sand is fine to coarse. (HEAD GRAVEL)	(0.30)	
2.00 2.10-2.60	8	PID B	0.0ppm			Light orangish yellow silty very sandy subangular to subrounded fine to coarse GRAVEL of chert and flint. (HEAD GRAVEL)	2.10	
							(1.10)	
3.00 3.00	9	W PID	0.0ppm				3.20	
Trial pit terminated at 3.20m depth.								

Plan (Not to Scale)



General Remarks

1. Groundwater strike at 3.00m depth and rose to 2.20m depth.
2. Pit unstable below 1.80m depth and collapsed.
3. Backfilled with arisings on completion.

All dimensions in metres

Scale:

1:25

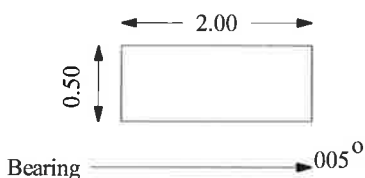
Method Used:	Machine dug	Plant Used:	JCB-3CX	Logged By:	APope	Checked By:	JS	AGS
--------------	--------------------	-------------	----------------	------------	--------------	-------------	-----------	------------



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP24	
Contract Ref: 727927		Start: 17.06.13 End: 17.06.13		Ground Level: --- Co-ordinates: ---	
				Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.50	1	B				MADE GROUND: White sandy subangular to subrounded fine to coarse GRAVEL of chalk. Rare glazed clay pipe fragments and brick.		
0.50		PID	0.0ppm				(1.00)	
1.00-1.50	2	B				Dark brown clayey sandy angular to subangular fine to coarse GRAVEL of chert and flint. Sand is fine to coarse. (HEAD GRAVEL)	1.00	
1.00		PID	0.0ppm				(0.50)	
1.50	3	ES				Multicoloured slightly silty sandy subangular to rounded fine to coarse GRAVEL of chert and flint with medium cobble content. Sand is fine to coarse. Abundant shell fragments. (HEAD GRAVEL)	1.50	
1.60	4	ES						
1.60-2.10	5	B						
2.00	6	W					(1.10)	
2.00		PID	0.0ppm				2.60	
... at 2.60m depth 2 no. clods of silt recovered approx 200 x 150 x 150mm. Trial pit terminated at 2.60m depth.								

Plan (Not to Scale)



General Remarks

- Hole excavated to 2.60m depth before collapse to 2.00m depth.
- Groundwater strike at 1.60m depth.
- Backfilled with arisings on completion.

All dimensions in metres

Scale:

1:25

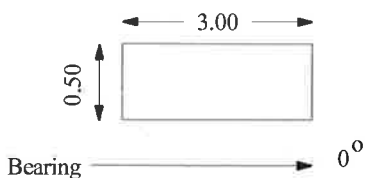
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: APope	Checked By: JS	AGS
---------------------------------	----------------------------	-------------------------	-----------------------	------------



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Trial Pit: TP26	
Contract Ref: 727927		Start: 17.06.13 End: 17.06.13		Ground Level: --- Co-ordinates: ---	
				Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20-0.40 0.20	1	B PID	0.0ppm			MADE GROUND: Topsoil.	0.20	
0.40-1.10 0.50	2	B PID	0.0ppm			MADE GROUND: Orangish brown slightly silty gravelly fine to coarse SAND. Gravel is subrounded to rounded fine to coarse of sandstone.	0.40	
						MADE GROUND: Multicoloured slightly sandy clayey subangular to subrounded fine to coarse GRAVEL of chalk and flint. Rare decaying organic matter.	(0.70)	
							1.10	
1.10-1.60 1.10	3 4	B ES				POSSIBLE MADE GROUND: White and brown slightly clayey sandy angular to subrounded fine to coarse GRAVEL of flint.	(0.50)	
							1.60	
1.60-2.10 1.60 1.70	5 6	B ES PID	36.4ppm			Creamy grey slightly sandy subangular to rounded fine to coarse GRAVEL of flint and chalk. High cobble content of the same. Strong hydrocarbon odour. (HEAD GRAVEL)	(1.40)	
2.80-3.00 2.80 2.90 3.00 3.00	7 8 9	B PID ES W PID	6.1ppm 0.0ppm				3.00	
						Trial pit terminated at 3.00m depth.		

Plan (Not to Scale)



General Remarks

1. Pit unstable below 1.60m depth and collapsed at 3.00m depth to 2.00m depth.
2. Groundwater strike at 2.10m depth.

All dimensions in metres

Scale:

1:25

Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: APope	Checked By: VS	
---------------------------------	----------------------------	-------------------------	-----------------------	--



Contract: Harts Farm Way, Havant			Client: Upton McGougan		Window Sample: WS1
Contract Ref: 727927	Start: 19.06.13	Ground Level	Co-ordinates: ---	Sheet: 1 of 1	
	End: 19.06.13	---	---		

Progress		Samples / Tests			Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
	0.15-0.50	1	B			MADE GROUND: Light brown silty gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse flint.	0.15	
	0.50	2	ES			MADE GROUND: Dark brown slightly clayey sandy angular to rounded fine to coarse GRAVEL of flint, chalk, brick, concrete and chert. Low cobble content of brick.	(1.15)	
	0.50-1.00	3	B					
	1.30-1.80	4	B			MADE GROUND: Light yellowish brown clayey sandy subangular to subrounded fine to coarse GRAVEL of chert and flint.	1.30	
	1.20 - 2.00 (87mm dia) 100% rec						(0.65)	
	1.95-2.55	5	B			MADE GROUND: Soft dark brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint, clinker and limestone.	1.95	
	2.00	7	ES				(0.60)	
	2.00 - 3.00 (87mm dia) 100% rec					Grey clayey sandy angular to subrounded fine to coarse GRAVEL of flint. (HEAD GRAVEL)	2.55	
	2.55-3.00	6	B				(0.45)	
						Window sampling terminated at 3.00m depth.	3.00	

Drilling Progress and Water Observations						General Remarks		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)			
19/06/13		3.00	-	101	2.00			
						1. Hand excavated inspection pit from ground level to 1.20m depth. 2. Groundwater at 2.00m depth. 3. 40mm diameter standpipe installed to 3.00m. Response zone 1.00m to 3.00m.		
All dimensions in metres					Scale:	1:25		
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor	Drilled By: RD	Logged By: APope	Checked By: JS	AGS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Window Sample: WS2
Contract Ref: 727927	Start: 19.06.13 End: 19.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress		Samples / Tests			Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
	0.15-0.65	1	B			MADE GROUND: Asphalt.	0.15	
	0.15-2.10	5	ES			MADE GROUND: Dark grey clayey sandy subangular to subrounded fine to coarse GRAVEL of limestone and asphalt.	(0.55)	
						MADE GROUND: Light grey angular to subangular medium to coarse GRAVEL of concrete and flint.	0.70	
						MADE GROUND: Dark grey clayey sandy subangular to subrounded fine to coarse GRAVEL of limestone.	0.80	
						MADE GROUND: Dark grey clayey sandy subangular to subrounded fine to coarse GRAVEL of limestone.	(0.30)	
						MADE GROUND: Orangish yellow silty sandy angular to subangular fine to coarse GRAVEL of flint.	1.10	
	1.10-1.60	2	B			MADE GROUND: Orangish yellow silty sandy angular to subangular fine to coarse GRAVEL of flint.	(0.50)	
	1.10-1.60	7	ES				1.60	
						MADE GROUND: Dark grey clayey sandy subangular to subrounded fine to coarse GRAVEL of limestone.	(0.50)	
	1.60-2.10	3	B				2.10	
						Light grey silty sandy angular to subangular fine to coarse GRAVEL of flint and chert. (HEAD GRAVEL)	(0.90)	
	2.10-3.00	4	B				3.00	
	2.50	6	ES					
						Window sampling terminated at 3.00m depth.		

Drilling Progress and Water Observations						General Remarks		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)			
19/06/13		3.00	-	101	2.00	1. Hand dug inspection pit from ground level to 1.20m depth. 2. Groundwater at 2.00m depth. 3. Environmental sample 5 is a composite sample from 0.15m depth and 2.10m depth. 4. 40mm diameter standpipe pipe installed to 2.90m. Response zone 1.00m to 3.00m.		
All dimensions in metres						Scale:	1:25	
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	RD	Logged By: APope Checked By: TS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Window Sample: WS3
Contract Ref: 727927	Start: 01.07.13 End: 01.07.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
						MADE GROUND: Tarmacadam.	0.10	
	0.20-0.70	1	B			MADE GROUND: Orangish brown slightly silty SAND and GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of chert.	0.20	
	0.50	2	ES			MADE GROUND: Light greyish brown clayey sandy angular to subrounded fine to coarse of chalk, chert and flint. Light organic odour.	(0.70)	
	0.90-1.40	3	B			MADE GROUND: Chalk fill. Cream slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint and chalk.	0.90	
	1.00	4	ES				(0.50)	
	1.20 - 2.00 (87mm dia) 100% rec	6	B			Light brownish grey silty very sandy angular to subangular GRAVEL of flint. (HEAD GRAVEL)	1.40	
	2.00 - 3.00 (78mm dia) 80% rec						(1.60)	
							3.00	
						Window sampling terminated at 3.00m depth.		

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
01/07/13		3.00	-	92	-	1. Hand excavated pit from ground level to 1.20m depth. 2. Window sample hole dry. 3. 40mm diameter standpipe pipe installed to 3.00m. Response zone 0.50m to 3.00m.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	RD
						Logged By:	APope
						Checked By:	AGS

GINT LIBRARY V8 04 GLB Log WINDOW SAMPLE LOG | 727927 FORMER COUNCIL DEPOT HAVANT GPJ - v8 04 | 07/08/13 - 08:08 JS.
 Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email: ask@soils.co.uk.



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Window Sample: WS4
Contract Ref: 727927	Start: 01.07.13 End: 01.07.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
						MADE GROUND: Tarmac.	0.20	
	0.20-0.90	1	B			MADE GROUND: Light brown clayey sandy angular to subrounded fine to coarse GRAVEL of rinded flint, concrete, chalk.		
	0.30	2	ES				(0.70)	
							0.90	
	0.90-1.20	3	B			MADE GROUND: Chalk fill. Dark greyish cream sandy gravelly SILT. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint. Organic odour. Occasional dark grey staining.	(0.30)	
	1.00	4	ES				1.20	
	1.20-1.70	5	B			MADE GROUND: Light brown silty sandy angular to subrounded fine to coarse GRAVEL of flint and chalk.		
	1.50	6	ES				(0.70)	
	1.90-2.40	7	B			Light greyish cream silty sandy angular fine to coarse GRAVEL of flint. (HEAD GRAVEL)	1.90	
							(1.10)	
							3.00	
						Window sampling terminated at 3.00m depth.		

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
01/07/13		3.00	-	92	-	1. Hand excavated pit from ground level to 1.20m depth. 2. Hole collapse from 3.00m to 1.80m depth. 3. 40mm diameter standpipe pipe installed to 2.00m. Response zone 0.50m to 2.00m.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	RD
						Logged By:	APope
						Checked By:	JS
							AGS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Window Sample: WS5	
Contract Ref: 727927		Start: 01.07.13 End: 01.07.13		Ground Level: --- Co-ordinates: ---	
Sheet: 1 of 1					

Progress		Samples / Tests			Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
	0.10-0.55	1	B			MADE GROUND: Topsoil.	0.10	
						MADE GROUND: Light yellowish brown clayey sandy angular to subangular fine to coarse GRAVEL of flint and concrete. Occasional roots.	(0.45)	
	0.40	2	ES				0.55	
	0.60-1.10	3	B			MADE GROUND: Chalk fill. Cream slightly sandy slightly gravelly SILT with low cobble content of brick. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of chalk and flint.	(0.65)	
	1.00	4	ES				1.20	
	1.20-1.90	5	B			MADE GROUND: Dark brown very clayey sandy subangular to subrounded fine to coarse GRAVEL of brick, concrete and flint.	(0.70)	
	1.50	6	ES				1.90	
	2.00-2.50	7	B			Light grey silty sandy angular to subangular fine to coarse GRAVEL of flint. (HEAD GRAVEL)	(1.10)	
						Window sampling terminated at 3.00m depth.	3.00	

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
01/07/13		3.00	-	92	-	1. No groundwater strike. 2. Hand excavated inspection pit from ground level to 1.20m depth. 3. Windowless sampling 1.20m to 3.00m depth. 4. Hole collapse from 2.00m to 3.00m depth. Hole reamed out and collapsed again. 5. 40mm diameter standpipe pipe installed to 3.00m. Response zone 0.50m to 3.00m.	
						All dimensions in metres	Scale: 1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	RD
						Logged By:	APope
						Checked By:	



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Window Sample: WS6
Contract Ref: 727927	Start: 19.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1
End: 19.06.13				

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.10-0.30	1	B				MADE GROUND: Tarmacadam.	0.10	
	0.30-0.80	2	B				MADE GROUND: Light orangish yellow slightly silty SAND and GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of flint, chert and tarmac.	0.30	
	0.50	3	ES				MADE GROUND: Dark brown clayey sandy angular to subrounded fine to coarse GRAVEL of flint. Sand is fine to coarse.	(0.50)	
	0.80-1.30	4	B				Light orangish yellow silty sandy angular to subrounded fine to coarse GRAVEL of flint. Sand is fine to coarse. (HEAD GRAVEL)	0.80	
	1.00	5	ES						
	1.20 - 2.00 (87mm dia) 100% rec								
	2.00 - 2.30 (77mm dia) 100% rec								
							Window sampling terminated at 2.30m depth.	2.30	

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
19/06/13		2.30	-	92	1.50	1. Hand dug inspection pit from ground level to 1.20m depth. 2. Ground water at 1.50m depth. 3. NB. Hole collapse re-excavated and collapsed again to 1.50m depth. 4. 40mm diameter standpipe pipe installed to 1.50m. Response zone 0.50m to 1.50m.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	RD
						Logged By:	APope
						Checked By:	JS
							AGS

GINT_LIBRARY_V8_04_GLBLog WINDOW SAMPLE LOG 727927 FORMER COUNCIL DEPOT HAVANT.GPJ - v8_04 | 07/08/13 - 08:03 | JS, Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email: ask@soils.co.uk.



Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
1.20 - 2.00 (87mm dia) 100% rec 2.00 - 2.60 (77mm dia) 100% rec	0.00-0.50	1	B	0.0ppm			MADE GROUND: Chalk fill with low cobble content of flint.	(1.10)	
	0.40 0.50	2	ES PID						
	1.00 1.10-1.40	3	PID B				0.0ppm		
	1.40-1.90 1.50	4 5	B ES	6.1ppm			MADE GROUND: Dark grey clayey sandy angular to subrounded fine to coarse GRAVEL of flint. Sand fine to coarse. Rare rootlets.	(0.30)	
	MADE GROUND: Chalk fill.		1.40						
			(0.50)						
			1.90						
	POSSIBLE MADE GROUND: Light brownish grey silty sandy angular to subrounded fine to coarse GRAVEL of flint. Strong hydrocarbon odour.		(0.70)						
	2.00 2.00	7	ES PID				2.60		
	Window sampling terminated at 2.60m depth.								

GINT LIBRARY V8 04 GLB\Log WINDOW SAMPLE LOG | 727927 FORMER COUNCIL DEPOT HAVANT GPJ - v8_04 | 07/08/13 - 08:03 JS.
Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email: ask@soils.co.uk.



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Window Sample: WS17
Contract Ref: 727927	Start: 01.07.13 End: 01.07.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.10	1	B				MADE GROUND: Dark brown and white very clayey sandy angular to subrounded fine to coarse GRAVEL of brick, concrete, chalk, flint, tile, glazed pipe. Occasional plastic fragments.		
	0.50	2	ES					(1.40)	
	1.20 - 1.50 (87mm dia) 50% rec	3	D				MADE GROUND: Possible flint cobble. Window sampling terminated at 1.50m depth.	1.40 1.50	

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
01/07/13		1.50	-	101	-	1. Hand excavated pit from ground level to 1.20m depth. 2. Windowless sampling from 1.20m to 1.50m depth. 3. Refusal at 1.50m depth. Hole backfilled with arisings.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	RD
						Logged By:	APope
						Checked By:	JS
							AGS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Window Sample: WS25
Contract Ref: 727927	Start: 19.06.13 End: 19.06.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20-0.70	1	B				MADE GROUND: Brownish cream silty sandy subangular to rounded fine to coarse GRAVEL of various lithologies with high cobble content of brick, concrete and tarmac.	0.20	
	0.50	2	ES				MADE GROUND: Chalk fill.	(1.00)	
	1.20-1.60	3	B				MADE GROUND: Dark brown clayey sandy angular to subangular fine to coarse GRAVEL of flint.	1.20	
	1.40	4	ES					(0.40)	
	1.60-2.10	5	B				POSSIBLE MADE GROUND: Light grey with frequent dark grey / black staining silty sandy angular to subrounded fine to coarse GRAVEL of flint. Strong hydrocarbon odour.	1.60	
	2.50	6	ES					(1.30)	
							Window sampling terminated at 2.90m depth.	2.90	

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
19/06/13		2.90	-	92	2.00	1. Hand dug inspection pit from ground level to 1.20m depth. 2. Ground water strike at 2.00m depth. 3. Backfilled with arisings on completion.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	RD
						Logged By:	APope
						Checked By:	JS
							AGS



Contract: Harts Farm Way, Havant		Client: Upton McGougan		Window Sample: WS27
Contract Ref: 727927	Start: 01.07.13 End: 01.07.13	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
						MADE GROUND: Light orangish brown slightly silty very sandy angular to subangular fine to coarse GRAVEL of flint, chert and concrete.	(0.50)	
	0.40	1	ES				0.50	
	0.50-1.00	2	B			MADE GROUND: Chalk infill. Firm greenish white slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint and chalk.	(0.90)	
	1.00	3	ES				1.40	
	1.50	4	ES			Light brown clayey sandy angular to subangular fine to coarse GRAVEL of various lithologies. (HEAD GRAVEL)	(0.30)	
						Light grey silty sandy angular fine to coarse GRAVEL of flint. (HEAD GRAVEL)	1.70	
							(1.30)	
							3.00	
						Window sampling terminated at 3.00m depth.		

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
01/07/13		3.00	-	92	-	1. Hand excavated pit from ground level to 1.20m depth. 2. Windowless sampling from 1.20m to 3.00m depth. 3. Hole collapsed to 3.00m at 1.50m depth, reamed out and collapsed to 2.00m depth. 4. 40mm diameter standpipe pipe installed to 2.00m. Response zone 1.00m to 2.00m.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	RD
						Logged By:	APope
						Checked By:	JS
							AGS

APPENDIX C

- (i) Standard Penetration Test (SPT) Summary Sheet
 - (ii) SPT Hammer Calibration Records
 - (iii) SPT N value versus Depth Plot
 - (iv) SPT $N_{(60)}$ Value versus Depth Plot
- (v) California Bearing Ratio (CBR) Test Results
 - (vi) Permeability Test Results

STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
BH7	1.20		0.00	Dry	2,1	150	3,2,4,4		N=13	RD02-2012	28/09/2012	71.7	16	
	2.00	200	1.70	0.50	3,3	150	4,6,7,5		N=22	RD02-2012	28/09/2012	71.7	26	
	4.00	200	4.00	1.50	3,3	150	6,5,4,7		N=22	RD02-2012	28/09/2012	71.7	26	
	6.00	200	6.00	2.00	4,4	150	5,6,7,9		N=27	RD02-2012	28/09/2012	71.7	32	
	7.50	200	7.00	3.00	4,3	150	3,5,4,3		N=15	RD02-2012	28/09/2012	71.7	18	
	9.00	200	9.00	3.00	2,3	150	3,4,4,3		N=14	RD02-2012	28/09/2012	71.7	17	
	12.00	150	12.00	4.00	3,2	150	3,3,3,5		N=14	RD02-2012	28/09/2012	71.7	17	
	15.00	150	15.00	4.50	4,4	150	6,6,5,7		N=24	RD02-2012	28/09/2012	71.7	29	
	18.00	150	18.00	5.00	4,4	150	6,7,8,9		N=30	RD02-2012	28/09/2012	71.7	36	
BH8	1.20		0.00	Dry	1,2	150	1,2,2,1		N=6	RD02-2012	28/09/2012	71.7	7	
	2.00	200	1.70	Dry	1,0	150	1,2,3,2		N=8	RD02-2012	28/09/2012	71.7	10	
	3.00	200	3.00	2.00	3,3	150	4,6,5,6		N=21	RD02-2012	28/09/2012	71.7	25	SPT(c)
	4.00	200	4.00	2.00	2,3	150	3,4,6,6		N=19	RD02-2012	28/09/2012	71.7	23	SPT(c)
	5.00	200	4.50	2.50	4,3	150	5,6,4,5		N=20	RD02-2012	28/09/2012	71.7	24	SPT(c)
	6.00	200	6.00	2.50	3,4	150	3,3,5,4		N=15	RD02-2012	28/09/2012	71.7	18	SPT(c)
	7.50	200	7.50	3.00	4,5	150	4,5,5,5		N=19	RD02-2012	28/09/2012	71.7	23	SPT(c)
	9.00	200	9.00	3.00	3,3	150	5,5,6,5		N=21	RD02-2012	28/09/2012	71.7	25	SPT(c)

Notes:

1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
2. Reported blows are for 75mm penetration unless indicated "+".
3. Where full test drive was not achieved, actual penetration (R) and extrapolated N value (N*) reported.
4. Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
5. Entries in the water depth column reflects the measured water depth at time of test.

$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By		Date	Contract Ref: 727927
			01.08.13	
	Contract: Harts Farm Way, Havant			Page 1 of 3 

STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
BH8	10.50	150	10.50	2.00	4,5	150	5,6,7,6		N=24	RD02-2012	28/09/2012	71.7	29	SPT(c)
	13.50	150	13.50	1.70	3,3	150	3,4,7,8		N=22	RD02-2012	28/09/2012	71.7	26	
	16.50	150	16.50	2.00	3,4	150	5,7,8,8		N=28	RD02-2012	28/09/2012	71.7	33	
	19.50	150	19.50	3.00	4,5	150	5,8,8,9		N=30	RD02-2012	28/09/2012	71.7	36	
BH9	1.20		0.00	Dry	3,2	150	3,3,4,3		N=13	RD02-2012	28/09/2012	71.7	16	
	2.00	200	1.70	Dry	1,1	150	1,1,3,2		N=7	RD02-2012	28/09/2012	71.7	8	
	3.00	200	3.00	2.00	3,4	150	4,3,3,5		N=15	RD02-2012	28/09/2012	71.7	18	SPT(c)
	4.00	200	4.00	2.00	3,4	150	6,5,5,7		N=23	RD02-2012	28/09/2012	71.7	27	SPT(c)
	5.00	200	5.00	2.50	4,4	150	6,5,6,8		N=25	RD02-2012	28/09/2012	71.7	30	SPT(c)
	6.00	200	6.00	2.50	3,3	150	4,6,5,6		N=21	RD02-2012	28/09/2012	71.7	25	
	7.50	200	7.50	2.50	1,2	150	1,2,3,5		N=11	RD02-2012	28/09/2012	71.7	13	
	9.00	200	9.00	2.00	2,2	150	3,3,3,4		N=13	RD02-2012	28/09/2012	71.7	16	
	10.50	150	10.50	2.00	2,2	150	3,2,3,3		N=11	RD02-2012	28/09/2012	71.7	13	
	13.50	150	13.50	2.50	2,3	150	3,3,5,4		N=15	RD02-2012	28/09/2012	71.7	18	
	16.50	150	16.50	2.50	3,4	150	3,3,5,6		N=17	RD02-2012	28/09/2012	71.7	20	
	19.50	150	19.50	3.00	5,4	150	6,9,8,8		N=31	RD02-2012	28/09/2012	71.7	37	

Notes:

1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
2. Reported blows are for 75mm penetration unless indicated "+".
3. Where full test drive was not achieved, actual penetration (R) and extrapolated N value (N*) reported.
4. Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
5. Entries in the water depth column reflects the measured water depth at time of test.

$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

JS

JSOUTHERN

Date

01.08.13

Contract Ref:

727927

Contract:

Harts Farm Way, Havant

Page

2 of **3**



STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
BH10	1.20		0.00	Dry	1,2	150	2,3,2,1		N=8	RD02-2012	28/09/2012	71.7	10	
	2.00	200	1.70	Dry	1,2	150	1,1,1,3		N=6	RD02-2012	28/09/2012	71.7	7	
	3.00	200	3.00	2.00	2,3	150	3,5,7,7		N=22	RD02-2012	28/09/2012	71.7	26	
	4.00	200	4.00	3.00	4,3	150	6,7,9,9		N=31	RD02-2012	28/09/2012	71.7	37	
	5.00	200	5.00	3.00	4,5	150	7,9,9,10		N=35	RD02-2012	28/09/2012	71.7	42	
	6.00	200	6.00	3.50	3,4	150	4,7,9,8		N=28	RD02-2012	28/09/2012	71.7	33	
	7.50	200	7.50	4.00	4,5	150	7,6,8,9		N=30	RD02-2012	28/09/2012	71.7	36	
	9.00	200	9.00	4.00	5,4	150	4,7,9,9		N=29	RD02-2012	28/09/2012	71.7	35	
	10.50	200	10.50	4.00	3,4	150	4,5,5,6		N=20	RD02-2012	28/09/2012	71.7	24	
	12.00	150	12.00	4.50	3,4	150	5,6,5,5		N=21	RD02-2012	28/09/2012	71.7	25	
	15.00	150	15.00	5.00	3,4	150	5,6,7,7		N=25	RD02-2012	28/09/2012	71.7	30	
	18.00	150	18.00	5.00	5,4	150	6,8,9,9		N=32	RD02-2012	28/09/2012	71.7	38	

Notes:

1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
2. Reported blows are for 75mm penetration unless indicated "+".
3. Where full test drive was not achieved, actual penetration (R) and extrapolated N value (N*) reported.
4. Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
5. Entries in the water depth column reflects the measured water depth at time of test.

$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By		Date	Contract Ref: 727927
			01.08.13	
	Contract: Harts Farm Way, Havant			Page 3 of 3 

SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer SPT HAMMER
 Client STRUCTURAL SOILS
 Test No EQU706
 Test Depth (m) 7.87
 Date of Test 28 September 2012
 Valid until 28 September 2013
 Hammer ID RDO2

Mass of the hammer $m = 63.5\text{kg}$
 Falling height $h = 0.76\text{m}$
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$

Characteristics of the instrumented rod

Diameter $d_r = 0.052\text{ m}$
 Length of the instrumented rod 0.558 m
 Area $A = 11.61\text{ cm}^2$
 Modulus $E_a = 206843\text{ MPa}$

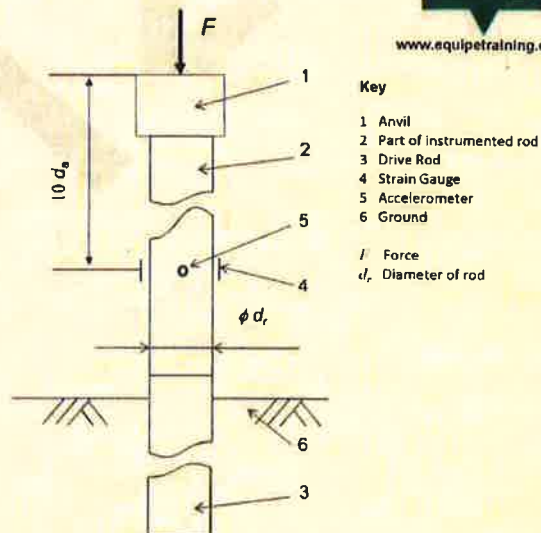
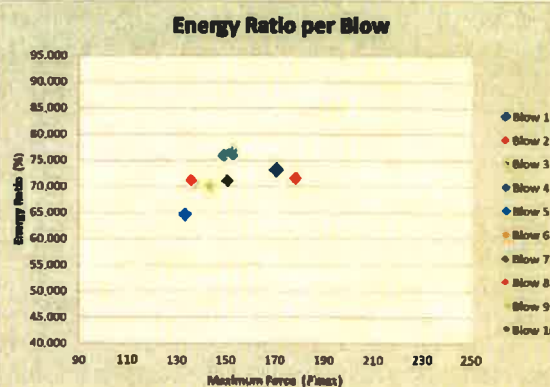
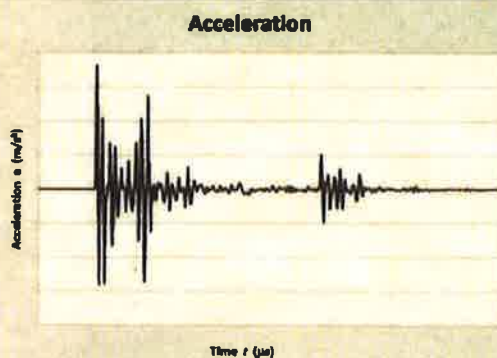
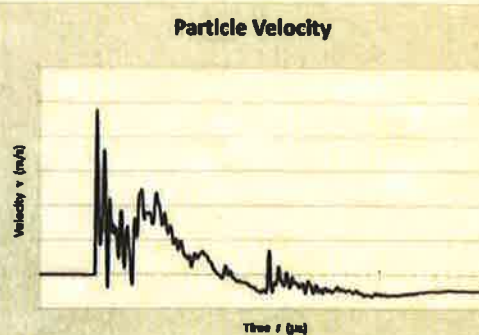
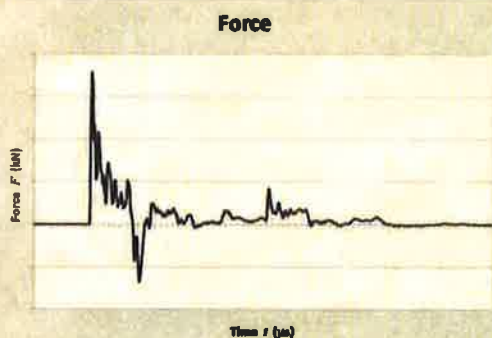


Fig B.1 and B.2 BS EN ISO 22476-3 : 2005



Observations:

1.

$E_{\text{meas}} = 0.339\text{ kN-m}$

$E_{\text{theor}} = 0.473\text{ kN-m}$

$$\text{Energy Ratio} = \frac{E_{\text{meas}}}{E_{\text{theor}}} = 71.70\%$$

Equipe SPT Analyzer Operators:

JML

Prepared by:

h. Spies

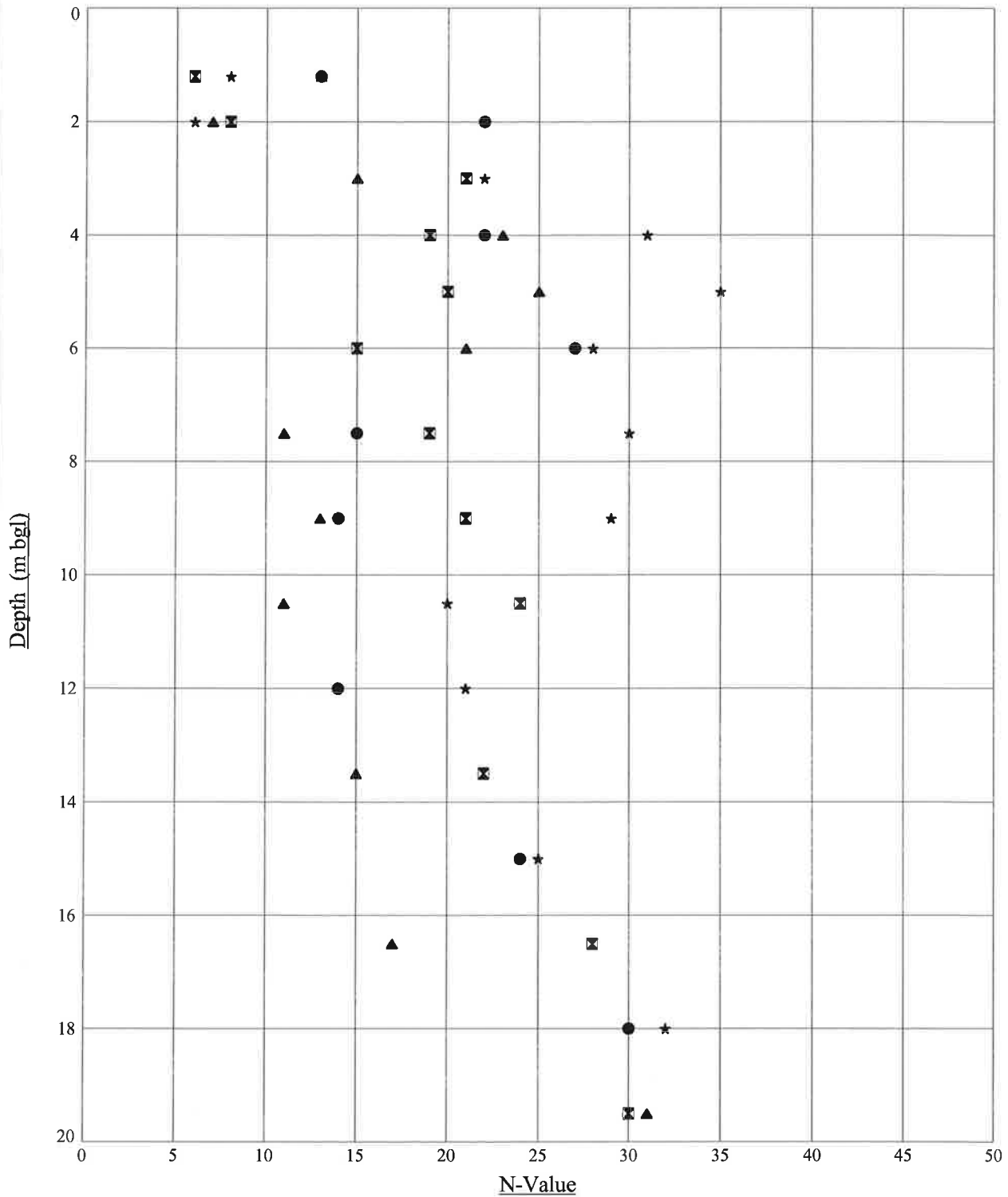
Checked by:

h. Spies

Date

08/10/2012

STANDARD PENETRATION TEST (SPT N-Value) VS DEPTH



Key: ★ = BH10, ● = BH7, ☒ = BH8, ▲ = BH9



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Contract

Harts Farm Way, Havant

Client

Upton McGougan

Date

01.08.13

Compiled By

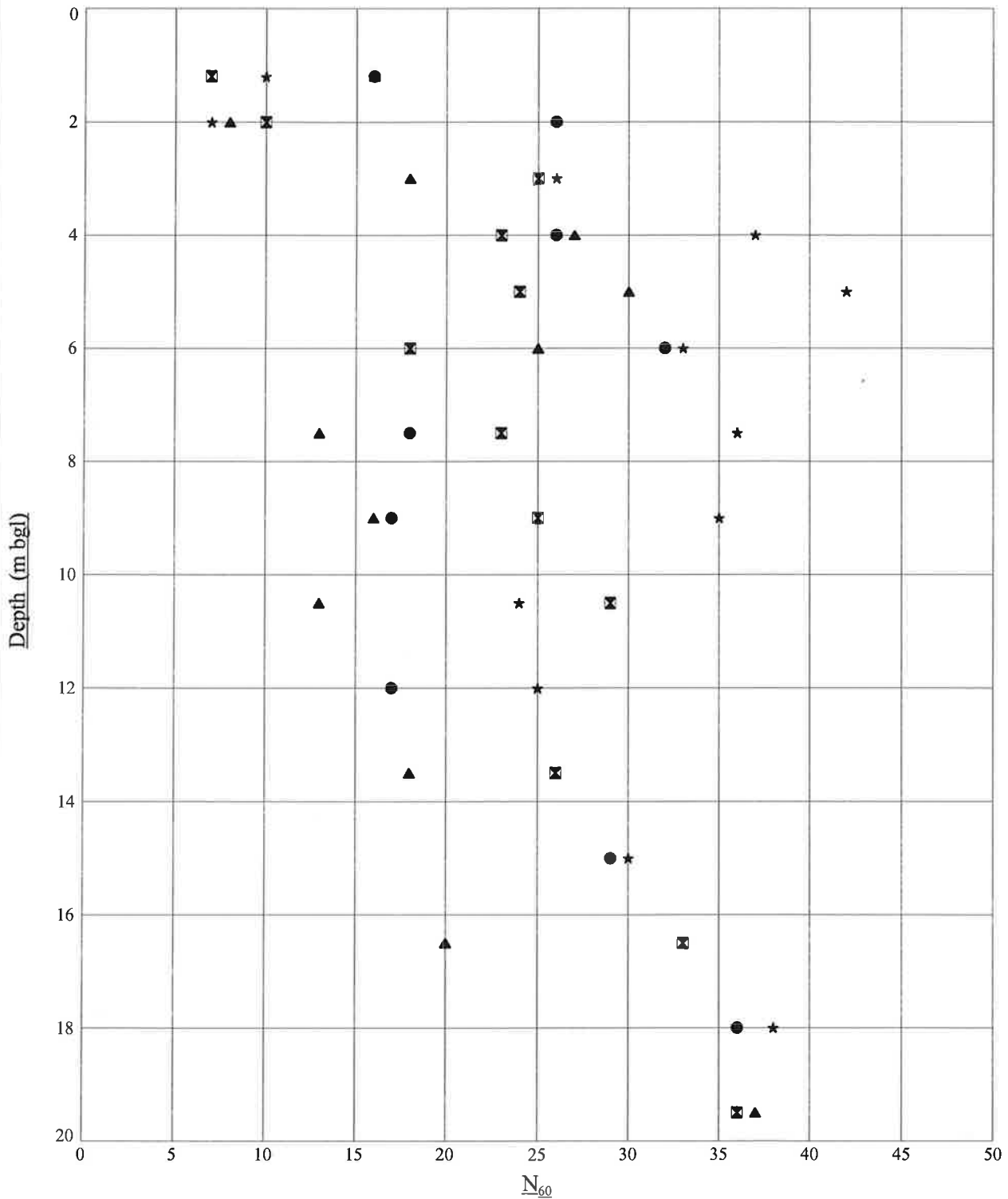
VS

Contract Ref:

727927



STANDARD PENETRATION TEST (SPT N_{60}) vs DEPTH



Key: ★ = BH10, ● = BH7, ⊠ = BH8, ▲ = BH9



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Contract

Harts Farm Way, Havant

Client

Upton McGougan

Date

01.08.13

Compiled By

JS

Contract Ref:

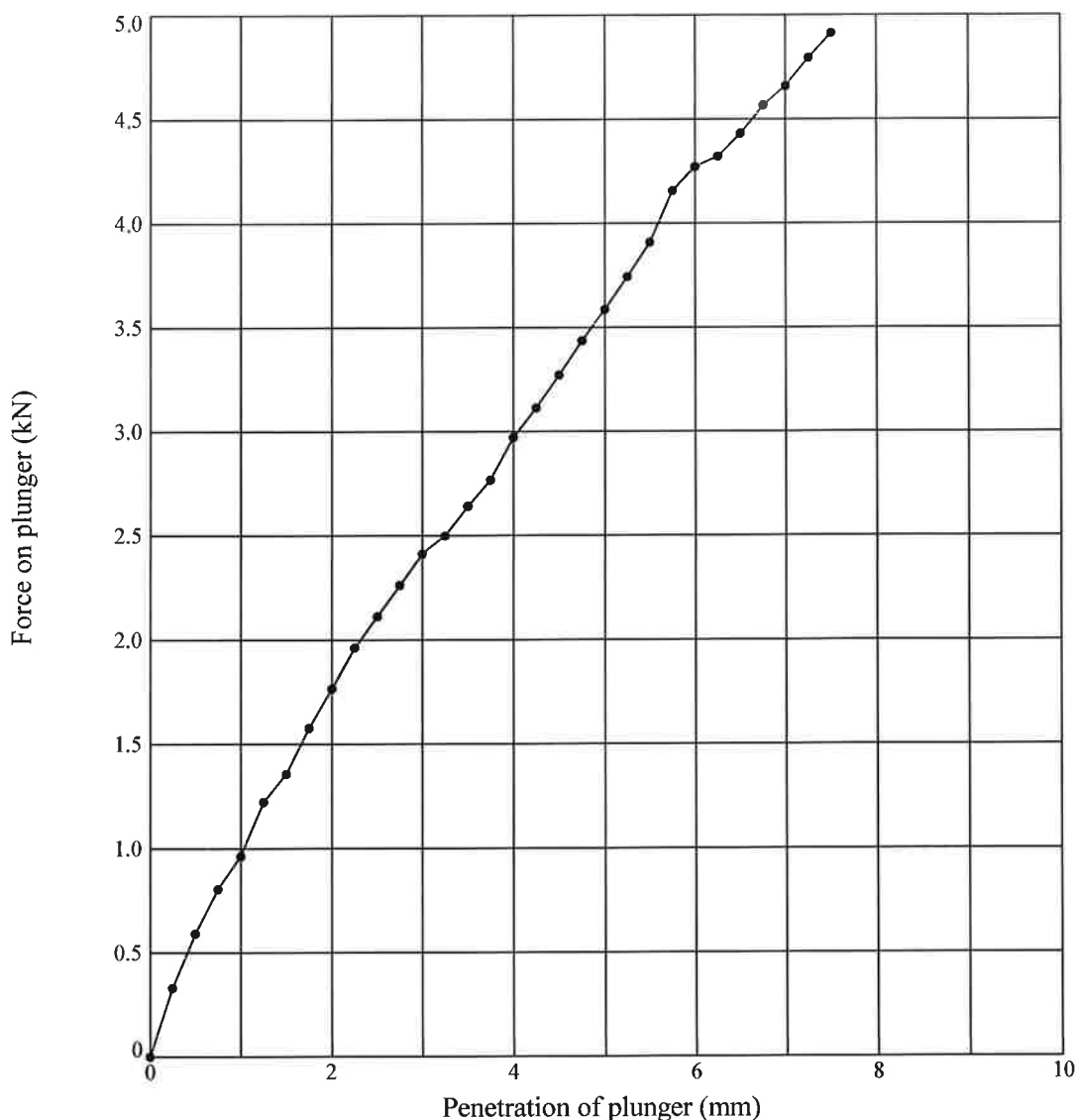
727927



IN SITU CALIFORNIA BEARING RATIO TEST

In accordance with BS1377:Part 9:1990

Position Ref: **CBR1** Depth (m): **0.30** Date: **20/06/13**



Test Details	Initial Ground Conditions	Test Results
Kentledge : Landrover	Initial Moisture Content (%) : NA	CBR Value (%) : 18
Surcharge (kg) : 4.54	Percentage greater than 20 mm : 0	
Sample Description		Remarks
Off white CHALK		No moisture content sample taken.

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
<i>M. Stokes</i>	MATT STOKES	26/06/13
Contract Former Council Depot Havant		Contract Ref: 727927



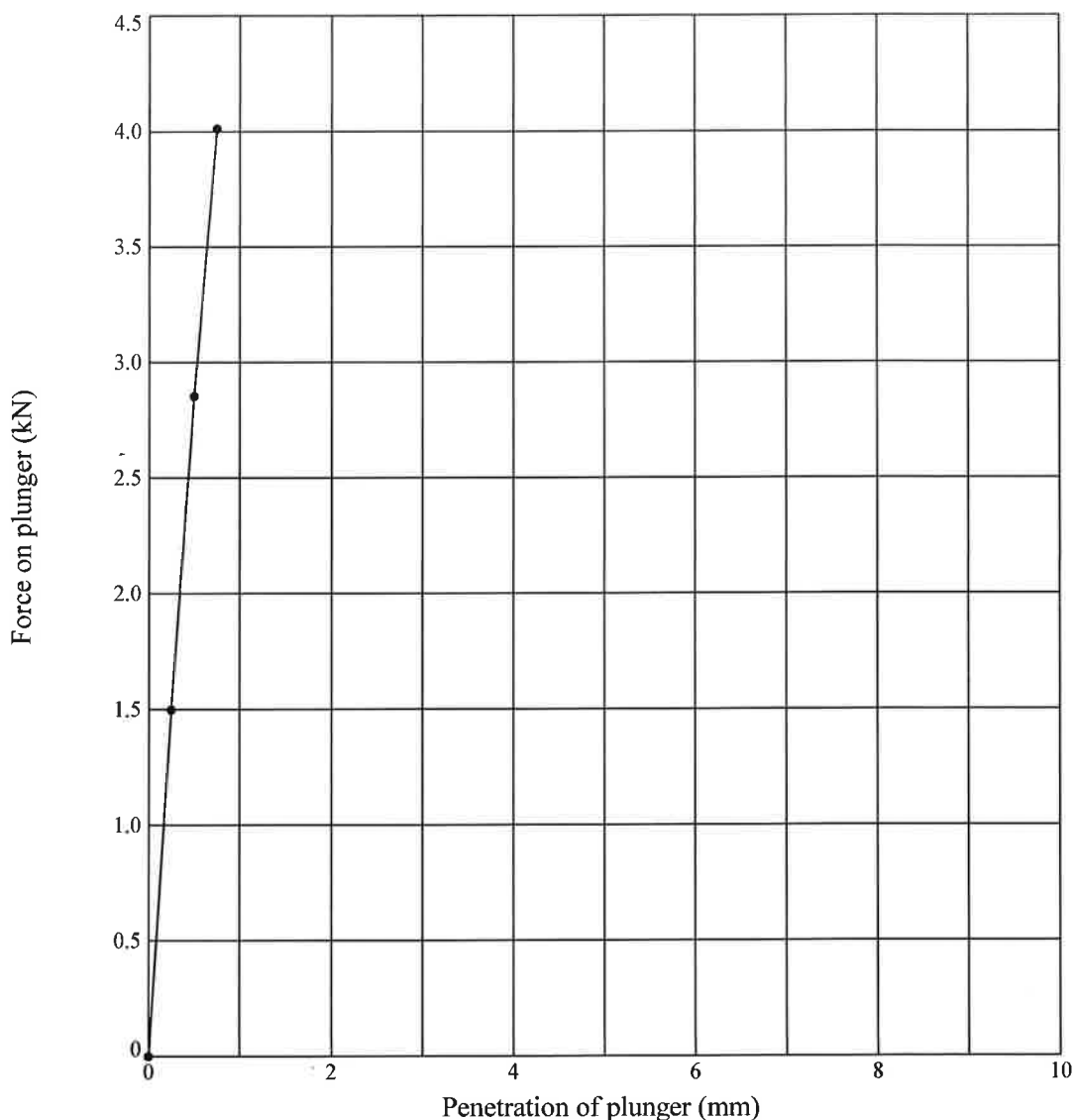
IN SITU CALIFORNIA BEARING RATIO TEST

In accordance with BS1377:Part 9:1990

Position Ref: **CBR2**

Depth (m): **0.34**

Date: **20/06/13**



Test Details		Initial Ground Conditions		Test Results
Kentledge	: Landrover	Initial Moisture Content (%)	: 16	CBR Value (%) : >30
Surcharge (kg)	: 4.54	Percentage greater than 20 mm	: 0	
Sample Description			Remarks	
Off white CHALK			Test stopped prematurely due to liits of equipment being reached.	

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK

 STRUCTURAL SOILS 1a Princess Street Bedminster Bristol BS3 4AG	Compiled By		Date
		MATT STOKES	26/06/13
	Contract Former Council Depot Havant		Contract Ref: 727927



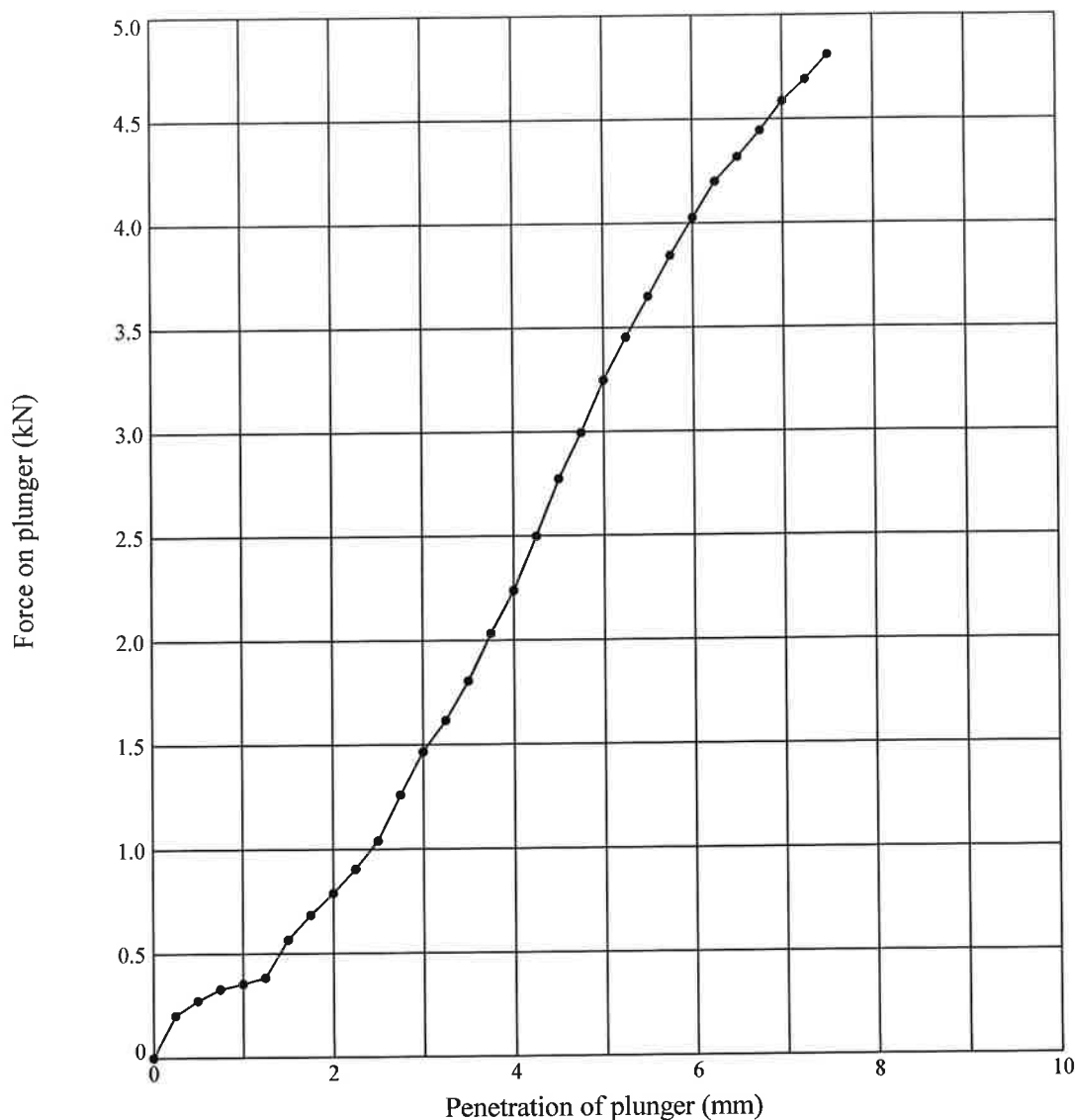
IN SITU CALIFORNIA BEARING RATIO TEST

In accordance with BS1377:Part 9:1990

Position Ref: **CBR3**

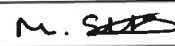
Depth (m): **0.30**

Date: **20/06/13**



Test Details		Initial Ground Conditions		Test Results
Kentledge	: Landrover	Initial Moisture Content (%)	: 9.4	CBR Value (%) : 16
Surcharge (kg)	: 4.54	Percentage greater than 20 mm	: 5	
Sample Description			Remarks	
Dark brown silty very sandy GRAVEL				

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK

 STRUCTURAL SOILS 1a Princess Street Bedminster Bristol BS3 4AG	Compiled By		Date
			26/06/13
	Contract	Contract Ref:	
	Former Council Depot Havant	727927	



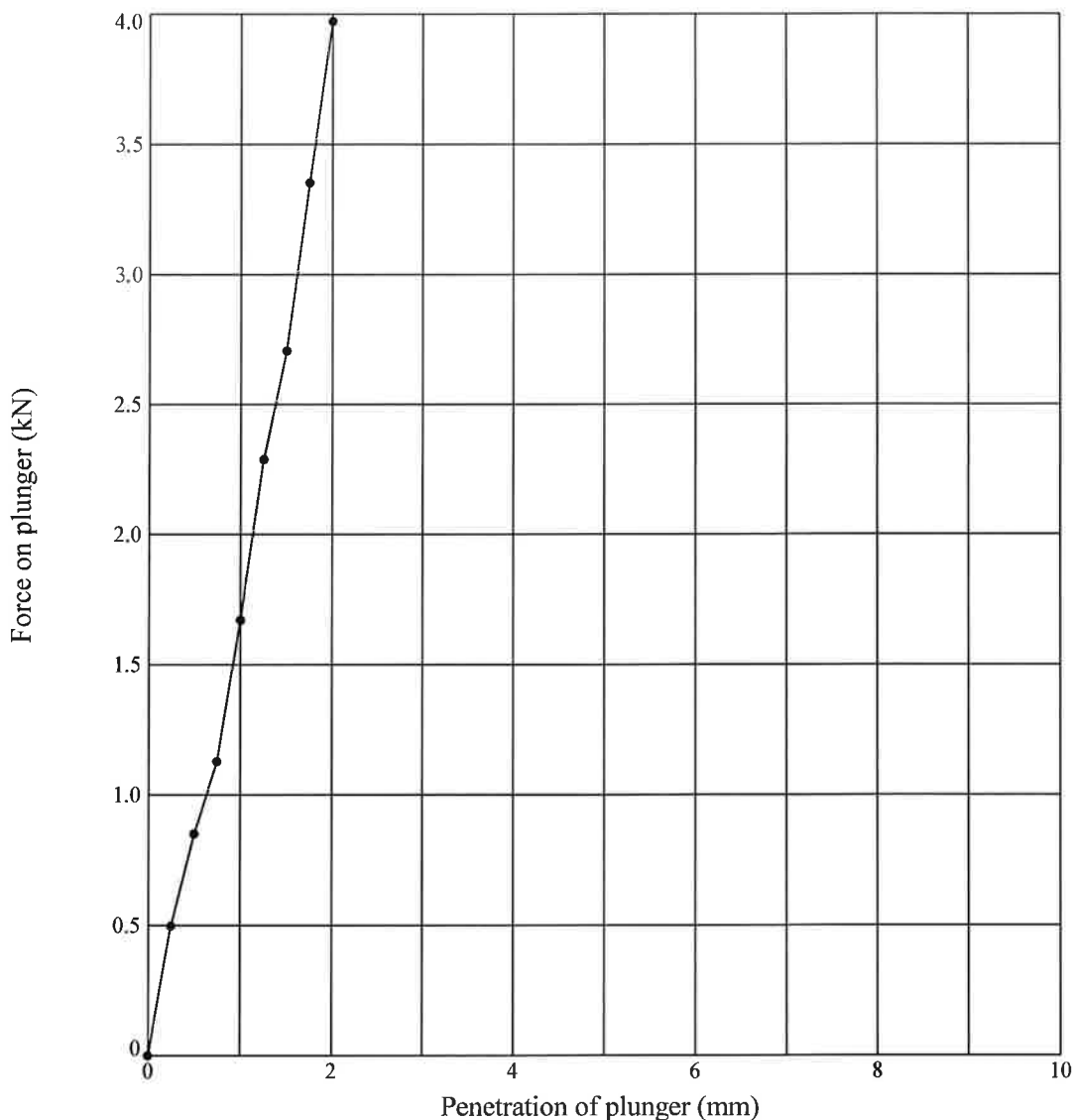
IN SITU CALIFORNIA BEARING RATIO TEST

In accordance with BS1377:Part 9:1990

Position Ref: **CBR4**

Depth (m): **0.30**

Date: **20/06/13**



Test Details		Initial Ground Conditions		Test Results
Kentledge	: Landrover	Initial Moisture Content (%)	: 12	CBR Value (%) : >30
Surcharge (kg)	: 4.54	Percentage greater than 20 mm	: 2	
Sample Description			Remarks	
Dark brown silty very sandy GRAVEL			Test stopped prematurely due to limits of equipment being reached.	

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
<i>M. Stokes</i>		26/06/13
Contract	Contract Ref:	
Former Council Depot Havant	727927	



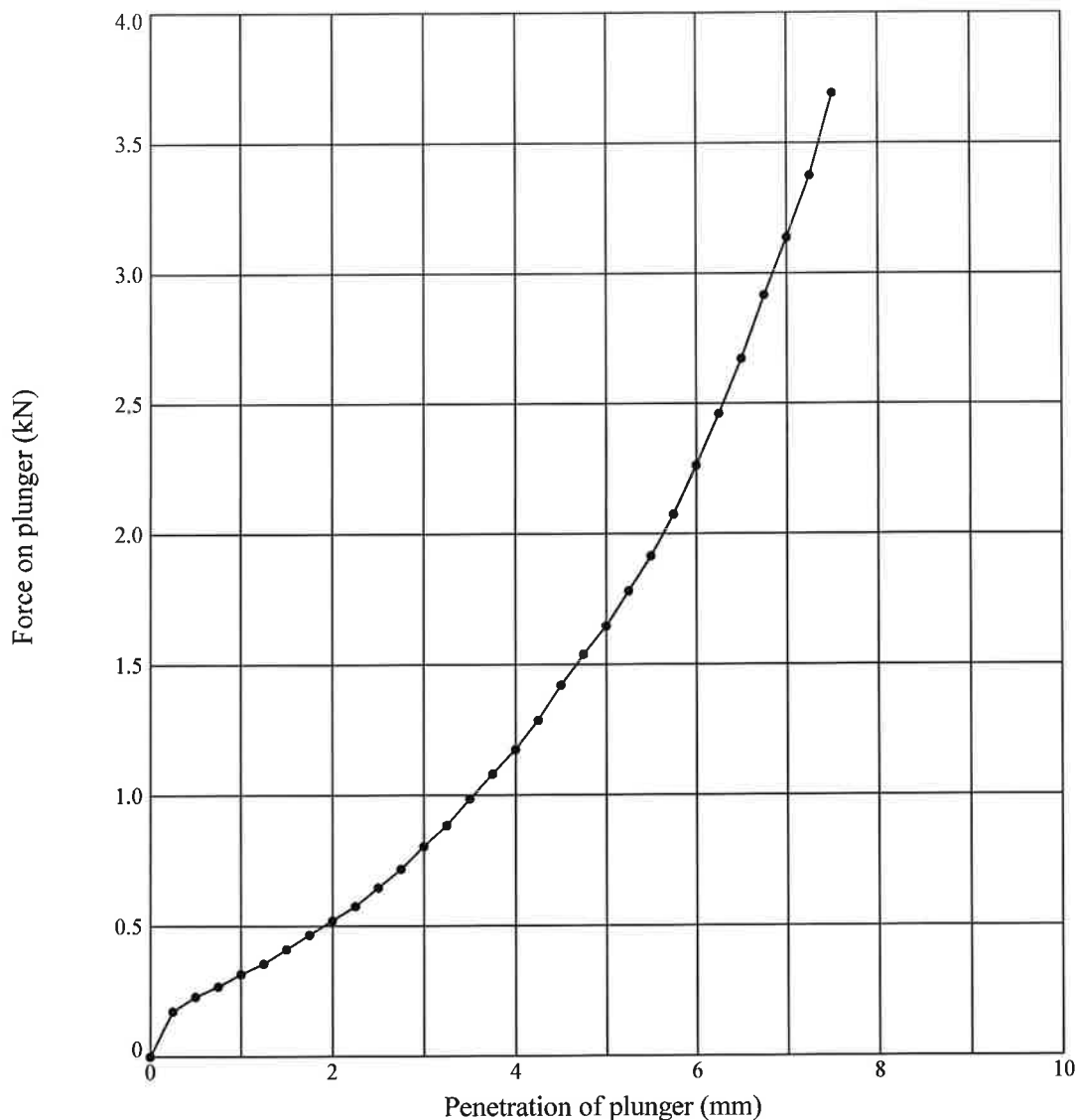
IN SITU CALIFORNIA BEARING RATIO TEST

In accordance with BS1377:Part 9:1990

Position Ref: **CBR5**

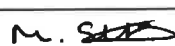
Depth (m): **0.30**

Date: **20/06/13**



Test Details		Initial Ground Conditions		Test Results
Kentledge	: Landrover	Initial Moisture Content (%)	: 20	CBR Value (%) : 8.3
Surcharge (kg)	: 4.54	Percentage greater than 20 mm	: 0	
Sample Description			Remarks	
White CHALK				

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK

 STRUCTURAL SOILS 1a Princess Street Bedminster Bristol BS3 4AG	Compiled By		Date
			MATT STOKES
	Contract		Contract Ref:
Former Council Depot Havant		727927	
			

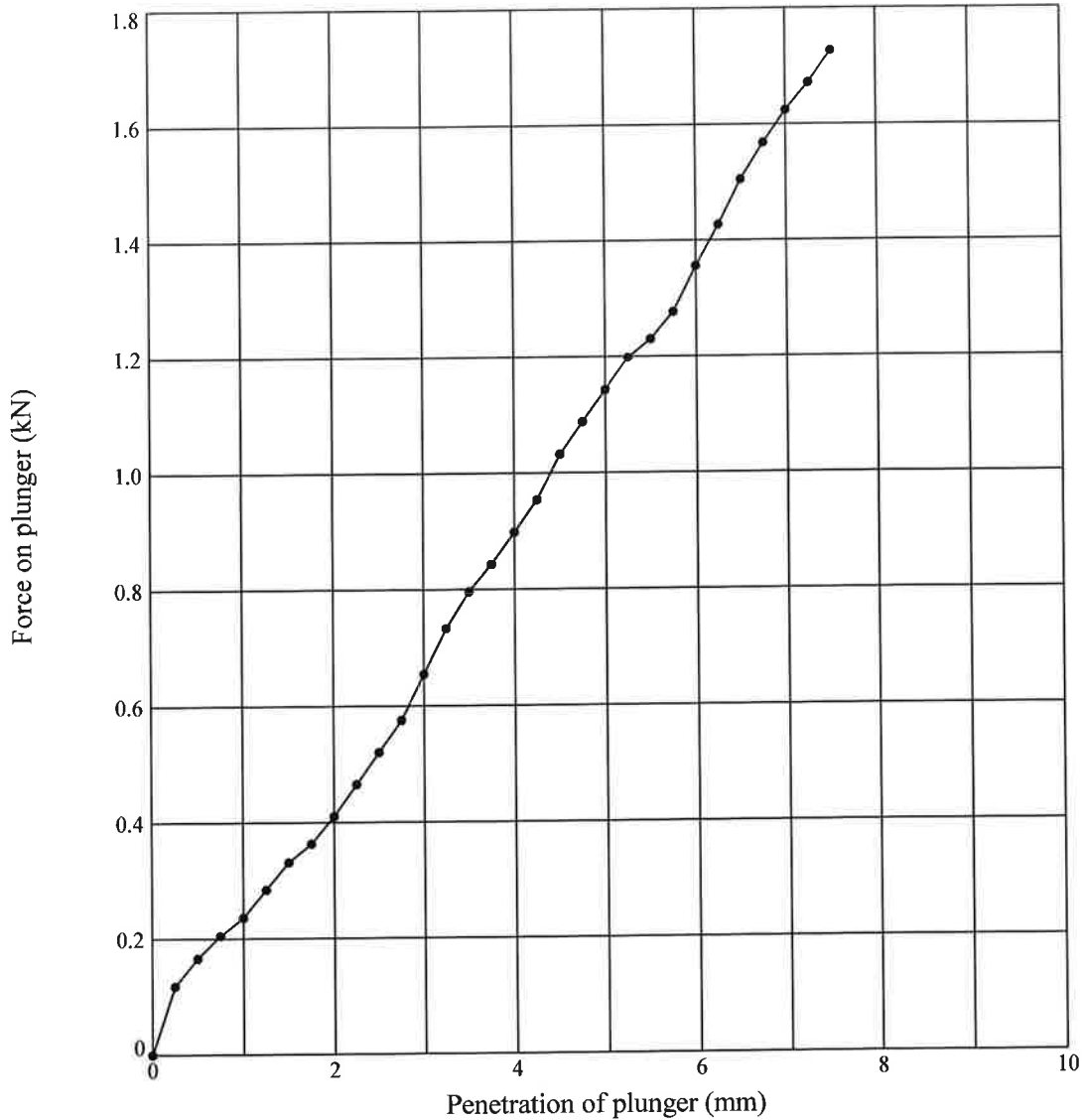
IN SITU CALIFORNIA BEARING RATIO TEST

In accordance with BS1377:Part 9:1990

Position Ref: **CBR6**

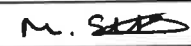
Depth (m): **0.30**

Date: **20/06/13**



Test Details		Initial Ground Conditions		Test Results
Kentledge	: Landrover	Initial Moisture Content (%)	: 15	CBR Value (%) : 5.7
Surcharge (kg)	: 4.54	Percentage greater than 20 mm	: 5	
Sample Description			Remarks	
Dark brown slightly sandy gravelly CLAY				

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK

 STRUCTURAL SOILS 1a Princess Street Bedminster Bristol BS3 4AG	Compiled By		Date
	 MATT STOKES		26/06/13
	Contract Former Council Depot Havant		Contract Ref: 727927



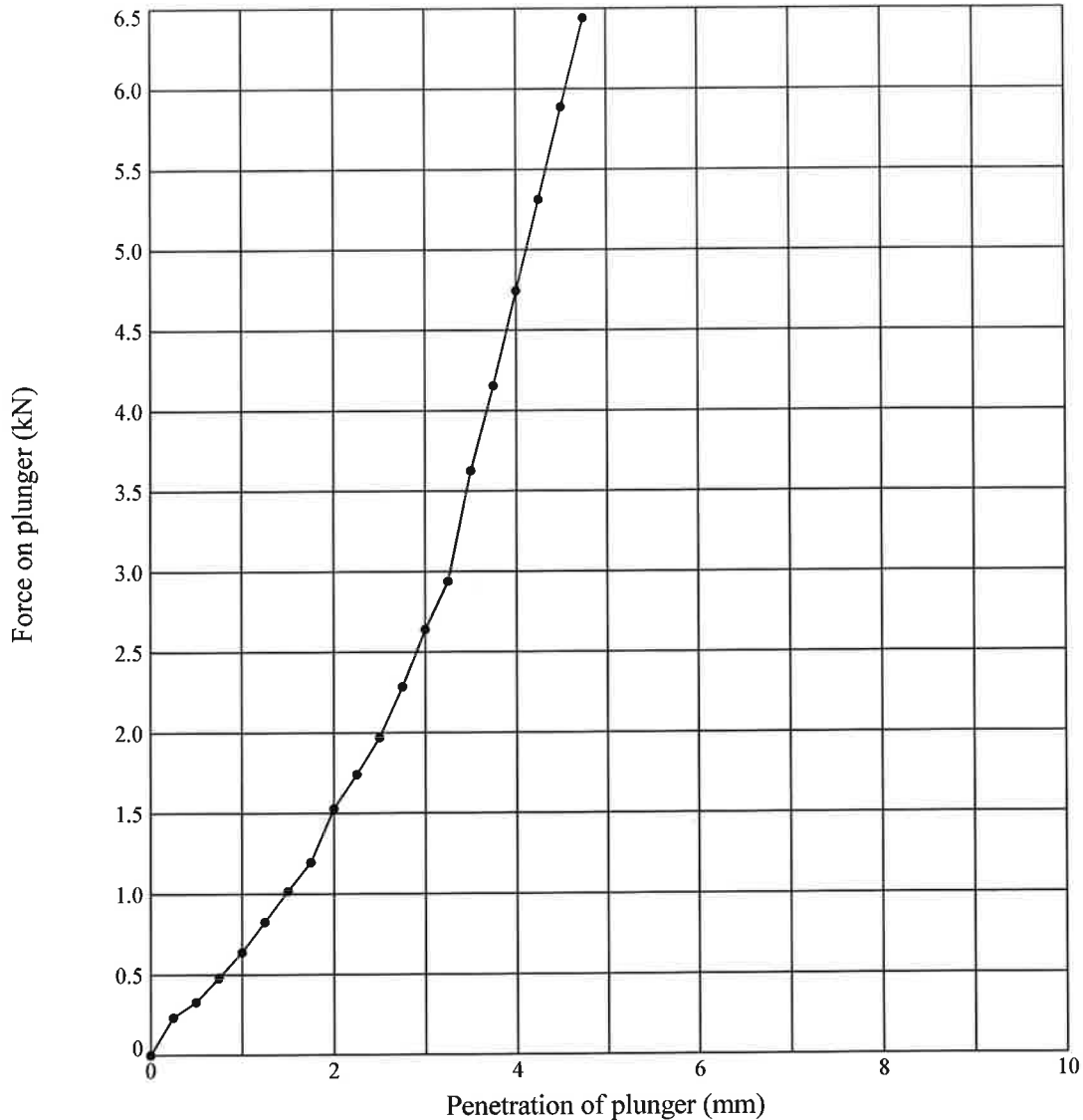
IN SITU CALIFORNIA BEARING RATIO TEST

In accordance with BS1377:Part 9:1990

Position Ref: **CBR7**

Depth (m): **0.30**

Date: **20/06/13**



Test Details	Initial Ground Conditions	Test Results
Kentledge : Landrover	Initial Moisture Content (%) : 13	CBR Value (%) : >32
Surcharge (kg) : 4.54	Percentage greater than 20 mm : 10	
Sample Description		Remarks
Light brown silty very sandy GRAVEL		Test stopped prematurely due to limits of equipment being reached.

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
<i>M. Stokes</i>	MATT STOKES	26/06/13
Contract Former Council Depot Havant		Contract Ref: 727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH7**

Depth (m below GL): **3.50**

Test Number: **1**

Test Date: **20/06/2013**

Test Supervisor: **Adam Rosser**

TEST SETUP DETAILS

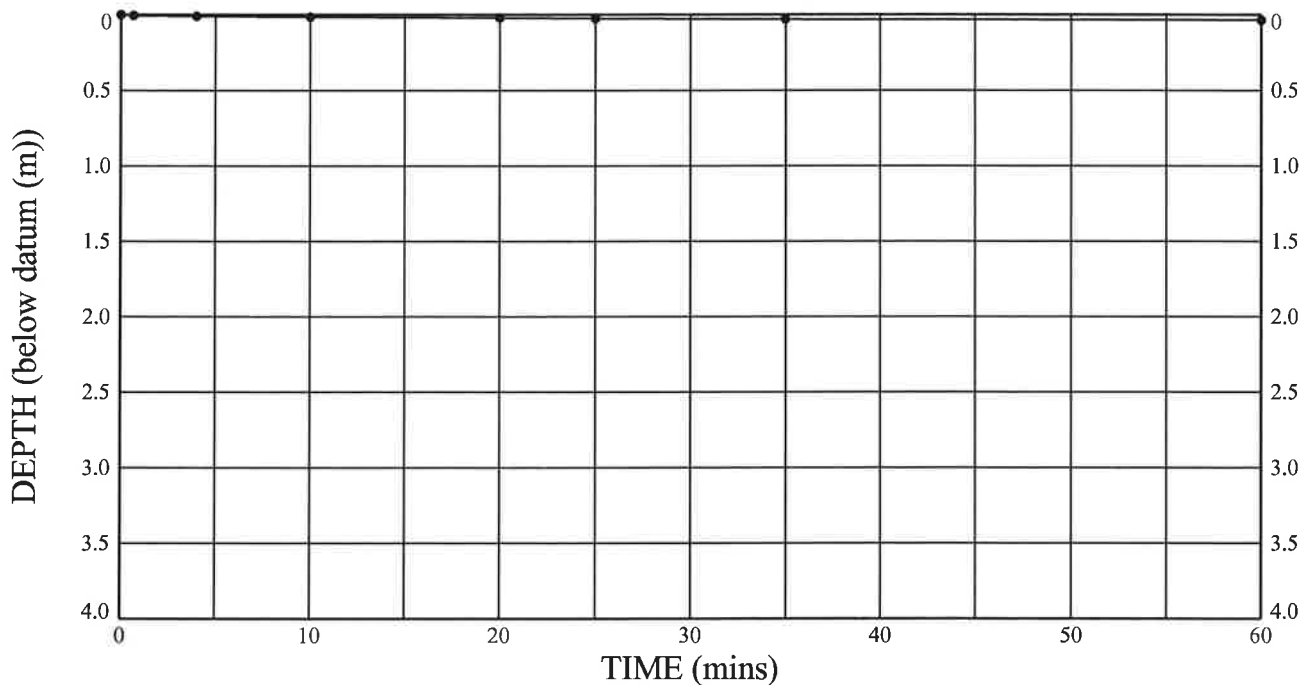
Depth measurements recorded from ground level.

Depth to top of response zone:	3.50 m	Borehole diameter:	200 mm
Depth to base of response zone:	3.50 m		
Length of response zone:	0.00 m	Depth to base of casing:	3.50 m
Initial groundwater level prior to test:	1.50 m	Casing diameter:	200 mm
Depth to base of borehole at start of test:	3.50 m		
Depth to base of borehole at completion of test:	3.50 m	Weather:	Fine

TEST MEASUREMENTS

Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho
00:00:00	0.00	1.46	1.00								
00:00:40	0.01	1.46	1.00								
00:04:00	0.01	1.45	0.99								
00:10:00	0.02	1.44	0.99								
00:20:00	0.02	1.44	0.99								
00:25:00	0.03	1.44	0.98								
00:35:00	0.03	1.43	0.98								
01:00:00	0.04	1.42	0.98								

PLOT OF WATER DEPTH AGAINST TIME



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date

Checked By

Date

ASR

02/08/13

ASR

02/08/13

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH7**

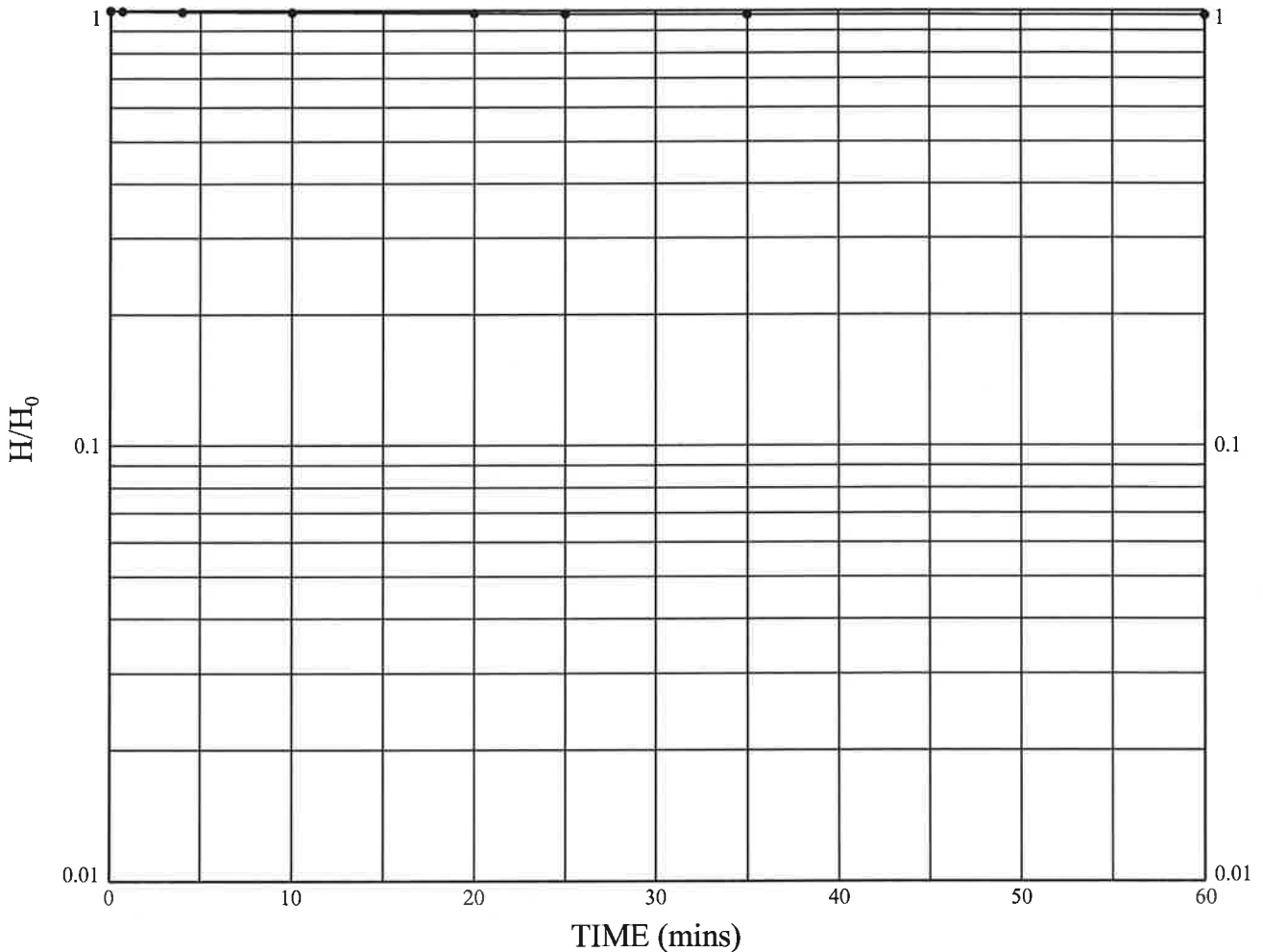
Depth (m below GL): **3.50**

Test Number: **1**

Test Date: **20/06/2013**

Test Supervisor: **Adam Rosser**

PLOT OF H/H_0 AGAINST TIME



Cross Sectional Area, A	=	-	m ²
Intake Factor, F	=	-	m
Basic Time Lag, T (from plot)	=	-	sec
In-situ Permeability, k	=	-	m/sec

Notes : No calculation of permeability was possible due to unsuitable field data.



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By	Date	Checked By	Date
<i>ASR</i>	02/08/13	<i>ASR</i>	02/08/13
Contract: Harts Farm Way, Havant		Contract Ref: 727927	

IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH7**

Depth (m below GL): **7.00-7.50**

Test Number: **2**

Test Date: **20/06/2013**

Test Supervisor: **Adam Rosser**

TEST SETUP DETAILS

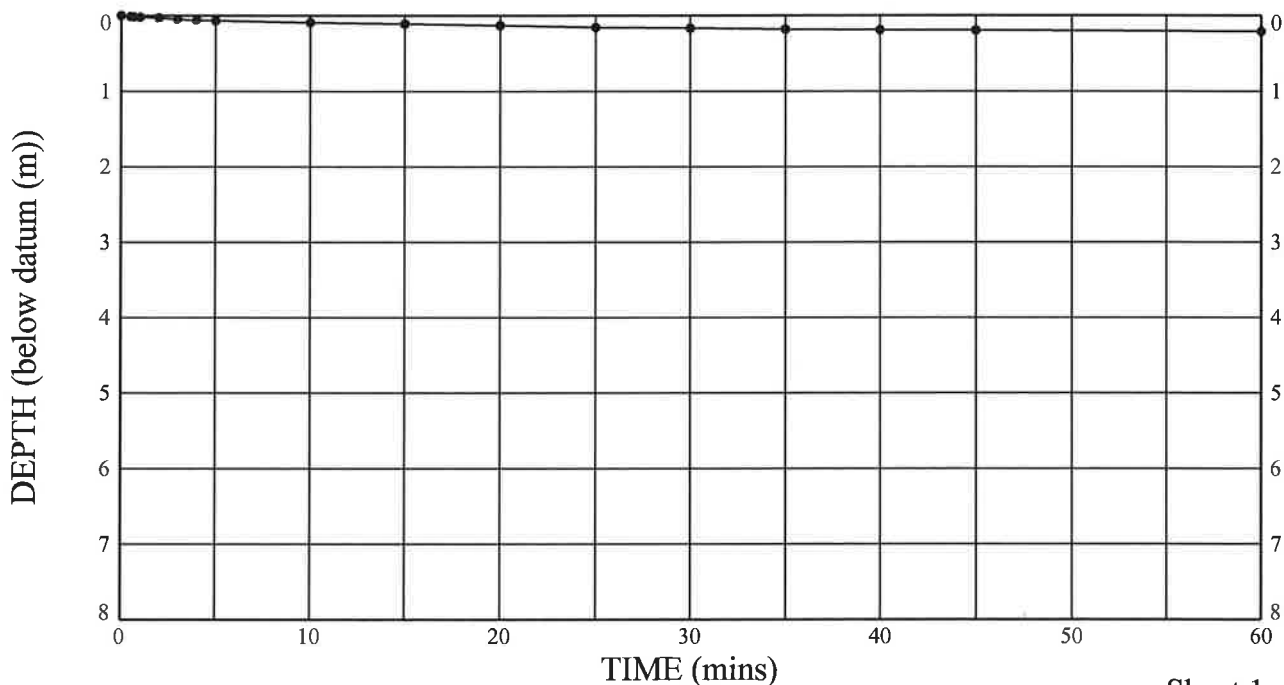
Depth measurements recorded from ground level.

Depth to top of response zone:	7.00 m	Borehole diameter:	200 mm
Depth to base of response zone:	7.50 m		
Length of response zone:	0.50 m	Depth to base of casing:	7.00 m
Initial groundwater level prior to test:	3.00 m	Casing diameter:	200 mm
Depth to base of borehole at start of test:	7.50 m		
Depth to base of borehole at completion of test:	7.50 m	Weather:	Fine

TEST MEASUREMENTS

Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho
00:00:00	0.00	1.46	1.00	00:20:00	0.13	1.33	0.91				
00:00:30	0.01	1.45	0.99	00:25:00	0.16	1.30	0.89				
00:00:40	0.02	1.44	0.99	00:30:00	0.17	1.30	0.89				
00:01:00	0.02	1.44	0.99	00:35:00	0.18	1.28	0.88				
00:02:00	0.03	1.43	0.98	00:40:00	0.19	1.27	0.87				
00:03:00	0.05	1.41	0.97	00:45:00	0.20	1.26	0.87				
00:04:00	0.06	1.40	0.96	01:00:00	0.21	1.25	0.86				
00:05:00	0.07	1.40	0.96								
00:10:00	0.09	1.37	0.94								
00:15:00	0.11	1.35	0.93								

PLOT OF WATER DEPTH AGAINST TIME



Sheet 1 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date

Checked By

Date

Adam Rosser

02/08/13

Adam Rosser

02/08/13

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH7**

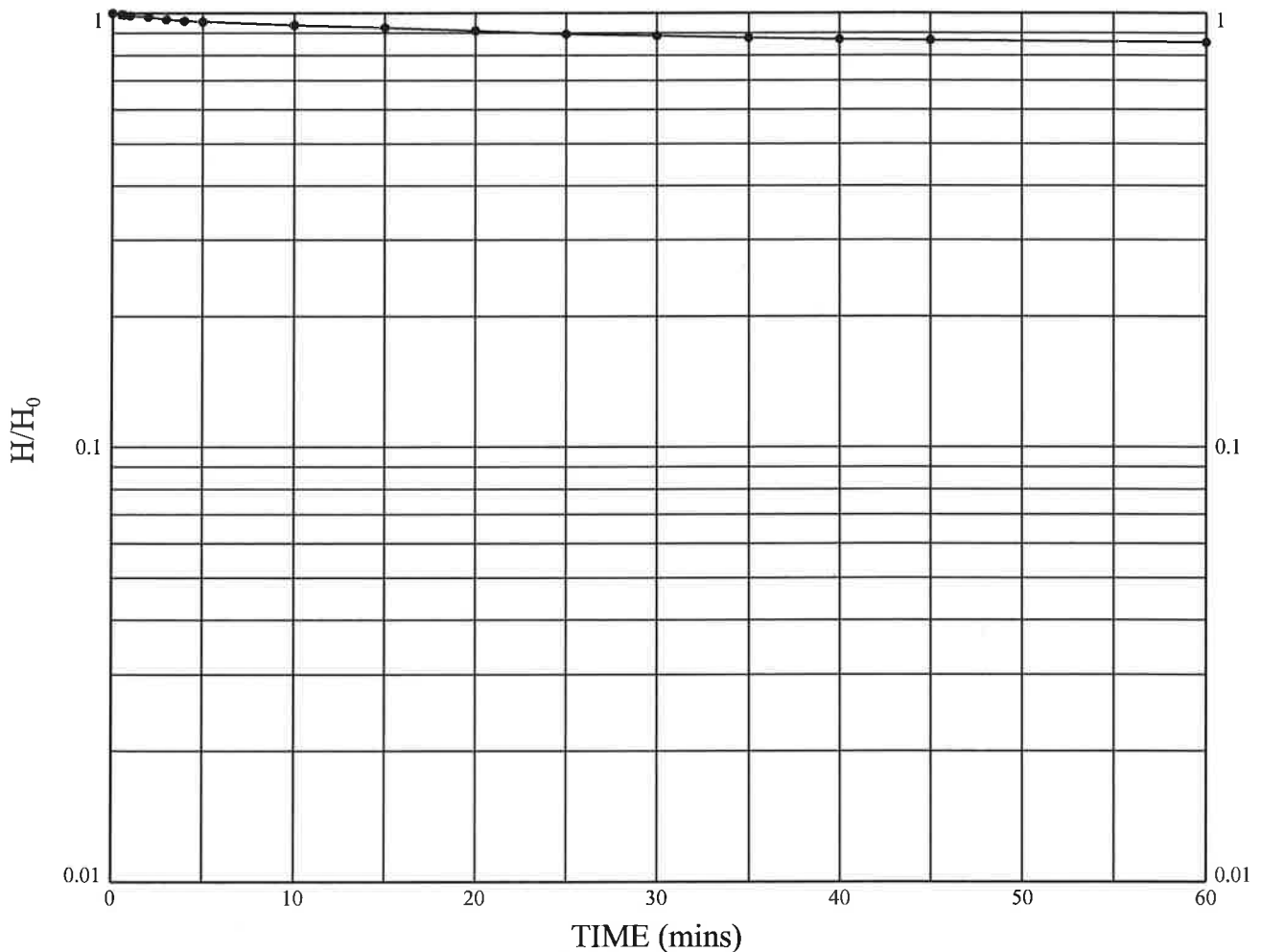
Depth (m below GL): **7.00-7.50**

Test Number: **2**

Test Date: **20/06/2013**

Test Supervisor: **Adam Rosser**

PLOT OF H/H_0 AGAINST TIME



Cross Sectional Area, A = **0.03142** m²

Intake Factor, F = **1.907** m

Basic Time Lag, T (from plot) = **68595** sec

In-situ Permeability, $k = \frac{A}{F \times T}$ = **2.40×10^{-7}** m/sec

Notes : Intake Factor equation D from Fig 6 BS5930:1999 + A2 (2010) section 25.4.6 has been used to calculate permeability. To enable calculation of permeability an assumed standing water level of 1.46m below datum was used to determine head, H. Although the previous assumed standing water level has been used in the calculation of permeability the measured groundwater level prior to the test was recorded as 3m below datum. Permeability has been calculated using the Graphical method in accordance with BS5930:1999 + A2 (2010) 25.4.6.1 b.

Sheet 2 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By	Date	Checked By	Date
<i>ASR</i>	02/08/13	<i>ASR</i>	02/08/13
Contract:		Contract Ref:	
Harts Farm Way, Havant		727927	



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH8**

Depth (m below GL): **4.50-5.00**

Test Number: **1**

Test Date: **17/06/2013**

Test Supervisor: **Adam Rosser**

TEST SETUP DETAILS

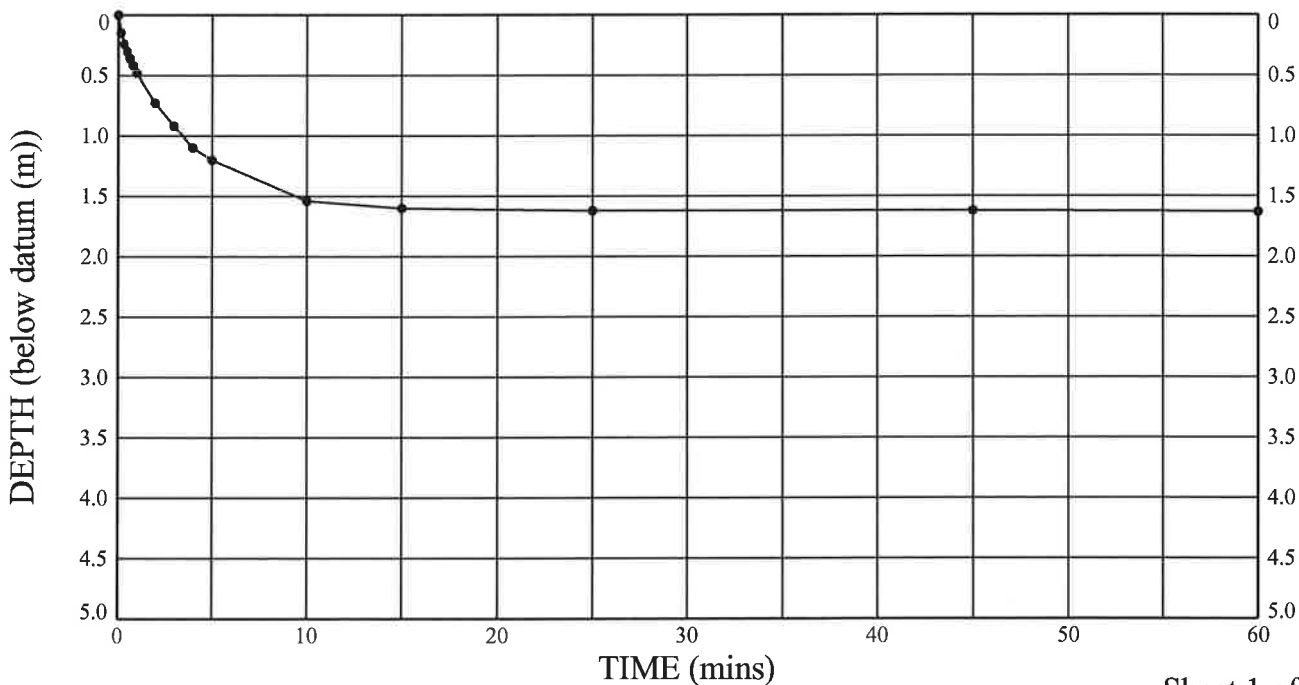
Depth measurements recorded from ground level.

Depth to top of response zone:	4.50 m	Borehole diameter:	200 mm
Depth to base of response zone:	5.00 m		
Length of response zone:	0.50 m	Depth to base of casing:	4.50 m
Initial groundwater level prior to test:	2.50 m	Casing diameter:	200 mm
Depth to base of borehole at start of test:	5.00 m		
Depth to base of borehole at completion of test:	5.00 m	Weather:	Fine

TEST MEASUREMENTS

Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho
00:00:00	0.00	1.78	1.00	00:05:00	1.20	0.58	0.33				
00:00:10	0.15	1.63	0.92	00:10:00	1.54	0.24	0.14				
00:00:20	0.24	1.54	0.87	00:15:00	1.60	0.18	0.10				
00:00:30	0.30	1.48	0.83	00:25:00	1.62	0.16	0.09				
00:00:40	0.36	1.42	0.80	00:45:00	1.62	0.16	0.09				
00:00:50	0.42	1.36	0.76	01:00:00	1.63	0.15	0.08				
00:01:00	0.48	1.30	0.73								
00:02:00	0.73	1.05	0.59								
00:03:00	0.92	0.86	0.48								
00:04:00	1.10	0.68	0.38								

PLOT OF WATER DEPTH AGAINST TIME



Sheet 1 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date

Checked By

Date

ASR

02/08/13

ASR

02/08/13

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH8**

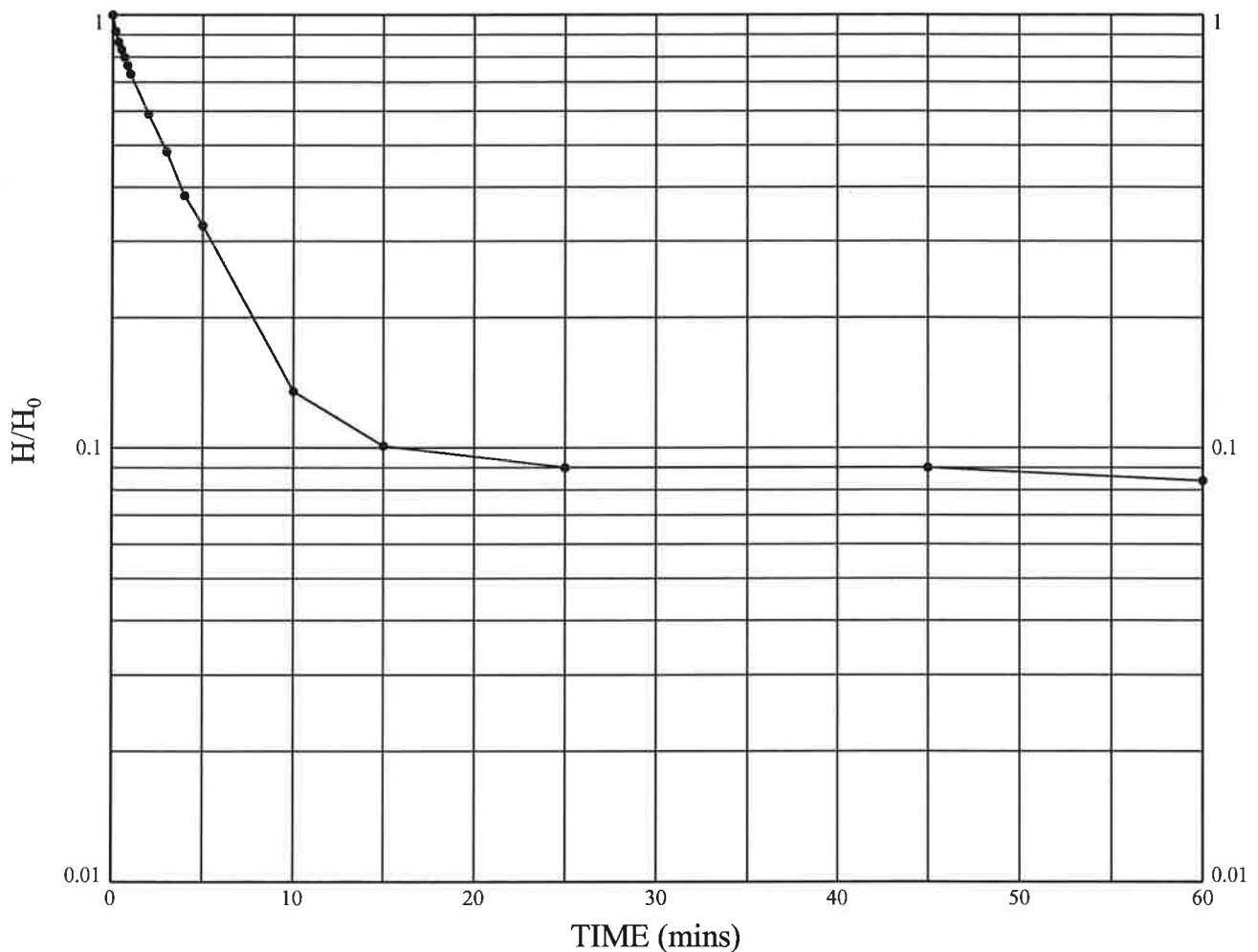
Depth (m below GL): **4.50-5.00**

Test Number: **1**

Test Date: **17/06/2013**

Test Supervisor: **Adam Rosser**

PLOT OF H/H_0 AGAINST TIME



Cross Sectional Area, A = **0.03142** m²

Intake Factor, F = **1.907** m

Basic Time Lag, T (from plot) = **252** sec

In-situ Permeability, $k = \frac{A}{F \times T}$ = **6.54×10^{-5}** m/sec

Notes : Intake Factor equation D from Fig 6 BS5930:1999 + A2 (2010) section 25.4.6 has been used to calculate permeability. To enable calculation of permeability an assumed standing water level of 1.78m below datum was used to determine head, H. Although the previous assumed standing water level has been used in the calculation of permeability the measured groundwater level prior to the test was recorded as 2.5m below datum. Permeability has been calculated using the Graphical method in accordance with BS5930:1999 + A2 (2010) 25.4.6.1 b.

Sheet 2 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By	Date	Checked By	Date
<i>ASR</i>	02/08/13	<i>ASR</i>	02/08/13
Contract: Harts Farm Way, Havant		Contract Ref: 727927	



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH8**

Depth (m below GL): **12.50-13.50**

Test Number: **2**

Test Date: **17/06/2013**

Test Supervisor: **Adam Rosser**

TEST SETUP DETAILS

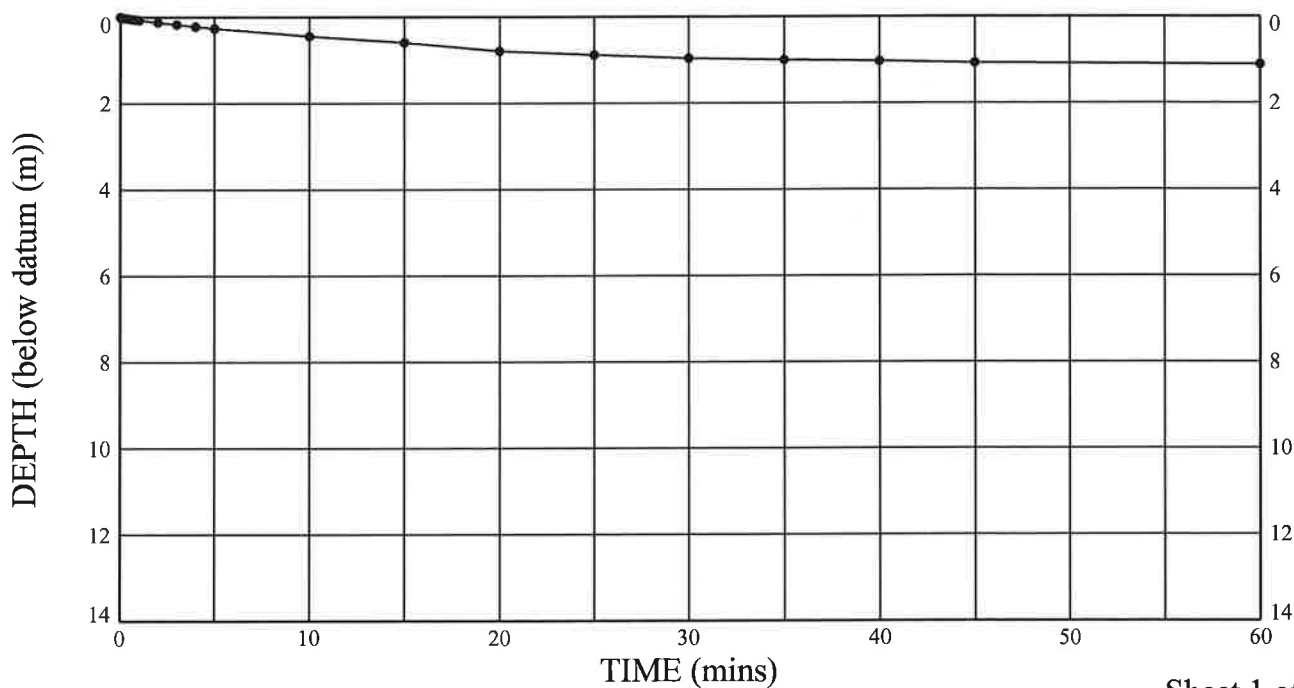
Depth measurements recorded from ground level.

Depth to top of response zone:	12.50 m	Borehole diameter:	150 mm
Depth to base of response zone:	13.50 m		
Length of response zone:	1.00 m	Depth to base of casing:	12.50 m
Initial groundwater level prior to test:	2.50 m	Casing diameter:	150 mm
Depth to base of borehole at start of test:	13.50 m		
Depth to base of borehole at completion of test:	13.50 m	Weather:	Fine

TEST MEASUREMENTS

Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho
00:00:00	0.00	1.78	1.00	00:05:00	0.26	1.52	0.85				
00:00:10	0.02	1.76	0.99	00:10:00	0.44	1.34	0.75				
00:00:20	0.03	1.75	0.98	00:15:00	0.59	1.19	0.67				
00:00:30	0.04	1.74	0.98	00:20:00	0.79	0.99	0.56				
00:00:40	0.05	1.73	0.97	00:25:00	0.88	0.90	0.51				
00:00:50	0.06	1.72	0.97	00:30:00	0.96	0.82	0.46				
00:01:00	0.07	1.71	0.96	00:35:00	1.00	0.78	0.44				
00:02:00	0.12	1.66	0.93	00:40:00	1.03	0.75	0.42				
00:03:00	0.17	1.61	0.90	00:45:00	1.07	0.71	0.40				
00:04:00	0.22	1.56	0.88	01:00:00	1.11	0.67	0.38				

PLOT OF WATER DEPTH AGAINST TIME



Sheet 1 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date

Checked By

Date

AS Rosser

02/08/13

AS Rosser

02/08/13

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH8**

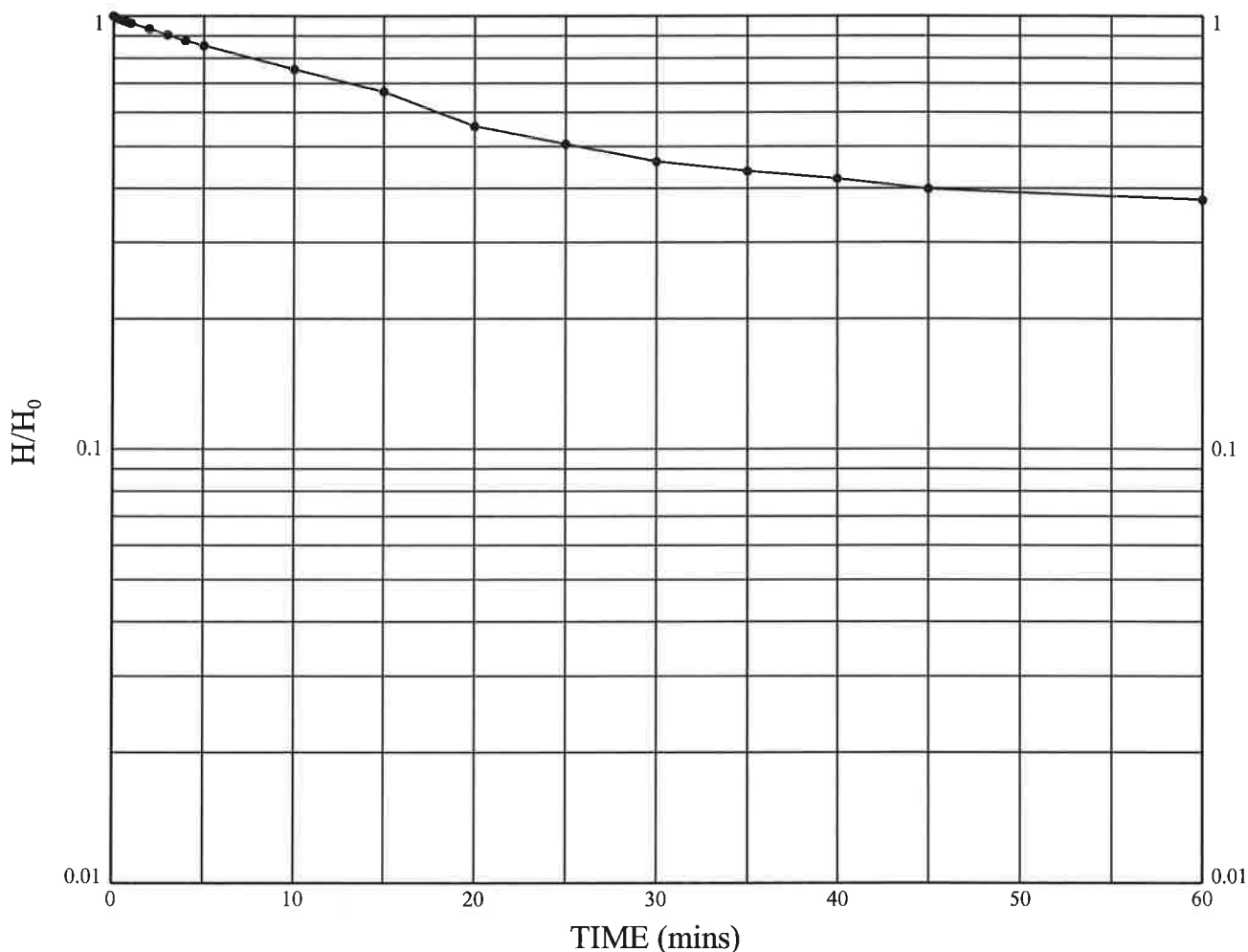
Depth (m below GL): **12.50-13.50**

Test Number: **2**

Test Date: **17/06/2013**

Test Supervisor: **Adam Rosser**

PLOT OF H/H_0 AGAINST TIME



Cross Sectional Area, A = **0.01767** m²

Intake Factor, F = **2.420** m

Basic Time Lag, T (from plot) = **3844** sec

In-situ Permeability, $k = \frac{A}{F \times T}$ = **1.90×10^{-6}** m/sec

Notes : Intake Factor equation D from Fig 6 BS5930:1999 + A2 (2010) section 25.4.6 has been used to calculate permeability. To enable calculation of permeability an assumed standing water level of 1.78m below datum was used to determine head, H. Although the previous assumed standing water level has been used in the calculation of permeability the measured groundwater level prior to the test was recorded as 2.5m below datum. Permeability has been calculated using the Graphical method in accordance with BS5930:1999 + A2 (2010) 25.4.6.1 b.

Sheet 2 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By	Date	Checked By	Date
<i>ASR</i>	02/08/13	<i>ASR</i>	02/08/13
Contract: Harts Farm Way, Havant		Contract Ref: 727927	



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH9**

Depth (m below GL): **4.50-5.00**

Test Number: **1**

Test Date: **18/06/2013**

Test Supervisor: **Adam Rosser**

TEST SETUP DETAILS

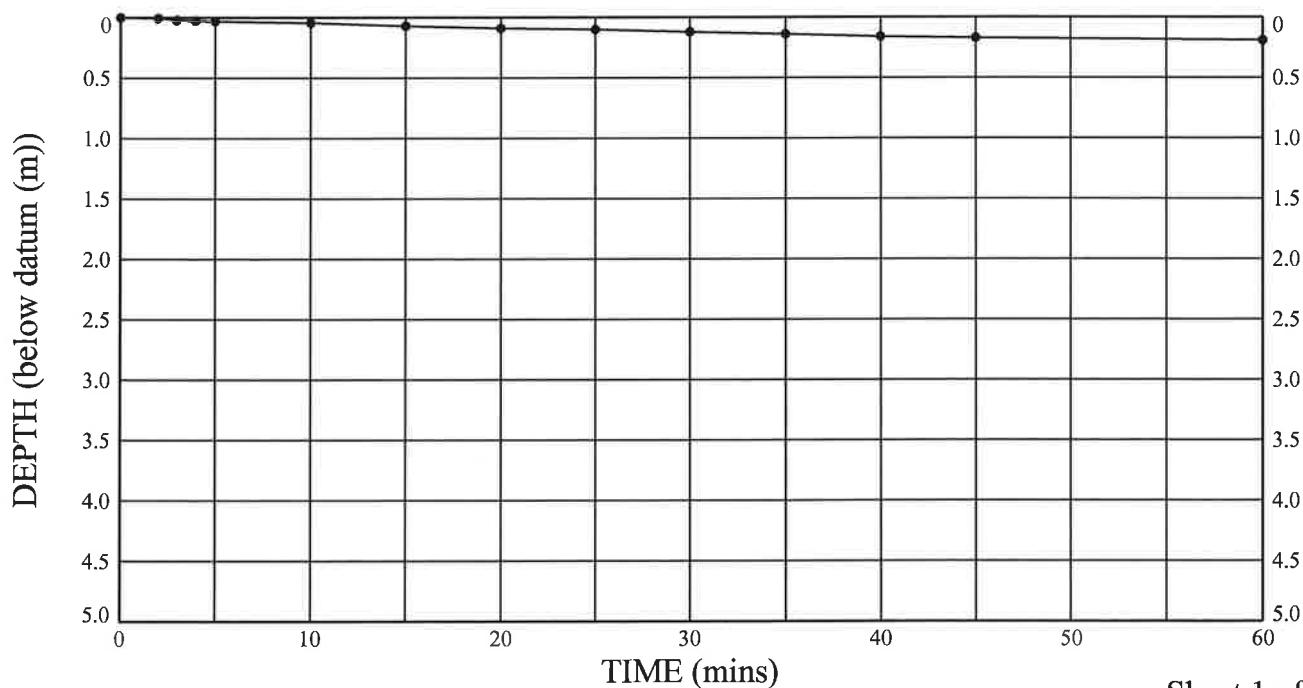
Depth measurements recorded from ground level.

Depth to top of response zone:	4.50 m	Borehole diameter:	200 mm
Depth to base of response zone:	5.00 m		
Length of response zone:	0.50 m	Depth to base of casing:	4.50 m
Initial groundwater level prior to test:	2.50 m	Casing diameter:	200 mm
Depth to base of borehole at start of test:	5.00 m		
Depth to base of borehole at completion of test:	5.00 m	Weather:	Fine

TEST MEASUREMENTS

Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho
00:00:00	0.00	1.60	1.00	00:35:00	0.14	1.46	0.91				
00:02:00	0.01	1.60	1.00	00:40:00	0.16	1.44	0.90				
00:03:00	0.02	1.58	0.99	00:45:00	0.17	1.43	0.89				
00:04:00	0.03	1.58	0.98	01:00:00	0.19	1.41	0.88				
00:05:00	0.03	1.57	0.98								
00:10:00	0.05	1.56	0.97								
00:15:00	0.07	1.53	0.96								
00:20:00	0.09	1.51	0.94								
00:25:00	0.10	1.50	0.94								
00:30:00	0.12	1.48	0.93								

PLOT OF WATER DEPTH AGAINST TIME



Sheet 1 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date

Checked By

Date

Adam Rosser

02/08/13

Adam Rosser

02/08/13

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH9**

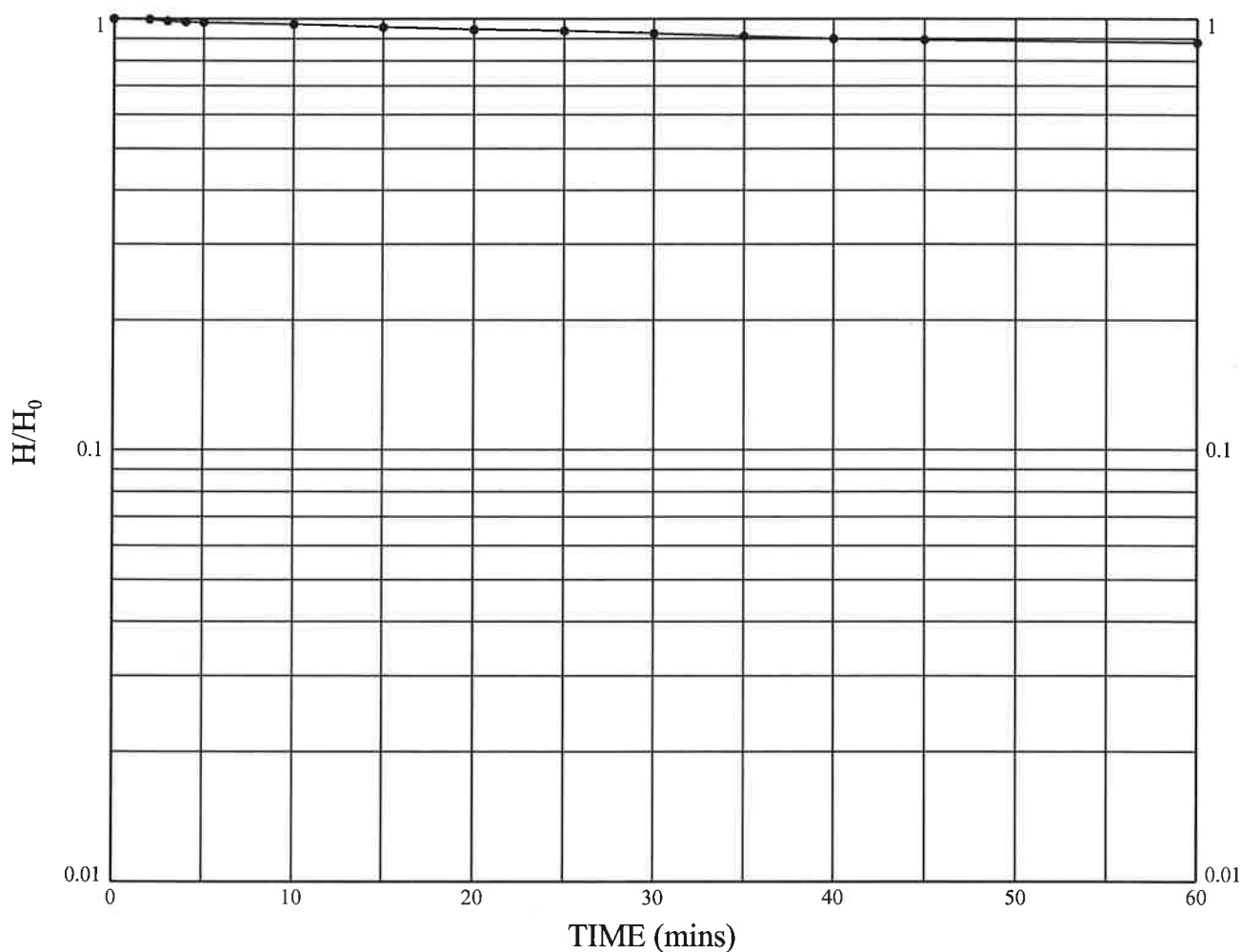
Depth (m below GL): **4.50-5.00**

Test Number: **1**

Test Date: **18/06/2013**

Test Supervisor: **Adam Rosser**

PLOT OF H/H_0 AGAINST TIME



Cross Sectional Area, A = **0.03142** m²

Intake Factor, F = **1.907** m

Basic Time Lag, T (from plot) = **56904** sec

In-situ Permeability, $k = \frac{A}{F \times T}$ = **2.89×10^{-7}** m/sec

Notes : Intake Factor equation D from Fig 6 BS5930:1999 + A2 (2010) section 25.4.6 has been used to calculate permeability. To enable calculation of permeability an assumed standing water level of 1.6m below datum was used to determine head, H. Although the previous assumed standing water level has been used in the calculation of permeability the measured groundwater level prior to the test was recorded as 2.5m below datum. Permeability has been calculated using the Graphical method in accordance with BS5930:1999 + A2 (2010) 25.4.6.1 b.

Sheet 2 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By	Date	Checked By	Date
<i>[Signature]</i>	02/08/13	<i>[Signature]</i>	02/08/13
Contract: Harts Farm Way, Havant		Contract Ref: 727927	



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH9**

Depth (m below GL): **17.50-18.00**

Test Number: **2**

Test Date: **19/06/2013**

Test Supervisor: **Adam Rosser**

TEST SETUP DETAILS

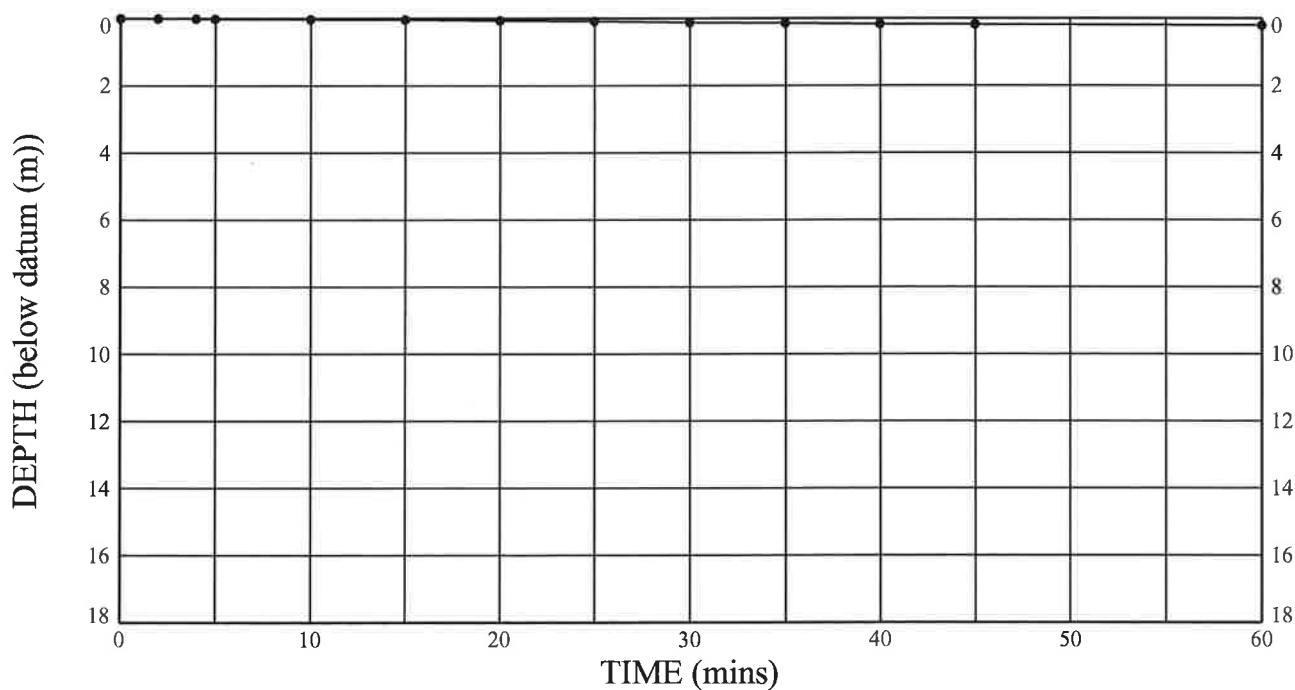
Depth measurements recorded from ground level.

Depth to top of response zone:	17.50 m	Borehole diameter:	150 mm
Depth to base of response zone:	18.00 m		
Length of response zone:	0.50 m	Depth to base of casing:	17.50 m
Initial groundwater level prior to test:	2.50 m	Casing diameter:	150 mm
Depth to base of borehole at start of test:	18.00 m		
Depth to base of borehole at completion of test:	18.00 m	Weather:	Fine

TEST MEASUREMENTS

Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho
00:00:01	0.00	1.60	1.00	00:40:00	0.17	1.44	0.90				
00:02:00	0.01	1.60	1.00	00:45:00	0.18	1.42	0.89				
00:04:00	0.01	1.59	0.99	01:00:00	0.21	1.39	0.87				
00:05:00	0.01	1.59	0.99								
00:10:00	0.03	1.58	0.98								
00:15:00	0.04	1.57	0.98								
00:20:00	0.06	1.54	0.96								
00:25:00	0.08	1.52	0.95								
00:30:00	0.12	1.48	0.93								
00:35:00	0.14	1.46	0.91								

PLOT OF WATER DEPTH AGAINST TIME



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date

Checked By

Date

AS

02/08/13

AS

02/08/13

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH9**

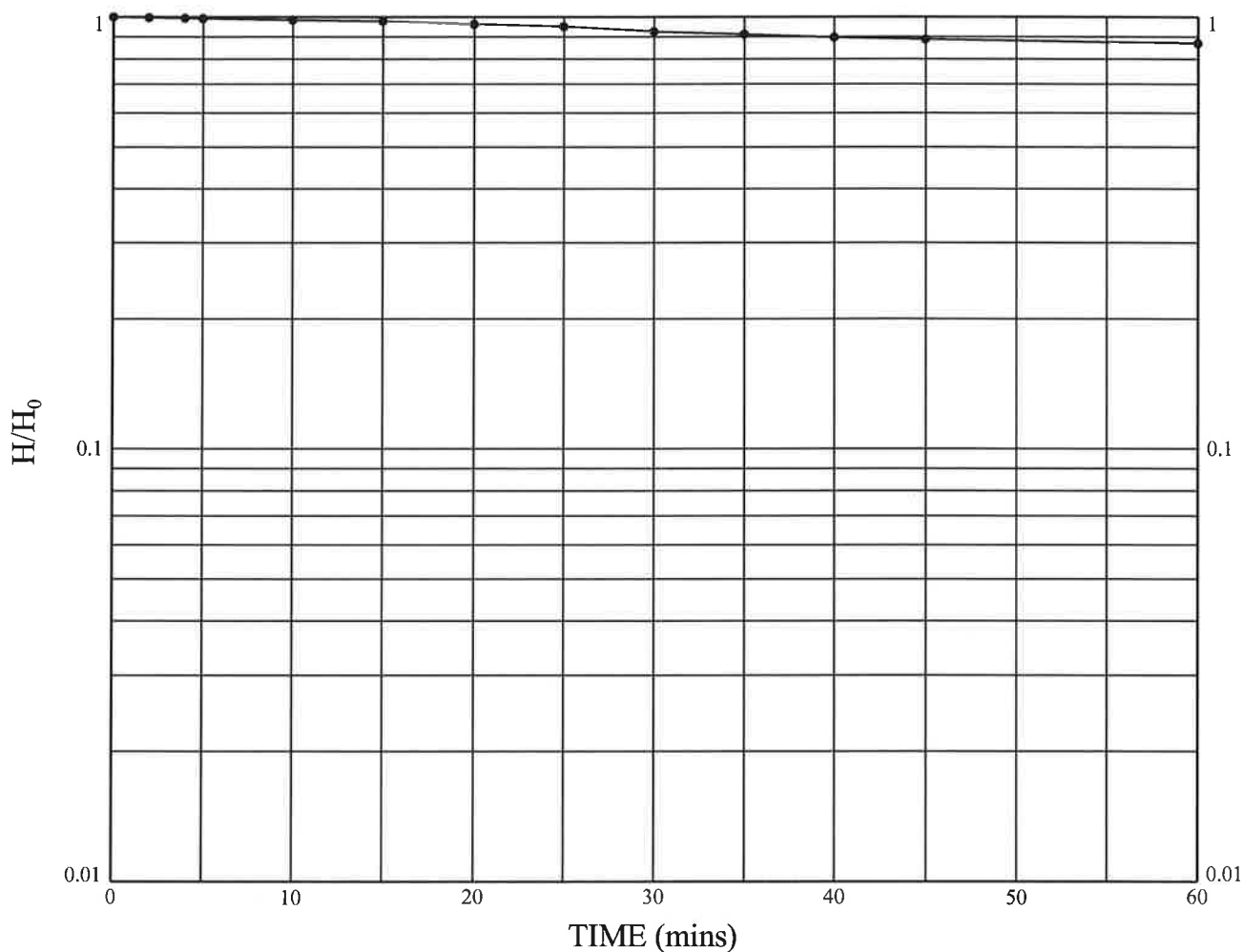
Depth (m below GL): **17.50-18.00**

Test Number: **2**

Test Date: **19/06/2013**

Test Supervisor: **Adam Rosser**

PLOT OF H/H_0 AGAINST TIME



Cross Sectional Area, A	=	-	m ²
Intake Factor, F	=	-	m
Basic Time Lag, T (from plot)	=	-	sec
In-situ Permeability, k	=	-	m/sec

Notes : No calculation of permeability was possible due to unsuitable field data.



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date

Checked By

Date

ASR

02/08/13

ASR

02/08/13

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH10**

Depth (m below GL): **1.70-2.50**

Test Number: **1**

Test Date: **24/06/2013**

Test Supervisor: **Adam Rosser**

TEST SETUP DETAILS

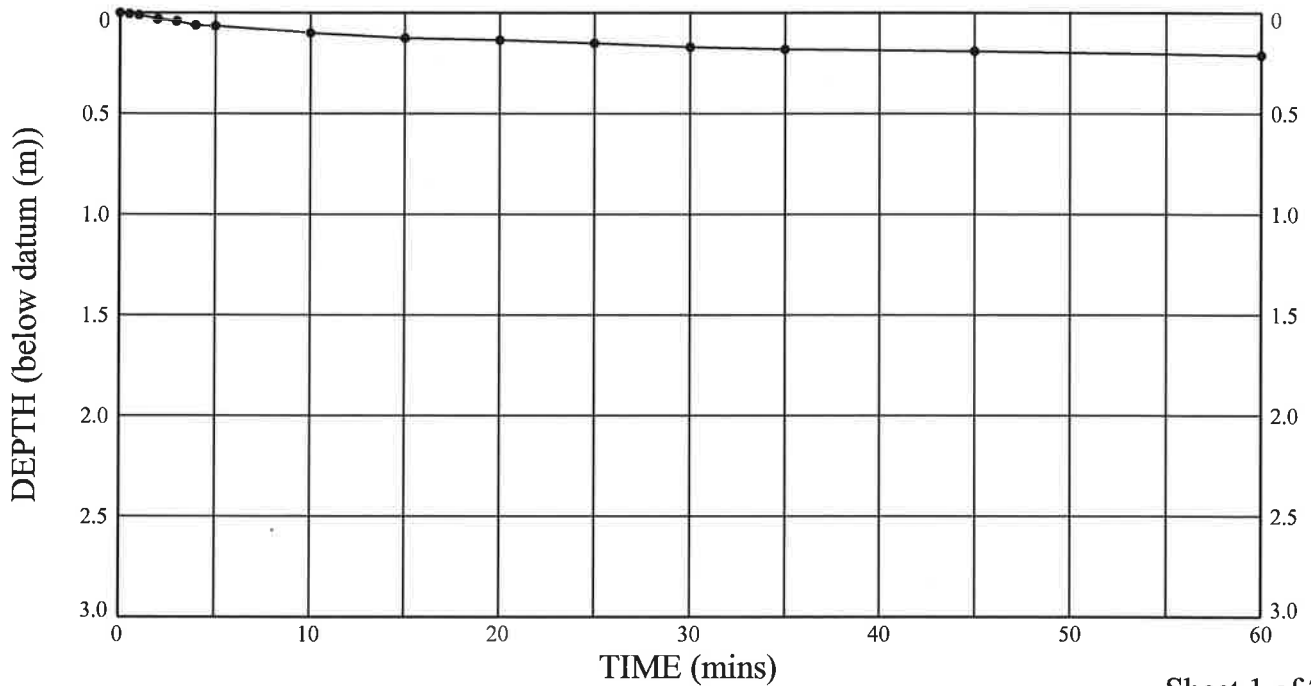
Depth measurements recorded from ground level.

Depth to top of response zone:	1.70 m	Borehole diameter:	200 mm
Depth to base of response zone:	2.50 m		
Length of response zone:	0.80 m	Depth to base of casing:	1.70 m
Initial groundwater level prior to test:	2.00 m	Casing diameter:	200 mm
Depth to base of borehole at start of test:	2.50 m		
Depth to base of borehole at completion of test:	2.50 m	Weather:	Fine

TEST MEASUREMENTS

Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho
00:00:00	0.00	2.01	1.00	00:25:00	0.15	1.86	0.93				
00:00:30	0.01	2.00	1.00	00:30:00	0.17	1.84	0.92				
00:01:00	0.01	2.00	1.00	00:35:00	0.18	1.83	0.91				
00:02:00	0.03	1.98	0.99	00:45:00	0.19	1.82	0.91				
00:03:00	0.04	1.97	0.98	01:00:00	0.21	1.80	0.90				
00:04:00	0.06	1.95	0.97								
00:05:00	0.07	1.94	0.97								
00:10:00	0.10	1.91	0.95								
00:15:00	0.13	1.88	0.94								
00:20:00	0.14	1.87	0.93								

PLOT OF WATER DEPTH AGAINST TIME



Sheet 1 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date

Checked By

Date

ASR

02/08/13

ASR

02/08/13

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH10**

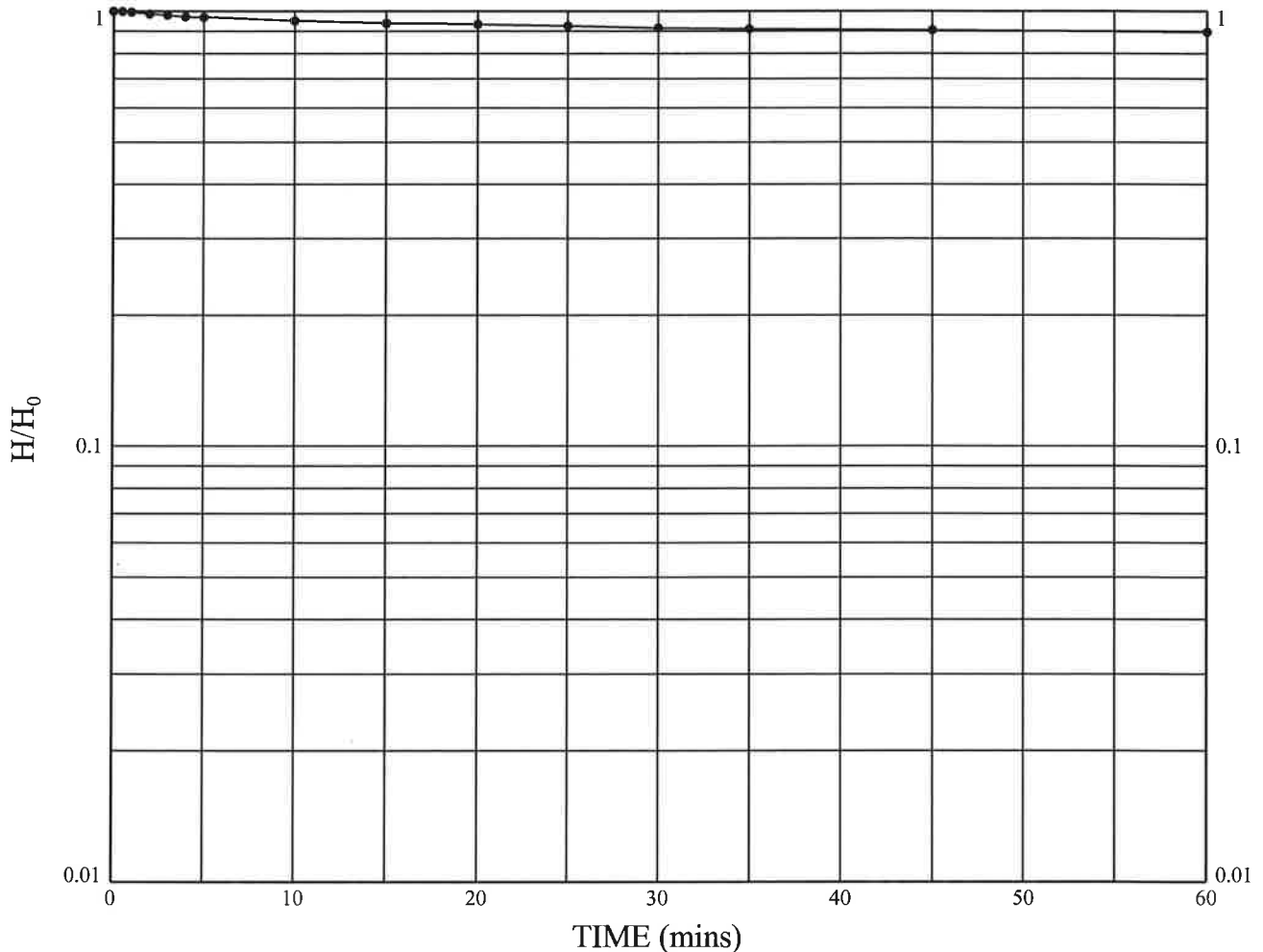
Depth (m below GL): **1.70-2.50**

Test Number: **1**

Test Date: **24/06/2013**

Test Supervisor: **Adam Rosser**

PLOT OF H/H_0 AGAINST TIME



Cross Sectional Area, A = **0.03142** m²

Intake Factor, F = **2.400** m

Basic Time Lag, T (from plot) = **83243** sec

In-situ Permeability, $k = \frac{A}{F \times T}$ = **1.57×10^{-7}** m/sec

Notes : Intake Factor equation D from Fig 6 BS5930:1999 + A2 (2010) section 25.4.6 has been used to calculate permeability. To enable calculation of permeability an assumed standing water level of 2.01m below datum was used to determine head, H. Although the previous assumed standing water level has been used in the calculation of permeability the measured groundwater level prior to the test was recorded as 2m below datum. Permeability has been calculated using the Graphical method in accordance with BS5930:1999 + A2 (2010) 25.4.6.1 b.

Sheet 2 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By	Date	Checked By	Date
<i>JS</i>	02/08/13	<i>JS</i>	02/08/13
Contract:		Contract Ref:	
Harts Farm Way, Havant		727927	



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH10**

Depth (m below GL): **7.50-8.00**

Test Number: **2**

Test Date: **24/06/2013**

Test Supervisor: **Adam Rosser**

TEST SETUP DETAILS

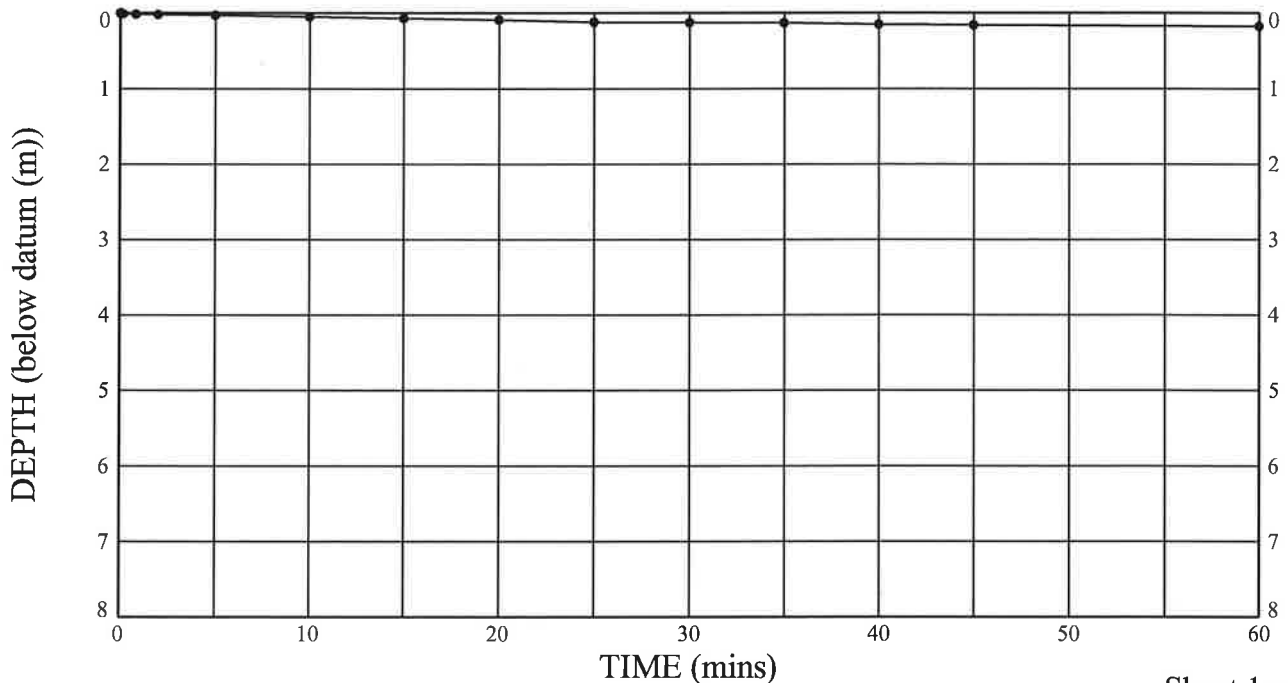
Depth measurements recorded from ground level.

Depth to top of response zone:	7.50 m	Borehole diameter:	200 mm
Depth to base of response zone:	8.00 m		
Length of response zone:	0.50 m	Depth to base of casing:	7.50 m
Initial groundwater level prior to test:	4.00 m	Casing diameter:	200 mm
Depth to base of borehole at start of test:	8.00 m		
Depth to base of borehole at completion of test:	8.00 m	Weather:	Fine

TEST MEASUREMENTS

Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho	Time (mins)	Water depth (m)	Head (m)	H/Ho
00:00:01	0.00	2.01	1.00	00:35:00	0.13	1.88	0.94				
00:00:10	0.01	2.00	1.00	00:40:00	0.15	1.86	0.93				
00:00:50	0.02	2.00	0.99	00:45:00	0.16	1.85	0.92				
00:02:00	0.02	1.99	0.99	01:00:00	0.18	1.83	0.91				
00:05:00	0.03	1.98	0.99								
00:10:00	0.05	1.96	0.98								
00:15:00	0.07	1.94	0.97								
00:20:00	0.09	1.92	0.96								
00:25:00	0.12	1.89	0.94								
00:30:00	0.13	1.88	0.94								

PLOT OF WATER DEPTH AGAINST TIME



Sheet 1 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date

Checked By

Date

AS Rosser

02/08/13

AS Rosser

02/08/13

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



IN-SITU PERMEABILITY TEST - FALLING HEAD

In accordance with BS 5930:1999

Borehole : **BH10**

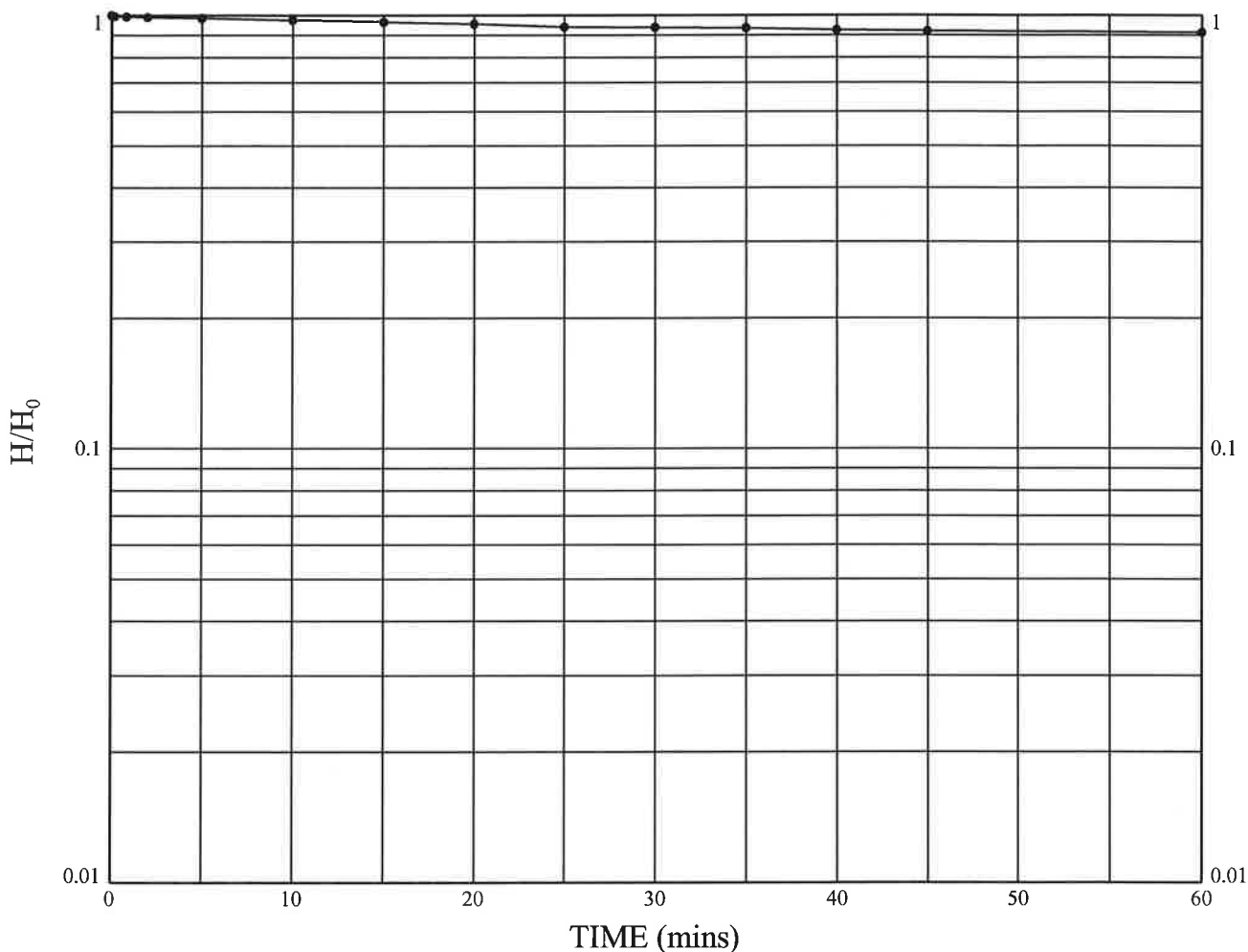
Depth (m below GL): **7.50-8.00**

Test Number: **2**

Test Date: **24/06/2013**

Test Supervisor: **Adam Rosser**

PLOT OF H/H₀ AGAINST TIME



Cross Sectional Area, A	=	0.03142	m ²
Intake Factor, F	=	1.907	m
Basic Time Lag, T (from plot)	=	110032	sec
In-situ Permeability, $k = \frac{A}{F \times T}$	=	1.50×10^{-7}	m/sec

Notes : Intake Factor equation D from Fig 6 BS5930:1999 + A2 (2010) section 25.4.6 has been used to calculate permeability. To enable calculation of permeability an assumed standing water level of 2.01m below datum was used to determine head, H. Although the previous assumed standing water level has been used in the calculation of permeability the measured groundwater level prior to the test was recorded as 4m below datum. Permeability has been calculated using the Graphical method in accordance with BS5930:1999 + A2 (2010) 25.4.6.1 b.

Sheet 2 of 2



STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By	Date	Checked By	Date
<i>ASR</i>	02/08/13	<i>ASR</i>	02/08/13
Contract: Harts Farm Way, Havant		Contract Ref: 727927	



APPENDIX D

- (i) Geotechnical Laboratory Test Verification Sheet
- (ii) Geotechnical Laboratory Test Results

TESTING VERIFICATION CERTIFICATE

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with Structural Soils Ltd Laboratory Quality Assurance Manual, Issue 6, January 2010 all results sheets and summaries of results issued by the laboratory are checked by an approved signatory. This check will also involve checking of at least 10% of calculations for each test type to ensure that data has been correctly entered into the computer and calculated. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Assurance Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **27/06/2013 15:07:01.**

Testing reported after this date is not covered by this Verification Certificate.



Approved Signatory
Sam Handcock (Site Testing Manager)



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Contract:

Former Council Depot Havant

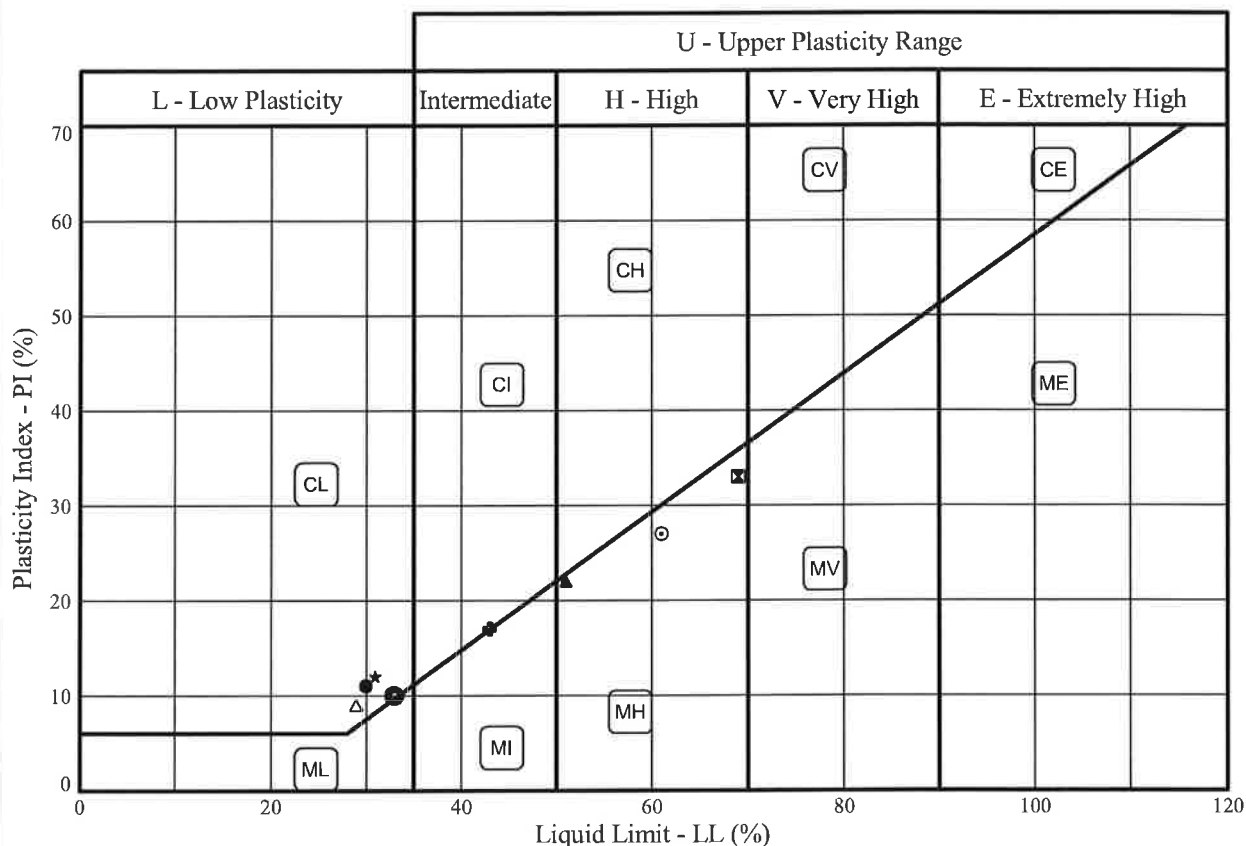
Job No:

727927



PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1999
Testing in accordance with BS1377-2:1990



Sample Identification			BS Test Method #	Preparation Method +	MC %	LL %	PL %	PI %	<425um %	
Exploratory Position ID	Sample	Depth (m)								
●	BH9	3DSPT	1.20	3.2/4.4/5.3/5.4	4.2.4	18	30	19	11	79
☒	TP20	4B	0.90	3.2/4.4/5.3/5.4	4.2.4	16	69	36	33	38
▲	TP22	4B	0.80	3.2/4.4/5.3/5.4	4.2.4	19	51	29	22	63
★	TP23	3B	0.70	3.2/4.4/5.3/5.4	4.2.4	8.2	31	19	12	29
⊙	TP23	5B	1.40	3.2/4.4/5.3/5.4	4.2.4	34	61	34	27	79
⊕	WS1	5B	1.95	3.2/4.4/5.3/5.4	4.2.4	15	43	26	17	67
⊙	WS7	4B	1.40	3.2/4.4/5.3/5.4	4.2.4	25	33	23	10	84
△	WS25	1B	0.20	3.2/4.4/5.3/5.4	4.2.4	16	29	20	9	69

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non standard test, NP = Non plastic.

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By

M. Stokes

MATT STOKES

Date

30/07/13

Contract

Harts Farm Way, Havant

Contract Ref:

727927



SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %	% <425um	Description of Sample
BH9	3	DSPT	1.20	18	30	19	11	79	Dark brown mottled light brown slightly sandy slightly gravelly silty CLAY
TP20	4	B	0.90	16	69	36	33	38	Dark brown sandy very silty GRAVEL
TP22	4	B	0.80	19	51	29	22	63	Brown slightly sandy slightly gravelly SILT
TP23	3	B	0.70	8.2	31	19	12	29	Light brown and white CHALK with some flint gravel
TP23	5	B	1.40	34	61	34	27	79	Brown slightly sandy slightly gravelly SILT
WS1	5	B	1.95	15	43	26	17	67	Brown slightly sandy slightly gravelly CLAY
WS7	4	B	1.40	25	33	23	10	84	White CHALK
WS25	1	B	0.20	16	29	20	9	69	Light brown and white CHALK with some flint gravel



**STRUCTURAL
SOILS LTD**

Contract:

Harts Farm Way, Havant

Contract Ref:

727927



SUMMARY OF SMC (SATURATED MOISTURE CONTENT) TESTS

In accordance with clause 3.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Bulk Density Mg/m ³	Dry Density Mg/m ³	Saturated Moisture Content %	Description of Sample
BH8	23	B	10.00	24	2.11	1.71	22	White CHALK
BH8	29	B	12.60	21	2.16	1.78	19	White CHALK
BH8	35	B	15.00	22	2.13	1.74	20	White CHALK
BH8	42	B	18.30	20	2.15	1.80	19	White CHALK
BH9	27	B	13.00	24	2.18	1.76	20	Greyish white CHALK

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By

M. Stokes

MATT STOKES

Date

30.07.13

Contract Ref:

727927

Contract:

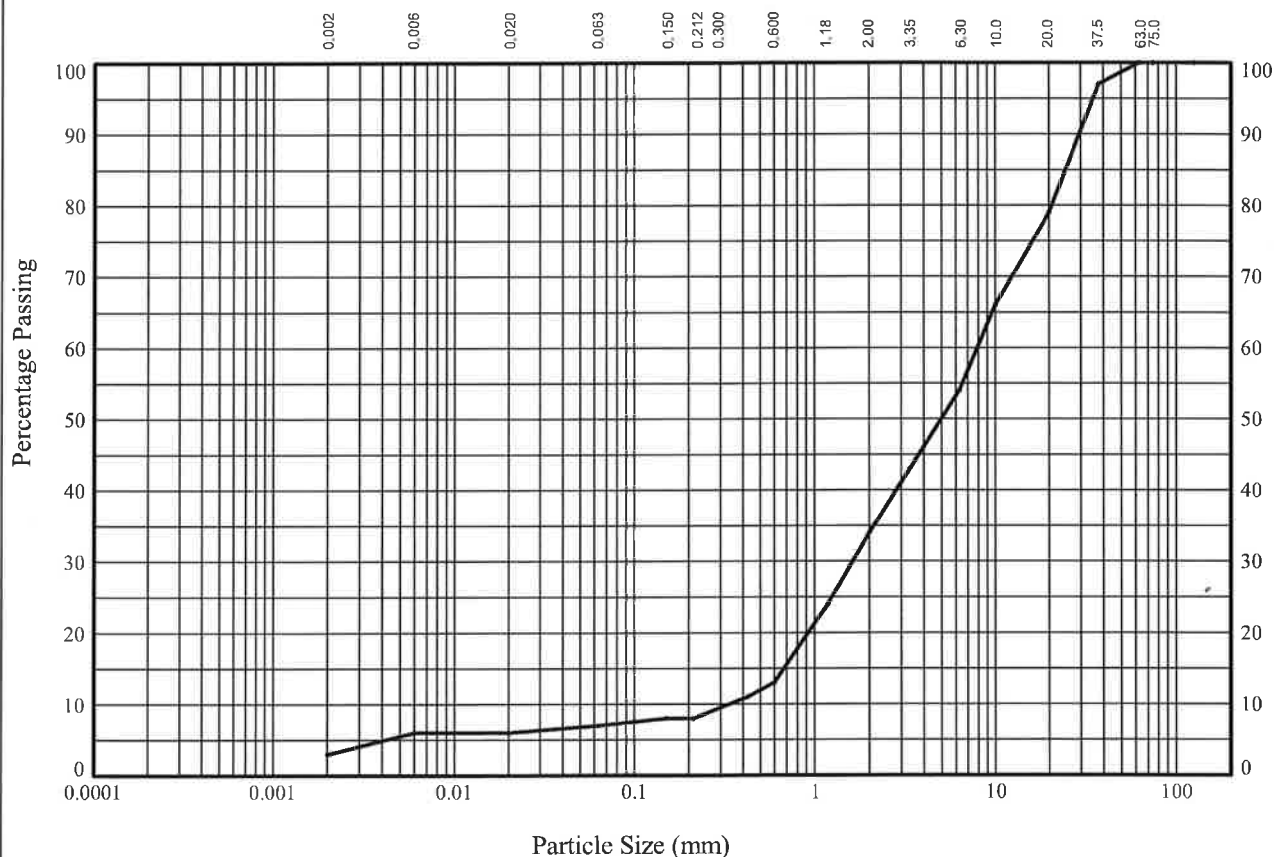
Harts Farm Way, Havant



PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

Borehole : **BH9** Sample Ref: **14** Sample Type: **B** Depth (m): **6.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	100
63.0	100
37.5	97
20.0	79
10.0	66
6.30	54
3.35	43
2.00	34
1.18	24
0.600	13
0.425	11
0.212	8
0.150	8
0.063	7

Particle Diameter	Percentage Passing
0.02	6
0.006	6
0.002	3

Soil Fraction	Sieve Percentage
GRAVEL	66
SAND	27
SILT	4
CLAY	3

Soil Description:

Yellowish brown slightly clayey very sandy GRAVEL

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
<i>M. Stokes</i>		30/07/13
Contract		Contract Ref:
Harts Farm Way, Havant		727927

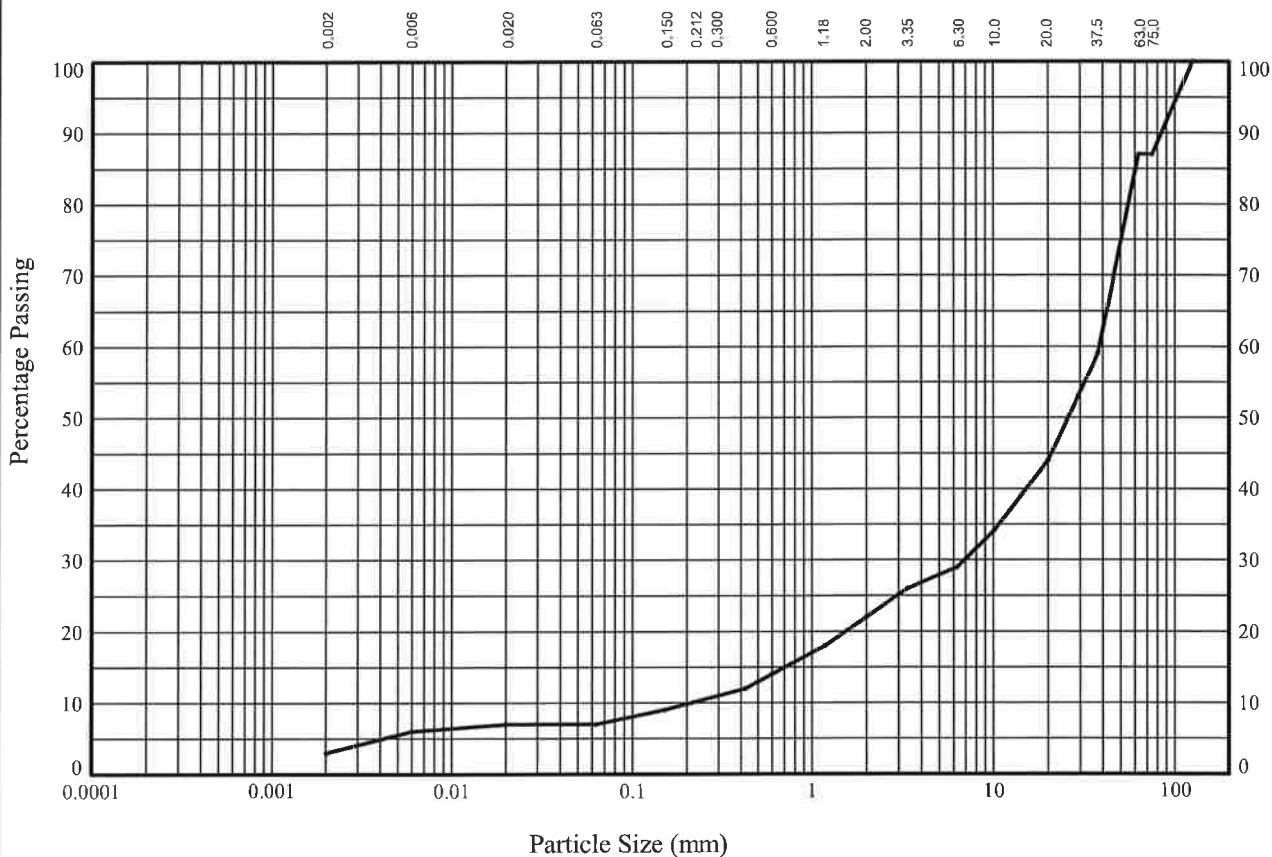


PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

NON STANDARD TEST

Borehole : **BH9** Sample Ref: **17** Sample Type: **B** Depth (m): **7.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	87
63.0	87
37.5	59
20.0	44
10.0	34
6.30	29
3.35	26
2.00	22
1.18	18
0.600	14
0.425	12
0.212	10
0.150	9
0.063	7

Particle Diameter	Percentage Passing
0.02	7
0.006	6
0.002	3

Soil Fraction	Sieve Percentage
COBBLES	13
GRAVEL	65
SAND	15
SILT	4
CLAY	3

Soil Description:

Light brown slightly clayey sandy GRAVEL with medium cobble content

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By

M. Stokes

MATT STOKES

Date

30/07/13

Contract

Harts Farm Way, Havant

Contract Ref:

727927



PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

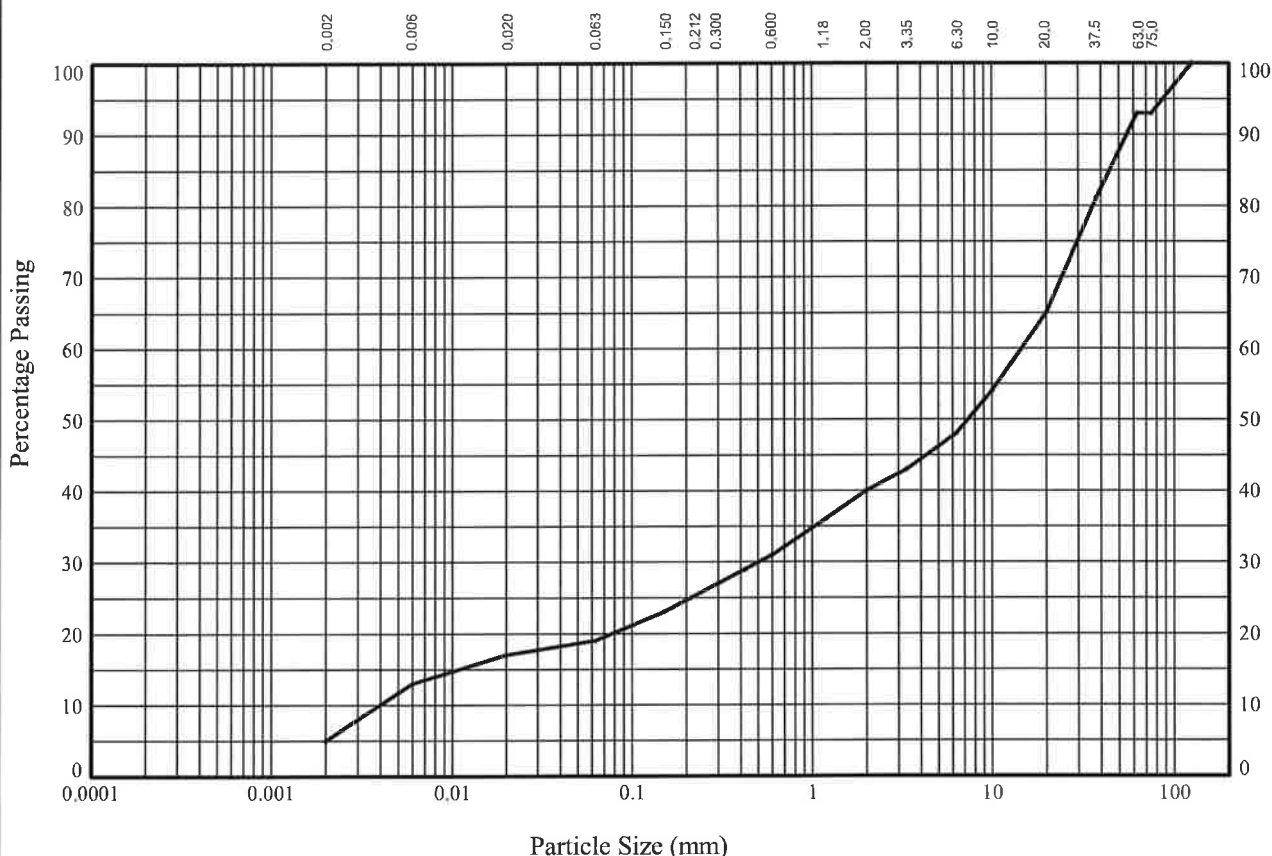
NON STANDARD TEST

Trial Pit : **TP12**

Sample Ref: **9**

Sample Type: **B**

Depth (m): **2.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	93
63.0	93
37.5	81
20.0	65
10.0	54
6.30	48
3.35	43
2.00	40
1.18	36
0.600	31
0.425	29
0.212	25
0.150	23
0.063	19

Particle Diameter	Percentage Passing
0.02	17
0.006	13
0.002	5

Soil Fraction	Sieve Percentage
COBBLES	7
GRAVEL	53
SAND	21
SILT	14
CLAY	5

Soil Description:

Yellowish brown silty very sandy GRAVEL with low cobble content

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By

M. Stokes

MATT STOKES

Date

30/07/13

Contract

Harts Farm Way, Havant

Contract Ref:

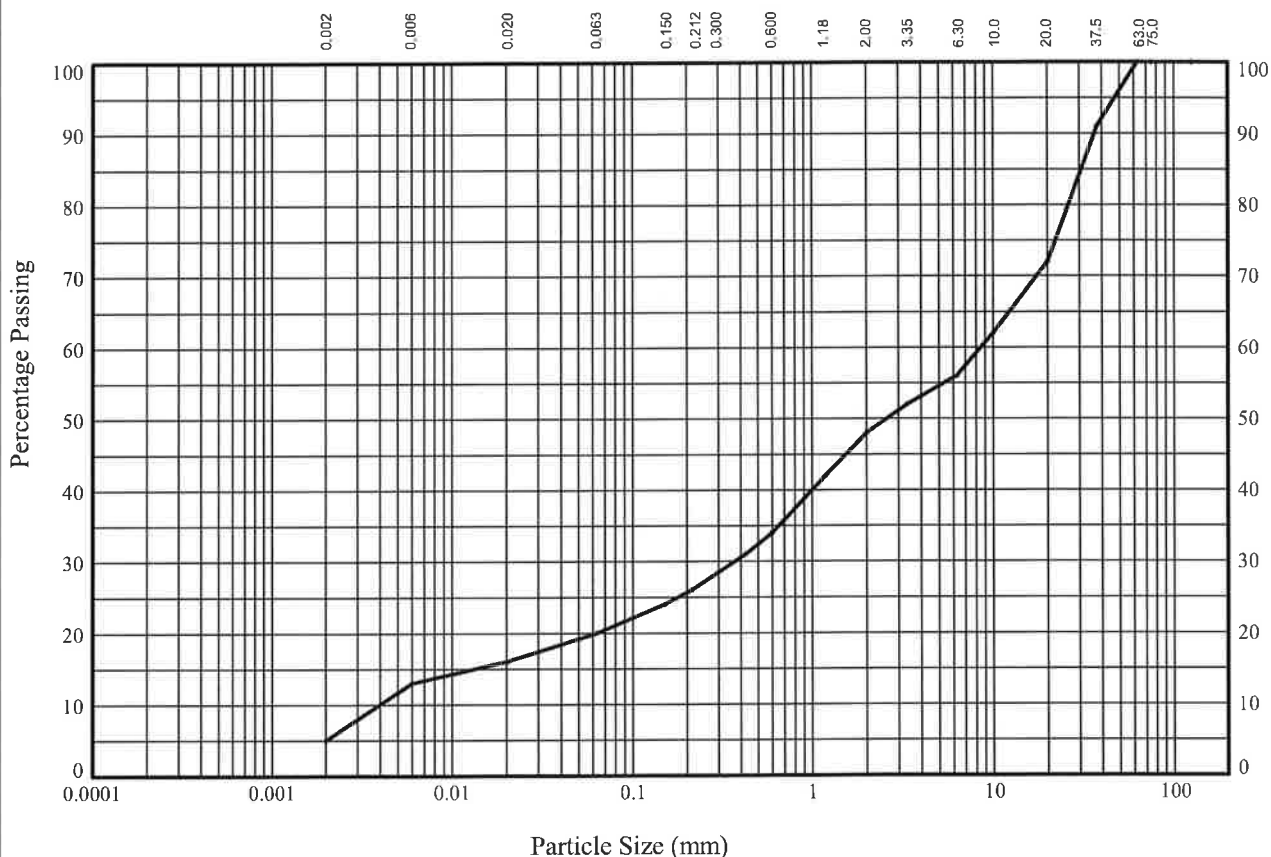
727927



PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

Trial Pit : **TP23** Sample Ref: **8** Sample Type: **B** Depth (m): **2.10**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	100
63.0	100
37.5	91
20.0	72
10.0	62
6.30	56
3.35	52
2.00	48
1.18	42
0.600	34
0.425	31
0.212	26
0.150	24
0.063	20

Particle Diameter	Percentage Passing
0.02	16
0.006	13
0.002	5

Soil Fraction	Sieve Percentage
GRAVEL	52
SAND	28
SILT	15
CLAY	5

Soil Description:

Light grey silty very sandy GRAVEL

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
<i>M. Stokes</i>		30/07/13
Contract	Contract Ref:	
Harts Farm Way, Havant	727927	

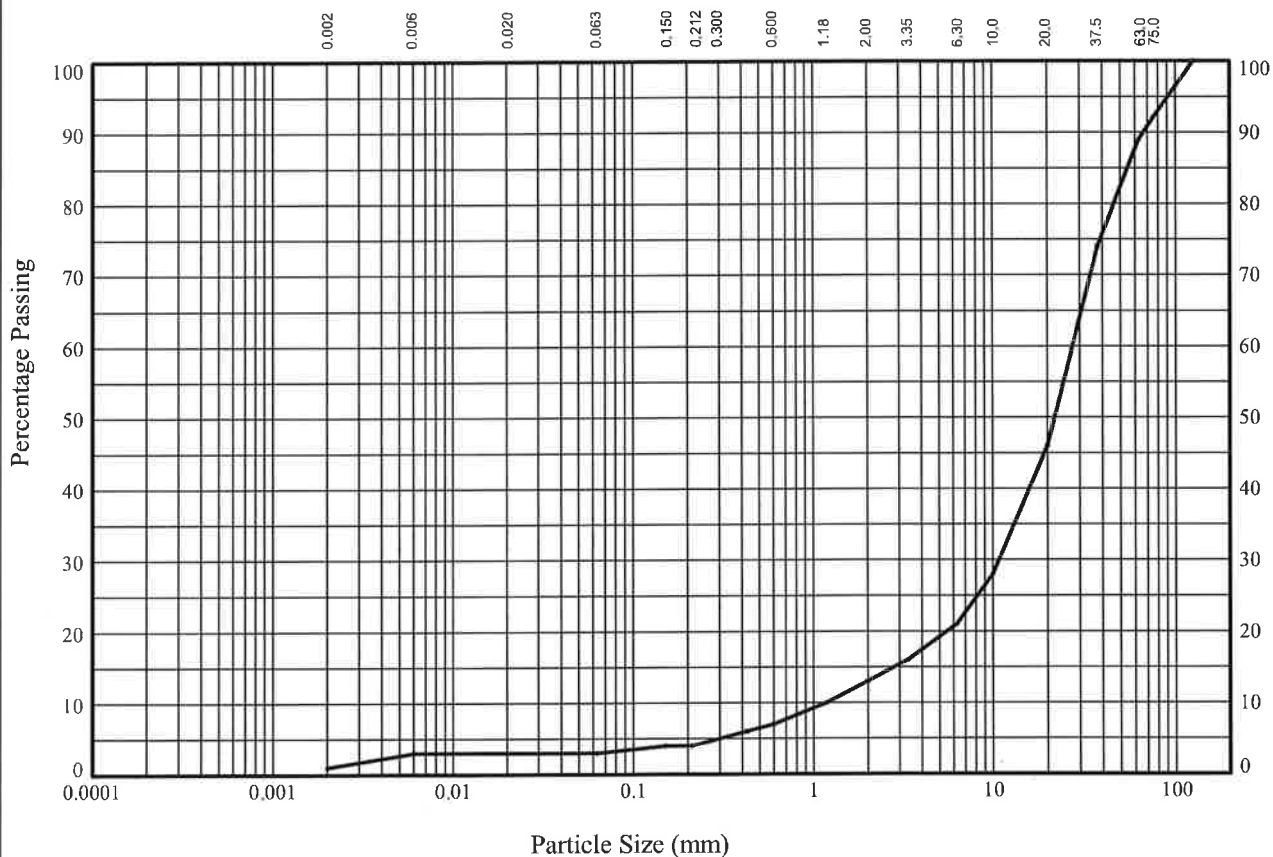


PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.5 of BS1377:Part 2:1990

NON STANDARD TEST

Trial Pit : **TP24** Sample Ref: **5** Sample Type: **B** Depth (m): **1.60**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125.0	100
75.0	92
63.0	89
37.5	74
20.0	46
10.0	28
6.30	21
3.35	16
2.00	13
1.18	10
0.600	7
0.425	6
0.212	4
0.150	4
0.063	3

Particle Diameter	Percentage Passing
0.02	3
0.006	3
0.002	1

Soil Fraction	Sieve Percentage
COBBLES	11
GRAVEL	76
SAND	10
SILT	2
CLAY	1

Soil Description:

Light brown slightly silty sandy GRAVEL with medium cobble content

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
<i>M. Stokes</i>		30/07/13
Contract		Contract Ref:
Harts Farm Way, Havant		727927



SUMMARY OF CHEMICAL ANALYSES

[illegible]

NOTES:- All chemical tests were undertaken by Envirolab.

Approved Signatories: D. TROWBRIDGE A. FROST M. STOKES S. HANDCOCK



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By

Date _____

Contract Ref:

M. ~~St~~

MATT STOKES

30.07.13

Contract:

Harts Farm Way, Havant

727927



APPENDIX E

- (i) Contamination Laboratory Test Results
- (ii) Initial Waste Characterisation (Haswaste)
- (iii) Laboratory UKAS Accreditation Certificate

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 13/03106
Issue Number: 1
Date: 18 July, 2013

Client: Structural Soils Bristol
The Old School House
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: SSL Enviro / Andre Gilleard/ Andrew Pope
Project Name: Harts Farm, Havant
Project Ref: 727927
Order No: Not specified
Date Samples Received: 04/07/13
Date Instructions Received: 05/07/13
Date Analysis Completed: 17/07/13

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Carolyn Field
Client Service Manager

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
% Stones >10mm [#]	15.4	21.3	26.4	<0.1	<0.1	34.5	26.0	<0.1	% w/w	A-T-044
pH _D ^{M#}	8.71	7.92	-	-	-	-	-	-	pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.09	<0.01	-	-	-	-	-	-	g/l	A-T-026s
Organic matter _D ^{M#}	0.4	2.4	0.2	1.7	0.8	1.1	4.0	1.3	% w/w	A-T-032 OM
Arsenic _D ^{M#}	3	8	-	-	-	-	-	-	mg/kg	A-T-024
Cadmium _D ^{M#}	<0.5	0.8	-	-	-	-	-	-	mg/kg	A-T-024
Copper _D ^{M#}	5	109	-	-	-	-	-	-	mg/kg	A-T-024
Chromium _D ^{M#}	11	25	-	-	-	-	-	-	mg/kg	A-T-024
Lead _D ^{M#}	6	102	-	-	-	-	-	-	mg/kg	A-T-024
Mercury _D	0.86	0.74	-	-	-	-	-	-	mg/kg	A-T-024
Nickel _D ^{M#}	8	17	-	-	-	-	-	-	mg/kg	A-T-024
Selenium _D [#]	<1	<1	-	-	-	-	-	-	mg/kg	A-T-024
Zinc _D ^{M#}	25	183	-	-	-	-	-	-	mg/kg	A-T-024

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
TPH CWG										
Ali >C5-C6 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C6-C8 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C8-C10 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C10-C12 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C12-C16 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C16-C21 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C21-C35 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Total Aliphatics _A	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C8-C9 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C9-C10 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C10-C12 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C12-C16 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C16-C21 _A [#]	-	2.6	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C21-C35 _A [#]	-	2.8	-	-	-	-	-	-	mg/kg	A-T-023s
Total Aromatics _A	-	5.4	-	-	-	-	-	-	mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	-	5.4	-	-	-	-	-	-	mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
MTBE _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
PAH 16										
Acenaphthene _A ^{M#}	0.05	0.04	<0.01	0.03	<0.01	<0.01	0.64	<0.01	mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.16	<0.01	mg/kg	A-T-019s
Anthracene _A ^{M#}	0.17	0.18	0.03	0.09	<0.02	<0.02	0.99	<0.02	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.23	1.19	0.06	0.52	0.04	<0.04	2.84	0.09	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.16	1.52	0.05	0.53	0.06	<0.04	2.59	0.11	mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.18	1.95	0.06	0.67	0.07	<0.05	2.73	0.10	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.15	1.56	0.06	0.61	0.07	<0.05	2.30	0.11	mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.10	0.69	<0.07	0.27	<0.07	<0.07	1.07	<0.07	mg/kg	A-T-019s
Chrysene _A ^{M#}	0.29	1.59	0.08	0.77	0.09	<0.06	2.99	0.11	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	0.44	<0.04	0.14	<0.04	<0.04	0.55	<0.04	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.70	1.98	0.14	1.29	0.15	<0.08	5.44	0.12	mg/kg	A-T-019s
Fluorene _A ^{M#}	0.07	0.04	<0.01	0.03	<0.01	<0.01	0.54	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.16	1.62	0.06	0.62	0.07	<0.03	2.06	0.12	mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.08	<0.03	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	0.70	0.63	0.08	0.47	0.10	0.03	3.43	0.03	mg/kg	A-T-019s
Pyrene _A ^{M#}	0.44	1.53	0.09	0.96	0.10	<0.07	5.00	0.10	mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	3.42	15	0.68	7.00	0.74	<0.08	33.4	0.88	mg/kg	A-T-019s
TPH Banded 1										
>C6-C8 _A [#]	-	-	<10	<10	<10	<10	<10	<10	mg/kg	A-T-007s
>C8-C10 _A [#]	-	-	<10	<10	<10	<10	<10	<10	mg/kg	A-T-007s
>C10-C12 _A [#]	-	-	<10	<10	<10	<10	<10	<10	mg/kg	A-T-007s
>C12-C16 _A [#]	-	-	<10	<10	<10	<10	51	<10	mg/kg	A-T-007s
>C16-C21 _A [#]	-	-	<10	<10	<10	<10	158	<10	mg/kg	A-T-007s
>C21-C40 _A	-	-	<10	16	<10	<10	1380	<10	mg/kg	A-T-007s

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
TPH Banded 2										
>C6-C10 _A [#]	<10	-	-	-	-	-	-	-	mg/kg	A-T-007s
>C10-C25 _A [#]	<10	-	-	-	-	-	-	-	mg/kg	A-T-007s
>C25-C40 _A	11	-	-	-	-	-	-	-	mg/kg	A-T-007s

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/9								Units	Method ref
Client Sample No	3									
Client Sample ID	TP15									
Depth to Top	1.50									
Depth To Bottom										
Date Sampled	17-Jun-13									
Sample Type	Soil - ES									
Sample Matrix Code	5AB									
% Stones >10mm _A [#]	32.2								% w/w	A-T-044
Organic matter _D ^{M#}	1.4								% w/w	A-T-032 OM

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/9								Units	Method ref
Client Sample No	3									
Client Sample ID	TP15									
Depth to Top	1.50									
Depth To Bottom										
Date Sampled	17-Jun-13									
Sample Type	Soil - ES									
Sample Matrix Code	5AB									
PAH 16										
Acenaphthene _A ^{M#}	<0.01								mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01								mg/kg	A-T-019s
Anthracene _A ^{M#}	<0.02								mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04								mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04								mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05								mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05								mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07								mg/kg	A-T-019s
Chrysene _A ^{M#}	<0.06								mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04								mg/kg	A-T-019s
Fluoranthene _A ^{M#}	<0.08								mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01								mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03								mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03								mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.03								mg/kg	A-T-019s
Pyrene _A ^{M#}	<0.07								mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	<0.08								mg/kg	A-T-019s
TPH Banded 1										
>C6-C8 _A [#]	<10								mg/kg	A-T-007s
>C8-C10 _A [#]	<10								mg/kg	A-T-007s
>C10-C12 _A [#]	<10								mg/kg	A-T-007s
>C12-C16 _A [#]	<10								mg/kg	A-T-007s
>C16-C21 _A [#]	<10								mg/kg	A-T-007s
>C21-C40 _A	<10								mg/kg	A-T-007s

REPORT NOTES

Notes - Soil analysis

All results are reported as dry weight (<40 °C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

Superscript "M" indicates method accredited to MCERTS.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations. If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 13/03106
Issue Number: 1
Date: 18 July, 2013

Client: Structural Soils Bristol
The Old School House
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: SSL Enviro / Andre Gilleard/ Andrew Pope
Project Name: Harts Farm, Havant
Project Ref: 727927
Order No: Not specified
Date Samples Received: 04/07/13
Date Instructions Received: 05/07/13
Date Analysis Completed: 17/07/13

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Carolyn Field
Client Service Manager

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
% Stones >10mm [#]	15.4	21.3	26.4	<0.1	<0.1	34.5	26.0	<0.1	% w/w	A-T-044
pH _D ^{M#}	8.71	7.92	-	-	-	-	-	-	pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.09	<0.01	-	-	-	-	-	-	g/l	A-T-026s
Organic matter _D ^{M#}	0.4	2.4	0.2	1.7	0.8	1.1	4.0	1.3	% w/w	A-T-032 OM
Arsenic _D ^{M#}	3	8	-	-	-	-	-	-	mg/kg	A-T-024
Cadmium _D ^{M#}	<0.5	0.8	-	-	-	-	-	-	mg/kg	A-T-024
Copper _D ^{M#}	5	109	-	-	-	-	-	-	mg/kg	A-T-024
Chromium _D ^{M#}	11	25	-	-	-	-	-	-	mg/kg	A-T-024
Lead _D ^{M#}	6	102	-	-	-	-	-	-	mg/kg	A-T-024
Mercury _D	0.86	0.74	-	-	-	-	-	-	mg/kg	A-T-024
Nickel _D ^{M#}	8	17	-	-	-	-	-	-	mg/kg	A-T-024
Selenium _D [#]	<1	<1	-	-	-	-	-	-	mg/kg	A-T-024
Zinc _D ^{M#}	25	183	-	-	-	-	-	-	mg/kg	A-T-024

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
TPH CWG										
Ali >C5-C6 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C6-C8 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C8-C10 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C10-C12 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C12-C16 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C16-C21 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C21-C35 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Total Aliphatics _A	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C8-C9 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C9-C10 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C10-C12 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C12-C16 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C16-C21 _A [#]	-	2.6	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C21-C35 _A [#]	-	2.8	-	-	-	-	-	-	mg/kg	A-T-023s
Total Aromatics _A	-	5.4	-	-	-	-	-	-	mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	-	5.4	-	-	-	-	-	-	mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
MTBE _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
PAH 16										
Acenaphthene _A ^{M#}	0.05	0.04	<0.01	0.03	<0.01	<0.01	0.64	<0.01	mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.16	<0.01	mg/kg	A-T-019s
Anthracene _A ^{M#}	0.17	0.18	0.03	0.09	<0.02	<0.02	0.99	<0.02	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.23	1.19	0.06	0.52	0.04	<0.04	2.84	0.09	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.16	1.52	0.05	0.53	0.06	<0.04	2.59	0.11	mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.18	1.95	0.06	0.67	0.07	<0.05	2.73	0.10	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.15	1.56	0.06	0.61	0.07	<0.05	2.30	0.11	mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.10	0.69	<0.07	0.27	<0.07	<0.07	1.07	<0.07	mg/kg	A-T-019s
Chrysene _A ^{M#}	0.29	1.59	0.08	0.77	0.09	<0.06	2.99	0.11	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	0.44	<0.04	0.14	<0.04	<0.04	0.55	<0.04	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.70	1.98	0.14	1.29	0.15	<0.08	5.44	0.12	mg/kg	A-T-019s
Fluorene _A ^{M#}	0.07	0.04	<0.01	0.03	<0.01	<0.01	0.54	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.16	1.62	0.06	0.62	0.07	<0.03	2.06	0.12	mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.08	<0.03	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	0.70	0.63	0.08	0.47	0.10	0.03	3.43	0.03	mg/kg	A-T-019s
Pyrene _A ^{M#}	0.44	1.53	0.09	0.96	0.10	<0.07	5.00	0.10	mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	3.42	15	0.68	7.00	0.74	<0.08	33.4	0.88	mg/kg	A-T-019s
TPH Banded 1										
>C6-C8 _A [#]	-	-	<10	<10	<10	<10	<10	<10	mg/kg	A-T-007s
>C8-C10 _A [#]	-	-	<10	<10	<10	<10	<10	<10	mg/kg	A-T-007s
>C10-C12 _A [#]	-	-	<10	<10	<10	<10	<10	<10	mg/kg	A-T-007s
>C12-C16 _A [#]	-	-	<10	<10	<10	<10	51	<10	mg/kg	A-T-007s
>C16-C21 _A [#]	-	-	<10	<10	<10	<10	158	<10	mg/kg	A-T-007s
>C21-C40 _A	-	-	<10	16	<10	<10	1380	<10	mg/kg	A-T-007s

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
TPH Banded 2										
>C6-C10 _A [#]	<10	-	-	-	-	-	-	-	mg/kg	A-T-007s
>C10-C25 _A [#]	<10	-	-	-	-	-	-	-	mg/kg	A-T-007s
>C25-C40 _A	11	-	-	-	-	-	-	-	mg/kg	A-T-007s

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/9								Units	Method ref
Client Sample No	3									
Client Sample ID	TP15									
Depth to Top	1.50									
Depth To Bottom										
Date Sampled	17-Jun-13									
Sample Type	Soil - ES									
Sample Matrix Code	5AB									
% Stones >10mm _A [#]	32.2								% w/w	A-T-044
Organic matter _D ^{M#}	1.4								% w/w	A-T-032 OM

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/9								Units	Method ref
Client Sample No	3									
Client Sample ID	TP15									
Depth to Top	1.50									
Depth To Bottom										
Date Sampled	17-Jun-13									
Sample Type	Soil - ES									
Sample Matrix Code	5AB									
PAH 16										
Acenaphthene _A ^{M#}	<0.01								mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01								mg/kg	A-T-019s
Anthracene _A ^{M#}	<0.02								mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04								mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04								mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05								mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05								mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07								mg/kg	A-T-019s
Chrysene _A ^{M#}	<0.06								mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04								mg/kg	A-T-019s
Fluoranthene _A ^{M#}	<0.08								mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01								mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03								mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03								mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.03								mg/kg	A-T-019s
Pyrene _A ^{M#}	<0.07								mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	<0.08								mg/kg	A-T-019s
TPH Banded 1										
>C6-C8 _A [#]	<10								mg/kg	A-T-007s
>C8-C10 _A [#]	<10								mg/kg	A-T-007s
>C10-C12 _A [#]	<10								mg/kg	A-T-007s
>C12-C16 _A [#]	<10								mg/kg	A-T-007s
>C16-C21 _A [#]	<10								mg/kg	A-T-007s
>C21-C40 _A	<10								mg/kg	A-T-007s

REPORT NOTES

Notes - Soil analysis

All results are reported as dry weight (<40 °C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

Superscript "M" indicates method accredited to MCERTS.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations. If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 13/02893
Issue Number: 1

Date: 05 July, 2013

Client: Structural Soils Bristol
The Old School House
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: SSL Enviro / Andre Gilleard
Project Name: Harts Farm, Havant
Project Ref: 727927
Order No: Not specified
Date Samples Received: 24/06/13
Date Instructions Received: 24/06/13
Date Analysis Completed: 05/07/13

Prepared by:



Carolyn Field
Client Service Manager

Approved by:



Iain Haslock
Analytical Consultant

Envirolab Job Number: 13/02893

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/02893/1	13/02893/2	13/02893/3	13/02893/4					Units	Method ref
Client Sample No	6	8	7	10						
Client Sample ID	TP13	TP20	TP24	TP26						
Depth to Top	1.30	0.55	0.00	0.20						
Depth To Bottom	1.80	0.90	0.50	0.40						
Date Sampled	21-Jun-13	21-Jun-13	21-Jun-13	21-Jun-13						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	7	7	7	1ABE						
% Stones >10mm [#]	<0.1	<0.1	<0.1	11.0					% w/w	A-T-044
Asbestos in soil [#]	-	NAD	-	-						A-T-045
pH ^{M#}	-	8.84	9.12	-					pH	A-T-031 s
Sulphate (water sol 2:1) ^{M#}	-	0.06	0.01	-					g/l	A-T-026 s
Organic matter ^{M#}	0.3	0.3	0.3	0.4					% w/w	A-T-032 OM
Arsenic ^{M#}	-	2	2	-					mg/kg	A-T-024
Cadmium ^{M#}	-	0.6	0.6	-					mg/kg	A-T-024
Copper ^{M#}	-	4	2	-					mg/kg	A-T-024
Chromium ^{M#}	-	4	2	-					mg/kg	A-T-024
Lead ^{M#}	-	7	9	-					mg/kg	A-T-024
Mercury ^D	-	1.36	1.49	-					mg/kg	A-T-024
Nickel ^D	-	4	2	-					mg/kg	A-T-024
Selenium [#]	-	<1	<1	-					mg/kg	A-T-024
Zinc ^{M#}	-	19	17	-					mg/kg	A-T-024

Envirolab Job Number: 13/02893

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/02893/1	13/02893/2	13/02893/3	13/02893/4					Units	Method ref
Client Sample No	6	8	7	10						
Client Sample ID	TP13	TP20	TP24	TP26						
Depth to Top	1.30	0.55	0.00	0.20						
Depth To Bottom	1.80	0.90	0.50	0.40						
Date Sampled	21-Jun-13	21-Jun-13	21-Jun-13	21-Jun-13						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	7	7	7	1ABE						
PAH 16										
Acenaphthene _A ^{M#}	<0.01	0.04	<0.01	-					mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	-					mg/kg	A-T-019s
Anthracene _A ^{M#}	<0.02	0.14	<0.02	-					mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.44	0.54	0.13	-					mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.96	0.99	0.64	-					mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.84	0.99	0.53	-					mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.41	0.58	0.37	-					mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.46	0.50	0.27	-					mg/kg	A-T-019s
Chrysene _A ^{M#}	0.51	0.60	0.15	-					mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.12	0.16	0.10	-					mg/kg	A-T-019s
Fluoranthene _A ^{M#}	<0.08	0.71	<0.08	-					mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	0.06	<0.01	-					mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.42	0.59	0.38	-					mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	-					mg/kg	A-T-019s
Phenanthrene _A ^{M#}	0.05	0.57	0.05	-					mg/kg	A-T-019s
Pyrene _A ^{M#}	<0.07	0.47	<0.07	-					mg/kg	A-T-019s
Total PAH _A ^{M#}	4.23	6.93	2.59	-					mg/kg	A-T-019s

Envirolab Job Number: 13/02893

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/02893/1	13/02893/2	13/02893/3	13/02893/4					Units	Method ref
Client Sample No	6	8	7	10						
Client Sample ID	TP13	TP20	TP24	TP26						
Depth to Top	1.30	0.55	0.00	0.20						
Depth To Bottom	1.80	0.90	0.50	0.40						
Date Sampled	21-Jun-13	21-Jun-13	21-Jun-13	21-Jun-13						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	7	7	7	1ABE						
Speciated PCB-EC7										
PCB BZ 28 _A	-	<0.005	-	-					mg/kg	A-T-004s
PCB BZ 52 _A	-	<0.005	-	-					mg/kg	A-T-004s
PCB BZ 101 _A	-	<0.005	-	-					mg/kg	A-T-004s
PCB BZ 118 _A	-	<0.005	-	-					mg/kg	A-T-004s
PCB BZ 138 _A	-	<0.005	-	-					mg/kg	A-T-004s
PCB BZ 153 _A	-	<0.005	-	-					mg/kg	A-T-004s
PCB BZ 180 _A	-	<0.005	-	-					mg/kg	A-T-004s
TPH Banded 1										
>C6-C8 _A [#]	-	-	-	<10					mg/kg	A-T-007s
>C8-C10 _A [#]	-	-	-	<10					mg/kg	A-T-007s
>C10-C12 _A [#]	-	-	-	<10					mg/kg	A-T-007s
>C12-C16 _A [#]	-	-	-	<10					mg/kg	A-T-007s
>C16-C21 _A [#]	-	-	-	16					mg/kg	A-T-007s
>C21-C40 _A	-	-	-	41					mg/kg	A-T-007s
TPH Banded 2										
>C6-C10 _A [#]	-	<10	<10	-					mg/kg	A-T-007s
>C10-C25 _A [#]	-	<10	<10	-					mg/kg	A-T-007s
>C25-C40 _A	-	<10	<10	-					mg/kg	A-T-007s

Envirolab Job Number: 13/02893

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/02893/1	13/02893/2	13/02893/3	13/02893/4					Units	Method ref
Client Sample No	6	8	7	10						
Client Sample ID	TP13	TP20	TP24	TP26						
Depth to Top	1.30	0.55	0.00	0.20						
Depth To Bottom	1.80	0.90	0.50	0.40						
Date Sampled	21-Jun-13	21-Jun-13	21-Jun-13	21-Jun-13						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	7	7	7	1ABE						
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
Ali >C6-C8 _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
Ali >C8-C10 _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
Ali >C10-C12 _A [#]	<0.1	-	-	-					mg/kg	A-T-023s
Ali >C12-C16 _A [#]	<0.1	-	-	-					mg/kg	A-T-023s
Ali >C16-C21 _A [#]	<0.1	-	-	-					mg/kg	A-T-023s
Ali >C21-C35 _A [#]	<0.1	-	-	-					mg/kg	A-T-023s
Total Aliphatics _A	<0.1	-	-	-					mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
Aro >C7-C8 _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
Aro >C8-C9 _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
Aro >C9-C10 _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
Aro >C10-C12 _A [#]	<0.1	-	-	-					mg/kg	A-T-023s
Aro >C12-C16 _A [#]	<0.1	-	-	-					mg/kg	A-T-023s
Aro >C16-C21 _A [#]	<0.1	-	-	-					mg/kg	A-T-023s
Aro >C21-C35 _A [#]	<0.1	-	-	-					mg/kg	A-T-023s
Total Aromatics _A	<0.1	-	-	-					mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	<0.1	-	-	-					mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
BTEX - Toluene _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
BTEX - o Xylene _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
MTBE _A [#]	<0.01	-	-	-					mg/kg	A-T-022s
Mineral Oil (>C10-C35) _A	<0.1	-	-	-					mg/kg	A-T-023s

REPORT NOTES

Notes - Soil analysis

All results are reported as dry weight (<40 °C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

Superscript "M" indicates method accredited to MCERTS.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations. If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 13/03106
Issue Number: 1
Date: 18 July, 2013

Client: Structural Soils Bristol
The Old School House
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: SSL Enviro / Andre Gilleard/ Andrew Pope
Project Name: Harts Farm, Havant
Project Ref: 727927
Order No: Not specified
Date Samples Received: 04/07/13
Date Instructions Received: 05/07/13
Date Analysis Completed: 17/07/13

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Carolyn Field
Client Service Manager

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
% Stones >10mm [#]	15.4	21.3	26.4	<0.1	<0.1	34.5	26.0	<0.1	% w/w	A-T-044
pH _D ^{M#}	8.71	7.92	-	-	-	-	-	-	pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.09	<0.01	-	-	-	-	-	-	g/l	A-T-026s
Organic matter _D ^{M#}	0.4	2.4	0.2	1.7	0.8	1.1	4.0	1.3	% w/w	A-T-032 OM
Arsenic _D ^{M#}	3	8	-	-	-	-	-	-	mg/kg	A-T-024
Cadmium _D ^{M#}	<0.5	0.8	-	-	-	-	-	-	mg/kg	A-T-024
Copper _D ^{M#}	5	109	-	-	-	-	-	-	mg/kg	A-T-024
Chromium _D ^{M#}	11	25	-	-	-	-	-	-	mg/kg	A-T-024
Lead _D ^{M#}	6	102	-	-	-	-	-	-	mg/kg	A-T-024
Mercury _D	0.86	0.74	-	-	-	-	-	-	mg/kg	A-T-024
Nickel _D ^{M#}	8	17	-	-	-	-	-	-	mg/kg	A-T-024
Selenium _D [#]	<1	<1	-	-	-	-	-	-	mg/kg	A-T-024
Zinc _D ^{M#}	25	183	-	-	-	-	-	-	mg/kg	A-T-024

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
TPH CWG										
Ali >C5-C6 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C6-C8 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C8-C10 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C10-C12 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C12-C16 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C16-C21 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C21-C35 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Total Aliphatics _A	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C8-C9 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C9-C10 _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C10-C12 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C12-C16 _A [#]	-	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C16-C21 _A [#]	-	2.6	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C21-C35 _A [#]	-	2.8	-	-	-	-	-	-	mg/kg	A-T-023s
Total Aromatics _A	-	5.4	-	-	-	-	-	-	mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	-	5.4	-	-	-	-	-	-	mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
MTBE _A [#]	-	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
PAH 16										
Acenaphthene _A ^{M#}	0.05	0.04	<0.01	0.03	<0.01	<0.01	0.64	<0.01	mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.16	<0.01	mg/kg	A-T-019s
Anthracene _A ^{M#}	0.17	0.18	0.03	0.09	<0.02	<0.02	0.99	<0.02	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.23	1.19	0.06	0.52	0.04	<0.04	2.84	0.09	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.16	1.52	0.05	0.53	0.06	<0.04	2.59	0.11	mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.18	1.95	0.06	0.67	0.07	<0.05	2.73	0.10	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.15	1.56	0.06	0.61	0.07	<0.05	2.30	0.11	mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.10	0.69	<0.07	0.27	<0.07	<0.07	1.07	<0.07	mg/kg	A-T-019s
Chrysene _A ^{M#}	0.29	1.59	0.08	0.77	0.09	<0.06	2.99	0.11	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	0.44	<0.04	0.14	<0.04	<0.04	0.55	<0.04	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.70	1.98	0.14	1.29	0.15	<0.08	5.44	0.12	mg/kg	A-T-019s
Fluorene _A ^{M#}	0.07	0.04	<0.01	0.03	<0.01	<0.01	0.54	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.16	1.62	0.06	0.62	0.07	<0.03	2.06	0.12	mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.08	<0.03	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	0.70	0.63	0.08	0.47	0.10	0.03	3.43	0.03	mg/kg	A-T-019s
Pyrene _A ^{M#}	0.44	1.53	0.09	0.96	0.10	<0.07	5.00	0.10	mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	3.42	15	0.68	7.00	0.74	<0.08	33.4	0.88	mg/kg	A-T-019s
TPH Banded 1										
>C6-C8 _A [#]	-	-	<10	<10	<10	<10	<10	<10	mg/kg	A-T-007s
>C8-C10 _A [#]	-	-	<10	<10	<10	<10	<10	<10	mg/kg	A-T-007s
>C10-C12 _A [#]	-	-	<10	<10	<10	<10	<10	<10	mg/kg	A-T-007s
>C12-C16 _A [#]	-	-	<10	<10	<10	<10	51	<10	mg/kg	A-T-007s
>C16-C21 _A [#]	-	-	<10	<10	<10	<10	158	<10	mg/kg	A-T-007s
>C21-C40 _A	-	-	<10	16	<10	<10	1380	<10	mg/kg	A-T-007s

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/1	13/03106/2	13/03106/3	13/03106/4	13/03106/5	13/03106/6	13/03106/7	13/03106/8	Units	Method ref
Client Sample No	2	2	1	4	6	8	7	8		
Client Sample ID	WS3	WS17	WS27	WS27	BH10	BH10	WS2	WS7		
Depth to Top	0.50	0.50	0.40	1.50	1.50	2.00	1.60	1.10		
Depth To Bottom										
Date Sampled	01-Jul-13	01-Jul-13	01-Jul-13	01-Jul-13	24-Jun-13	24-Jun-13	19-Jun-13	19-Jun-13		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	5AB	6AB	1A	7	7	6A	4AB	7		
TPH Banded 2										
>C6-C10 _A [#]	<10	-	-	-	-	-	-	-	mg/kg	A-T-007s
>C10-C25 _A [#]	<10	-	-	-	-	-	-	-	mg/kg	A-T-007s
>C25-C40 _A	11	-	-	-	-	-	-	-	mg/kg	A-T-007s

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/9								Units	Method ref
Client Sample No	3									
Client Sample ID	TP15									
Depth to Top	1.50									
Depth To Bottom										
Date Sampled	17-Jun-13									
Sample Type	Soil - ES									
Sample Matrix Code	5AB									
% Stones >10mm _A [#]	32.2								% w/w	A-T-044
Organic matter _D ^{M#}	1.4								% w/w	A-T-032 OM

Envirolab Job Number: 13/03106

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/03106/9								Units	Method ref
Client Sample No	3									
Client Sample ID	TP15									
Depth to Top	1.50									
Depth To Bottom										
Date Sampled	17-Jun-13									
Sample Type	Soil - ES									
Sample Matrix Code	5AB									
PAH 16										
Acenaphthene _A ^{M#}	<0.01								mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01								mg/kg	A-T-019s
Anthracene _A ^{M#}	<0.02								mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04								mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04								mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05								mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05								mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07								mg/kg	A-T-019s
Chrysene _A ^{M#}	<0.06								mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04								mg/kg	A-T-019s
Fluoranthene _A ^{M#}	<0.08								mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01								mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03								mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03								mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.03								mg/kg	A-T-019s
Pyrene _A ^{M#}	<0.07								mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	<0.08								mg/kg	A-T-019s
TPH Banded 1										
>C6-C8 _A [#]	<10								mg/kg	A-T-007s
>C8-C10 _A [#]	<10								mg/kg	A-T-007s
>C10-C12 _A [#]	<10								mg/kg	A-T-007s
>C12-C16 _A [#]	<10								mg/kg	A-T-007s
>C16-C21 _A [#]	<10								mg/kg	A-T-007s
>C21-C40 _A	<10								mg/kg	A-T-007s

REPORT NOTES

Notes - Soil analysis

All results are reported as dry weight (<40 °C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

Superscript "M" indicates method accredited to MCERTS.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations. If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 13/02906
Issue Number: 1
Date: 08 July, 2013

Client: Structural Soils Bristol
The Old School House
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: SSL Enviro / Andre Gilliard
Project Name: Harts Farm, Havant
Project Ref: 727927
Order No: Not specified
Date Samples Received: 25/06/13
Date Instructions Received: 25/06/13
Date Analysis Completed: 08/07/13

Prepared by:



Carolyn Field
Client Service Manager

Approved by:



Iain Haslock
Analytical Consultant

Envirolab Job Number: 13/02906

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/02906/1	13/02906/2							Units	Method ref
Client Sample No	1	1								
Client Sample ID	SS1	SS2								
Depth to Top										
Depth To Bottom										
Date Sampled	21-Jun-13	21-Jun-13								
Sample Type	Water - EW	Water - EW								
Sample Matrix Code										
pH (w) _A [#]	7.43	7.50							pH	A-T-031w
Hardness _A [#]	302	397							mg/l Ca CO3	A-T-049
Sulphate (w) _A [#]	18	18							mg/l	A-T-026w
Arsenic (dissolved) _A [#]	<1	1							µg/l	A-T-025
Cadmium (dissolved) _A [#]	<1	1							µg/l	A-T-025
Copper (dissolved) _A [#]	<1	34							µg/l	A-T-025
Chromium (dissolved) _A [#]	<1	2							µg/l	A-T-025
Lead (dissolved) _A [#]	<1	74							µg/l	A-T-025
Mercury (dissolved) _A [#]	<0.1	<0.1							µg/l	A-T-025
Nickel (dissolved) _A [#]	<1	17							µg/l	A-T-025
Selenium (dissolved) _A [#]	<1	<1							µg/l	A-T-025
Zinc (dissolved) _A [#]	5	148							µg/l	A-T-025

Envirolab Job Number: 13/02906

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/02906/1	13/02906/2							Units	Method ref
Client Sample No	1	1								
Client Sample ID	SS1	SS2								
Depth to Top										
Depth To Bottom										
Date Sampled	21-Jun-13	21-Jun-13								
Sample Type	Water - EW	Water - EW								
Sample Matrix Code										
TPH CWG										
Ali >C5-C6 (w) _A [#]	<1	<1							µg/l	A-T-022w
Ali >C6-C8 (w) _A [#]	<1	<1							µg/l	A-T-022w
Ali >C8-C10 (w) _A [#]	<1	<1							µg/l	A-T-022w
Ali >C10-C12 (w) _A [#]	<5	<5							µg/l	A-T-023w
Ali >C12-C16 (w) _A [#]	<5	<5							µg/l	A-T-023w
Ali >C16-C21 (w) _A [#]	<5	<5							µg/l	A-T-023w
Ali >C21-C35 (w) _A [#]	<5	<5							µg/l	A-T-023w
Total Aliphatics (w) _A	<5	<5							µg/l	A-T-022+23w
Aro >C5-C7 (w) _A [#]	<1	<1							µg/l	A-T-022w
Aro >C7-C8 (w) _A [#]	<1	<1							µg/l	A-T-022w
Aro >C8-C9 (w) _A [#]	<1	<1							µg/l	A-T-022w
Aro >C9-C10 (w) _A [#]	<1	<1							µg/l	A-T-022w
Aro >C10-C12 (w) _A [#]	<5	<5							µg/l	A-T-023w
Aro >C12-C16 (w) _A [#]	<5	<5							µg/l	A-T-023w
Aro >C16-C21 (w) _A [#]	<5	<5							µg/l	A-T-023w
Aro >C21-C35 (w) _A [#]	<5	<5							µg/l	A-T-023w
Total Aromatics (w) _A	<5	<5							µg/l	A-T-022+23w
TPH (Ali & Aro) (w) _A	<5	<5							µg/l	A-T-022+23w
BTEX - Benzene (w) _A [#]	<1	<1							µg/l	A-T-022w
BTEX - Toluene (w) _A [#]	<1	<1							µg/l	A-T-022w
BTEX - Ethyl Benzene (w) _A [#]	<1	<1							µg/l	A-T-022w
BTEX - m & p Xylene (w) _A [#]	<1	<1							µg/l	A-T-022w
BTEX - o Xylene (w) _A [#]	<1	<1							µg/l	A-T-022w
MTBE (w) _A [#]	<1	<1							µg/l	A-T-022w

Envirolab Job Number: 13/02906

Client Project Name: Harts Farm, Havant

Client Project Ref: 727927

Lab Sample ID	13/02906/1	13/02906/2							Units	Method ref
Client Sample No	1	1								
Client Sample ID	SS1	SS2								
Depth to Top										
Depth To Bottom										
Date Sampled	21-Jun-13	21-Jun-13								
Sample Type	Water - EW	Water - EW								
Sample Matrix Code										
PAH 16MS (w)										
Acenaphthene (w) _A [#]	<0.01	<0.01							µg/l	A-T-019w
Acenaphthylene (w) _A [#]	<0.01	<0.01							µg/l	A-T-019w
Anthracene (w) _A [#]	<0.01	<0.01							µg/l	A-T-019w
Benzo(a)anthracene (w) _A [#]	<0.01	0.15							µg/l	A-T-019w
Benzo(a)pyrene (w) _A [#]	<0.01	0.30							µg/l	A-T-019w
Benzo(b)fluoranthene (w) _A [#]	<0.01	0.57							µg/l	A-T-019w
Benzo(ghi)perylene (w) _A [#]	<0.01	0.18							µg/l	A-T-019w
Benzo(k)fluoranthene (w) _A [#]	<0.01	0.29							µg/l	A-T-019w
Chrysene (w) _A [#]	<0.01	0.37							µg/l	A-T-019w
Dibenzo(ah)anthracene (w) _A [#]	<0.01	<0.01							µg/l	A-T-019w
Fluoranthene (w) _A [#]	<0.01	1.37							µg/l	A-T-019w
Fluorene (w) _A [#]	<0.01	<0.01							µg/l	A-T-019w
Indeno(123-cd)pyrene (w) _A [#]	<0.01	0.16							µg/l	A-T-019w
Naphthalene (w) _A [#]	<0.01	<0.01							µg/l	A-T-019w
Phenanthrene (w) _A [#]	<0.01	0.20							µg/l	A-T-019w
Pyrene (w) _A [#]	<0.01	0.99							µg/l	A-T-019w
Total PAH (w) _A [#]	<0.01	4.58							µg/l	A-T-019w

REPORT NOTES

Notes - Soil analysis

All results are reported as dry weight (<40 °C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

Superscript "M" indicates method accredited to MCERTS.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations. If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 13/03146
Issue Number: 1

Date: 18 July, 2013

Client: Structural Soils Bristol
The Old School House
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: SSL Enviro / Adam Lumber / Luke Burgess
Project Name: Harts Farm Way, Havant
Project Ref: 727927
Order No: Not specified
Date Samples Received: 05/07/13
Date Instructions Received: 08/07/13
Date Analysis Completed: 18/07/13

Prepared by:



John Gustafson
Director

Approved by:



Iain Haslock
Analytical Consultant

Envirolab Job Number: 13/03146

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03146/1	13/03146/3	13/03146/6	13/03146/7	13/03146/8	13/03146/9	13/03146/10	13/03146/11	Units	Method ref
Client Sample No										
Client Sample ID	BH10	BH8	WS5	WS4	WS3	WS2	WS1	BH10		
Depth to Top	10.00							15.00		
Depth To Bottom										
Date Sampled	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13		
Sample Type	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W		
Sample Matrix Code										
pH (w) _A [#]	-	7.68	6.95	-	7.78	-	-	-	pH	A-T-031w
Hardness _A [#]	-	431	1172	-	384	-	-	-	mg/l Ca CO ₃	A-T-049
Sulphate (w) _A [#]	-	35	152	-	91	-	-	-	mg/l	A-T-026w
Arsenic (dissolved) _A [#]	-	<1	12	-	4	-	-	-	µg/l	A-T-025
Cadmium (dissolved) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-025
Copper (dissolved) _A [#]	-	1	5	-	4	-	-	-	µg/l	A-T-025
Chromium (dissolved) _A [#]	-	24	<1	-	16	-	-	-	µg/l	A-T-025
Lead (dissolved) _A [#]	-	<1	2	-	<1	-	-	-	µg/l	A-T-025
Mercury (dissolved) _A [#]	-	<0.1	<0.1	-	<0.1	-	-	-	µg/l	A-T-025
Nickel (dissolved) _A [#]	-	<1	7	-	3	-	-	-	µg/l	A-T-025
Selenium (dissolved) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-025
Zinc (dissolved) _A [#]	-	2	9	-	1	-	-	-	µg/l	A-T-025

Envirolab Job Number: 13/03146

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03146/1	13/03146/3	13/03146/6	13/03146/7	13/03146/8	13/03146/9	13/03146/10	13/03146/11	Units	Method ref
Client Sample No										
Client Sample ID	BH10	BH8	WS5	WS4	WS3	WS2	WS1	BH10		
Depth to Top	10.00							15.00		
Depth To Bottom										
Date Sampled	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13		
Sample Type	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W		
Sample Matrix Code										
TPHCWG										
Ali >C5-C6 (w) _A [#]	-	<1	<1	-	27	-	-	-	µg/l	A-T-022w
Ali >C6-C8 (w) _A [#]	-	<1	2	-	12	-	-	-	µg/l	A-T-022w
Ali >C8-C10 (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
Ali >C10-C12 (w) _A [#]	-	<5	<5	-	<5	-	-	-	µg/l	A-T-023w
Ali >C12-C16 (w) _A [#]	-	<5	<5	-	<5	-	-	-	µg/l	A-T-023w
Ali >C16-C21 (w) _A [#]	-	<5	<5	-	<5	-	-	-	µg/l	A-T-023w
Ali >C21-C35 (w) _A [#]	-	<5	<5	-	<5	-	-	-	µg/l	A-T-023w
Total Aliphatics (w) _A	-	<5	<5	-	39	-	-	-	µg/l	A-T-022+23w
Aro >C5-C7 (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
Aro >C7-C8 (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
Aro >C8-C9 (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
Aro >C9-C10 (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
Aro >C10-C12 (w) _A [#]	-	<5	<5	-	<5	-	-	-	µg/l	A-T-023w
Aro >C12-C16 (w) _A [#]	-	<5	<5	-	<5	-	-	-	µg/l	A-T-023w
Aro >C16-C21 (w) _A [#]	-	<5	<5	-	<5	-	-	-	µg/l	A-T-023w
Aro >C21-C35 (w) _A [#]	-	<5	<5	-	<5	-	-	-	µg/l	A-T-023w
Total Aromatics (w) _A	-	<5	<5	-	<5	-	-	-	µg/l	A-T-022+23w
TPH (Ali & Aro) (w) _A	-	<5	<5	-	39	-	-	-	µg/l	A-T-022+23w
BTEX - Benzene (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
BTEX - Toluene (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
BTEX - Ethyl Benzene (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
BTEX - m & p Xylene (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
BTEX - o Xylene (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w
MTBE (w) _A [#]	-	<1	<1	-	<1	-	-	-	µg/l	A-T-022w

Envirolab Job Number: 13/03146

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03146/1	13/03146/3	13/03146/6	13/03146/7	13/03146/8	13/03146/9	13/03146/10	13/03146/11	Units	Method ref
Client Sample No										
Client Sample ID	BH10	BH8	WS5	WS4	WS3	WS2	WS1	BH10		
Depth to Top	10.00							15.00		
Depth To Bottom										
Date Sampled	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13		
Sample Type	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W		
Sample Matrix Code										
PAH 16MS (w)										
Acenaphthene (w) _A [#]	<0.01	<0.01	0.07	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Acenaphthylene (w) _A [#]	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Anthracene (w) _A [#]	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Benzo(a)anthracene (w) _A [#]	0.01	<0.01	<0.01	-	<0.01	<0.01	0.02	<0.01	µg/l	A-T-019w
Benzo(a)pyrene (w) _A [#]	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Benzo(b)fluoranthene (w) _A [#]	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Benzo(ghi)perylene (w) _A [#]	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Benzo(k)fluoranthene (w) _A [#]	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Chrysene (w) _A [#]	<0.01	<0.01	<0.01	-	<0.01	<0.01	0.06	<0.01	µg/l	A-T-019w
Dibenzo(ah)anthracene (w) _A [#]	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Fluoranthene (w) _A [#]	<0.01	<0.01	0.07	-	0.03	0.02	0.09	<0.01	µg/l	A-T-019w
Fluorene (w) _A [#]	<0.01	<0.01	0.03	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Indeno(123-cd)pyrene (w) _A [#]	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Naphthalene (w) _A [#]	<0.01	<0.01	0.09	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Phenanthrene (w) _A [#]	<0.01	<0.01	0.02	-	<0.01	<0.01	<0.01	<0.01	µg/l	A-T-019w
Pyrene (w) _A [#]	<0.01	<0.01	0.04	-	0.08	0.02	0.10	<0.01	µg/l	A-T-019w
PAH (total 16) (w) _A [#]	0.01	<0.01	0.32	-	0.11	0.04	0.27	<0.01	µg/l	A-T-019w
TPH Banded 1 (w)										
>C6-C8 (w) _A [#]	<50	-	-	-	-	<50	<50	<50	µg/l	A-T-007w
>C8-C10 (w) _A [#]	<50	-	-	-	-	<50	<50	<50	µg/l	A-T-007w
>C10-C12 (w) _A [#]	<50	-	-	-	-	<50	<50	<50	µg/l	A-T-007w
>C12-C16 (w) _A [#]	<50	-	-	-	-	<50	<50	<50	µg/l	A-T-007w
>C16-C21 (w) _A [#]	<50	-	-	-	-	<50	<50	<50	µg/l	A-T-007w
>C21-C40 (w) _A	<50	-	-	-	-	<50	<50	<50	µg/l	A-T-007w

Envirolab Job Number: 13/03146

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03146/1	13/03146/3	13/03146/6	13/03146/7	13/03146/8	13/03146/9	13/03146/10	13/03146/11	Units	Method ref
Client Sample No										
Client Sample ID	BH10	BH8	WS5	WS4	WS3	WS2	WS1	BH10		
Depth to Top	10.00							15.00		
Depth To Bottom										
Date Sampled	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13		
Sample Type	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W		
Sample Matrix Code										
VOC (w)										
Dichlorodifluoromethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Chloromethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Vinyl Chloride _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Bromomethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Chloroethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Trichlorofluoromethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
trans 1,2-Dichloroethene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Dichloromethane _A	-	-	-	<100	-	-	-	-	µg/l	A-T-006
Carbon Disulphide _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,1-Dichloroethene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,1-Dichloroethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
cis 1,2-Dichloroethene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Bromochloromethane _A [#]	-	-	-	<5	-	-	-	-	µg/l	A-T-006
Chloroform _A [#]	-	-	-	<25	-	-	-	-	µg/l	A-T-006
2,2-Dichloropropane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,2-Dichloroethane _A [#]	-	-	-	<2	-	-	-	-	µg/l	A-T-006
1,1,1-Trichloroethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,1-Dichloropropene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Benzene VOC _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Carbon Tetrachloride _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Dibromomethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,2-Dichloropropane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Bromodichloromethane _A [#]	-	-	-	<10	-	-	-	-	µg/l	A-T-006
Trichloroethene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
cis 1,3-Dichloropropene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
trans 1,3-Dichloropropene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,1,2-Trichloroethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Toluene VOC _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,3-Dichloropropane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006

Envirolab Job Number: 13/03146

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03146/1	13/03146/3	13/03146/6	13/03146/7	13/03146/8	13/03146/9	13/03146/10	13/03146/11	Units	Method ref
Client Sample No										
Client Sample ID	BH10	BH8	WS5	WS4	WS3	WS2	WS1	BH10		
Depth to Top	10.00							15.00		
Depth To Bottom										
Date Sampled	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13	03-Jul-13		
Sample Type	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W	Water - W		
Sample Matrix Code										
Dibromochloromethane _A [#]	-	-	-	<3	-	-	-	-	µg/l	A-T-006
1,2-Dibromoethane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Tetrachloroethene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,1,1,2-Tetrachloroethane _A	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Chlorobenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Ethylbenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
m & p Xylene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Bromoform _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Styrene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,1,2,2-Tetrachloroethane _A	-	-	-	<1	-	-	-	-	µg/l	A-T-006
o-Xylene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,2,3-Trichloropropane _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Isopropylbenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
Bromobenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
2-Chlorotoluene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
n-propylbenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
4-Chlorotoluene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,2,4-Trimethylbenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
4-Isopropyltoluene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,3,5-Trimethylbenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,2-Dichlorobenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,4-Dichlorobenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
sec-Butylbenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
tert-Butylbenzene _A [#]	-	-	-	<2	-	-	-	-	µg/l	A-T-006
1,3-Dichlorobenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
n-butylbenzene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006
1,2-Dibromo-3-chloropropane _A [#]	-	-	-	<2	-	-	-	-	µg/l	A-T-006
1,2,4-Trichlorobenzene _A [#]	-	-	-	<3	-	-	-	-	µg/l	A-T-006
1,2,3-Trichlorobenzene _A [#]	-	-	-	<3	-	-	-	-	µg/l	A-T-006
Hexachlorobutadiene _A [#]	-	-	-	<1	-	-	-	-	µg/l	A-T-006

REPORT NOTES

Notes - Soil analysis

All results are reported as dry weight (<40 °C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

Superscript "M" indicates method accredited to MCERTS.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations. If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 13/03372
Issue Number: 1

Date: 01 August, 2013

Client: Structural Soils Bristol
The Old School House
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: SSL Enviro / Andre Gilliard / Luke Burgess
Project Name: Harts Farm Way, Havant
Project Ref: 727927
Order No: Not specified
Date Samples Received: 18/07/13
Date Instructions Received: 19/07/13
Date Analysis Completed: 01/08/13

Prepared by:



Melanie Marshall
Laboratory Coordinator

Approved by:



Iain Haslock
Analytical Consultant

Envirolab Job Number: 13/03372

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03372/1	13/03372/2	13/03372/3	13/03372/4					Units	Method ref
Client Sample No	Deep		Original	East						
Client Sample ID	BH10	WS7	SS2	SS2 Upstream						
Depth to Top	15.00									
Depth To Bottom										
Date Sampled	16-Jul-13	16-Jul-13	16-Jul-13	16-Jul-13						
Sample Type	Water - W	Water - W	Water - W	Water - W						
Sample Matrix Code										
pH (w) _A [#]	-	-	7.55	7.47					pH	A-T-031w
Hardness _A [#]	-	-	288	283					mg/l Ca CO3	A-T-049
Sulphate (w) _A [#]	-	-	16	16					mg/l	A-T-026w
Arsenic (dissolved) _A [#]	-	-	<1	<1					µg/l	A-T-025
Cadmium (dissolved) _A [#]	-	-	<1	<1					µg/l	A-T-025
Copper (dissolved) _A [#]	-	-	<1	<1					µg/l	A-T-025
Chromium (dissolved) _A [#]	-	-	<1	7					µg/l	A-T-025
Lead (dissolved) _A [#]	-	-	<1	<1					µg/l	A-T-025
Mercury (dissolved) _A [#]	-	-	<0.1	<0.1					µg/l	A-T-025
Nickel (dissolved) _A [#]	-	-	<1	<1					µg/l	A-T-025
Selenium (dissolved) _A [#]	-	-	<1	<1					µg/l	A-T-025
Zinc (dissolved) _A [#]	-	-	2	2					µg/l	A-T-025

Envirolab Job Number: 13/03372

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03372/1	13/03372/2	13/03372/3	13/03372/4					Units	Method ref
Client Sample No	Deep		Original	East						
Client Sample ID	BH10	WS7	SS2	SS2 Upstream						
Depth to Top	15.00									
Depth To Bottom										
Date Sampled	16-Jul-13	16-Jul-13	16-Jul-13	16-Jul-13						
Sample Type	Water - W	Water - W	Water - W	Water - W						
Sample Matrix Code										
TPH CWG										
Ali >C5-C6 (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
Ali >C6-C8 (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
Ali >C8-C10 (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
Ali >C10-C12 (w) _A [#]	<5	<5	<5	<5					µg/l	A-T-023w
Ali >C12-C16 (w) _A [#]	<5	<5	<5	<5					µg/l	A-T-023w
Ali >C16-C21 (w) _A [#]	<5	<5	<5	<5					µg/l	A-T-023w
Ali >C21-C35 (w) _A [#]	<5	<5	<5	<5					µg/l	A-T-023w
Total Aliphatics (w) _A	<5	<5	<5	<5					µg/l	A-T-022+23w
Aro >C5-C7 (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
Aro >C7-C8 (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
Aro >C8-C9 (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
Aro >C9-C10 (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
Aro >C10-C12 (w) _A [#]	<5	<5	<5	<5					µg/l	A-T-023w
Aro >C12-C16 (w) _A [#]	<5	<5	<5	<5					µg/l	A-T-023w
Aro >C16-C21 (w) _A [#]	<5	<5	<5	<5					µg/l	A-T-023w
Aro >C21-C35 (w) _A [#]	<5	<5	<5	<5					µg/l	A-T-023w
Total Aromatics (w) _A	<5	<5	<5	<5					µg/l	A-T-022+23w
TPH (Ali & Aro) (w) _A	<5	<5	<5	<5					µg/l	A-T-022+23w
BTEX - Benzene (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
BTEX - Toluene (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
BTEX - Ethyl Benzene (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
BTEX - m & p Xylene (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
BTEX - o Xylene (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w
MTBE (w) _A [#]	<1	<1	<1	<1					µg/l	A-T-022w

Envirolab Job Number: 13/03372

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03372/1	13/03372/2	13/03372/3	13/03372/4					Units	Method ref
Client Sample No	Deep		Original	East						
Client Sample ID	BH10	WS7	SS2	SS2 Upstream						
Depth to Top	15.00									
Depth To Bottom										
Date Sampled	16-Jul-13	16-Jul-13	16-Jul-13	16-Jul-13						
Sample Type	Water - W	Water - W	Water - W	Water - W						
Sample Matrix Code										
PAH 16MS (w)										
Acenaphthene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Acenaphthylene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Anthracene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Benzo(a)anthracene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Benzo(a)pyrene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Benzo(b)fluoranthene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Benzo(ghi)perylene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Benzo(k)fluoranthene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Chrysene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Dibenzo(ah)anthracene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Fluoranthene (w) _A [#]	<0.01	<0.01	<0.01	0.01					µg/l	A-T-019w
Fluorene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Indeno(123-cd)pyrene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Naphthalene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Phenanthrene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
Pyrene (w) _A [#]	<0.01	<0.01	<0.01	<0.01					µg/l	A-T-019w
PAH (total 16) (w) _A [#]	<0.01	<0.01	<0.01	0.01					µg/l	A-T-019w

Envirolab Job Number: 13/03372

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03372/1	13/03372/2	13/03372/3	13/03372/4					Units	Method ref
Client Sample No	Deep		Original	East						
Client Sample ID	BH10	WS7	SS2	SS2 Upstream						
Depth to Top	15.00									
Depth To Bottom										
Date Sampled	16-Jul-13	16-Jul-13	16-Jul-13	16-Jul-13						
Sample Type	Water - W	Water - W	Water - W	Water - W						
Sample Matrix Code										
TPH CWG										
Mineral Oil (>C10-C35) (w) _A [#]	<5	<5	-	-					µg/l	A-T-023w

REPORT NOTES

Notes - Soil analysis

All results are reported as dry weight (<40 °C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

Superscript "M" indicates method accredited to MCERTS.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations. If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 13/03837

Issue Number: 1

Date: 16 August, 2013

Client: Structural Soils Bristol
The Old School House
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: SSL Enviro / Simon Pond / Jim Southern

Project Name: Harts Farm Way, Havant

Project Ref: 727927

Order No: Not specified

Date Samples Received: 14/08/13

Date Instructions Received: 14/08/13

Date Analysis Completed: 16/08/13

Prepared by:



Melanie Marshall
Laboratory Coordinator

Approved by:



John Gustafson
Director

Envirolab Job Number: 13/03837

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03837/1	13/03837/2	13/03837/3	13/03837/4	13/03837/5				Units	Method ref
Client Sample No										
Client Sample ID	BH8	WS1	WS3	WS5	BH10					
Depth to Top										
Depth To Bottom										
Date Sampled	12-Aug-13	12-Aug-13	12-Aug-13	12-Aug-13	12-Aug-13					
Sample Type	Water - W	Water - W	Water - W	Water - W	Water - W					
Sample Matrix Code										
pH (w) _A [#]	6.99	6.99	7.24	6.86	7.30				pH	A-T-031w
Hardness _A [#]	463	392	379	812	299				mg/l Ca CO3	A-T-049
Sulphate (w) _A [#]	126	42	44	112	28				mg/l	A-T-026w
Arsenic (dissolved) _A [#]	1	2	<1	4	<1				µg/l	A-T-025
Cadmium (dissolved) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-025
Copper (dissolved) _A [#]	<1	2	<1	<1	1				µg/l	A-T-025
Chromium (dissolved) _A [#]	4	6	4	2	8				µg/l	A-T-025
Lead (dissolved) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-025
Mercury (dissolved) _A [#]	<0.1	<0.1	<0.1	0.2	0.5				µg/l	A-T-025
Nickel (dissolved) _A [#]	5	2	<1	2	2				µg/l	A-T-025
Selenium (dissolved) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-025
Zinc (dissolved) _A [#]	5	3	1	1	2				µg/l	A-T-025

Envirolab Job Number: 13/03837

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03837/1	13/03837/2	13/03837/3	13/03837/4	13/03837/5				Units	Method ref
Client Sample No										
Client Sample ID	BH8	WS1	WS3	WS5	BH10					
Depth to Top										
Depth To Bottom										
Date Sampled	12-Aug-13	12-Aug-13	12-Aug-13	12-Aug-13	12-Aug-13					
Sample Type	Water - W	Water - W	Water - W	Water - W	Water - W					
Sample Matrix Code										
TPH CWG										
Ali >C5-C6 (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
Ali >C6-C8 (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
Ali >C8-C10 (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
Ali >C10-C12 (w) _A [#]	<5	<5	<5	<5	<5				µg/l	A-T-023w
Ali >C12-C16 (w) _A [#]	<5	<5	<5	<5	<5				µg/l	A-T-023w
Ali >C16-C21 (w) _A [#]	<5	<5	<5	<5	<5				µg/l	A-T-023w
Ali >C21-C35 (w) _A [#]	<5	6	<5	<5	<5				µg/l	A-T-023w
Total Aliphatics (w) _A	<5	6	<5	<5	<5				µg/l	A-T-022+23w
Aro >C5-C7 (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
Aro >C7-C8 (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
Aro >C8-C9 (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
Aro >C9-C10 (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
Aro >C10-C12 (w) _A [#]	<5	<5	<5	<5	<5				µg/l	A-T-023w
Aro >C12-C16 (w) _A [#]	<5	<5	<5	<5	<5				µg/l	A-T-023w
Aro >C16-C21 (w) _A [#]	<5	<5	<5	<5	<5				µg/l	A-T-023w
Aro >C21-C35 (w) _A [#]	<5	<5	<5	<5	<5				µg/l	A-T-023w
Total Aromatics (w) _A	<5	<5	<5	<5	<5				µg/l	A-T-022+23w
TPH (Ali & Aro) (w) _A	<5	6	<5	<5	<5				µg/l	A-T-022+23w
BTEX - Benzene (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
BTEX - Toluene (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
BTEX - Ethyl Benzene (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
BTEX - m & p Xylene (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
BTEX - o Xylene (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w
MTBE (w) _A [#]	<1	<1	<1	<1	<1				µg/l	A-T-022w

Envirolab Job Number: 13/03837

Client Project Name: Harts Farm Way, Havant

Client Project Ref: 727927

Lab Sample ID	13/03837/1	13/03837/2	13/03837/3	13/03837/4	13/03837/5				Units	Method ref
Client Sample No										
Client Sample ID	BH8	WS1	WS3	WS5	BH10					
Depth to Top										
Depth To Bottom										
Date Sampled	12-Aug-13	12-Aug-13	12-Aug-13	12-Aug-13	12-Aug-13					
Sample Type	Water - W	Water - W	Water - W	Water - W	Water - W					
Sample Matrix Code										
PAH 16MS (w)										
Acenaphthene (w) _A [#]	<0.01	0.05	0.04	0.02	<0.01				µg/l	A-T-019w
Acenaphthylene (w) _A [#]	<0.01	<0.01	0.08	<0.01	<0.01				µg/l	A-T-019w
Anthracene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
Benzo(a)anthracene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
Benzo(a)pyrene (w) _A [#]	<0.01	<0.01	0.01	<0.01	<0.01				µg/l	A-T-019w
Benzo(b)fluoranthene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
Benzo(ghi)perylene (w) _A [#]	<0.01	0.02	<0.01	<0.01	<0.01				µg/l	A-T-019w
Benzo(k)fluoranthene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
Chrysene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
Dibenzo(ah)anthracene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	0.01				µg/l	A-T-019w
Fluoranthene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
Fluorene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
Indeno(123-cd)pyrene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
Naphthalene (w) _A [#]	<0.01	<0.01	<0.01	0.03	<0.01				µg/l	A-T-019w
Phenanthrene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
Pyrene (w) _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01				µg/l	A-T-019w
PAH (total 16) (w) _A [#]	<0.01	0.07	0.13	0.05	0.01				µg/l	A-T-019w

REPORT NOTES

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

Superscript "M" indicates method accredited to MCERTS.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations. If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

Harts Farm Way, Havant T27927																	
WS1 0.50 13/02/87/1/1	WS6 0.50 13/02/87/1/2	WS7 0.40 13/02/87/1/3	WS7 1.50 13/02/87/1/4	WS7 2.00 13/02/87/1/5	TP13 0.40 13/02/87/1/6	TP14 1.40 13/02/87/1/7	TP14 1.60 13/02/87/1/8	TP16 0.60 13/02/87/1/9	TP18 0.60 13/02/87/1/10	TP19 0.50 13/02/87/1/11	TP21 0.50 13/02/87/1/12	TP22 0.50 13/02/87/1/13	TP23 0.50 13/02/87/1/14	TP23 1.50 13/02/87/1/15	WS25 0.50 13/02/87/1/16		
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
4	1	1						2	6	1				2			
8	11	2						8	33	16				11			
6	10	1						5	293	5				3			
55	41	2						9	43	14				5			
5	7	2						6	20	8				6			
62	74	32						24	238	41				11			
0.6	0.6	0.5						0.5	1.1	0.5				0.5			
0.81	0.17	1.50						1.12	0.30	0.17				0.26			
1	1	1						1	1	1				1			
50.60	0.06	0.01	0.01	0.01		0.83	0.18	0.01	0.01	0.01	0.02	0.01	6.05	0.01	0.01		
0.72	0.01	0.01	0.01	0.01		0.01	0.06	0.01	0.01	0.01	0.03	0.02	0.02	0.01	0.01		
10.70	0.11	0.02	0.02	0.02		0.15	0.07	0.02	0.05	0.02	0.06	0.04	13.20	0.02	0.02		
13.10	0.15	0.04	0.14	0.04		0.04	0.04	0.04	0.42	0.04	0.52	0.65	14.20	0.04	0.04		
6.60	0.11	0.04	0.19	0.04		0.06	0.04	0.04	0.53	0.04	0.71	0.92	9.96	0.04	0.04		
8.91	0.13	0.05	0.21	0.05		0.05	0.05	0.05	0.73	0.05	0.91	1.03	12.30	0.05	0.05		
2.96	0.07	0.05	0.10	0.05		0.05	0.05	0.05	0.54	0.05	0.59	0.62	4.18	0.05	0.05		
3.69	0.08	0.07	0.09	0.07		0.07	0.07	0.07	0.25	0.07	0.40	0.46	5.85	0.07	0.07		
12.60	0.20	0.06	0.20	0.06		0.07	0.06	0.06	0.57	0.06	0.68	0.78	14.10	0.06	0.06		
0.81	0.04	0.04	0.04	0.04		0.04	0.04	0.04	0.07	0.04	0.12	0.12	1.28	0.04	0.04		
50.40	0.58	0.08	0.34	0.08		0.26	0.08	0.13	0.96	0.08	0.93	1.19	42.10	0.08	0.08		
36.00	0.08	0.01	0.01	0.02		0.32	0.31	0.01	0.01	0.01	0.02	0.01	9.21	0.01	0.01		
2.90	0.07	0.03	0.10	0.03		0.05	0.03	0.03	0.45	0.03	0.50	0.56	4.62	0.03	0.03		
3.11	0.12	0.03	0.03	0.03		0.03	0.04	0.03	0.03	0.03	0.03	0.03	9.03	0.03	0.03		
61.50	0.78	0.03	0.10	0.04		0.72	0.67	0.04	0.25	0.03	0.23	0.22	55.50	0.05	0.04		
36.70	0.37	0.07	0.30	0.07		0.18	0.11	0.10	0.76	0.07	0.85	1.07	28.80	0.07	0.07		
	0.01	0.01	0.01	0.01		0.01	0.05										
	0.01	0.01	0.01	0.01		0.01	0.05										
	0.01	0.01	0.01	0.01		0.01	0.05										
	0.01	0.01	0.01	0.01		0.01	0.05										

[illegible][illegible]

Table 3.2 of Annex VI of the CLP Regulation including 3rd ATP where applicable (sometimes called ATP3)

Harts Farm Way, Havant 727927

[illegible]

United Kingdom Accreditation Service

ACCREDITATION CERTIFICATE



TESTING LABORATORY
No. 1247

Envirolab

is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005
General Requirements for the competence of testing and calibration laboratories.

This accreditation demonstrates technical competence for a defined scope as detailed in and at the locations specified in the schedule to this certificate, and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated 18 June 2005).

The schedule to this certificate is an essential accreditation document and from time to time may be revised and reissued by the United Kingdom Accreditation Service. The most recent issue of the schedule of accreditation, which bears the same accreditation number as this certificate, is available from the UKAS website www.ukas.org.

This accreditation is subject to continuing conformity with United Kingdom Accreditation Service requirements. The absence of a schedule on the UKAS website indicates that the accreditation is no longer in force.

R. Belkiss

Accreditation Manager, United Kingdom Accreditation Service

Initial Accreditation date
02 December 1992

This certificate issued on
11 August 2006

The Department of Trade and Industry (DTI) has entered into a memorandum of understanding with the United Kingdom Accreditation Service (UKAS) through which UKAS is recognised as the national body responsible for assessing and accrediting the competence of organisations in the fields of calibration, testing, inspection and certification of systems, products and persons

APPENDIX F

- (i) Soil Guideline Value Derivation
- (ii) UKWIR Guidelines
- (iii) Risk Assessment Methodology
- (iv) RSK Group Generic Assessment Criteria (GAC)

Risk Assessment Methodology

Risk is a combination of the ‘likelihood’ of an event occurring and the magnitude of its ‘consequences’. Therefore, in order to assess risk, both the likelihood and the consequences of an event must be taken into account. RSK Group Plc has adopted guidance provided in CIRIA C552 for use in the production of risk assessments.

The likelihood of an event can be classified on a four point system using the following terms and definitions based on CIRIA C552:

Highly likely: The event appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution;

Likely: It is probable that an event will occur, or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term;

Low likelihood: Circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term;

Unlikely: Circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

Severe: Short term (acute) risk to human health likely to result in ‘significant harm’ as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in ‘Draft Circular on Contaminated Land’, DETR 2000);

Medium: Chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);

Mild: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment; and

Minor: Harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the likelihood of an event occurring and its severity have been classified, a risk category can be assigned the table below.

RISK CLASSIFICATION SYSTEM (CIRIA 552)					
Consequence					
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/Low	Low
	Low likelihood	Moderate	Moderate/Low	Low	Very Low
	Unlikely	Moderate/Low	Low	Very Low	Very Low

UKWIR Guidelines

A range of pipe materials are available and careful selection, design and installation is required to ensure that water supply pipes are satisfactorily installed and meet the requirements of the Water Supply (Water Fittings) Regulations 1999 in England and Wales, the Byelaws 2000 in Scotland and the Northern Ireland Water Regulations. The regulations include a requirement to use only suitable materials when laying water pipes, and laying water pipes without protection is not permitted at contaminated sites. The water supply company has a statutory duty to enforce the regulations.



Contaminants in the ground can pose a risk to potable water supply by permeating plastic water supply pipes. To fulfil their statutory obligations, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from specific contaminants, or that a remedial strategy is proposed that will mitigate any existing risk. If these requirements cannot be demonstrated to the satisfaction of the relevant water company, it becomes necessary to specify an alternative pipe material on the whole development or in specific zones.

In 2010, UK Water Industry Research (UKWIR) published Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (Report Ref. No. 10/WM/03/21). This report reviewed previously published industry guidelines and threshold concentrations adopted by individual water supply companies.

The focus of the UKWIR project was to develop clear and concise procedures, which provide consistency in the pipe selection decision process. It was also to provide guidance that can be used to ensure compliance with current regulations and to prevent water supply pipes failing prematurely due to the presence of contamination.

Report 10/WM/03/21 concluded that in most circumstances only organic contaminants pose a potential risk to plastic pipe materials and Table 3.1 of the report provides threshold concentrations for PE and PVC pipes for the organic contaminants of concern. The report also makes recommendations for the procedures to be adopted in the design of site investigations and sampling strategies, and the assessment of data, to ensure that the ground through which water supply pipes will be laid is adequately characterised.

Risks to water supply pipes have therefore been assessed against the threshold concentrations for PE and PVC pipe specified in Table 3.1 of Report 10/WM/03/21, which have been adopted as the GACs for this linkage and are reproduced in the table on the following page.

Since water supply pipes are typically laid at a minimum depth of 750mm below finished ground levels, sample results from depths between 0.5m and 1.5m below finished ground level are generally considered suitable for assessing risks to water supply. Samples outside these depths can be used provided that they are considered representative of the strata within those depths. Report 10/WM/03/21 also specifies that sampling should characterise the



ground conditions to a minimum of 0.5m below the proposed depth of the pipe and to 15m either side of it.

It should be noted that the assessment provided in this report is a guide only and the method of assessment and recommendations should be checked with the relevant water supply company.

Where a water main and/or service pipe is to be laid close to fuel or chemical storage tanks (e.g. petrol filling stations) then the local water company may require the pipe materials laid within a designated distance of the facility to take account of future contamination risk.

Generic assessment criteria (GAC) for water supply pipes

		Pipe material	
		GAC (mg/kg)	
	Parameter group	PE	PVC
1	Extended VOC suite by purge and trap or head space and GC-MS with TIC	0.5#	0.125#
1a	• BTEX + MTBE	0.1	0.03
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C ₅ -C ₁₀)	2##	1.4##
2e	• Phenols	2	0.4
2f	• Cresols and chlorinated phenols	2	0.04
3	Mineral oil C ₁₁ -C ₂₀	10	Suitable
4	Mineral oil C ₂₁ -C ₄₀	500	Suitable
5	Corrosive (conductivity, redox and pH)	Suitable	Suitable
Further parameters identified as relevant following site investigation			
2a	Ethers	0.5	1
2b	Nitrobenzene	0.5	0.4
2c	Ketones	0.5	0.02
2d	Aldehydes	0.5	0.02
6	Amines	Not suitable	Suitable

Notes: where indicated as 'suitable', the material is considered resistant to permeation or degradation and no threshold concentration has been specified by UKWIR.

#: Total VOC result minus BTEX and MTBE results

##: Total SVOC result minus total phenols/cresols/chlorinated phenols results



Soil Guideline Value Derivation

The Soil Guideline Values (SGVs) derived from the CLEA model and published by DEFRA provide initial screening criteria to establish whether sources of contamination are significant. These can then be compared with the site-specific analytical data to establish whether the hazards have the potential to cause unacceptable health risks.

In August 2008 the Environment Agency and the Department of Environment, Food and Rural Affairs (Defra) withdrew Contaminated Land Reports CLR7 to CLR10, together with the previously published Soil Guideline Values (SGVs) and CLEA UK software. In September 2009 version 1.06 of the CLEA model was issued and in May 2010 RSK released screening values (Generic Assessment Criteria (GAC)) derived in accordance with this model. RSK Group Plc has followed the same approach as CLEA to derive GAC for relevant contaminants for which SGVs are as yet not published.

The CLEA system also introduces some statistical testing of the test results. In principle, the mean (average) of the results for a given contaminant could be compared with the SGV. However, the measured mean could differ significantly from the true mean if only a limited number of results were available. Therefore in the mean value test, the value below which the true mean value for the site lies (US95), is calculated at the 95% confidence limit. Therefore if the US95 is below the SGV then there is 95% confidence that the true mean is below the SGV and that there is no significant risk to health. If the mean value exceeds the SGV then this may indicate a requirement for remediation or further investigation.

If the mean value lies below the SGV, then remediation is not likely to be required. This may be the case even if some individual results exceed the SGV, as long as the elevated results fall within the same sample population, as discussed below. There is also a maximum value test and this determines whether individual results which exceed a SGV fall within the range that can be expected from the sample population, or whether they are indicative of an area of greater contaminant concentrations (e.g. a hotspot). In this latter case such elevated results are called “outliers” and such outliers may indicate a requirement for remediation or further investigation.

Generic assessment criteria for human health: commercial scenario

The human health generic assessment criteria (GAC) have been developed during a period of regulatory review and updating of the Contaminated Land Exposure Assessment (CLEA) project. Therefore, the Environment Agency (EA) is in the process of publishing updated reports relating to the CLEA project and the GAC presented in this document may change to reflect these updates. This issue was prepared following the publication of soil guideline value (SGV) reports and associated publications⁽¹⁾ for mercury, selenium, benzene, toluene, ethylbenzene and xylene in March 2009, arsenic and nickel in May 2009, cadmium and phenol in June 2009, dioxins, furans and dioxin-like polychlorinated biphenyls (PCBs) in September 2009. It was also produced following publication of GAC by LQM⁽⁶⁾. Where available, the published soil guideline values (SGV)⁽¹⁾ were used as the GAC. The GAC for lead is discussed separately below owing to it not being derived using the same approach as other compounds.

Lead GAC derivation

The Environment Agency SGV and Tox reports for lead were withdrawn in 2009. In addition, the provisional tolerable weekly intake data published in the Netherlands was also withdrawn in 2010 owing to concerns that it was not suitably protective of human health. The withdrawn SGV was based on a target blood lead concentration 10 µg/dl. In the absence of current guidelines, many consultants have continued to use the withdrawn SGV. However, as this is not considered sufficiently protective of human health RSK has revised its GAC for lead and is currently undertaking a review of recent toxicological developments that will be used to refine this GAC further in the coming months.

Variable	Description of variable	Units	Value in SGV10	Revised value for RSK GAC
T	Health criteria value – reduced owing to concern that 10ug/dl may not be suitably protective of human health	ug/dl	10	5
G	Geometric standard deviation for B typically in range of 1.8 to 2.1	-	2.0	1.8
B	Geometric mean of blood lead concentration in adult women. The value used in SGV10 was based on UK data from 1995 from women in an urban area aged 16–44. Data in the US has shown decreases from between 1.7 and 2.2 to 1ug/dl between the late 1980s/early 1990s and late 1990s/early 2000s for adult females between 17 and 45 years old. Lead concentrations in blood are likely to be decreasing in the UK owing to a ban on lead in internal paint, a ban on lead in fuel and replacement of lead pipes for water supply	ug/dl	2.3	1.0
n	Selected on the basis of the degree of protection needed for a population at risk at the target concentration (T); the default value is 95%	-	1.645	1.645
AT _{s,d}	Averaging time assuming exposure over working lifetime. The value has been revised to reflect 49 years in accordance with CLEA commercial scenario outlined in SR3	days	15695	17885
BKSF	Biokinetic slope factor	ug/dl per ug/day	0.4	0.4
IR _s	Soil ingestion rate (including soil-derived indoor dust). This value has been revised to reflect the CLEA commercial scenario outlined in SR3	g/day	0.040	0.050
AF _{s,d}	Absorption fraction (same for soil and dust)	-	0.12	0.12
EF _{s,d}	Exposure frequency – based on CLEA commercial conceptual model	days/yr	230	230
ED	Exposure duration. This value has been revised to reflect CLEA commercial conceptual model outlined in SR3	years	43	49

The methodology utilised for the adult receptor is the Adult Lead Methodology used in the USA, which is a similar equation to that used in production of the UK SGV outlined in R&D publication SGV10. Parameters within the equation are presented below and have been updated to reflect:

- a revised and more health protective target blood level
- more recent US data pertaining to the geometric blood lead concentration, which indicates decreasing concentrations from 1988 to 2004
- more recent US data regarding the geometric standard deviation (the measure of inter-individual variability in blood lead concentrations within the adult population).

Although the update is based on US data, RSK considers that background blood levels in the UK will also be decreasing owing to lead pipes being replaced, lead no longer being used in fuel and lead paints being banned from internal use. Furthermore, RSK has run the equation with varying inputs to ascertain its sensitivity to certain parameters. Using the parameters outlined above RSK obtains a GAC of **600mg/kg** for an adult in a commercial setting. A similar value is obtained if all input parameters remain equal to those used in production of the former SGV but the soil ingestion rate is increased to reflect 50mg/day reported for the commercial scenario in SR3.

GAC derivation for other metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated for compounds where SGV have not been published using CLEA v1.06 and the supporting UK guidance⁽¹⁻⁶⁾. Groundwater assessment criteria (GrAC) protective of human health via the inhalation pathway were derived using the RBCA 1.3b model. RSK has updated the inputs within RBCA to reflect the UK guidance⁽²⁻⁵⁾. The SAC and GrAC collectively are termed GAC.

Pathway selection

In accordance with EA Science Report SC050221/SR3⁽³⁾ the commercial scenario considers risks to a female worker who works from the age of 16 to 65 years. It should be noted that this end use is not suitable for a workplace nursery but also may be appropriate for a sport centre or shopping centre where children are present. In accordance with Box 3.5, SR3⁽³⁾ the pathways considered for production of the SAC in the commercial scenario are:

- direct soil and dust ingestion
- dermal contact with soil both indoor and outdoors
- indoor air inhalation from soil and vapour and outdoor inhalation of soil and vapour.

Figure 1 is a conceptual model illustrating these linkages.

The pathway considered in production of the GrAC is the volatilisation of compounds from groundwater and subsequent vapour inhalation by workers while indoors. Figure 2 illustrates this linkage. Although the outdoor air inhalation pathway is also valid, this contributes little to the overall risks owing to the dilution in outdoor air.

Within RBCA, the solubility limit of the determinant restricts the extent of volatilisation, which in turn drives the indoor air inhalation pathway. While the same restriction is not built into the CLEA model, the model output cells are flagged red where the soil saturation limit has been exceeded.

An assumption used in the CLEA model is that of simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase⁽⁴⁾. The upper boundaries of this partitioning are represented by the aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous-based or the vapour-based saturation limits. Where model output cells are flagged red the soil or vapour saturation limit has been exceeded and further consideration of the SAC to be used within the assessment is required. One approach that could be adopted is to use the 'modelled' solubility saturation limit or vapour saturation limit of the compound as the SAC. However, as stated within the CLEA handbook⁽⁴⁾ this is likely to be impractical in many cases because of the very low solubility/vapour saturation limits and, in any case, is highly conservative. Unless free-phase product is present, concentrations of the chemical are unlikely to be present at sufficient concentration to result in an exceedance of the health criteria value (HCV).

RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH⁽⁶⁾ whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets. Therefore, when using the SAC to screen laboratory analysis the assessor should take note if a given SAC has a corresponding solubility saturation or vapour saturation limit (in brackets), and subsequently incorporate this information within the screening analytical discussion. If further assessment is required following this process then an additional approach can be utilised as detailed within Section 4.12 of the CLEA model handbook⁽⁴⁾ which explains how to calculate an effective assessment criterion manually.

Input selection

Chemical data was obtained from EA Report SC050021/SR7⁽⁵⁾ and the health criteria values (HCV) from the UK TOX⁽¹⁾ reports where available. For SAC for total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH), toxicological and specific chemical parameters were obtained from the LQM/CIEH report⁽⁶⁾. Similarly, toxicological and specific chemical parameters for the volatile organic compound 1,2,4-trimethylbenzene were obtained from EIC/AGS/CL:AIRE⁽⁷⁾.

For TPH, aromatic hydrocarbons C₅–C₈ were not modelled since benzene and toluene are being modelled separately. The aromatic C₈–C₉ hydrocarbon fraction comprises ethylbenzene, xylene and styrene. As ethylbenzene and xylene are being modelled separately, the physical, chemical and toxicological data for this band have been taken from styrene.

Owing to the lack of UK-specific data, default information in the RBCA model was used to evaluate methyl tertiary butyl ether (MTBE). No published UK data was available for 1,3,5-trimethylbenzene, so information was obtained from the US EPA as in the RBCA model. RBCA

uses toxicity data for the inhalation pathway in different units to the CLEA model and cannot consider separately the mean daily intake (MDI), occupancy periods or breathing rates. Therefore, the HCV in RBCA was amended to take account of:

- an adult weighing 70kg and breathing 14.8m³ air per day in accordance with the UK TOX reports⁽²⁾ and SR3⁽³⁾
- the 50% rule (for petroleum hydrocarbons, trimethylbenzenes and MTBE)⁽²⁾ where MDI data is not currently available but background exposure is considered important in the overall exposure.

Physical parameters

For the commercial end use, the CLEA default pre-1970s three-storey office building was used. SR3 notes this commercial building type to be the most conservative in terms of protection from vapour intrusion. The building parameters are outlined in Table 3.

The parameters for a sandy loam soil type were used in line with SR3⁽³⁾. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this parameter, RSK has produced an additional set of SAC for an SOM of 1% and 2.5%.

For the GrAC, the depth to groundwater was taken as 2.5m based on RSK's experience of assessing the volatilisation pathway from groundwater.

GAC

The SAC were produced using the input parameters in Tables 1, 2 and 3 and the GrAC using the input parameters in Table 4. The final selected GAC are presented by pathway in Table 5 with the combined GAC in Table 6.

Figure 1: Conceptual model for CLEA commercial scenario

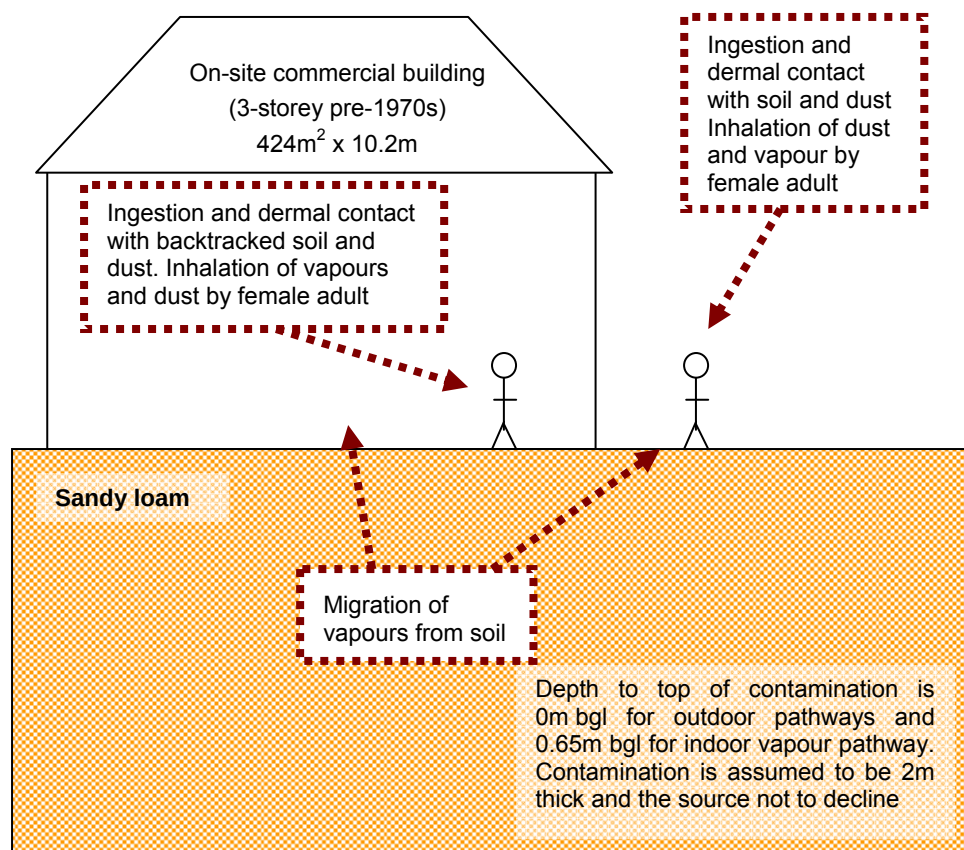


Table 1: Exposure assessment parameters for commercial scenario – inputs for CLEA model

Parameter	Value	Justification
Land use	Commercial	Chosen land use
Receptor	Female worker	Taken as female adult exposed over 49 years from age 16 to 65 years, Box 3.5, SR3 ⁽³⁾
Building	Office (pre-1970)	Key generic assumption given in Box 3.5, SR3 ⁽³⁾ . Pre-1970s three-storey office building chosen as it is the most conservative in terms of protection from vapour intrusion (Section 3.4.6, SR3 ⁽³⁾)
Soil type	Sandy loam	Most common UK soil type (Section 4.3.1, Table 4.4, SR3 ⁽³⁾). Table 4 presents soil-specific inputs
Start age class (AC)	17	AC corresponding to key generic assumption that the critical receptor is a working female adult exposed over a 49-year period from age 16 to 65 years. Assumption given in Box 3.5, SR3 ⁽³⁾ . Data specific to AC exposure is presented in Table 2 and receptor specific in Table 3
End AC	17	
SOM (%)	6	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' ⁽⁸⁾
	1	To provide SAC for sites where SOM < 6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Commercial – receptor inputs for CLEA model

Parameter	Unit	Value	Justification
Exposure frequency (EF) (soil and dust ingestion)	day yr ⁻¹	230	From Table 3.9, SR3 ⁽³⁾ . The working week is assumed 45 hours including a 1-hour lunch break each day. Indoor and outdoor exposure are weighted by the frequency of time spent indoors and outdoors (8.3 hours a day and 0.7 hours a day respectively)
EF (dermal contact with dust, indoor)	day yr ⁻¹	230	
EF (dermal contact with soil, outdoor)	day yr ⁻¹	170	
EF (inhalation of dust and vapour, indoor)	day yr ⁻¹	230	
EF (inhalation of dust and vapour, outdoor)	day yr ⁻¹	170	
Occupancy period (indoor)	hr day ⁻¹	8.3	Box 3.6, SR3 ⁽³⁾ . Weighted average based on a nine-hour day including one-hour lunch being spent outside 75% of the year
Occupancy period (outdoor)	hr day ⁻¹	0.7	
Soil to skin adherence factor (indoor and outdoor)	mg cm ⁻² day ⁻¹	0.14	Table 8.1, SR3 ⁽³⁾ for age class 17
Soil and dust ingestion rate	g day ⁻¹	0.05	Table 6.2, SR3 ⁽³⁾ for age class 17
Body weight	kg	70	Table 4.6, SR3 ⁽³⁾ for female AC 17
Body height	m	1.6	Table 4.6, SR3 ⁽³⁾ for female AC 17
Inhalation rate	m ³ day ⁻¹	14.8	Table 4.14, SR3 ⁽³⁾ for female AC 17
Max. exposed skin fraction (indoor and outdoors)	m ² m ⁻²	0.08	Based on adult female assuming face and hands are exposed. Table 4.7, SR3 ⁽³⁾

Table 3: Commercial – soil, air and building inputs for CLEA model

Parameter	Unit	Value	Justification
Soil properties for sandy loam			
Porosity, total	$\text{cm}^3 \text{ cm}^{-3}$	0.53	Default soil type is sandy loam, Section 4.3.1, SR3 ⁽³⁾ . Parameters for sandy loam from Table 4.4, SR3 ⁽³⁾
Porosity, air filled	$\text{cm}^3 \text{ cm}^{-3}$	0.20	
Porosity, water filled	$\text{cm}^3 \text{ cm}^{-3}$	0.33	
Residual soil water content	$\text{cm}^3 \text{ cm}^{-3}$	0.12	
Saturated hydraulic conductivity	cm s^{-1}	0.00356	
van Genuchten shape parameter (m)	-	0.3201	
Bulk density	g cm^{-3}	1.21	
Threshold value of wind speed at 10m	m s^{-1}	7.20	Default value taken from Section 9.2.2, SR3 ⁽³⁾
Empirical function (F_x) for dust model	-	1.22	Value taken from Section 9.2.2, SR3 ⁽³⁾
Ambient soil temperature	K	283	Annual average soil temperature of UK surface soils. Section 4.3.1, SR3 ⁽³⁾
Air dispersion model			
Mean annual wind speed (10m)	m s^{-1}	5.0	Default value taken from Section 9.2.2, SR3 ⁽³⁾
Air dispersion factor at height of 1.6m	$\text{g m}^{-2} \text{ s}^{-1}$ per kg m^{-3}	120	From Table 9.1, SR3. Values for a 2ha site, appropriate to a commercial land use in Newcastle (most representative city for UK, section 9.2.1, SR3 ⁽³⁾)
Fraction of site with hard or vegetative cover	$\text{m}^2 \text{ m}^{-2}$	0.8	Section 3.4.6 and 9.2.2, SR3 ⁽³⁾ for average office such as that used in the commercial scenario
Building properties for office (pre-1970) with ground-bearing floor slab			
Building footprint	m^2	424	From Table 3.10, SR3 ⁽³⁾
Living space air exchange rate	hr^{-1}	1.0	
Living space height (above ground)	m	9.6	
Living space height (below ground)	m	0.0	Assumed no basement.
Pressure difference (soil to enclosed space)	Pa	4.4	From Table 3.10, SR3 ⁽³⁾
Foundation thickness	m	0.15	

Parameter	Unit	Value	Justification
Floor crack area	m ²	0.165	
Dust loading factor	µg m ⁻³	100	Default value for a commercial site taken from Section 9.3, SR3 ⁽³⁾
Vapour model			
Default soil gas ingress rate	cm ³ s ⁻¹	150	Section 10.3, report SC050021/SR3 ⁽³⁾
Depth to top of source (beneath building for indoor exposure)	cm	50	Section 3.4.6, SR3 ⁽³⁾ states source is 50cm below building or 65cm below ground surface
Depth to top of source (outdoors)	cm	0	Section 10.2, SR3 ⁽³⁾ assumes impact from 0-1m for outdoor inhalation pathway
Thickness of contaminant layer	cm	200	Model default for indoor air, Section 4.9, SR4 ⁽⁴⁾
Time average period for surface emissions	years	49	Working lifetime from 16–65 years. Key generic assumption given in Box 3.5, SR3 ⁽³⁾
User-defined effective air permeability	cm ²	3.05E-08	Calculated for sandy loam using equations in Appendix 1, SR3 ⁽³⁾

Figure 2: GrAC conceptual model for RBCA commercial scenario

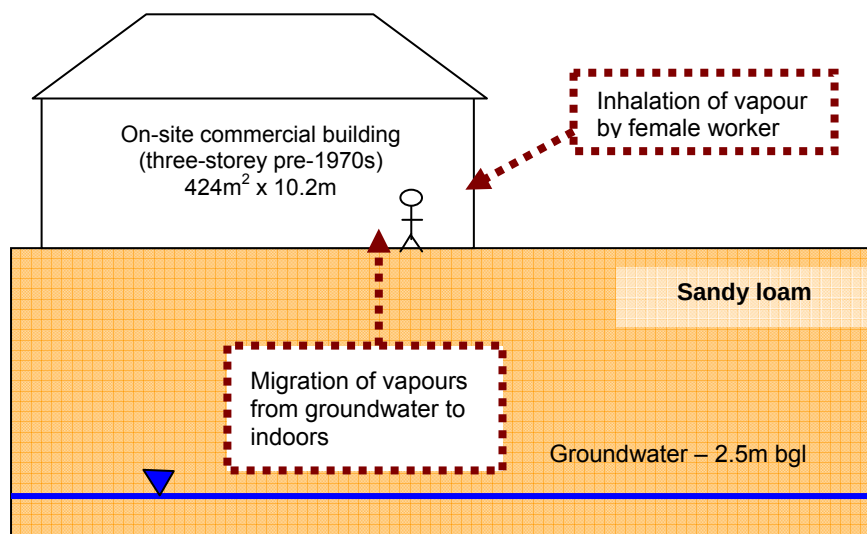


Table 4: Commercial – RBCA inputs

Parameter	Unit	Value	Justification
Receptor			
Averaging time	Years	49	From Box 3.5, SR3 ⁽³⁾
Receptor weight	kg	70	Female adult, Table 4.6, SR3 ⁽³⁾
Exposure duration	Years	49	From Box 3.5, SR3 ⁽³⁾
Exposure frequency	Days/yr	86.25	Weighted using occupancy period of 9 hours per day for 230 days of the year ((9hours x 230 days)/24 hours)
Soil type – sandy loam			
Total porosity	-	0.53	CLEA value for sandy loam. Parameters for sandy loam from Table 4.4, SR3 ⁽³⁾
Volumetric water content	-	0.33	
Volumetric air content	-	0.20	
Dry bulk density	g cm ⁻³	1.21	
Vertical hydraulic conductivity	cm s ⁻¹	3.56E-3	CLEA value for saturated conductivity of sandy loam, Table 4.4, SR3 ⁽³⁾
Vapour permeability	m ²	3.05E-12	Calculated for sandy loam using equations in Appendix 1, SR3 ⁽³⁾
Capillary zone	m	0.1	Professional judgement

Parameter	Unit	Value	Justification
thickness			
Building			
Building volume/area ratio	m	9.6	Table 3.10, SR3 ⁽³⁾
Foundation area	m ²	424	Table 3.10, SR3 ⁽³⁾
Foundation perimeter	m	82.40	Based on square root of building area being 20.59m
Building air exchange rate	d ⁻¹	24	Table 3.10, SR3 ⁽³⁾
Depth to bottom of foundation slab	m	0.15	
Foundation thickness	m	0.15	Table 3.10, SR3 ⁽³⁾
Foundation crack fraction	-	3.89E-04	Calculated from floor crack area of 0.165m ² and building footprint of 424m ² in Table 4.21, SR3 ⁽³⁾
Volumetric water content of cracks	-	0.33	Assumed equal to underlying soil type in assumption that cracks become filled with soil over time. Parameters for sandy loam from Table 4.4, SR3 ⁽³⁾
Volumetric air content of cracks	-	0.2	
Indoor/outdoor differential pressure	Pa	4.4	From Table 3.10, SR3 ⁽³⁾

References

1. Environment Agency (2009), 'Science Report SC050021/benzene SGV, toluene SGV, ethylbenzene SGV, xylene SGV, mercury SGV, selenium SGV, nickel SGV, arsenic SGV, cadmium SGV, phenol SGV, dioxins, furans and dioxin like PCBs SGVs', 'Supplementary information for the derivation of SGV for: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin- like PCBs', and 'Contaminants in soil: updated collation of toxicological data and intake values for humans: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin- like PCBs', March 2009, May 2009 and September 2009.
2. Environment Agency (2009), *Human health toxicological assessment of contaminants in soil. Science Report – Final SC050021/SR2*, January (Bristol: Environment Agency).
3. Environment Agency (2009), *Science Report – SC050021/SR3. Updated technical background to the CLEA model* (Bristol: Environment Agency).
4. Environment Agency (2009), Contaminated Land Exposure Assessment (CLEA) software, version 1.06.
5. Environment Agency (2008), *Science Report SC050021/SR7. Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values* (Bristol: Environment Agency).
6. Chartered Institute for Environmental Health and Land Quality Management (2009), 'The LQM/CIEH Generic Assessment Criteria for Human Health', second edition.
7. CL:AIRE (2009), *Soil Generic Assessment Criteria for Human Health Risk Assessment* (London: CL:AIRE).
8. Changes made to the CLEA framework documents after the three-month evaluation period in 2008, released January 2009 by the Environment Agency.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL



Table 5

Human health generic assessment criteria by pathway for commercial scenario

Compound	Notes	GrAC (mg/l)	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
			Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals														
Arsenic	(b)(c)	-	6.35E+02	6.95E+02	-	NR	6.35E+02	6.95E+02	-	NR	6.35E+02	6.95E+02	-	NR
Cadmium	(b)	-	3.99E+02	3.87E+02	2.30E+02	NR	3.99E+02	3.87E+02	2.30E+02	NR	3.99E+02	3.87E+02	2.30E+02	NR
Chromium (III) - oxide	-	-	3.31E+05	3.34E+04	3.04E+04	NR	3.31E+05	3.34E+04	3.04E+04	NR	3.31E+05	3.34E+04	3.04E+04	NR
Chromium (VI) - hexavalent	-	-	2.01E+03	3.48E+01	3.42E+01	NR	2.01E+03	3.48E+01	3.42E+01	NR	2.01E+03	3.48E+01	3.42E+01	NR
Copper	-	-	1.78E+05	9.60E+04	7.17E+04	NR	1.78E+05	9.60E+04	7.17E+04	NR	1.78E+05	9.60E+04	7.17E+04	NR
Lead	(a)	-	6.00E+02	-	-	NR	6.00E+02	-	-	-	6.00E+02	-	-	NR
Elemental mercury (Hg ⁰)	(b)(d)	5.60E-02	-	1.84E+01	-	4.31E+00	-	4.57E+01	-	1.07E+01	-	1.09E+02	-	2.58E+01
Inorganic mercury (Hg ²⁺)	(b)	-	4.41E+03	2.09E+04	3.64E+03	NR	4.41E+03	2.09E+04	3.64E+03	-	4.41E+03	2.09E+04	3.64E+03	NR
Methyl mercury (Hg ⁴⁺)	(b)	1.00E+02	4.25E+02	2.73E+03	3.68E+02	7.33E+01	4.25E+02	4.97E+03	3.91E+02	1.42E+02	4.25E+02	9.41E+03	4.07E+02	3.04E+02
Nickel	(b)	-	2.22E+04	1.79E+03	-	NR	2.22E+04	1.79E+03	-	NR	2.22E+04	1.79E+03	-	NR
Selenium	(b)(c)	-	1.30E+04	-	-	NR	1.30E+04	-	-	NR	1.30E+04	-	-	NR
Zinc	(c)	-	6.67E+05	2.09E+08	-	NR	6.67E+05	2.09E+08	-	NR	6.67E+05	2.09E+08	-	NR
Cyanide	-	-	1.69E+04	1.95E+03	1.81E+03	NR	1.69E+04	1.95E+03	1.81E+03	NR	1.69E+04	1.95E+03	1.81E+03	NR
Volatile organic compounds														
Benzene	(b)	1.40E+02	5.53E+02	2.96E+01	2.81E+01	1.22E+03	5.53E+02	5.51E+01	5.01E+01	2.26E+03	5.53E+02	1.14E+02	9.47E+01	4.71E+03
Toluene	(b)	5.90E+02	4.25E+05	6.85E+04	5.90E+04	8.69E+02	4.25E+05	1.51E+05	1.11E+05	1.92E+03	4.25E+05	3.42E+05	1.89E+05	4.36E+03
Ethylbenzene	(b)	1.80E+02	1.91E+05	1.84E+04	1.68E+04	5.18E+02	1.91E+05	4.31E+04	3.51E+04	1.22E+03	1.91E+05	1.00E+05	6.57E+04	2.84E+03
Xylene - m	(b)	2.00E+02	3.43E+05	6.59E+03	6.46E+03	6.25E+02	3.43E+05	1.55E+04	1.48E+04	1.47E+03	3.43E+05	3.61E+04	3.27E+04	3.46E+03
Xylene - o		1.70E+02	3.43E+05	7.08E+03	6.94E+03	4.78E+02	3.43E+05	1.65E+04	1.58E+04	1.12E+03	3.43E+05	3.84E+04	3.46E+04	2.62E+03
Xylene - p		2.00E+02	3.43E+05	6.34E+03	6.22E+03	5.76E+02	3.43E+05	1.48E+04	1.42E+04	1.35E+03	3.43E+05	3.45E+04	3.14E+04	3.17E+03
Total xylene	(b)	2.00E+02	3.43E+05	6.59E+03	6.46E+03	6.25E+02	3.43E+05	1.55E+04	1.48E+04	1.47E+03	3.43E+05	3.61E+04	3.27E+04	3.46E+03
Methyl tertiary butyl ether (MTBE)	-	4.80E+04	9.53E+03	2.09E+04	8.21E+03	1.66E+04	9.53E+03	2.72E+04	8.55E+03	2.16E+04	9.53E+03	4.18E+04	8.93E+03	3.34E+04
Trichloroethene	-	3.60E+01	9.92E+03	1.19E+01	1.19E+01	1.54E+03	9.92E+03	2.49E+01	2.49E+01	3.22E+03	9.92E+03	5.54E+01	5.50E+01	7.14E+03
Tetrachloroethene	-	2.30E+02	2.65E+04	1.31E+02	1.31E+02	4.24E+02	2.65E+04	2.94E+02	2.91E+02	9.51E+02	2.65E+04	6.75E+02	6.58E+02	2.18E+03
1,1,1-Trichloroethane	-	1.30E+03	1.14E+06	7.01E+02	7.00E+02	1.43E+03	1.14E+06	1.43E+03	1.43E+03	2.92E+03	1.14E+06	3.14E+03	3.13E+03	6.39E+03
1,1,1,2-Tetrachloroethane	-	1.10E+03	1.10E+04	1.16E+02	1.15E+02	2.60E+03	1.10E+04	2.68E+02	2.62E+02	6.02E+03	1.10E+04	6.24E+02	5.91E+02	1.40E+04
1,1,2,2-Tetrachloroethane	-	1.10E+03	1.10E+04	2.98E+02	2.90E+02	2.67E+03	1.10E+04	6.10E+02	5.78E+02	5.46E+03	1.10E+04	1.34E+03	1.19E+03	1.20E+04
Carbon Tetrachloride (tetrachloromethane)	-	5.70E+00	2.70E+03	3.04E+00	3.04E+00	1.52E+03	2.70E+03	6.67E+00	6.65E+00	3.32E+03	2.70E+03	1.51E+01	1.50E+01	7.54E+03
1,2-Dichloroethane	-	6.10E+00	2.29E+02	7.14E-01	7.12E-01	3.41E+03	2.29E+02	1.03E+00	1.03E+00	4.91E+03	2.29E+02	1.77E+00	1.75E+00	8.43E+03
Vinyl Chloride (chloroethene)	-	4.10E-01	2.67E+01	6.31E-02	6.30E-02	1.36E+03	2.67E+01	8.16E-02	8.14E-02	1.76E+03	2.67E+01	1.25E-01	1.24E-01	2.69E+03
1,2,4-Trimethylbenzene	-	5.70E+01	-	4.17E+01	-	5.57E+02	-	9.89E+01	-	1.36E+03	-	2.19E+02	-	3.25E+03
1,3,5-Trimethylbenzene	-	3.80E+01	2.19E+04	4.71E+01	4.71E+01	9.47E+01	2.19E+04	1.12E+02	1.12E+02	2.26E+02	2.19E+04	2.63E+02	2.63E+02	5.33E+02
Semi-volatile organic compounds														
Acenaphthene	-	3.20E+00	1.10E+05	3.75E+05	8.49E+04	5.70E+01	1.10E+05	8.95E+05	9.77E+04	1.41E+02	1.10E+05	2.00E+06	1.04E+05	3.36E+02
Acenaphthylene	-	1.61E+01	1.10E+05	3.64E+05	8.43E+04	8.61E+01	1.10E+05	8.68E+05	9.74E+04	2.12E+02	1.10E+05	1.94E+06	1.04E+05	5.06E+02
Anthracene	-	2.10E-02	5.49E+05	1.19E+07	5.25E+05	1.17E+00	5.49E+05	2.49E+07	5.37E+05	2.91E+00	5.49E+05	4.38E+07	5.42E+05	6.96E+00
Benzo(a)anthracene	-	3.80E-03	2.52E+02	1.39E+02	8.95E+01	1.71E+00	2.52E+02	1.52E+02	9.48E+01	4.28E+00	2.52E+02	1.59E+02	9.74E+01	1.03E+01
Benzo(b)fluoranthene	-	2.00E-03	2.60E+02	1.63E+02	1.00E+02	1.22E+00	2.60E+02	1.67E+02	1.02E+02	3.04E+00	2.60E+02	1.69E+02	1.03E+02	7.29E+00
Benzo(g,h,i)perylene	-	2.60E-04	1.66E+03	1.08E+03	6.54E+02	1.54E-02	1.66E+03	1.09E+03	6.59E+02	3.85E-02	1.66E+03	1.10E+03	6.61E+02	9.23E-02
Benzo(k)fluoranthene	-	8.00E-04	3.66E+02	2.31E+02	1.41E+02	6.87E-01	3.66E+02	2.35E+02	1.43E+02	1.72E+00	3.66E+02	2.38E+02	1.44E+02	4.12E+00
Chrysene	-	2.00E-03	3.66E+02	2.20E+02	1.37E+02	4.40E-01	3.66E+02	2.29E+02	1.41E+02	1.10E+00	3.66E+02	2.34E+02	1.43E+02	2.64E+00
Dibenzo(a,h)anthracene	-	6.00E-04	3.29E+01	2.80E+01	1.27E+01	3.93E-03	3.29E+01	2.12E+01	1.29E+01	9.82E-03	3.29E+01	2.15E+01	1.30E+01	2.36E-02
Fluoranthene	-	2.30E-01	2.29E+04	2.01E+06	2.26E+04	1.89E+01	2.29E+04	2.89E+06	2.27E+04	4.73E+01	2.29E+04	3.52E+06	2.27E+04	1.13E+02
Fluorene	-	1.90E+00	7.31E+04	4.82E+05	6.35E+04	3.09E+01	7.31E+04	1.12E+06	6.87E+04	7.65E+01	7.31E+04	2.38E+06	7.10E+04	1.83E+02
Indeno(1,2,3-cd)pyrene	-	2.00E-04	1.57E+02	9.71E+01	6.00E+01	6.13E-02	1.57E+02	9.98E+01	6.11E+01	1.53E-01	1.57E+02	1.01E+02	6.17E+01	3.68E-01
Phenanthrene	-	5.30E-01	2.28E+04	5.67E+05	2.19E+04	3.60E+01	2.28E+04	1.16E+06	2.24E+04	8.96E+01	2.28E+04	1.98E+06	2.26E+04	2.14E+02
Pyrene	-	1.30E-01	5.49E+04	4.74E+06	5.42E+04	2.20E+00	5.49E+04	6.86E+06	5.44E+04	5.49E+00	5.49E+04	8.39E+06	5.45E+04	1.32E+01
Benzo(a)pyrene	-	3.80E-03	3.66E+01	2.30E+01	1.41E+01	9.11E-01	3.66E+01	2.35E+01	1.43E+01	2.28E+00	3.66E+01	2.38E+01	1.44E+01	5.46E+00
Naphthalene	-	1.90E+01	3.64E+04	2.05E+02	2.04E+02	7.64E+01	3.64E+04	4.90E+02	4.83E+02	1.83E+02	3.64E+04	1.15E+03	1.12E+03	4.32E+02
Phenol	(b)(e)	-	1.54E+06	3.16E+04	3.10E+04	4.16E+04	1.00E+06	3.57E+04	3.49E+04	8.15E+04	1.54E+06	3.85E+04	3.76E+04	1.74E+05
Total petroleum hydrocarbons														
Aliphatic hydrocarbons EC ₅ -EC ₆	-	3.60E+01	4.77E+06	3.38E+03	3.39E+03	3.04E+02	4.77E+06	6.21E+03	6.21E+03	5.58E+02	4.77E+06	1.28E+04	1.28E+04	1.15E+03
Aliphatic hydrocarbons >EC ₆ -EC ₈	-	5.40E+00	4.77E+06	8.26E+03	8.25E+03	1.44E+02	4.77E+06	1.84E+04	1.84E+04	3.22E+02	4.77E+06	4.21E+04	4.20E+04	7.36E+02
Aliphatic hydrocarbons >EC ₈ -EC ₁₀	-	4.30E-01	9.53E+04	2.14E+03	2.13E+03	7.77E+01	9.53E+04	5.21E+03	5.14E+03	1.90E+02	9.53E+04	1.24E+04	1.19E+04	4.51E+02
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂	-	3.40E-02	9.53E+04	1.06E+04	1.03E+04	4.75E+01	9.53E+04	2.62E+04	2.42E+04	1.18E+02	9.53E+04	6.25E+04	4.93E+04	2.83E+02

Table 5

Human health generic assessment criteria by pathway for commercial scenario

Compound	Zn	GrAC (mg/l)	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
			Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆		7.60E-04	9.53E+04	8.75E+04	6.08E+04	2.37E+01	9.53E+04	2.16E+05	8.26E+04	5.91E+01	9.53E+04	5.10E+05	9.50E+04	1.42E+02
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	(c)	-	1.59E+06	-	-	8.48E+00	1.76E+06	-	-	2.12E+01	1.83E+06	-	-	5.09E+01
Aliphatic hydrocarbons >EC ₃₆ -EC ₄₄	(c)	-	1.59E+06	-	-	8.48E+00	1.76E+06	-	-	2.12E+01	1.83E+06	-	-	5.09E+01
Aromatic hydrocarbons >EC ₉ -EC ₉ (styrene)		6.50E+01	1.14E+05	3.00E+04	2.77E+04	6.20E+02	1.14E+05	7.30E+04	5.81E+04	1.52E+03	1.14E+05	1.73E+05	9.00E+04	3.61E+03
Aromatic hydrocarbons >EC ₉ -EC ₁₀		6.50E+01	3.81E+04	3.76E+03	3.67E+03	6.13E+02	3.81E+04	9.18E+03	8.56E+03	1.50E+03	3.81E+04	2.17E+04	1.78E+04	3.58E+03
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂		2.50E+01	3.81E+04	2.03E+04	1.69E+04	3.64E+02	3.81E+04	4.97E+04	2.85E+04	8.99E+02	3.81E+04	1.17E+05	3.45E+04	2.15E+03
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆	(c)	5.80E+00	3.81E+04	2.15E+05	3.63E+04	1.69E+02	3.81E+04	5.05E+05	3.74E+04	4.19E+02	3.81E+04	1.09E+06	3.78E+04	1.00E+03
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	(c)	-	2.82E+04	-	-	5.37E+01	2.83E+04	-	-	1.34E+02	2.84E+04	-	-	3.21E+02
Aromatic hydrocarbons >EC ₂₁ -EC ₃₅	(c)	-	2.84E+04	-	-	4.83E+00	2.84E+04	-	-	1.21E+01	2.84E+04	-	-	2.90E+01
Aromatic hydrocarbons >EC ₃₅ -EC ₄₄	(c)	-	2.84E+04	-	-	4.83E+00	2.84E+04	-	-	1.21E+01	2.84E+04	-	-	2.90E+01

Notes:

'-': Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway or an absence of toxicological data.

NR - the compound is not volatile and therefore a soil saturation limit not calculated within CLEA

EC - equivalent carbon. GrAC - groundwater screening value. SAC - soil screening value.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

	Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%. This shading has also been used for the RBCA output where the theoretical solubility limit has been exceeded. The SAC has been set as the model calculated SAC with the saturation limits shown in brackets.
	Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.
	Calculated SAC does not exceed the soil saturation limit.

For consistency where the theoretical solubility limit within RBCA has been exceeded in production of the GrAC, these cells have also been hatched red and the GrAC set at the solubility limit.

The SAC for organic compounds are dependent upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58; 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3

(a) RSK Lead GAC obtained following sensitivity analysis of blood lead concentrations.

(b) GAC taken from the Environment Agency SGV reports published 2009.

(c) SAC for selenium, aliphatic and aromatic hydrocarbons >EC16 does not include inhalation pathway owing to absence of toxicity data. SAC for arsenic is only based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The same approach has been adopted for zinc.

(d) SAC for elemental mercury, chromium VI and nickel is based on the inhalation pathway only owing to an absence of toxicity for elemental mercury, in accordance with the SGV report for nickel and LQM report for chromium VI.

(e) The GAC for phenol is based on a threshold which is protective of acute direct skin contact with phenol (the figure in brackets is based on health effects following long-term exposure and is provided for illustration only).

Table 6
Selected human health generic assessment criteria for commercial scenario

Compound	GrAC for groundwater (mg/l)	SAC for soil SOM 1% (mg/kg)	SAC for soil SOM 2.5% (mg/kg)	SAC for soil SOM 6% (mg/kg)
Metals				
Arsenic	-	640	640	640
Cadmium	-	230	230	230
Chromium (III) - oxide	-	30,000	30,000	30,000
Chromium (VI) - hexavalent	-	35	35	35
Copper	-	72,000	72,000	72,000
Lead	-	600	600	600
Elemental mercury (Hg ⁰)	0.056	18 (4.3)	46 (11)	110 (26)
Inorganic mercury (Hg ²⁺)	-	3,600	3,600	3,600
Methyl mercury (Hg ⁺)	100	370 (73)	391	410
Nickel	-	1,800	1,800	1,800
Selenium	-	13,000	13,000	13,000
Zinc	-	670,000	670,000	670,000
Cyanide	-	1,800	1,800	1,800
Volatile organic compounds				
Benzene	140	28	50	95
Toluene	590	59,000 (870)	110,000 (1,900)	189,000 (4,400)
Ethylbenzene	180	17,000 (520)	35,000 (1,200)	65,700 (2,800)
Xylene - m	200	6,500 (620)	15,000 (1,500)	32,700 (3,500)
Xylene - o	170	6,900 (480)	16,000 (1,100)	34,600 (2,600)
Xylene - p	200	6,200 (580)	14,000 (1,400)	31,400 (3,200)
Total xylene	200	6,500 (630)	15,000 (1,500)	32,700 (3,500)
Methyl tertiary butyl ether (MTBE)	48,000	8,200	8,600	8,900
Trichloroethene	36	12	25	55
Tetrachloroethene	230	130	1,400	660
1,1,1-Trichloroethane	1,300	700	1,400	3,100
1,1,1,2 Tetrachloroethane	1,100	120	260	590
1,1,2,2 Tetrachloroethane	1,100	290	580	1,200
Carbon tetrachloride (tetrachloromethane)	5.7	3.0	6.7	15
1,2-Dichloroethane	6.1	0.71	1.0	1.8
Vinyl chloride (chloroethene)	0.41	0.063	0.08	0.12
1,2,4-Trimethylbenzene	57	42	99	220
1,3,5-Trimethylbenzene	38	47	110	260
Semi-volatile organic compounds				
Acenaphthene	3.2	85,000 (57)	98,000 (141)	100,000
Acenaphthylene	16	84,000 (86)	97,000 (212)	100,000
Anthracene	0.021	530,000	540,000	540,000
Benzo(a)anthracene	0.0038	90	95	97
Benzo(b)fluoranthene	0.0020	100	100	100
Benzo(g,h,i)perylene	0.00026	650	660	660
Benzo(k)fluoranthene	0.00080	140	140	140
Chrysene	0.0020	140	140	140
Dibenzo(a,h)anthracene	0.00060	13	13	13
Fluoranthene	0.23	23,000	23,000	23,000
Fluorene	1.9	64,000 (31)	69,000	71,000
Indeno(1,2,3-cd)pyrene	0.00020	60	61	62
Phenanthrene	0.53	22,000	22,000	23,000
Pyrene	0.13	54,000	54,000	55,000
Benzo(a)pyrene	0.0038	14	14	14
Naphthalene	19	200 (76)	480 (183)	1100 (432)
Phenol	-	3,200 * (31,000)	3,200* (35,000)	3,200 * (38,000)
Total petroleum hydrocarbons				
Aliphatic hydrocarbons EC ₅ -EC ₆	36	3,400 (304)	6,200 (558)	13,000 (1,150)
Aliphatic hydrocarbons >EC ₆ -EC ₈	5.4	8,300 (144)	18,000 (322)	42,000 (736)
Aliphatic hydrocarbons >EC ₈ -EC ₁₀	0.43	2,100 (78)	5,100 (190)	12,000 (451)
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂	0.034	10,000 (48)	24,000 (118)	49,000 (283)
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆	0.00076	61,000 (24)	83,000 (59)	91,000 (142)
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	-	1,000,000**	1,000,000**	1,000,000**
Aliphatic hydrocarbons >EC ₃₅ -EC ₄₄	-	1,000,000**	1,000,000**	1,000,000**
Aromatic hydrocarbons >EC ₉ -EC ₉ (styrene)	65	28,000 (620)	58,000 (1,500)	90,000 (3,600)
Aromatic hydrocarbons >EC ₉ -EC ₁₀	65	3,700 (610)	8,600 (1,500)	18,000 (3,600)
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂	25	17,000 (364)	29,000 (899)	35,000 (2,150)
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆	5.8	36,000 (169)	37,000	38,000
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	-	28,000	28,000	28,000
Aromatic hydrocarbons >EC ₂₁ -EC ₃₅	-	28,000	28,000	28,000
Aromatic hydrocarbons >EC ₃₅ -EC ₄₄	-	28,000	28,000	28,000
Notes:				
* Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway or an absence of toxicological data.				
** Denotes SAC calculated exceeds 100% contaminant. Hence 100% taken as SAC.				
EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.				
* The GrAC for phenol is based on a threshold which is protective of direct skin contact with phenol (the figure in brackets is based on health effects following long-term exposure and is provided for illustration only).				
The SAC for organic compounds are dependent on soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58; 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.				
SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.				
The SAC has been set as the model calculated SAC with the saturation limit shown in brackets. For consistency where the GrAC exceeds the solubility limit, GrAC has been set at the solubility limit. The GrAC are highly conservative as concentrations of the chemical are very unlikely to be at sufficient concentration to result in an exceedance of the health criteria value at the point of exposure (i.e. indoor air) provided free-phase product is absent.				

APPENDIX M

GENERIC ASSESSMENT CRITERIA FOR CONTROLLED WATERS

The water environment in England and Wales is protected under a number of regulatory regimes, many regulated by the Environment Agency. The Environment Agency is consulted where there may be a risk that pollution of 'controlled waters' may occur or may have occurred in the past. Controlled waters are coastal waters, inland freshwaters and groundwaters. The EU Water Framework Directive (WFD) (2000/60/EC) is implemented via various regulations and guidance, covering aspects of groundwater, surface water and drinking water supply policy. The regulations mainly apply to England and Wales, therefore if you are working on a site in Scotland or Northern Ireland, please review the equivalent legislation and guidance provided by the Scottish Environmental Protection Agency (SEPA) or the Northern Ireland Environment Agency (NIEA).

The main objectives of the protection and remediation of groundwater under threat from land contamination are set out in the Environment Agency's Groundwater Protection: Principles and Practice (GP3) series of documents⁽¹⁾. When assessing risks to groundwater the following need to be taken into consideration:

- Where pollutants have not yet entered groundwater, all necessary and reasonable measures must be taken to:
 - *Prevent the input of hazardous substances into groundwater (see description of hazardous substances below)*
 - *Limit the entry of other (non-hazardous) pollutants into groundwater so as to avoid pollution, and to avoid deterioration of the status of groundwater bodies or sustained, upward trends in pollutant concentration*
- Where hazardous substances or non-hazardous pollutants have already entered groundwater, the priority is to:
 - *Minimise further entry of hazardous substances and non-hazardous pollutants into groundwater*
 - *Take necessary and reasonable measures to limit the pollution of groundwater or impact on the status of the groundwater body from the future expansion of a contaminant 'plume', if necessary by actively reducing its extent.*

Definitions

Hazardous Substances are defined in the Water Framework Directive 2000/60/EC as 'substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances which give rise to an equivalent level of concern. All List 1 substances under the old Groundwater Directive (80/68/EEC) are hazardous substances, all radioactive substances are hazardous substances.

Non-hazardous Substances are defined as 'substances capable of causing pollution that have not been classified as hazardous substances'. The non-hazardous list of pollutants does not simply replace the old WFD List II but includes a wider range.

For the current list of classified substances please visit the UKTAG website www.wfduk.org/jagdag/

When assessing the risks to surface waters, various standards apply, including Environmental Quality Standards which are protective of the water ecology⁽¹⁴⁾.

The Water Supply (Water Quality) Regulations^(2,3) are the primary source for assessing water bodies which may be used for public water supplies. There are also Private Water Supply Regulations which may be applicable in some cases.

This appendix presents the generic assessment criteria (GAC) that RSK considers are suitable for assessing risks to controlled waters.

The RSK GAC for controlled waters are presented in Table 1. In line with the Environment Agency's (2006b) Remedial Targets Methodology, the GAC for controlled waters are termed 'target concentrations'.

The target concentration can be derived by several means with consideration to:

- whether the substance is classified as hazardous or non-hazardous by the EU under the Water Framework Directive (2000/60/EC) and Groundwater Daughter Directive (2006/118/EC) implemented through the Environmental Permitting Regulations 2010
- background concentrations in the aquifer
- published guidance such as Environmental Quality Standards that are protective of ecology or The Water Supply (Water Quality) Regulations 2010 that are protective of drinking water
- Minimum Reporting Values (or method detection limits if MRV are not provided).

Table 1: Target concentrations for Controlled Waters

Analytes in bold are hazardous, *analytes in italics are non hazardous*, analytes in plain text are unclassified; according to JAGDAG Determination List June 2010

Target Concentrations shaded in GREEN are Statutory Values ORANGE are Non-Statutory Values

Determinant	Target concentrations (mg/l)			
	Minimum Reporting Value	UK Drinking Water Standard or Best Equivalent	Environmental Quality Standard or Best Equivalent	
			Freshwater	Transitional (estuaries) and Coastal Waters
Metals				
Arsenic	-	0.01 ⁽²⁾	0.05 ^(13a)	0.025 ^(13a)
Cadmium	0.0001 ⁽⁴⁾	0.005 ⁽²⁾	≤0.00008, 0.00008, 0.00009, 0.00015, 0.00025 ^(13b)	0.0002 ^(13c)
Chromium (total)	-	0.05 ⁽²⁾	Use values for chromium III and VI	
Chromium (III)	-	Use value for total chromium	0.0047 ^(13a)	0.032 ^(13c)
Chromium (VI)			0.0034 ^(13a)	0.0006 ^(13a)
Copper	-	2.0 ⁽²⁾	0.001, 0.006, 0.01, 0.028 ^(13e)	0.005 ^(13a)
Lead	-	0.025 (before 25/12/2013), 0.01 (after 25/12/2013) ⁽²⁾	0.0072 ^(13c)	0.0072 ^(13c)
Mercury	0.00001 ⁽⁴⁾	0.001 ⁽²⁾	0.00005 ^(13c)	0.00005 ^(13c)



Determinant	Target concentrations (mg/l)			
	Minimum Reporting Value	UK Drinking Water Standard or Best Equivalent	Environmental Quality Standard or Best Equivalent	
			Freshwater	Transitional (estuaries) and Coastal Waters
Nickel	-	0.02 ⁽²⁾	0.02 ^(13c)	0.02 ^(13c)
Selenium	-	0.01 ⁽²⁾	-	-
Zinc	-	5 ⁽³⁾	0.008, 0.05, 0.075, 0.125 ^(13e)	0.04 ^(13a)
Chlorinated solvents				
Trichloroethene	0.0001 ⁽⁴⁾	0.01 ⁽²⁾	0.01 ^(13c)	0.01 ^(13c)
Tetrachloroethene	0.0001 ⁽⁴⁾	0.01 ⁽²⁾	0.01 ^(13c)	0.01 ^(13c)
1,1,1-Trichloroethane	0.0001 ⁽⁴⁾	-	0.1 ^(13c)	0.1 ^(13c)
1,1,2-Trichloroethane	0.0001 ⁽⁴⁾	-	0.4 ^(13c)	0.3 ^(13c)
Carbon tetrachloride (Tetrachloromethane)	0.0001 ⁽⁴⁾	0.003 ⁽²⁾	0.012 ^(13c)	0.012 ^(13c)
1,2-Dichloroethane	0.001 ⁽⁴⁾	0.003 ⁽²⁾	0.01 ^(13c)	0.01 ^(13c)
Vinyl chloride (Chloroethene)	-	0.0005 ⁽²⁾	-	-
Trihalomethanes	-	0.1 ^(2, 5)	-	-
Chloroform (Trichloromethane) (one of the trihalomethanes included above)	0.0001 ⁽⁴⁾	0.1 ^(2, 5)	0.0025 ^(13c)	0.0025 ^(13c)
Polycyclic aromatic hydrocarbons				
Acenaphthene	-	-	0.0058 ⁽¹⁰⁾	
Acenaphthylene	-	-	0.0058 ⁽¹⁰⁾	
Anthracene	-	-	0.0001 ^(13c)	0.0001 ^(13c)



Determinant	Target concentrations (mg/l)			
	Minimum Reporting Value	UK Drinking Water Standard or Best Equivalent	Environmental Quality Standard or Best Equivalent	
			Freshwater	Transitional (estuaries) and Coastal Waters
Benzo(a)anthracene	-	-	0.000018 ⁽¹⁰⁾	
Benzo(b)fluoranthene	-	0.0001 ⁽²⁾	0.00003 ^(13f)	0.00003 ^(13f)
Benzo(k)fluoranthene	-		0.000002 ^(13g)	0.000002 ^(13g)
Benzo(g,h,i)perylene	-			
Indeno(1,2,3-cd)pyrene	-			
Chrysene	-	-	0.00001 ⁽¹⁰⁾	
Dibenzo(a,h)anthracene	-	-	0.00001 ⁽¹⁰⁾	
Fluoranthene	-	-	0.0001 ^(13c)	0.0001 ^(13c)
Fluorene	-	-	0.0021 ⁽¹⁰⁾	
Phenanthrene	-	-	0.003 ⁽¹⁰⁾	
Pyrene	-	-	0.00004 ⁽¹⁰⁾	
Benzo(a)pyrene	-	0.00001 ⁽²⁾	0.00005 ^(13c)	0.00005 ^(13c)
Naphthalene	-	-	0.0024 ^(13c)	0.0012 ^(13c)
Petroleum hydrocarbons				
Total petroleum hydrocarbons	-	0.01 ⁽³⁾	0.01 ^(3, 11)	
Benzene	0.001 ⁽⁴⁾	0.001 ⁽²⁾	0.01 ^(13c)	0.008 ^(13c)
Toluene	0.004 ⁽⁴⁾	0.7 ⁽⁹⁾	0.05 ^(13a)	0.04 ^(13a)
Ethylbenzene	-	0.3 ⁽⁹⁾	0.02 ⁽¹²⁾	0.02 ⁽¹²⁾
Xylene	0.003 ⁽⁴⁾	0.5 ⁽⁹⁾	0.03 ^(13c)	0.03 ^(13c)



Determinant	Target concentrations (mg/l)			
	Minimum Reporting Value	UK Drinking Water Standard or Best Equivalent	Environmental Quality Standard or Best Equivalent	
			Freshwater	Transitional (estuaries) and Coastal Waters
<i>Methyl tertiary butyl ether</i>	-	0.015 ⁽⁷⁾		
Pesticides and herbicides				
Aldrin	0.000003 ⁽⁴⁾	0.00003 ⁽²⁾	0.00001 ^(13d)	0.000005 ^(13d)
Dieldrin	0.003 ⁽⁴⁾	0.00003 ⁽²⁾		
Endrin	0.000003 ⁽⁴⁾	0.0006 ⁽⁹⁾		
Isodrin	0.000003 ⁽⁴⁾	-		
Heptachlor	-	0.00003 ⁽²⁾		
Heptachlor epoxide	-	0.00003 ⁽²⁾		
Other pesticides	-	0.0001 ⁽²⁾		
Total pesticides	-	0.0005 ⁽²⁾		
Total DDT	0.000004 ⁽⁴⁾	0.001 ⁽⁹⁾	0.000025 ^(13c)	0.000025 ^(13c)
Azinphos – methyl	0.000001 ⁽⁴⁾	-	0.00001 ⁽¹⁾	
Cyfluthrin	0.0001 ⁽⁴⁾	-	0.000001 ⁽¹⁴⁾	
Demeton	0.00005 ⁽⁴⁾	-	0.0005 ⁽¹⁴⁾	
Dichlorvos	-	-	0.000001 ^(13c)	0.00004 ^(13c)
Dimethoate	0.00001 ⁽⁴⁾	-	0.00048 ^(13a)	0.00048 ^(13a)
Endosulphan	0.000005 ⁽⁴⁾	-	0.000005 ^(13c)	0.0000005 ^(13c)
Fenitrothion	0.000001 ⁽⁴⁾	-	0.00001 ^(13c)	0.00001 ^(13c)
Fluclufuron	0.0001 ⁽⁴⁾	-	0.001 ⁽¹⁴⁾	



Determinant	Target concentrations (mg/l)			
	Minimum Reporting Value	UK Drinking Water Standard or Best Equivalent	Environmental Quality Standard or Best Equivalent	
			Freshwater	Transitional (estuaries) and Coastal Waters
Malathion	0.000001 ⁽⁴⁾	-	0.00001 ^(13c)	0.00002 ^(13c)
Mevinphos	0.000005 ⁽⁴⁾	-	0.00002 ⁽¹⁴⁾	-
Omethoate	0.0001 ⁽⁴⁾	-	0.00001 ⁽¹⁴⁾	
PCSDs (cyfluthrin, sulcofuron, flucofuron and permethrin)	-	-	0.00005 ⁽¹⁵⁾	
Permethrin	0.000001 ⁽⁴⁾	-	0.00001 ^(13a)	0.00001 ⁽¹³⁾
Sulcofuron	0.0001 ⁽⁴⁾	-	0.025 ^(8,14)	
Triazaphos	0.0001 ⁽⁴⁾	-	0.000005 ⁽⁸⁾	
Atrazine	0.00003 ⁽⁴⁾	-	0.0006 ^(13c)	0.0006 ^(13c)
Simazine	0.00003 ⁽⁴⁾	-	0.001 ^(13c)	0.001 ^(13c)
<i>Bentazone</i>	0.1 ⁽⁴⁾	-	0.5 ^(13c)	0.5 ^(13a)
Linuron	0.0001 ⁽⁴⁾	-	0.0005 ^(13a)	0.0005 ^(13a)
Mecoprop	0.00004 ⁽⁴⁾	-	0.018 ^(13a)	0.018 ^(13a)
Trifluralin	0.00001 ⁽⁴⁾	-	0.00003 ^(13c)	0.00003 ^(13c)
Miscellaneous				
Cyanide (Hydrogen cyanide)	-	0.05 ⁽²⁾	0.001 ^(13a)	0.001 ^(13a)
Phenol	0.0005 ⁽⁴⁾	-	0.0077 ^(13a)	0.0077 ^(13a)
Sodium	-	200 ⁽²⁾	-	
Chloride	-	250 ⁽²⁾	250 ^(6,14)	-



Determinant	Target concentrations (mg/l)			
	Minimum Reporting Value	UK Drinking Water Standard or Best Equivalent	Environmental Quality Standard or Best Equivalent	
			Freshwater	Transitional (estuaries) and Coastal Waters
Ammonium (as NH_4^+)	-	0.5 ⁽²⁾	0.3 ^(13a)	
<i>Ammonia</i> (NH_3)	-	-	0.025 ⁽¹⁵⁾	0.021 ^(13a)
Sulphate	-	250 ⁽²⁾	400 ^(6,14)	-
Iron	-	0.20 ⁽²⁾	1 ^(13a)	1 ^(13a)
Manganese	-	0.05 ⁽²⁾	0.03 ^(6,14)	No EQS required ⁽¹²⁾
<i>Aluminium</i>	-	0.2 ⁽²⁾	-	-
Nitrate (as NO_3)	-	50 ⁽²⁾	-	-
Nitrite (as NO_2)	-	0.1 ⁽²⁾	0.01 ⁽¹⁵⁾	-
Analytes in bold are hazardous, analytes in italics are non hazardous, analytes in plain text are unclassified; according to JAGDAG Determination List June 2010				

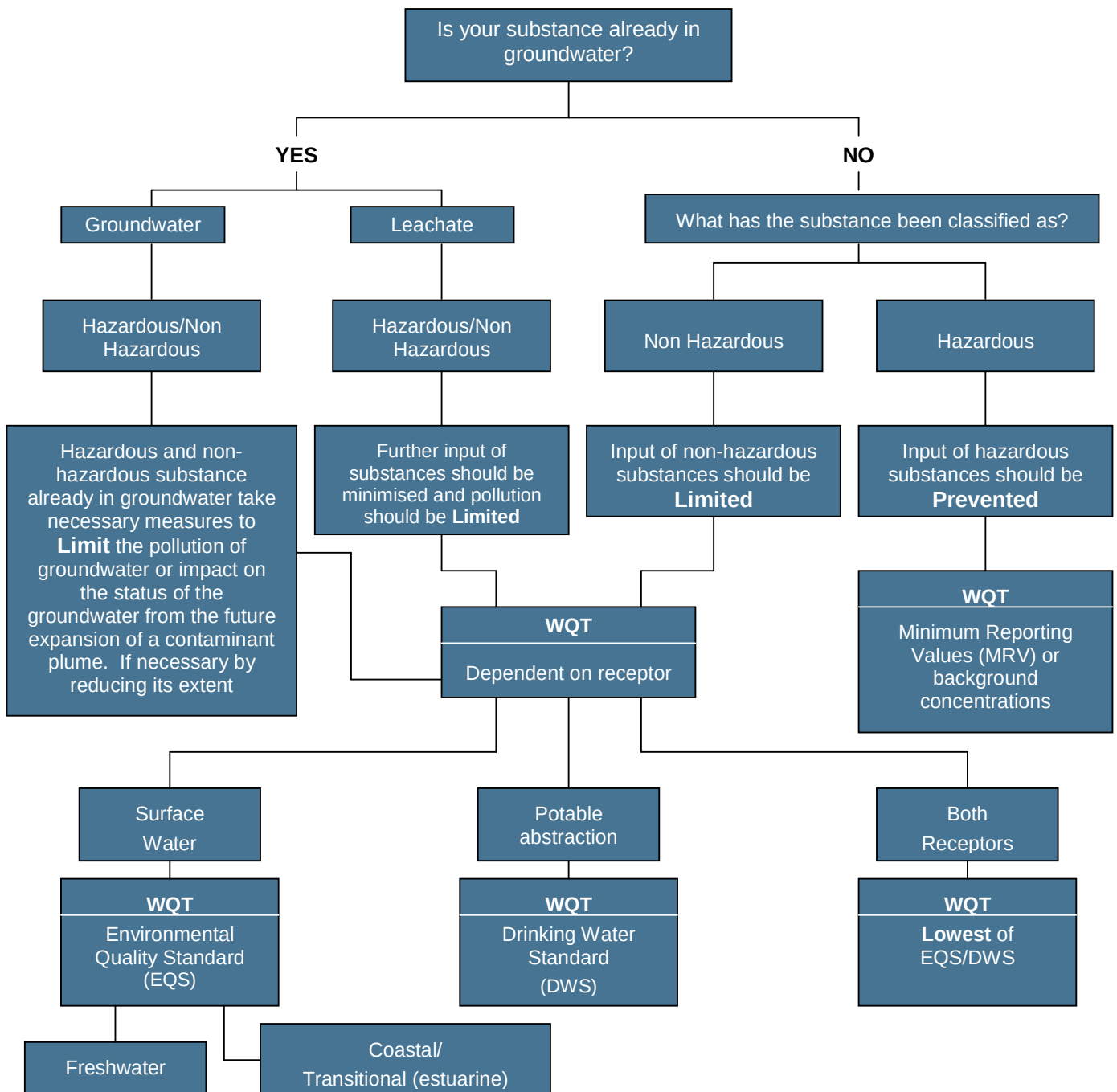
Notes:

1. Environment Agency. Groundwater Protection: Principles and Policy (GP3). Part 1 – 4. Part 4 and 5 under consultation.
2. Statutory Instrument 2000 No. 3184. The Water Supply (Water Quality) Regulations 2000, as amended by SI 2001/2885, SI 2002/2469, SI 2005/2035, SI 2007/2734 and SI 2010/991 (applying from April 20 2010)
3. Statutory Instrument 1989 No. 1147. The Water Supply (Water Quality) Regulations 1989, as amended.
4. Minimum reporting values listed in Annex (j) of Horizontal Guidance Note H1 (H1 Environmental Risk Assessment Framework, Environment Agency, April 2010 v2.0). Note target concentration for xylenes is 0.003mg/l each for o-xylene and m/p xylene.
5. Statutory Instrument 2000 No. 3184. The Water Supply (Water Quality) Regulations 2000 – sum of chloroform, bromoform, dibromochloromethane and bromodichloromethane.
6. Proposed list of EQS for implementation of the Dangerous Substances Directive (76/464.EEC).
7. Environment Agency MTBE guidance, 2006.
8. Freshwater Environmental Quality Standards: The Water Framework Directive 200/60/EC.
9. WHO (2004) guidelines for drinking-water quality.
10. WRc plc (2002), R&D Technical Report P45. Where predicted no-effect concentration is below the laboratory method detection limit (LMDL) for chrysene, dibenzo(a,h)anthracene and fluoranthene, the target concentration has been set at the LMDL of 0.00001mg/l.
11. Please note this is a very conservative value. If necessary please refer to EA, 2009. *Petroleum hydrocarbons in Groundwater Supplementary Guidance for Hydrogeological Risk Assessment*, which provides advice on risk rankings of TPH CWG fractions. It may be possible to eliminate low risk fractions and/or those not detected above LMDL from concern.
12. Environment Agency Chemical Standards Database (May 2011). <http://evidence.environment-agency.gov.uk/ChemicalStandards/home.aspx>
13. The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010.
 - 13a. Annual mean concentration (mg/l) for 'Good' standard.
 - 13b. Applies to hardness ranges of <40mg/l CaCO₃, 40–<50mg/l CaCO₃, 50–<100mg/l CaCO₃, 100–<200mg/l CaCO₃ and ≥200mg/l CaCO₃. The target concentrations included in Table 1 are listed in order of increasing calcium carbonate concentrations.
 - 13c. Annual Average EQS (surface waters).
 - 13d. Sum of aldrin, dieldrin, endrin and isodrin.
 - 13e. Applies to hardness ranges of 0–50mg/l CaCO₃, 50–100mg/l CaCO₃, 100–250mg/l CaCO₃ and >250mg/l CaCO₃. The target concentrations included in Table 1 are listed in order of increasing calcium carbonate concentrations; applies to annual mean concentration (mg/l) of CaCO₃. Applies to annual mean concentration of metal (mg/l) for 'Good' standard.

- 13f. Sum of benzo(b)fluoranthene and benzo(k)fluoranthene.
- 13g. Sum of benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene.
- 14. Council Directive on Pollution Caused by Certain Dangerous Substances Discharged into the Aquatic Environment of the Community (Dangerous Substances Directive) - List II Substances. Council Directive 76/464/EEC and Surface Waters (Dangerous Substances) (Classification) Regulations 1998
- 15. Council Directive on the Quality of Fresh Waters Needing Protection or Improvement in Order to Support Fish Life (Freshwater Fish Directive). Surface Waters (Fishlife) (Classification) Regulations 1997.

Note: '-' A target concentration is not available.

FLOW CHART TO ASSIST WITH SELECTION OF TARGET CONCENTRATIONS



WQT = Water Quality Target

When leachate is being assessed the 'compliance point' is the groundwater body. Therefore dilution within the groundwater body may be applied with caution before comparing with the WQT.

When directly assessing a receptor, e.g., a river, the appropriate WQT should be selected.

APPENDIX G

(i) Gas/Groundwater Monitoring Results

IN-SITU GAS MONITORING RESULTS

[Pressures]	Previous	During	Start	End	Equipment Used & Remarks
Round 1	Rising	Rising	1008	1013	GA2000 SN-GA07809 + Weather: Overcast + Ground: Dry + Wind: None
Round 2	Rising	Falling	1025	1019	GA2000 SN-GA07809 + Weather: Sunny + Ground: Damp + Wind: Light
Round 3	Constant	Constant	1009	1009	GA2000 SN-GA07809 + Weather: Overcast + Ground: Dry + Wind: Medium

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH7	1	50	1	10.00	8.68	1.00 to 10.00	03/07/2013 16:14:00	1013	1013	0.2 _(I)	1.46	-	-	-	-	0.0	-	-
BH7	1	50	1		---	1.00 to 10.00	120 secs	-	-	-0.1 _(SS)	-	-	-	-	-	-	-	-
BH7	1	50	1	10.00	---	1.00 to 10.00	03/07/2013 16:20:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH7	1	50	1		---	1.00 to 10.00	15 secs	-	-	-	-	2.9	0.0	17.1	0.0	-	0.0	0.0
BH7	1	50	1		---	1.00 to 10.00	30 secs	-	-	-	-	2.9	0.0	16.0	0.0	-	0.0	0.0
BH7	1	50	1		---	1.00 to 10.00	60 secs	-	-	-	-	3.0	0.0	15.8	0.0	-	0.0	0.0
BH7	1	50	1		---	1.00 to 10.00	90 secs	-	-	-	-	3.0	0.0	15.8	0.0	-	0.0	0.0
BH7	1	50	1		---	1.00 to 10.00	120 secs	-	-	-	-	3.0	0.0	15.8	0.0	-	0.0	0.0
BH7	1	50	1		---	1.00 to 10.00	180 secs	-	-	-	-	3.0	0.0	15.8	0.0	-	0.0	0.0
BH7	1	50	1		---	1.00 to 10.00	240 secs	-	-	-	-	3.0	0.0	15.8	0.0	-	0.0	0.0
BH7	1	50	1		---	1.00 to 10.00	300 secs	-	-	-	-	3.0	0.0	15.8	0.0	-	0.0	0.0
BH7	1	50	1		---	1.00 to 10.00	360 secs	-	-	-	-	3.0	0.0	15.8	0.0	-	0.0	0.0
	Remarks: Samples taken.																	
BH7	1	50	2	10.00	8.63	1.00 to 10.00	16/07/2013 13:20:00	1019	1019	0.3 _(I)	1.54	-	-	-	-	9.2	-	-
BH7	1	50	2		---	1.00 to 10.00	60 secs	-	-	-0.1 _(SS)	-	-	-	-	-	-	-	-
BH7	1	50	2	10.00	---	1.00 to 10.00	16/07/2013 13:22:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH7	1	50	2		---	1.00 to 10.00	15 secs	-	-	-	-	2.9	0.0	15.6	0.0	-	0.0	0.0
BH7	1	50	2		---	1.00 to 10.00	30 secs	-	-	-	-	3.0	0.0	14.9	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS Leo</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 1 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH7	1	50	2		---	1.00 to 10.00	60 secs	-	-	-	-	3.0	0.0	14.8	0.0	-	0.0	0.0
BH7	1	50	2		---	1.00 to 10.00	90 secs	-	-	-	-	3.0	0.0	14.8	0.0	-	0.0	0.0
BH7	1	50	2		---	1.00 to 10.00	120 secs	-	-	-	-	3.0	0.0	14.8	0.0	-	0.0	0.0
BH7	1	50	2		---	1.00 to 10.00	180 secs	-	-	-	-	3.0	0.0	14.8	0.0	-	0.0	0.0
BH7	1	50	2		---	1.00 to 10.00	240 secs	-	-	-	-	3.0	0.0	14.8	0.0	-	0.0	0.0
BH7	1	50	2		---	1.00 to 10.00	300 secs	-	-	-	-	3.0	0.0	14.8	0.0	-	0.0	0.0
Remarks: No samples taken.																		
BH7	1	50	3	10.00	8.57	1.00 to 10.00	02/08/2013 14:26:00	1009	1009	-0.1 _(I)	1.50	-	-	-	-	-	-	-
BH7	1	50	3		---	1.00 to 10.00	60 secs	-	-	-0.1 _(SS)	-	-	-	-	-	-	-	-
BH7	1	50	3	10.00	---	1.00 to 10.00	02/08/2013 14:28:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH7	1	50	3		---	1.00 to 10.00	15 secs	-	-	-	-	3.0	0.0	16.6	0.0	-	0.0	0.0
BH7	1	50	3		---	1.00 to 10.00	30 secs	-	-	-	-	3.0	0.0	15.5	0.0	-	0.0	0.0
BH7	1	50	3		---	1.00 to 10.00	60 secs	-	-	-	-	3.0	0.0	15.3	0.0	-	0.0	0.0
BH7	1	50	3		---	1.00 to 10.00	90 secs	-	-	-	-	3.0	0.0	15.3	0.0	-	0.0	0.0
BH7	1	50	3		---	1.00 to 10.00	120 secs	-	-	-	-	3.0	0.0	15.3	0.0	-	0.0	0.0
BH7	1	50	3		---	1.00 to 10.00	180 secs	-	-	-	-	3.0	0.0	15.2	0.0	-	0.0	0.0
BH7	1	50	3		---	1.00 to 10.00	240 secs	-	-	-	-	3.0	0.0	15.2	0.0	-	0.0	0.0
BH7	1	50	3		---	1.00 to 10.00	300 secs	-	-	-	-	3.0	0.0	15.2	0.0	-	0.0	0.0
BH8	1	50	1	10.00	8.94	1.00 to 10.00	03/07/2013 15:56:00	1013	1013	0.5 _(I)	1.78	-	-	-	-	0.0	-	-
BH8	1	50	1		---	1.00 to 10.00	60 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
BH8	1	50	1	10.00	---	1.00 to 10.00	03/07/2013 15:59:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH8	1	50	1		---	1.00 to 10.00	15 secs	-	-	-	-	0.3	0.0	20.2	0.0	-	0.0	0.0
BH8	1	50	1		---	1.00 to 10.00	30 secs	-	-	-	-	0.3	0.0	20.1	0.0	-	0.0	0.0
BH8	1	50	1		---	1.00 to 10.00	60 secs	-	-	-	-	0.3	0.0	20.1	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>JS</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 2 of 18



IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH8	1	50	1		---	1.00 to 10.00	90 secs	-	-	-	-	0.3	0.0	20.1	0.0	-	0.0	0.0
BH8	1	50	1		---	1.00 to 10.00	120 secs	-	-	-	-	0.3	0.0	20.1	0.0	-	0.0	0.0
BH8	1	50	1		---	1.00 to 10.00	180 secs	-	-	-	-	0.3	0.0	20.1	0.0	-	0.0	0.0
BH8	1	50	1		---	1.00 to 10.00	240 secs	-	-	-	-	0.3	0.0	20.1	0.0	-	0.0	0.0
BH8	1	50	1		---	1.00 to 10.00	300 secs	-	-	-	-	0.3	0.0	20.1	0.0	-	0.0	0.0
Remarks: Samples taken.																		
BH8	1	50	2	10.00	8.99	1.00 to 10.00	16/07/2013 13:05:00	1019	1019	0.3 _(I)	1.81	-	-	-	-	5.1	-	-
BH8	1	50	2		---	1.00 to 10.00	60 secs	-	-	0.0 _(SS)	-	-	-	-	-	-	-	-
BH8	1	50	2	10.00	---	1.00 to 10.00	16/07/2013 16:08:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH8	1	50	2		---	1.00 to 10.00	15 secs	-	-	-	-	0.6	0.0	18.2	0.0	-	0.0	0.0
BH8	1	50	2		---	1.00 to 10.00	30 secs	-	-	-	-	0.6	0.0	17.8	0.0	-	0.0	0.0
BH8	1	50	2		---	1.00 to 10.00	60 secs	-	-	-	-	0.6	0.0	17.7	0.0	-	0.0	0.0
BH8	1	50	2		---	1.00 to 10.00	90 secs	-	-	-	-	0.6	0.0	17.8	0.0	-	0.0	0.0
BH8	1	50	2		---	1.00 to 10.00	120 secs	-	-	-	-	0.6	0.0	17.7	0.0	-	0.0	0.0
BH8	1	50	2		---	1.00 to 10.00	180 secs	-	-	-	-	0.6	0.0	17.7	0.0	-	0.0	0.0
BH8	1	50	2		---	1.00 to 10.00	240 secs	-	-	-	-	0.6	0.0	17.7	0.0	-	0.0	0.0
BH8	1	50	2		---	1.00 to 10.00	300 secs	-	-	-	-	0.6	0.0	17.7	0.0	-	0.0	0.0
Remarks: No samples taken.																		
BH8	1	50	3	10.00	8.93	1.00 to 10.00	02/08/2013 14:12:00	1009	1009	0.0 _(I)	1.78	-	-	-	-	-	-	-
BH8	1	50	3		---	1.00 to 10.00	60 secs	-	-	0.0 _(SS)	-	-	-	-	-	-	-	-
BH8	1	50	3	10.00	---	1.00 to 10.00	02/08/2013 14:14:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH8	1	50	3		---	1.00 to 10.00	15 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0.0	0.0
BH8	1	50	3		---	1.00 to 10.00	30 secs	-	-	-	-	0.9	0.0	18.4	0.0	-	0.0	0.0
BH8	1	50	3		---	1.00 to 10.00	60 secs	-	-	-	-	0.9	0.0	18.5	0.0	-	0.0	0.0
BH8	1	50	3		---	1.00 to 10.00	90 secs	-	-	-	-	0.9	0.0	18.4	0.0	-	0.0	0.0

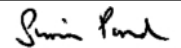
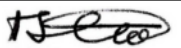
Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref: 727927
	<i>Simon Ford</i>	20/08/13	<i>TS</i>	06/08/13	
	Contract: Harts Farm Way, Havant				Page: 3 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH8	1	50	3		---	1.00 to 10.00	120 secs	-	-	-	-	0.9	0.0	18.4	0.0	-	0.0	0.0
BH8	1	50	3		---	1.00 to 10.00	180 secs	-	-	-	-	0.9	0.0	18.4	0.0	-	0.0	0.0
BH8	1	50	3		---	1.00 to 10.00	240 secs	-	-	-	-	0.9	0.0	18.4	0.0	-	0.0	0.0
BH8	1	50	3		---	1.00 to 10.00	300 secs	-	-	-	-	0.9	0.0	18.4	0.0	-	0.0	0.0
BH9	1	50	1	10.00	8.06	1.00 to 10.00	03/07/2013 15:40:00	1013	1013	0.1 _(I)	1.60	-	-	-	-	0.0	-	-
BH9	1	50	1		---	1.00 to 10.00	120 secs	-	-	0.0 _(SS)	-	-	-	-	-	-	-	-
BH9	1	50	1	10.00	---	1.00 to 10.00	03/07/2013 15:45:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH9	1	50	1		---	1.00 to 10.00	15 secs	-	-	-	-	1.4	0.0	19.2	0.0	-	0.0	0.0
BH9	1	50	1		---	1.00 to 10.00	30 secs	-	-	-	-	1.4	0.0	19.1	0.0	-	0.0	0.0
BH9	1	50	1		---	1.00 to 10.00	60 secs	-	-	-	-	1.4	0.0	18.9	0.0	-	0.0	0.0
BH9	1	50	1		---	1.00 to 10.00	90 secs	-	-	-	-	1.4	0.0	19.1	0.0	-	0.0	0.0
BH9	1	50	1		---	1.00 to 10.00	120 secs	-	-	-	-	1.4	0.0	19.1	0.0	-	0.0	0.0
BH9	1	50	1		---	1.00 to 10.00	180 secs	-	-	-	-	1.4	0.0	19.1	0.0	-	0.0	0.0
BH9	1	50	1		---	1.00 to 10.00	240 secs	-	-	-	-	1.4	0.0	19.1	0.0	-	0.0	0.0
BH9	1	50	1		---	1.00 to 10.00	300 secs	-	-	-	-	1.4	0.0	19.1	0.0	-	0.0	0.0
	Remarks: Samples taken.																	
BH9	1	50	2	10.00	8.02	1.00 to 10.00	16/07/2013 12:54:00	1027	1027	0.4 _(I)	1.68	-	-	-	-	15.7	-	-
BH9	1	50	2		---	1.00 to 10.00	120 secs	-	-	0.5 _(SS)	-	-	-	-	-	-	-	-
BH9	1	50	2	10.00	---	1.00 to 10.00	16/07/2013 12:58:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH9	1	50	2		---	1.00 to 10.00	15 secs	-	-	-	-	1.0	0.0	19.9	0.0	-	0.0	0.0
BH9	1	50	2		---	1.00 to 10.00	30 secs	-	-	-	-	1.0	0.0	19.8	0.0	-	0.0	0.0
BH9	1	50	2		---	1.00 to 10.00	60 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
BH9	1	50	2		---	1.00 to 10.00	90 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
BH9	1	50	2		---	1.00 to 10.00	120 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
		20/08/13		06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 4 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH9	1	50	2		---	1.00 to 10.00	180 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
BH9	1	50	2		---	1.00 to 10.00	240 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
BH9	1	50	2		---	1.00 to 10.00	300 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
Remarks: No samples taken.																		
BH9	1	50	3	10.00	8.03	1.00 to 10.00	02/08/2013 13:50:00	1009	1009	0.1 _(I)	1.62	-	-	-	-	-	-	-
BH9	1	50	3		---	1.00 to 10.00	60 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
BH9	1	50	3	10.00	---	1.00 to 10.00	02/08/2013 13:52:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH9	1	50	3		---	1.00 to 10.00	15 secs	-	-	-	-	1.2	0.0	20.2	0.0	-	0.0	0.0
BH9	1	50	3		---	1.00 to 10.00	30 secs	-	-	-	-	1.2	0.0	19.9	0.0	-	0.0	0.0
BH9	1	50	3		---	1.00 to 10.00	60 secs	-	-	-	-	1.2	0.0	19.9	0.0	-	0.0	0.0
BH9	1	50	3		---	1.00 to 10.00	90 secs	-	-	-	-	1.2	0.0	19.9	0.0	-	0.0	0.0
BH9	1	50	3		---	1.00 to 10.00	120 secs	-	-	-	-	1.3	0.0	19.9	0.0	-	0.0	0.0
BH9	1	50	3		---	1.00 to 10.00	180 secs	-	-	-	-	1.3	0.0	19.9	0.0	-	0.0	0.0
BH9	1	50	3		---	1.00 to 10.00	240 secs	-	-	-	-	1.3	0.0	19.9	0.0	-	0.0	0.0
BH9	1	50	3		---	1.00 to 10.00	300 secs	-	-	-	-	1.3	0.0	19.9	0.0	-	0.0	0.0
BH10	1	50	1	15.00	14.72	2.50 to 10.00	03/07/2013 11:00:00	1008	1008	-0.2 _(I)	2.01	-	-	-	-	0.0	-	-
BH10	1	50	1		---	2.50 to 10.00	60 secs	-	-	0.3 _(SS)	-	-	-	-	-	-	-	-
BH10	1	50	1	15.00	---	2.50 to 10.00	03/07/2013 11:03:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH10	1	50	1		---	2.50 to 10.00	15 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	1		---	2.50 to 10.00	30 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	1		---	2.50 to 10.00	60 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	1		---	2.50 to 10.00	90 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	1		---	2.50 to 10.00	120 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	1		---	2.50 to 10.00	180 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 5 of 18



IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH10	1	50	1		---	2.50 to 10.00	240 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	1		---	2.50 to 10.00	300 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0
Remarks: Samples taken.																		
BH10	2	50	1	10.00	9.24	13.00 to 15.00	03/07/2013 11:15:00	1008	1008	0.1 _(I)	2.01	-	-	-	-	0.0	-	-
BH10	2	50	1		---	13.00 to 15.00	120 secs	-	-	0.2 _(SS)	-	-	-	-	-	-	-	-
BH10	2	50	1	10.00	---	13.00 to 15.00	03/07/2013 11:20:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH10	2	50	1		---	13.00 to 15.00	15 secs	-	-	-	-	0.2	0.0	20.6	0.0	-	0.0	0.0
BH10	2	50	1		---	13.00 to 15.00	30 secs	-	-	-	-	0.2	0.1	20.7	2.0	-	0.0	0.0
BH10	2	50	1		---	13.00 to 15.00	60 secs	-	-	-	-	0.1	0.1	20.8	2.0	-	0.0	0.0
BH10	2	50	1		---	13.00 to 15.00	90 secs	-	-	-	-	0.1	0.1	20.8	2.0	-	0.0	0.0
BH10	2	50	1		---	13.00 to 15.00	120 secs	-	-	-	-	0.3	0.1	20.5	2.0	-	0.0	0.0
BH10	2	50	1		---	13.00 to 15.00	180 secs	-	-	-	-	0.4	0.0	20.4	0.0	-	0.0	0.0
BH10	2	50	1		---	13.00 to 15.00	240 secs	-	-	-	-	0.6	0.0	20.1	0.0	-	0.0	0.0
BH10	2	50	1		---	13.00 to 15.00	300 secs	-	-	-	-	0.5	0.0	20.2	0.0	-	0.0	0.0
BH10	2	50	1		---	13.00 to 15.00	360 secs	-	-	-	-	0.5	0.0	20.1	0.0	-	0.0	0.0
Remarks: Samples taken.																		
BH10	1	50	2	15.00	14.54	2.50 to 10.00	16/07/2013 10:30:00	1025	1025	0.2 _(I)	2.04	-	-	-	-	0.2	-	-
BH10	1	50	2		---	2.50 to 10.00	120 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
BH10	1	50	2	15.00	---	2.50 to 10.00	16/07/2013 10:35:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH10	1	50	2		---	2.50 to 10.00	15 secs	-	-	-	-	0.1	0.0	20.6	0.0	-	0.0	0.0
BH10	1	50	2		---	2.50 to 10.00	30 secs	-	-	-	-	0.1	0.0	20.6	0.0	-	0.0	0.0
BH10	1	50	2		---	2.50 to 10.00	60 secs	-	-	-	-	0.1	0.0	20.6	0.0	-	0.0	0.0
BH10	1	50	2		---	2.50 to 10.00	90 secs	-	-	-	-	0.1	0.0	20.5	0.0	-	0.0	0.0
BH10	1	50	2		---	2.50 to 10.00	120 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0
BH10	1	50	2		---	2.50 to 10.00	180 secs	-	-	-	-	0.1	0.0	20.5	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 6 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH10	1	50	2		---	2.50 to 10.00	240 secs	-	-	-	-	0.1	0.0	20.5	0.0	-	0.0	0.0
BH10	1	50	2		---	2.50 to 10.00	300 secs	-	-	-	-	0.1	0.0	20.5	0.0	-	0.0	0.0
Remarks: No samples taken.																		
BH10	2	50	2	10.00	9.20	13.00 to 15.00	16/07/2013 10:42:00	1025	1025	-0.1 _(I)	2.00	-	-	-	-	0.0	-	-
BH10	2	50	2		---	13.00 to 15.00	120 secs	-	-	-0.2 _(SS)	-	-	-	-	-	-	-	-
BH10	2	50	2	10.00	---	13.00 to 15.00	16/07/2013 10:46:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH10	2	50	2		---	13.00 to 15.00	15 secs	-	-	-	-	0.3	0.0	20.5	0.0	-	0.0	0.0
BH10	2	50	2		---	13.00 to 15.00	30 secs	-	-	-	-	0.5	0.0	20.2	0.0	-	0.0	0.0
BH10	2	50	2		---	13.00 to 15.00	60 secs	-	-	-	-	0.6	0.0	20.1	0.0	-	0.0	0.0
BH10	2	50	2		---	13.00 to 15.00	90 secs	-	-	-	-	0.6	0.0	20.1	0.0	-	0.0	0.0
BH10	2	50	2		---	13.00 to 15.00	120 secs	-	-	-	-	0.5	0.0	20.2	0.0	-	0.0	0.0
BH10	2	50	2		---	13.00 to 15.00	180 secs	-	-	-	-	0.5	0.0	20.2	0.0	-	0.0	0.0
BH10	2	50	2		---	13.00 to 15.00	240 secs	-	-	-	-	0.5	0.0	20.2	0.0	-	0.0	0.0
BH10	2	50	2		---	13.00 to 15.00	300 secs	-	-	-	-	0.5	0.0	20.2	0.0	-	0.0	0.0
Remarks: No samples taken.																		
BH10	1	50	3	15.00	14.70	2.50 to 10.00	02/08/2013 11:20:00	1009	1009	0.1 _(I)	1.99	-	-	-	-	-	-	-
BH10	1	50	3		---	2.50 to 10.00	60 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
BH10	1	50	3	15.00	---	2.50 to 10.00	02/08/2013 11:22:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH10	1	50	3		---	2.50 to 10.00	15 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	3		---	2.50 to 10.00	30 secs	-	-	-	-	0.1	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	3		---	2.50 to 10.00	60 secs	-	-	-	-	0.0	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	3		---	2.50 to 10.00	90 secs	-	-	-	-	0.0	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	3		---	2.50 to 10.00	120 secs	-	-	-	-	0.0	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	3		---	2.50 to 10.00	180 secs	-	-	-	-	0.0	0.0	20.7	0.0	-	0.0	0.0
BH10	1	50	3		---	2.50 to 10.00	240 secs	-	-	-	-	0.0	0.0	20.7	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS Leo</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 7 of 18



IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BH10	1	50	3		---	2.50 to 10.00	300 secs	-	-	-	-	0.0	0.0	20.7	0.0	-	0.0	0.0
BH10	2	50	3	10.00	9.22	13.00 to 15.00	02/08/2013 11:35:00	1008	1008	0.3 _(I)	1.99	-	-	-	-	-	-	-
BH10	2	50	3		---	13.00 to 15.00	60 secs	-	-	0.3 _(SS)	-	-	-	-	-	-	-	-
BH10	2	50	3	10.00	---	13.00 to 15.00	02/08/2013 11:37:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
BH10	2	50	3		---	13.00 to 15.00	15 secs	-	-	-	-	0.3	0.0	20.3	0.0	-	0.0	0.0
BH10	2	50	3		---	13.00 to 15.00	30 secs	-	-	-	-	0.2	0.0	20.3	0.0	-	0.0	0.0
BH10	2	50	3		---	13.00 to 15.00	60 secs	-	-	-	-	0.2	0.0	20.4	0.0	-	0.0	0.0
BH10	2	50	3		---	13.00 to 15.00	90 secs	-	-	-	-	0.1	0.0	20.3	0.0	-	0.0	0.0
BH10	2	50	3		---	13.00 to 15.00	120 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0
BH10	2	50	3		---	13.00 to 15.00	180 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0
BH10	2	50	3		---	13.00 to 15.00	240 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0
BH10	2	50	3		---	13.00 to 15.00	300 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0
WS1	1	40	1	3.00	2.84	1.00 to 3.00	03/07/2013 14:50:00	1012	1012	0.4 _(I)	1.81	-	-	-	-	0.2	-	-
WS1	1	40	1		---	1.00 to 3.00	120 secs	-	-	0.4 _(SS)	-	-	-	-	-	-	-	-
WS1	1	40	1	3.00	---	1.00 to 3.00	03/07/2013 14:55:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS1	1	40	1		---	1.00 to 3.00	15 secs	-	-	-	-	6.9	0.0	12.4	0.0	-	0.0	0.0
WS1	1	40	1		---	1.00 to 3.00	30 secs	-	-	-	-	7.2	0.0	8.4	0.0	-	0.0	0.0
WS1	1	40	1		---	1.00 to 3.00	60 secs	-	-	-	-	7.3	0.0	8.3	0.0	-	0.0	0.0
WS1	1	40	1		---	1.00 to 3.00	90 secs	-	-	-	-	7.3	0.0	8.2	0.0	-	0.0	0.0
WS1	1	40	1		---	1.00 to 3.00	120 secs	-	-	-	-	7.3	0.0	8.2	0.0	-	0.0	0.0
WS1	1	40	1		---	1.00 to 3.00	180 secs	-	-	-	-	7.3	0.0	8.2	0.0	-	0.0	0.0
WS1	1	40	1		---	1.00 to 3.00	240 secs	-	-	-	-	7.3	0.0	8.2	0.0	-	0.0	0.0
WS1	1	40	1		---	1.00 to 3.00	300 secs	-	-	-	-	7.3	0.0	8.2	0.0	-	0.0	0.0
Remarks: Samples taken.																		

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 8 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS1	1	40	2	3.00	2.80	1.00 to 3.00	16/07/2013 12:43:00	1025	1025	0.2 _(I)	2.00	-	-	-	-	9.2	-	-
WS1	1	40	2		---	1.00 to 3.00	60 secs	-	-	-0.1 _(SS)	-	-	-	-	-	-	-	-
WS1	1	40	2	3.00	---	1.00 to 3.00	16/07/2013 12:46:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	15 secs	-	-	-	-	3.3	0.0	16.7	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	30 secs	-	-	-	-	3.8	0.0	15.8	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	60 secs	-	-	-	-	4.4	0.0	15.0	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	90 secs	-	-	-	-	5.8	0.0	13.4	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	120 secs	-	-	-	-	6.3	0.0	13.1	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	180 secs	-	-	-	-	7.4	0.0	11.6	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	240 secs	-	-	-	-	9.1	0.0	10.2	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	300 secs	-	-	-	-	8.5	0.0	10.3	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	360 secs	-	-	-	-	8.6	0.0	10.4	0.0	-	0.0	0.0
WS1	1	40	2		---	1.00 to 3.00	420 secs	-	-	-	-	8.6	0.0	10.3	0.0	-	0.0	0.0
Remarks: No samples taken.																		
WS1	1	40	3	3.00	2.79	1.00 to 3.00	02/08/2013 13:12:00	1009	1009	-0.1 _(I)	2.10	-	-	-	-	-	-	-
WS1	1	40	3		---	1.00 to 3.00	60 secs	-	-	0.2 _(SS)	-	-	-	-	-	-	-	-
WS1	1	40	3	3.00	---	1.00 to 3.00	02/08/2013 13:14:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS1	1	40	3		---	1.00 to 3.00	15 secs	-	-	-	-	4.3	0.0	16.1	0.0	-	0.0	0.0
WS1	1	40	3		---	1.00 to 3.00	30 secs	-	-	-	-	4.5	0.0	13.0	0.0	-	0.0	0.0
WS1	1	40	3		---	1.00 to 3.00	60 secs	-	-	-	-	4.5	0.0	12.5	0.0	-	0.0	0.0
WS1	1	40	3		---	1.00 to 3.00	90 secs	-	-	-	-	4.7	0.0	12.2	0.0	-	0.0	0.0
WS1	1	40	3		---	1.00 to 3.00	120 secs	-	-	-	-	4.8	0.0	11.9	0.0	-	0.0	0.0
WS1	1	40	3		---	1.00 to 3.00	180 secs	-	-	-	-	4.8	0.0	11.8	0.0	-	0.0	0.0
WS1	1	40	3		---	1.00 to 3.00	240 secs	-	-	-	-	4.8	0.0	11.8	0.0	-	0.0	0.0
WS1	1	40	3		---	1.00 to 3.00	300 secs	-	-	-	-	4.8	0.0	11.8	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS Leo</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 9 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS2	1	40	1	2.90	2.87	1.00 to 2.90	03/07/2013 15:10:00	1013	1013	0.2 _(I)	1.41	-	-	-	-	0.0	-	-
WS2	1	40	1		---	1.00 to 2.90	60 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
WS2	1	40	1	2.90	---	1.00 to 2.90	03/07/2013 15:13:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS2	1	40	1		---	1.00 to 2.90	15 secs	-	-	-	-	0.6	0.0	20.3	0.0	-	0.0	0.0
WS2	1	40	1		---	1.00 to 2.90	30 secs	-	-	-	-	0.6	0.0	20.1	0.0	-	0.0	0.0
WS2	1	40	1		---	1.00 to 2.90	60 secs	-	-	-	-	0.6	0.0	20.1	0.0	-	0.0	0.0
WS2	1	40	1		---	1.00 to 2.90	90 secs	-	-	-	-	0.7	0.0	20.1	0.0	-	0.0	0.0
WS2	1	40	1		---	1.00 to 2.90	120 secs	-	-	-	-	0.7	0.0	20.1	0.0	-	0.0	0.0
WS2	1	40	1		---	1.00 to 2.90	180 secs	-	-	-	-	0.7	0.0	20.1	0.0	-	0.0	0.0
WS2	1	40	1		---	1.00 to 2.90	240 secs	-	-	-	-	0.7	0.0	20.1	0.0	-	0.0	0.0
WS2	1	40	1		---	1.00 to 2.90	300 secs	-	-	-	-	0.7	0.0	20.1	0.0	-	0.0	0.0
Remarks: Samples taken.																		
WS2	1	40	2	2.90	2.84	1.00 to 2.90	16/07/2013 12:39:00	1027	1027	0.4 _(I)	1.44	-	-	-	-	22.7	-	-
WS2	1	40	2		---	1.00 to 2.90	120 secs	-	-	0.2 _(SS)	-	-	-	-	-	-	-	-
WS2	1	40	2	2.90	---	1.00 to 2.90	16/07/2013 12:43:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS2	1	40	2		---	1.00 to 2.90	15 secs	-	-	-	-	0.9	0.0	19.8	0.0	-	0.0	0.0
WS2	1	40	2		---	1.00 to 2.90	30 secs	-	-	-	-	1.0	0.0	19.3	0.0	-	0.0	0.0
WS2	1	40	2		---	1.00 to 2.90	60 secs	-	-	-	-	1.0	0.0	19.3	0.0	-	0.0	0.0
WS2	1	40	2		---	1.00 to 2.90	90 secs	-	-	-	-	1.0	0.0	19.4	0.0	-	0.0	0.0
WS2	1	40	2		---	1.00 to 2.90	120 secs	-	-	-	-	1.0	0.0	19.5	0.0	-	0.0	0.0
WS2	1	40	2		---	1.00 to 2.90	180 secs	-	-	-	-	1.0	0.0	19.5	0.0	-	0.0	0.0
WS2	1	40	2		---	1.00 to 2.90	240 secs	-	-	-	-	1.0	0.0	19.5	0.0	-	0.0	0.0
WS2	1	40	2		---	1.00 to 2.90	300 secs	-	-	-	-	1.0	0.0	19.5	0.0	-	0.0	0.0
Remarks: No samples taken.																		

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 10 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS2	1	40	3	2.90	2.84	1.00 to 2.90	02/08/2013 12:50:00	1009	1009	0.3 _(I)	1.45	-	-	-	-	-	-	-
WS2	1	40	3		---	1.00 to 2.90	60 secs	-	-	-0.1 _(SS)	-	-	-	-	-	-	-	-
WS2	1	40	3	2.90	---	1.00 to 2.90	02/08/2013 12:52:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS2	1	40	3		---	1.00 to 2.90	15 secs	-	-	-	-	0.6	0.0	20.4	0.0	-	0.0	0.0
WS2	1	40	3		---	1.00 to 2.90	30 secs	-	-	-	-	0.6	0.0	19.9	0.0	-	0.0	0.0
WS2	1	40	3		---	1.00 to 2.90	60 secs	-	-	-	-	0.8	0.0	19.7	0.0	-	0.0	0.0
WS2	1	40	3		---	1.00 to 2.90	90 secs	-	-	-	-	0.9	0.0	19.5	0.0	-	0.0	0.0
WS2	1	40	3		---	1.00 to 2.90	120 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0.0	0.0
WS2	1	40	3		---	1.00 to 2.90	180 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0.0	0.0
WS2	1	40	3		---	1.00 to 2.90	240 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0.0	0.0
WS2	1	40	3		---	1.00 to 2.90	300 secs	-	-	-	-	0.9	0.0	19.4	0.0	-	0.0	0.0
WS3	1	50	1	3.00	2.87	0.50 to 3.00	03/07/2013 14:20:00	1011	1011	0.5 _(I)	1.89	-	-	-	-	0.0	-	-
WS3	1	50	1		---	0.50 to 3.00	60 secs	-	-	0.5 _(SS)	-	-	-	-	-	-	-	-
WS3	1	50	1	3.00	---	0.50 to 3.00	03/07/2013 14:23:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS3	1	50	1		---	0.50 to 3.00	15 secs	-	-	-	-	1.4	0.0	19.1	0.0	-	0.0	0.0
WS3	1	50	1		---	0.50 to 3.00	30 secs	-	-	-	-	1.5	0.0	18.9	0.0	-	0.0	0.0
WS3	1	50	1		---	0.50 to 3.00	60 secs	-	-	-	-	1.5	0.0	18.8	0.0	-	0.0	0.0
WS3	1	50	1		---	0.50 to 3.00	90 secs	-	-	-	-	1.5	0.0	18.9	0.0	-	0.0	0.0
WS3	1	50	1		---	0.50 to 3.00	120 secs	-	-	-	-	1.5	0.0	18.8	0.0	-	0.0	0.0
WS3	1	50	1		---	0.50 to 3.00	180 secs	-	-	-	-	1.5	0.0	18.8	0.0	-	0.0	0.0
WS3	1	50	1		---	0.50 to 3.00	240 secs	-	-	-	-	1.5	0.0	18.8	0.0	-	0.0	0.0
WS3	1	50	1		---	0.50 to 3.00	300 secs	-	-	-	-	1.5	0.0	18.8	0.0	-	0.0	0.0
		Remarks: Samples taken.																
WS3	1	50	2	3.00	2.81	0.50 to 3.00	16/07/2013 12:24:00	1027	1027	0.9 _(I)	1.93	-	-	-	-	0.0	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 11 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS3	1	50	2		---	0.50 to 3.00	120 secs	-	-	0.4 _(ss)	-	-	-	-	-	-	-	-
WS3	1	50	2	3.00	---	0.50 to 3.00	16/07/2013 12:30:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS3	1	50	2		---	0.50 to 3.00	15 secs	-	-	-	-	2.6	0.0	17.7	0.0	-	0.0	0.0
WS3	1	50	2		---	0.50 to 3.00	30 secs	-	-	-	-	2.7	0.0	17.0	0.0	-	0.0	0.0
WS3	1	50	2		---	0.50 to 3.00	60 secs	-	-	-	-	2.3	0.0	17.7	0.0	-	0.0	0.0
WS3	1	50	2		---	0.50 to 3.00	90 secs	-	-	-	-	1.9	0.0	17.8	0.0	-	0.0	0.0
WS3	1	50	2		---	0.50 to 3.00	120 secs	-	-	-	-	1.9	0.0	17.9	0.0	-	0.0	0.0
WS3	1	50	2		---	0.50 to 3.00	180 secs	-	-	-	-	2.2	0.0	17.5	0.0	-	0.0	0.0
WS3	1	50	2		---	0.50 to 3.00	240 secs	-	-	-	-	2.2	0.0	17.5	0.0	-	0.0	0.0
WS3	1	50	2		---	0.50 to 3.00	300 secs	-	-	-	-	2.2	0.0	17.4	0.0	-	0.0	0.0
Remarks: No samples taken.																		
WS3	1	50	3	3.00	2.80	0.50 to 3.00	02/08/2013 12:35:00	1009	1009	0.2 _(I)	1.89	-	-	-	-	-	-	-
WS3	1	50	3		---	0.50 to 3.00	60 secs	-	-	0.2 _(ss)	-	-	-	-	-	-	-	-
WS3	1	50	3	3.00	---	0.50 to 3.00	02/08/2013 12:37:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS3	1	50	3		---	0.50 to 3.00	15 secs	-	-	-	-	2.0	0.0	18.2	0.0	-	0.0	0.0
WS3	1	50	3		---	0.50 to 3.00	30 secs	-	-	-	-	2.0	0.0	18.1	0.0	-	0.0	0.0
WS3	1	50	3		---	0.50 to 3.00	60 secs	-	-	-	-	2.1	0.0	17.8	0.0	-	0.0	0.0
WS3	1	50	3		---	0.50 to 3.00	90 secs	-	-	-	-	2.1	0.0	17.8	0.0	-	0.0	0.0
WS3	1	50	3		---	0.50 to 3.00	120 secs	-	-	-	-	2.1	0.0	17.8	0.0	-	0.0	0.0
WS3	1	50	3		---	0.50 to 3.00	180 secs	-	-	-	-	2.1	0.0	17.8	0.0	-	0.0	0.0
WS3	1	50	3		---	0.50 to 3.00	240 secs	-	-	-	-	2.0	0.0	18.0	0.0	-	0.0	0.0
WS3	1	50	3		---	0.50 to 3.00	300 secs	-	-	-	-	2.0	0.0	18.0	0.0	-	0.0	0.0
WS3	1	50	3		---	0.50 to 3.00	360 secs	-	-	-	-	2.0	0.0	18.0	0.0	-	0.0	0.0
WS4	1	50	1	2.00	1.78	0.50 to 2.00	03/07/2013 14:01:00	-	-	0.3 _(I)	1.60	-	-	-	-	0.2	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS Leo</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 12 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS4	1	50	1		---	0.50 to 2.00	120 secs	-	-	0.2 _(ss)	-	-	-	-	-	-	-	-
WS4	1	50	1	2.00	---	0.50 to 2.00	03/07/2013 14:05:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS4	1	50	1		---	0.50 to 2.00	15 secs	-	-	-	-	4.0	0.0	12.3	0.0	-	0.0	0.0
WS4	1	50	1		---	0.50 to 2.00	30 secs	-	-	-	-	4.7	0.0	10.3	0.0	-	0.0	0.0
WS4	1	50	1		---	0.50 to 2.00	60 secs	-	-	-	-	6.1	0.0	6.9	0.0	-	0.0	0.0
WS4	1	50	1		---	0.50 to 2.00	90 secs	-	-	-	-	6.4	0.0	5.8	0.0	-	0.0	0.0
WS4	1	50	1		---	0.50 to 2.00	120 secs	-	-	-	-	6.5	0.0	5.5	0.0	-	0.0	0.0
WS4	1	50	1		---	0.50 to 2.00	180 secs	-	-	-	-	6.5	0.0	5.5	0.0	-	0.0	0.0
WS4	1	50	1		---	0.50 to 2.00	240 secs	-	-	-	-	6.5	0.0	5.5	0.0	-	0.0	0.0
WS4	1	50	1		---	0.50 to 2.00	300 secs	-	-	-	-	6.5	0.0	5.5	0.0	-	0.0	0.0
Remarks: Samples taken.																		
WS4	1	50	2	2.00	1.77	0.50 to 2.00	16/07/2013 12:21:00	1020	1020	0.1 _(I)	1.67	-	-	-	-	1.4	-	-
WS4	1	50	2		---	0.50 to 2.00	60 secs	-	-	0.4 _(ss)	-	-	-	-	-	-	-	-
WS4	1	50	2	2.00	---	0.50 to 2.00	16/07/2013 12:24:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	15 secs	-	-	-	-	5.2	0.0	13.4	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	30 secs	-	-	-	-	6.6	0.0	11.9	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	60 secs	-	-	-	-	8.5	0.0	10.1	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	90 secs	-	-	-	-	10.4	0.0	8.3	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	120 secs	-	-	-	-	11.0	0.0	7.6	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	180 secs	-	-	-	-	11.6	0.0	7.1	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	240 secs	-	-	-	-	12.2	0.0	6.7	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	300 secs	-	-	-	-	12.9	0.0	6.4	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	360 secs	-	-	-	-	13.7	0.0	6.1	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	420 secs	-	-	-	-	14.1	0.0	5.9	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	480 secs	-	-	-	-	14.5	0.0	5.8	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS Leo</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 13 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS4	1	50	2		---	0.50 to 2.00	540 secs	-	-	-	-	14.8	0.0	5.6	0.0	-	0.0	0.0
WS4	1	50	2		---	0.50 to 2.00	600 secs	-	-	-	-	15.3	0.0	5.6	0.0	-	0.0	0.0
Remarks: No samples taken.																		
WS4	1	50	3	2.00	1.78	0.50 to 2.00	02/08/2013 12:19:00	1009	1009	0.2 _(I)	1.62	-	-	-	-	-	-	-
WS4	1	50	3		---	0.50 to 2.00	60 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
WS4	1	50	3	2.00	---	0.50 to 2.00	02/08/2013 12:21:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS4	1	50	3		---	0.50 to 2.00	15 secs	-	-	-	-	6.1	0.0	14.2	0.0	-	0.0	0.0
WS4	1	50	3		---	0.50 to 2.00	30 secs	-	-	-	-	6.2	0.0	9.2	0.0	-	0.0	0.0
WS4	1	50	3		---	0.50 to 2.00	60 secs	-	-	-	-	6.2	0.0	9.0	0.0	-	0.0	0.0
WS4	1	50	3		---	0.50 to 2.00	90 secs	-	-	-	-	6.0	0.0	9.4	0.0	-	0.0	0.0
WS4	1	50	3		---	0.50 to 2.00	120 secs	-	-	-	-	6.0	0.0	9.3	0.0	-	0.0	0.0
WS4	1	50	3		---	0.50 to 2.00	180 secs	-	-	-	-	6.0	0.0	9.3	0.0	-	0.0	0.0
WS4	1	50	3		---	0.50 to 2.00	240 secs	-	-	-	-	6.0	0.0	9.5	0.0	-	0.0	0.0
WS4	1	50	3		---	0.50 to 2.00	300 secs	-	-	-	-	6.0	0.0	9.4	0.0	-	0.0	0.0
WS5	1	50	1	3.00	3.06	0.50 to 3.00	03/07/2013 13:37:00	1012	1012	0.0 _(I)	0.98	-	-	-	-	0.1	-	-
WS5	1	50	1		---	0.50 to 3.00	60 secs	-	-	0.4 _(SS)	-	-	-	-	-	-	-	-
WS5	1	50	1	3.00	---	0.50 to 3.00	03/07/2013 13:40:00	-	-	-	-	0.0	0.0	20.7	0.0	-	0.0	0.0
WS5	1	50	1		---	0.50 to 3.00	15 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	1		---	0.50 to 3.00	30 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	1		---	0.50 to 3.00	60 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	1		---	0.50 to 3.00	90 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	1		---	0.50 to 3.00	120 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	1		---	0.50 to 3.00	180 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	1		---	0.50 to 3.00	240 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS Leo</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 14 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS5	1	50	1		---	0.50 to 3.00	300 secs	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
Remarks: Samples taken.																		
WS5	1	50	2	3.00	3.03	0.50 to 3.00	16/07/2013 12:16:00	1027	1027	0.1 _(I)	2.01	-	-	-	-	0.0	-	-
WS5	1	50	2		---	0.50 to 3.00	120 secs	-	-	0.5 _(SS)	-	-	-	-	-	-	-	-
WS5	1	50	2	3.00	---	0.50 to 3.00	16/07/2013 12:20:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	2		---	0.50 to 3.00	15 secs	-	-	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	2		---	0.50 to 3.00	30 secs	-	-	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	2		---	0.50 to 3.00	60 secs	-	-	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	2		---	0.50 to 3.00	90 secs	-	-	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	2		---	0.50 to 3.00	120 secs	-	-	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	2		---	0.50 to 3.00	180 secs	-	-	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	2		---	0.50 to 3.00	240 secs	-	-	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	2		---	0.50 to 3.00	300 secs	-	-	-	-	0.1	0.0	20.8	0.0	-	0.0	0.0
Remarks: No samples taken.																		
WS5	1	50	3	3.00	3.00	0.50 to 3.00	02/08/2013 11:57:00	1009	1009	0.1 _(I)	1.98	-	-	-	-	-	-	-
WS5	1	50	3		---	0.50 to 3.00	60 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
WS5	1	50	3	3.00	---	0.50 to 3.00	02/08/2013 11:59:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS5	1	50	3		---	0.50 to 3.00	15 secs	-	-	-	-	0.3	0.0	20.3	0.0	-	0.0	0.0
WS5	1	50	3		---	0.50 to 3.00	30 secs	-	-	-	-	0.2	0.0	20.3	0.0	-	0.0	0.0
WS5	1	50	3		---	0.50 to 3.00	60 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0
WS5	1	50	3		---	0.50 to 3.00	90 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0
WS5	1	50	3		---	0.50 to 3.00	120 secs	-	-	-	-	0.1	0.0	20.3	0.0	-	0.0	0.0
WS5	1	50	3		---	0.50 to 3.00	180 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0
WS5	1	50	3		---	0.50 to 3.00	240 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0
WS5	1	50	3		---	0.50 to 3.00	300 secs	-	-	-	-	0.1	0.0	20.4	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS Leo</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 15 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS6	1	40	1	1.50	1.42	0.50 to 1.50	03/07/2013 16:30:00	1013	1013	0.2 _(I)	1.41	-	-	-	-	0.0	-	-
WS6	1	40	1		---	0.50 to 1.50	60 secs	-	-	0.3 _(SS)	-	-	-	-	-	-	-	-
WS6	1	40	1	1.50	---	0.50 to 1.50	03/07/2013 16:33:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS6	1	40	1		---	0.50 to 1.50	15 secs	-	-	-	-	1.8	0.0	19.9	0.0	-	0.0	0.0
WS6	1	40	1		---	0.50 to 1.50	30 secs	-	-	-	-	2.0	0.0	19.4	0.0	-	0.0	0.0
WS6	1	40	1		---	0.50 to 1.50	60 secs	-	-	-	-	2.0	0.0	19.3	0.0	-	0.0	0.0
WS6	1	40	1		---	0.50 to 1.50	90 secs	-	-	-	-	2.1	0.0	19.3	0.0	-	0.0	0.0
WS6	1	40	1		---	0.50 to 1.50	120 secs	-	-	-	-	2.1	0.0	19.4	0.0	-	0.0	0.0
WS6	1	40	1		---	0.50 to 1.50	180 secs	-	-	-	-	2.1	0.0	19.3	0.0	-	0.0	0.0
WS6	1	40	1		---	0.50 to 1.50	240 secs	-	-	-	-	2.1	0.0	19.3	0.0	-	0.0	0.0
WS6	1	40	1		---	0.50 to 1.50	300 secs	-	-	-	-	2.1	0.0	19.3	0.0	-	0.0	0.0
Remarks: No samples taken insufficient to sample.																		
WS6	1	40	2	1.50	1.42	0.50 to 1.50	16/07/2013 13:10:00	1027	1027	-0.1 _(I)	DRY	-	-	-	-	11.2	-	-
WS6	1	40	2		---	0.50 to 1.50	120 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
WS6	1	40	2	1.50	---	0.50 to 1.50	16/07/2013 13:15:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS6	1	40	2		---	0.50 to 1.50	15 secs	-	-	-	-	5.3	0.0	11.5	0.0	-	0.0	0.0
WS6	1	40	2		---	0.50 to 1.50	30 secs	-	-	-	-	5.7	0.0	9.7	0.0	-	0.0	0.0
WS6	1	40	2		---	0.50 to 1.50	60 secs	-	-	-	-	5.8	0.0	9.5	0.0	-	0.0	0.0
WS6	1	40	2		---	0.50 to 1.50	90 secs	-	-	-	-	5.7	0.0	9.5	0.0	-	0.0	0.0
WS6	1	40	2		---	0.50 to 1.50	120 secs	-	-	-	-	5.7	0.0	9.4	0.0	-	0.0	0.0
WS6	1	40	2		---	0.50 to 1.50	180 secs	-	-	-	-	5.7	0.0	9.4	0.0	-	0.0	0.0
WS6	1	40	2		---	0.50 to 1.50	240 secs	-	-	-	-	5.7	0.0	9.4	0.0	-	0.0	0.0
WS6	1	40	2		---	0.50 to 1.50	300 secs	-	-	-	-	5.7	0.0	9.4	0.0	-	0.0	0.0
Remarks: No sample staken.																		

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 16 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS6	1	40	3	1.50	1.42	0.50 to 1.50	02/08/2013 14:43:00	1009	1009	0.0 _(I)	1.41	-	-	-	-	-	-	-
WS6	1	40	3		---	0.50 to 1.50	60 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
WS6	1	40	3	1.50	---	0.50 to 1.50	02/08/2013 14:45:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS6	1	40	3		---	0.50 to 1.50	15 secs	-	-	-	-	4.7	0.0	13.2	0.0	-	0.0	0.0
WS6	1	40	3		---	0.50 to 1.50	30 secs	-	-	-	-	4.9	0.0	9.1	0.0	-	0.0	0.0
WS6	1	40	3		---	0.50 to 1.50	60 secs	-	-	-	-	4.9	0.0	9.1	0.0	-	0.0	0.0
WS6	1	40	3		---	0.50 to 1.50	90 secs	-	-	-	-	4.9	0.0	8.9	0.0	-	0.0	0.0
WS6	1	40	3		---	0.50 to 1.50	120 secs	-	-	-	-	4.9	0.0	8.8	0.0	-	0.0	0.0
WS6	1	40	3		---	0.50 to 1.50	180 secs	-	-	-	-	4.9	0.0	8.7	0.0	-	0.0	0.0
WS6	1	40	3		---	0.50 to 1.50	240 secs	-	-	-	-	4.9	0.0	8.7	0.0	-	0.0	0.0
WS6	1	40	3		---	0.50 to 1.50	300 secs	-	-	-	-	4.9	0.0	8.7	0.0	-	0.0	0.0
WS7	1	40	1	2.60	2.71	1.00 to 2.60	03/07/2013 12:56:00	1009	1009	0.4 _(I)	2.03	-	-	-	-	0.0	-	-
WS7	1	40	1		---	1.00 to 2.60	60 secs	-	-	0.3 _(SS)	-	-	-	-	-	-	-	-
WS7	1	40	1	2.60	---	1.00 to 2.60	03/07/2013 12:59:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS7	1	40	1		---	1.00 to 2.60	15 secs	-	-	-	-	1.2	0.0	19.9	0.0	-	0.0	0.0
WS7	1	40	1		---	1.00 to 2.60	30 secs	-	-	-	-	1.2	0.0	19.7	0.0	-	0.0	0.0
WS7	1	40	1		---	1.00 to 2.60	60 secs	-	-	-	-	1.2	0.0	19.8	0.0	-	0.0	0.0
WS7	1	40	1		---	1.00 to 2.60	90 secs	-	-	-	-	1.2	0.0	19.8	0.0	-	0.0	0.0
WS7	1	40	1		---	1.00 to 2.60	120 secs	-	-	-	-	1.2	0.0	19.7	0.0	-	0.0	0.0
WS7	1	40	1		---	1.00 to 2.60	180 secs	-	-	-	-	1.2	0.0	19.7	0.0	-	0.0	0.0
WS7	1	40	1		---	1.00 to 2.60	240 secs	-	-	-	-	1.2	0.0	19.7	0.0	-	0.0	0.0
WS7	1	40	1		---	1.00 to 2.60	300 secs	-	-	-	-	1.2	0.0	19.7	0.0	-	0.0	0.0
	Remarks: Samples taken.																	
WS7	1	40	2	2.60	2.69	1.00 to 2.60	16/07/2013 10:51:00	1025	1025	0.5 _(I)	2.07	-	-	-	-	5.1	-	-

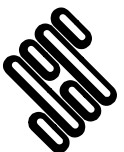
Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS Leo</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 17 of 18 

IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS7	1	40	2		---	1.00 to 2.60	120 secs	-	-	0.2 _(SS)	-	-	-	-	-	-	-	-
WS7	1	40	2	2.60	---	1.00 to 2.60	16/07/2013 10:55:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS7	1	40	2		---	1.00 to 2.60	15 secs	-	-	-	-	0.9	0.0	20.2	0.0	-	0.0	0.0
WS7	1	40	2		---	1.00 to 2.60	30 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
WS7	1	40	2		---	1.00 to 2.60	60 secs	-	-	-	-	1.0	0.0	20.1	0.0	-	0.0	0.0
WS7	1	40	2		---	1.00 to 2.60	90 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
WS7	1	40	2		---	1.00 to 2.60	120 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
WS7	1	40	2		---	1.00 to 2.60	180 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
WS7	1	40	2		---	1.00 to 2.60	240 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
WS7	1	40	2		---	1.00 to 2.60	300 secs	-	-	-	-	1.0	0.0	20.0	0.0	-	0.0	0.0
Remarks: No samples taken.																		
WS7	1	40	3	2.60	2.68	1.00 to 2.60	02/08/2013 11:00:00	1009	1009	0.2 _(I)	2.06	-	-	-	-	-	-	-
WS7	1	40	3		---	1.00 to 2.60	60 secs	-	-	0.1 _(SS)	-	-	-	-	-	-	-	-
WS7	1	40	3	2.60	---	1.00 to 2.60	02/08/2013 11:02:00	-	-	-	-	0.0	0.0	20.8	0.0	-	0.0	0.0
WS7	1	40	3		---	1.00 to 2.60	15 secs	-	-	-	-	1.2	0.0	20.2	0.0	-	0.0	0.0
WS7	1	40	3		---	1.00 to 2.60	30 secs	-	-	-	-	1.2	0.0	19.6	0.0	-	0.0	0.0
WS7	1	40	3		---	1.00 to 2.60	60 secs	-	-	-	-	1.2	0.0	19.5	0.0	-	0.0	0.0
WS7	1	40	3		---	1.00 to 2.60	90 secs	-	-	-	-	1.3	0.0	19.5	0.0	-	0.0	0.0
WS7	1	40	3		---	1.00 to 2.60	120 secs	-	-	-	-	1.3	0.0	19.5	0.0	-	0.0	0.0
WS7	1	40	3		---	1.00 to 2.60	180 secs	-	-	-	-	1.3	0.0	19.5	0.0	-	0.0	0.0
WS7	1	40	3		---	1.00 to 2.60	240 secs	-	-	-	-	1.3	0.0	19.5	0.0	-	0.0	0.0
WS7	1	40	3		---	1.00 to 2.60	300 secs	-	-	-	-	1.3	0.0	19.5	0.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By	Date	Checked By	Date	Contract Ref:
	<i>Simon Ford</i>	20/08/13	<i>TS Leo</i>	06/08/13	727927
	Contract: Harts Farm Way, Havant				Page: 18 of 18 

APPENDIX H

- (i) Tank Search Records
- (ii) GroundSure GeoInsight Report
- (iii) GroundSure EnviroInsight Report
- (iv) Historical Mapping

Petroleum Site Details Record

Address: HARTS FARM WAY HAVANT			Licence No: B4/4	Date of Associated Plan: 26/4/95		Sheet: 1 of: 1
TANK NO	1	2	3	4	5	6
Construction	SSS	SSS	SSS	SSS	SSS	SSS
Capacity (Litres)	22 500	2 250	4 500	2 250	22 500	9 000
Overfill Prevention	NO	NO	NO	NO	NO	NO
Leak Detection	NO	NO	NO	NO	NO	NO
Type of Fuel	4*	D	D	D	D	D
Pump Nos From Tank	1	2	3	4	4	4
Vapour Balancing	NO	NO	NO	NO	NO	NO
DCD Licence	NO	NO	NO	NO	NO	NO
Installation Date	1972	IDU	IDU	1972	1972	1972
Test Date:-						
20 Years					1980	1980
25 Years					1983	1983
30 Years						
30 Plus Years		Annual	Test	Required		

Remarks:- TANKS NO.4.5.6.
CHANGED TO DIESEL, 22/8/94

<u>Tanks</u>	<u>Contents</u>
SSS = Single Skin Steel DSS = Double Skin Steel GRP = Glass Reinforced Plastic IDU = Installation Date Unknown	SUL = Super Unleaded Petroleum Spirit UL = Unleaded Petroleum Spirit 4* = Four Star Petroleum Spirit D = Diesel P = Paraffin WO = Waste Oil LO = Lubrication Oil

19

**DERELICT TANK REGISTER
SUMMARY SHEET**

Register Reference
No. H

Licence No. B4/14

Loc ID

Name of Site HAVANT BOROUGH COUNCIL, HARTS FARM DEPOT

Address and Postcode HARTS FARM WAY, HAVANT

Name/Address of Owner/Occupier. HAVANT B/C

Tank Details

Tank No.	Installation Date	Capacity Litres	Product Type	Method Making Safe	Date Made Safe
<u>1</u>	<u>1972</u>	<u>22500</u>	<u>4*</u>	<u>CONVERTED TO DARN</u>	<u>2000</u>

Name of Contractor..... Petroleum Officer. JHF/LJ

Date Environment Agency Informed.....

Date Local Environmental Health Officer Informed.....

Tank Test Dates.....

Leaks and Spillages

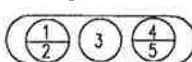
Details

Any Other Information Attached

☒ No

REMARKS

LEGEND OF SYMBOLS FOR PETROLEUM LICENCE

1		LOCATION OF CONTROL POINT WITHIN KIOSK
2		LOCATION OF CCTV MONITOR COVERING DISPENSING AREAS
3		AUTOMATIC PAYMENT POINT
4		DISPENSER/S WITH DISPENSING POINTS NUMBERED
5		TO COINCIDE WITH CONTROL EQUIPMENT AND FUSE
6		DISPENSERS SITED ON DISPENSING ISLAND
7		UNDERGROUND TANK AND NUMBER OR LETTER
8		ABOVE GROUND TANK AND NUMBER OR LETTER (NOT ACCEPTABLE FOR PETROLEUM)
9		UNDERGROUND DOUBLE SKIN TANK AND NUMBER OR LETTER
10		ABOVE GROUND BUNDED TANK AND NUMBER OR LETTER
11		DISUSED UNDERGROUND TANK MADE PERMANENTLY SAFE
12		TANK VENTS INDICATING THE NUMBER OF VENT PIPES FITTED
13		TANK VENTS ON VAPOUR BALANCING SYSTEM INDICATING THE NUMBER OF VENT PIPES FITTED BEFORE THE MANIFOLD
14		INTERCEPTOR/SEPARATOR VENTS INDICATING NUMBER OF VENT PIPES BEFORE MANIFOLD IF FITTED
15		ABOVE GROUND VAPOUR CONNECTION POINT
16		UNDERGROUND VAPOUR CONNECTION POINT
17		ABOVE GROUND OFFSET FILL POINT - NUMBER INDICATES RELEVANT TANKS
18		BELOW GROUND OFFSET FILL POINT - NUMBER INDICATES RELEVANT TANKS
19		REMOTE TANK MONITORING SYSTEM - GAUGES
20		ELECTRONIC TANK MONITORING SYSTEM
21		INTERCEPTOR 3 CHAMBERS
22		INTERCEPTOR 2 CHAMBERS
23		SINGLE CHAMBER SEPARATOR
24		TANK ALARM (INTERSTITIAL SPACE)
25		SEPARATOR ALARM(HIGH LEVEL)
26		INTERSTITIAL FLUID HEADER TANKS
27		PETROL PUMP SWITCH
28		SAND BUCKET
29		EXTINGUISHER (STATE B RATING)
30		TANKER STAND INDICATING DIRECTION OF EXIT
31		DRIVER CONTROLLED DELIVERIES (CONTROL POSITION)
32		EMERGENCY TELEPHONE
33		GULLY

ADDRESS:- HARTS FARM WAY
HAVANT

LICENCE NO:- B4/4

FILE NO:-

DATE:- 26.4.95

CAD NO:- B0404.PET

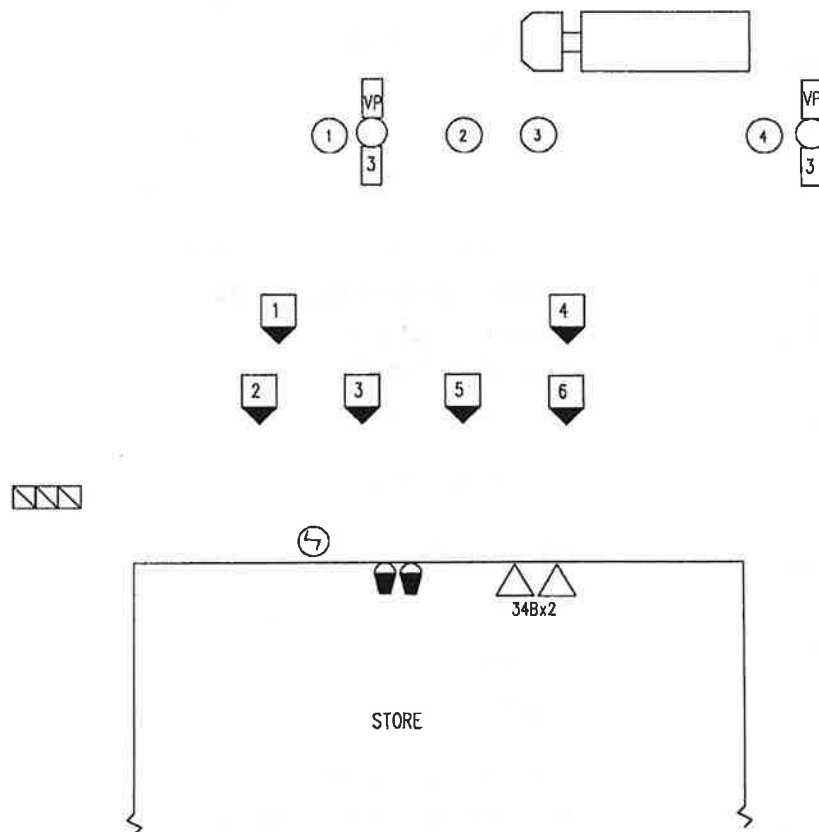
PLAN REF:- JHF. SPB.

NOT TO SCALE



ENTRANCE

HARTS FARM WAY



GroundSure GeoInsight

Address: Former Council Depot, Harts Farm Way, Havant, PO9 1HU,

Date: 3 Jun 2013

Report Reference: EMS-207470_272851

Your Reference: EMS_207470_272851



Brought to you by emapsite

emapsite™

Aerial Photograph of Study Site



Site Name: Former Council Depot, Harts Farm
Way, Havant, PO9 1HU,
Grid Reference: 470701, 105898
Size of Site: 3.74 ha

Aerial photography supplied by Getmapping PLC.
© Copyright Getmapping PLC 2003. All Rights Reserved.

Overview of Findings

The GroundSure GeoInsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and GroundSure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) m of the study site boundary
1. Geology	Description
1.1 Artificial Ground,	
1.1.1 Is there any Artificial Ground /Made Ground present beneath the study site?*	No
1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology & Landslips	
1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
1.2.2 Are there any records relating to permeability of superficial geology within the study site* boundary?	Yes
1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
1.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No
1.3 Bedrock, Solid Geology & Faults	
1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
1.3.2 Are there any records relating to permeability of bedrock within the study site* boundary?	Yes
1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.3.4 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 3 and 5% of properties are above the Action Level
1.3.5 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	Basic radon protective measures are necessary

* This includes an automatically generated 50m buffer zone around the site

Source:Scale 1:50,000 BGS Sheet No:316

[Report Reference: EMS-207470_272851](#)

If you would like any further assistance regarding this report then please contact emapsite on (T) 0118 9736883, (F) 0118 9730002 or email: sales@emapsite.com

2. Ground Workings	on-site	0-50	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	5	11	-	-
2.2 Historical Underground Workings Features from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	1	0	2

3. Mining, Extraction & Natural Cavities	on-site	0-50	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining*	2	0	2	10	19
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	1
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

*This includes an automatically generated 50m buffer zone around the site

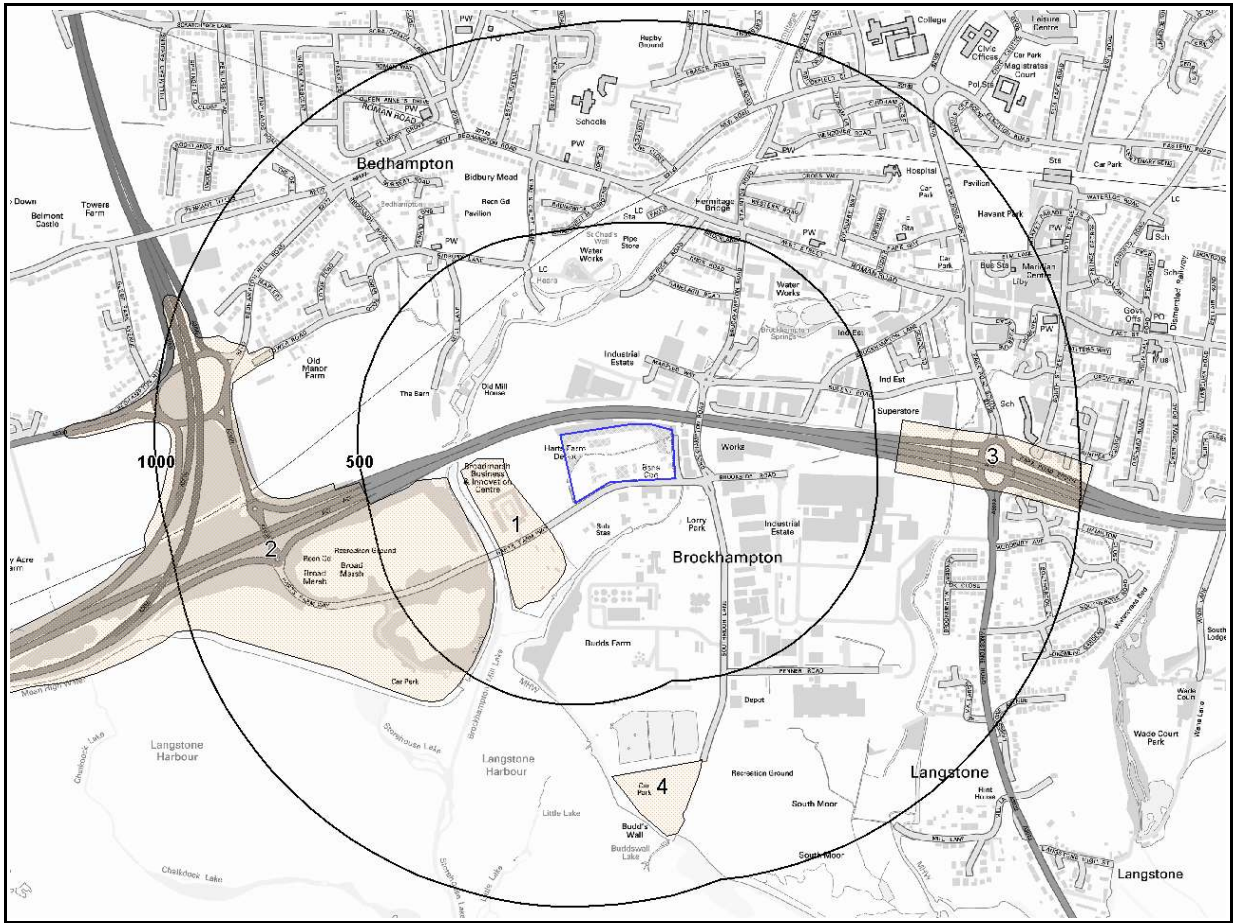
4. Natural Ground Subsidence	on-site*	0-50	51-250	251-500	501-1000
4.1 Shrink-Swell Clay	Low	-	-	-	-
4.2 Landslides	Very Low	-	-	-	-
4.3 Ground Dissolution of Soluble Rocks	Very Low	-	-	-	-
4.4 Compressible Deposits	Moderate	-	-	-	-
4.5 Collapsible Deposits	Low	-	-	-	-
4.6 Running Sand	Low	-	-	-	-

* This includes an automatically generated 50m buffer zone around the site

5. Borehole Records	on-site	0-50	51-250	251-500	501-1000
5.1 BGS Recorded Boreholes	1	3	30	-	-

6. Estimated Background Soil Chemistry	on-site	0-50	51-250	251-500	501-1000
6.1 Records of Background Soil Chemistry	3	4	0	-	-

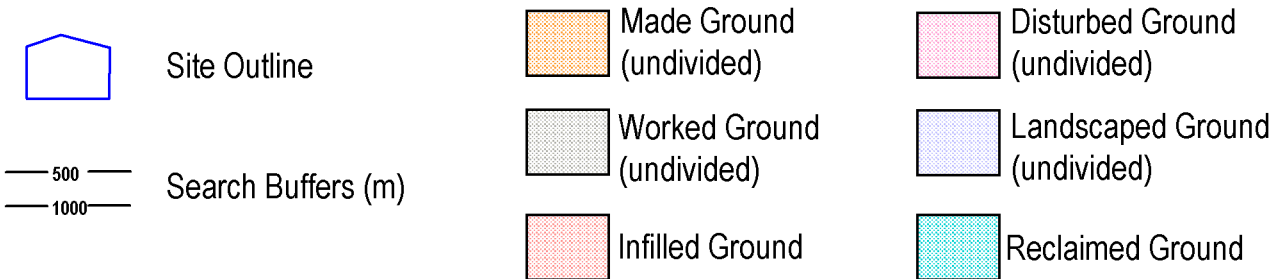
1.1 Artificial Ground Map



Artificial Ground Legend

Mapping
sourced from
Ordnance
Survey

© Crown copyright and database
rights 2013. Ordnance Survey
license 100035207.



Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

Report Reference: [EMS-207470_272851](#)

If you would like any further assistance regarding this report then please contact emapsite on (T) 0118 9736883, (F) 0118 9730002 or email: sales@emapsite.com

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:316

1.1.1 Artificial/Made Ground

Are there any records of Artificial/Made Ground within 500m of the study site boundary? **Yes**

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	94.0	SW	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	250.0	SW	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site* boundary? **No**

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site.

Mapping sourced from  Ordnance Survey®



— 500 —
— 1000 —

Page 7

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/Drift Geology

Are there any records of Superficial Deposits/Drift Geology within 500m of the study site boundary? **Yes**

ID	Distance (m)	Direction	Lex Code	Description	Rock Description
1	0.0	On Site	ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
2	0.0	On Site	RTDU-SSCL	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
3	0.0	On Site	HEAD-CLGR	HEAD	CLAYEY GRAVEL
4	45.0	SE	RTDU-SSCL	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
5	69.0	S	BTFU-CSSG	BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)	CLAY, SILT, SAND AND GRAVEL
6	250.0	SW	RMD-SAGR	RAISED MARINE DEPOSITS	SAND AND GRAVEL
7	281.0	SE	ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
8	297.0	W	RTDU-SSCL	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
9	354.0	N	HEAD-CLGR	HEAD	CLAYEY GRAVEL
10	420.0	SE	HEAD-CLGR	HEAD	CLAYEY GRAVEL
11	495.0	N	HEAD-CSSG	HEAD	CLAY, SILT, SAND AND GRAVEL

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site* boundary? **Yes**

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	High	Very Low
0.0	On Site	Mixed	High	Low
0.0	On Site	Intergranular	High	Low
45.0	SE	Intergranular	High	Low

1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary?

No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site* boundary?

No

Database searched and no data found.

*This includes an automatically generated 50m buffer zone around the site.

NW

N

NE

W

E

SW

S

SE

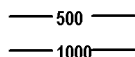


Mapping sourced from  Ordnance Survey®

© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



Site Outline



Search Buffers (m)

Report Reference: EMS-207470 272851

Page 9

1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:316

1.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	LPCK-CHLK	Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Portsdown C	Campanian / Turonian
2	466.0	N	LMBE-CLSS	Lambeth Group - Clay, Silt And Sand	Paleocene

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary? **Yes**

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Very High	Very High

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? **Yes**

ID	Distance (m)	Direction	Category Description	Feature Description
9	0.0	On Site	FOLD_AXIS	Axial plane trace of major anticline

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3.4 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is in a Radon Affected Area, as between 3 and 5% of properties are above the Action Level

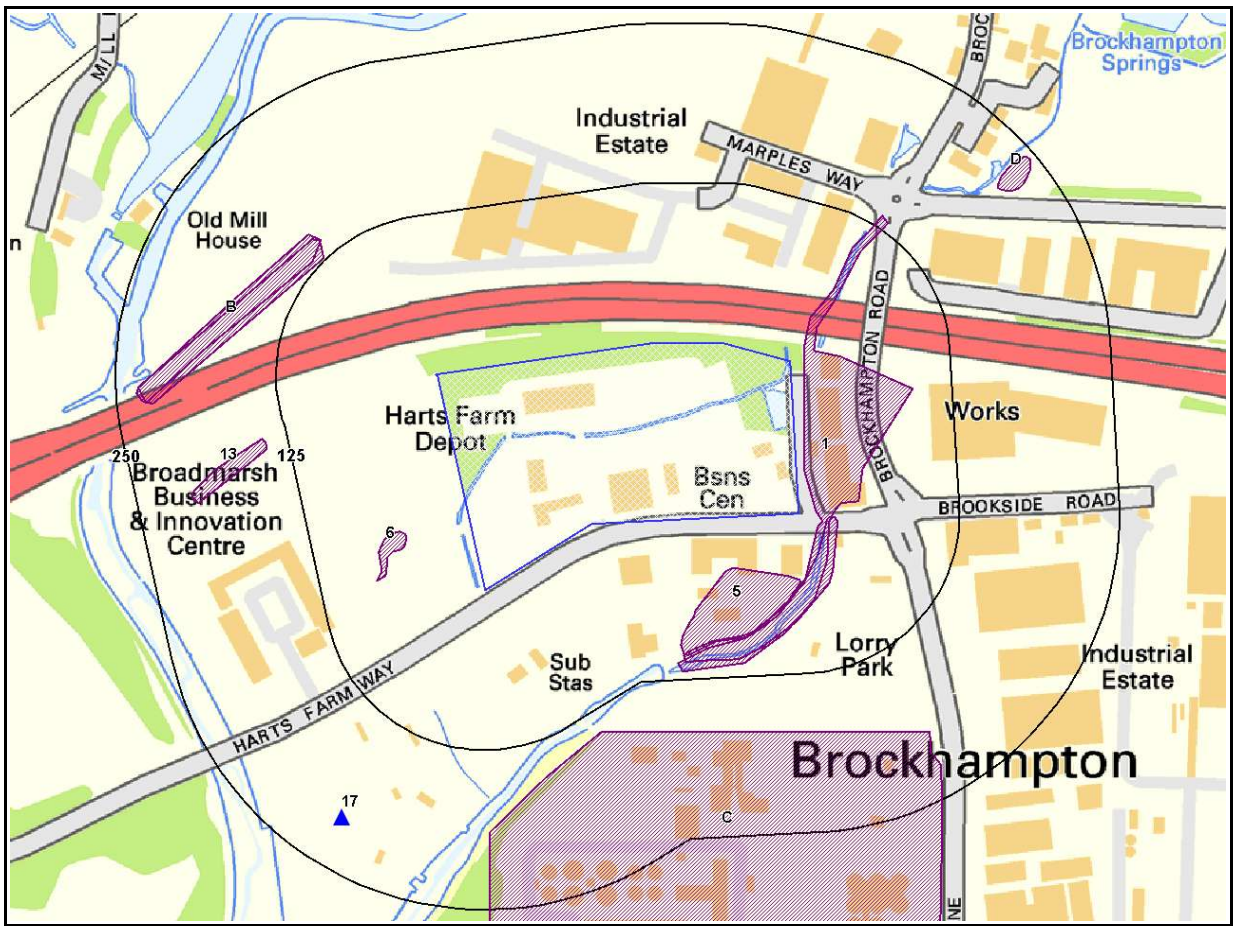
1.3.5 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?

* This includes an automatically generated 50m buffer zone around the site.

Basic radon protective measures are necessary

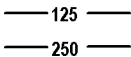
2. Ground Workings Map



Ground Workings Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.

- | | | | |
|---|--------------------|---|----------------------------------|
|  | Site Outline |  | Historic Surface Ground Workings |
|  | Search Buffers (m) |  | Historic Underground Workings |
| | |  | Current Ground Workings |

2. Ground Workings

2.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on GroundSure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? **Yes**

The following Historical Surface Ground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
1	6.0	E	470875,105898	Ponds	1866
2A	22.0	E	470852,105784	Mill Pond	1895
3A	22.0	E	470852,105784	Mill Pond	1907
4A	22.0	E	470852,105784	Mill Pond	1931
5	40.0	S	470796,105766	Old Mill Pond	1938
6	51.0	W	470518,105810	Pond	1866
7B	127.0	NW	470398,105994	Unspecified Heap	1938
8B	127.0	NW	470398,105994	Unspecified Heap	1931
9B	127.0	NW	470398,105994	Unspecified Heap	1907
10	131.0	NW	470398,105996	Unspecified Heap	1957
B					
11	142.0	SE	470778,105449	Sewage Works	1973
C					
12	142.0	SE	470778,105449	Sewage Works	1991
C					
13	142.0	W	470397,105877	Unspecified Heap	1907
14	211.0	NE	471010,106109	Pond	1942
D					
15	211.0	NE	471010,106109	Pond	1931
D					
16	211.0	NE	471010,106109	Pond	1907
D					

2.2 Historical Underground Workings Features derived from Historical Mapping

This data is derived from the GroundSure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? **No**

Database searched and no data found.

2.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Report Reference: EMS-207470_272851

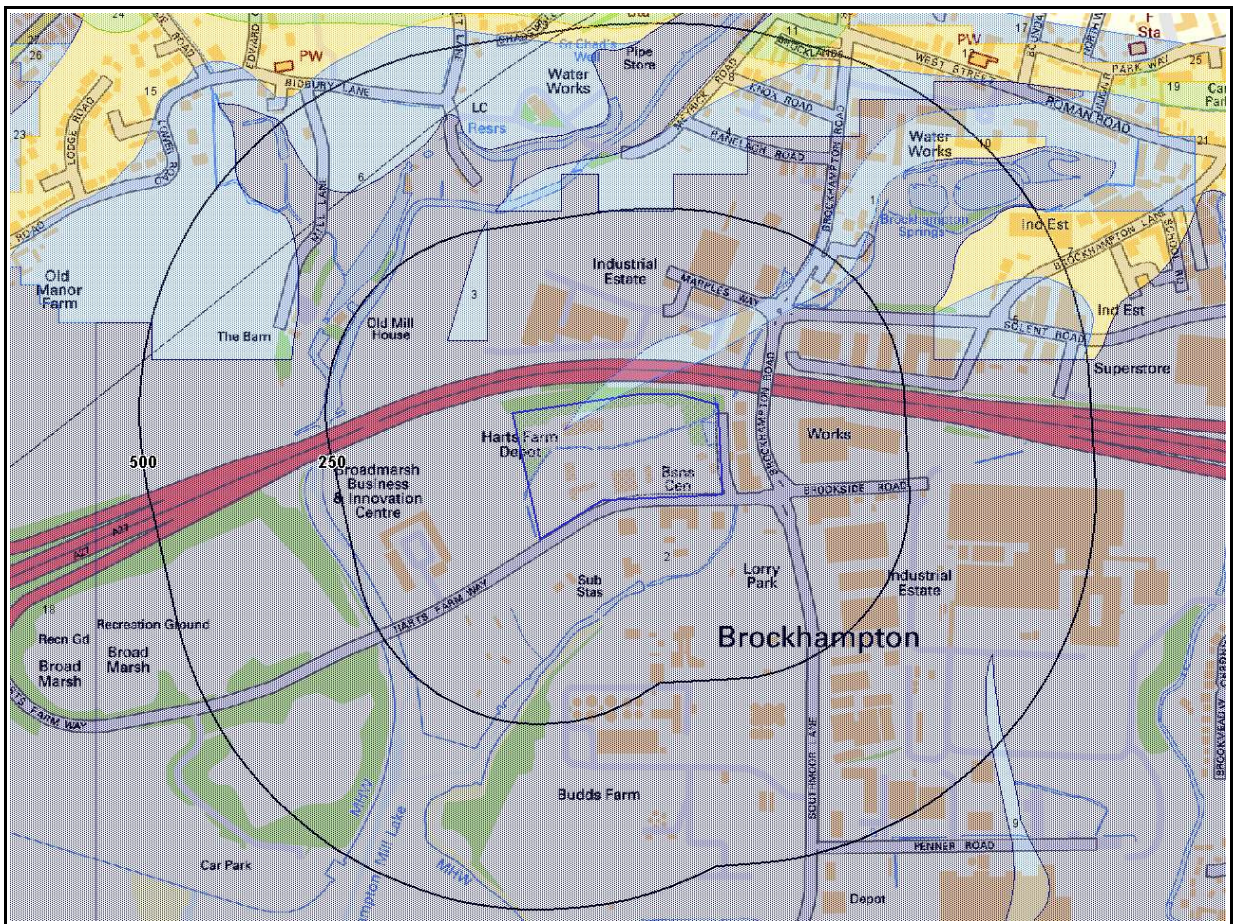
If you would like any further assistance regarding this report then please contact emapsite on (T) 0118 9736883, (F) 0118 9730002 or email: sales@emapsite.com

Are there any BGS Current Ground Workings within 1000m of the study site boundary? **Yes**

The following Current Ground Workings information is provided by British Geological Society:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
17	210.0	SW	4704 85,10 5605	Marine Sand & Gravel	Bedhampton Wharf	Sea, river or canal wharf where mineral commodities are unloaded and stored	Active
Not shown	891.0	NE	4712 93,10 6727	Clay & Shale	Havant Park Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	932.0	NW	4698 53,10 6560	Chalk	Belmont Farm Chalk Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

3. Mining, Extraction & Natural Cavities Map



Mining, Extraction & Natural Cavities
Legend



© Crown copyright and database
rights 2013. Ordnance Survey
license 100035207.



3. Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from GroundSure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary?

No

The following information provided by JPB is not represented on Mapping:

Database searched. No results found.

3.4 Non – Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary?

Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
2	0.0	On Site	Not available	Chalk	Rare - Infrequent minor mining may have occurred but restricted in extent.
3	104.0	N	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
4	248.0	N	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.

Report Reference: [EMS-207470_272851](#)

If you would like any further assistance regarding this report then please contact emapsite on (T) 0118 9736883, (F) 0118 9730002 or email: sales@emapsite.com

5	297.0	E	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
6	306.0	W	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
7	315.0	NE	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
8	354.0	N	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
9	420.0	SE	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
10	439.0	NE	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
11	466.0	N	Not available	Chalk	Likely - Underground mining known or suspected within or close to the area.
12	472.0	N	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
13	474.0	N	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
14	495.0	N	Not available	Chalk	Likely - Underground mining known or suspected within or close to the area.
15	519.0	NW	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
16	538.0	N	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
17	540.0	N	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
18	559.0	W	Not available	Chalk	Rare - Infrequent minor mining may have occurred but restricted in extent.
19	659.0	NE	Not available	Chalk	Likely - Underground mining known or suspected within or close to the area.
Not shown	662.0	NW	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
21	692.0	E	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
Not shown	702.0	E	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
23	714.0	W	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
24	721.0	NW	Not available	Chalk	Likely - Underground mining known or suspected within or close to the area.
25	734.0	NE	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
26	772.0	NW	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
27	773.0	NW	Not available	Chalk	Rare - Infrequent minor mining may have occurred but restricted in extent.
Not shown	783.0	S	Not available	Chalk	Rare - Infrequent minor mining may have occurred but restricted in extent.
29	785.0	NW	Not available	Chalk	Unlikely - Some small scale mining may have occurred but restricted in extent.
Not shown	828.0	NW	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
Not shown	841.0	E	Not available	Chalk	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
Not shown	971.0	NW	Not available	Chalk	Likely - Underground mining known or suspected within or close to the area.
Not shown	985.0	SW	Not available	Chalk	Rare - Infrequent minor mining may have occurred but restricted in extent.

3.5 Non – Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary?

No

Database searched and no data found.

3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary?

Yes

The following Natural Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Superficial Deposits	Bedrock Deposits	Cavity Type and Number
Not shown	966.0	NW	SU	Head	Chalk Group, Lambeth Group	Solution Pipe x 3

3.7 Brine Extraction

This dataset provides information from the Brine Compensation Board which has been discontinued and is now covered by the Coal Authority.

Are there any Brine Extraction areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level. More detailed information on potential Tin Mining may be found in Section 3.4 – Non-Coal Mining Hazards.

Are there any Tin Mining areas within 1000m of the study site boundary?

No

[Report Reference: EMS-207470_272851](#)

If you would like any further assistance regarding this report then please contact emapsite on (T) 0118 9736883, (F) 0118 9730002 or email: sales@emapsite.com

Database searched and no data found.

3.10 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

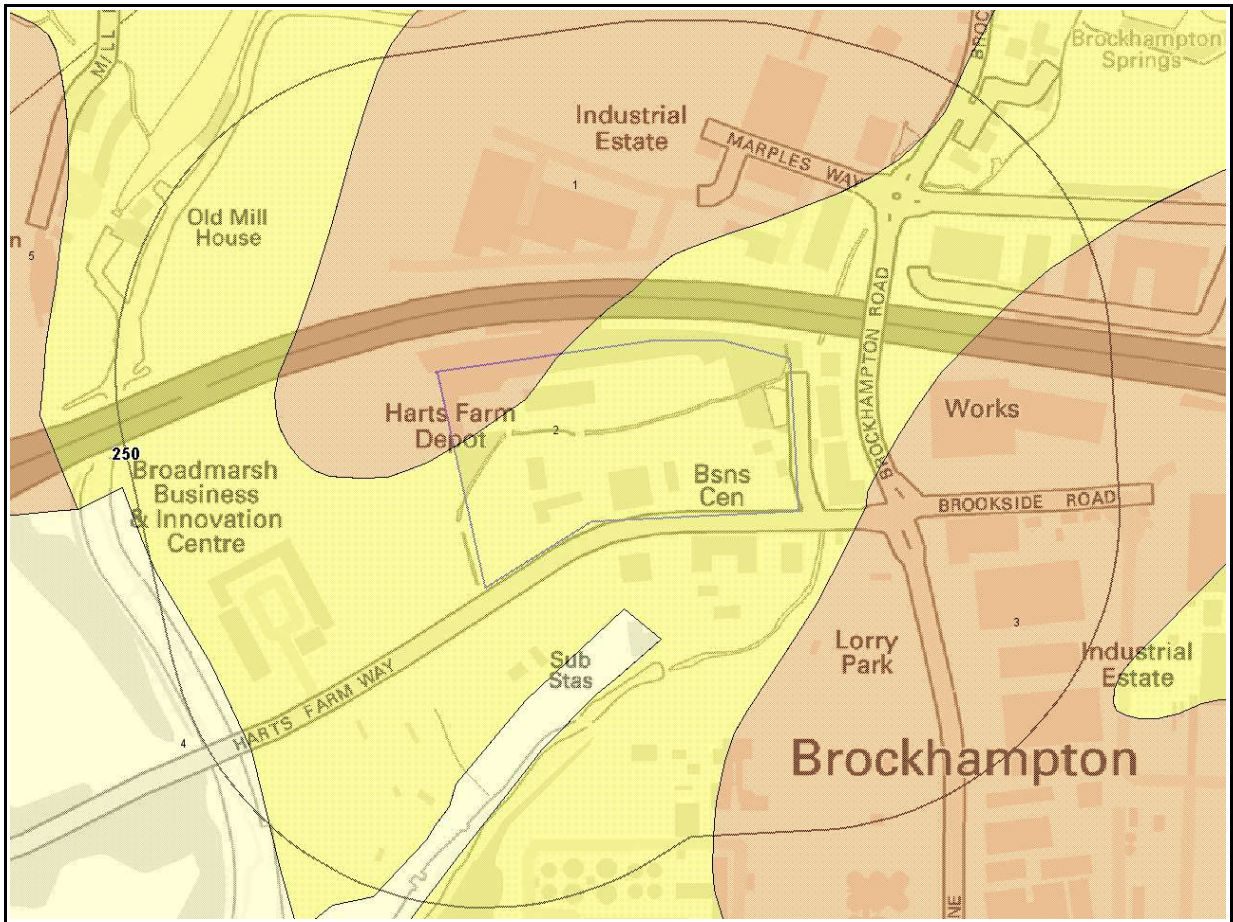
Are there any Clay Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

4. Natural Ground Subsidence

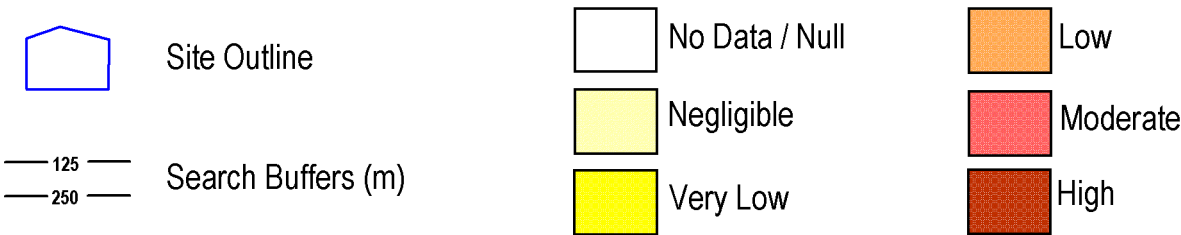
4.1 Shrink-Swell Clay Map



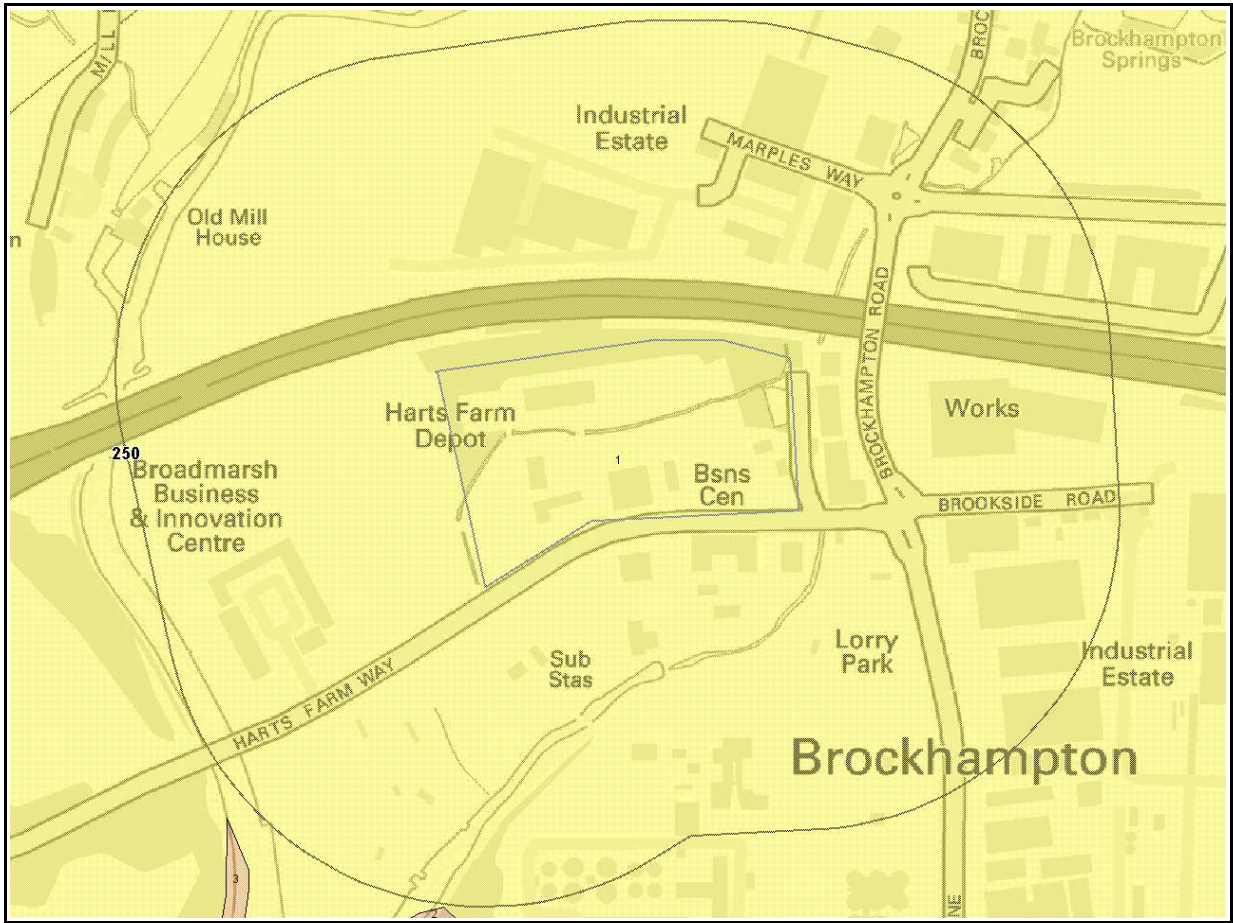
Shrink-Swell Clay Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



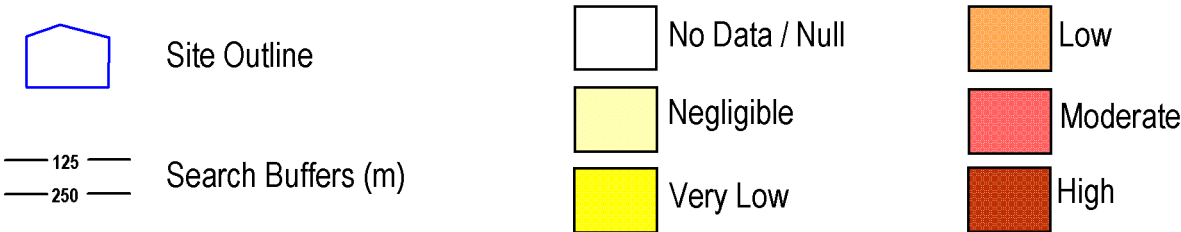
4.2 Landslides Map



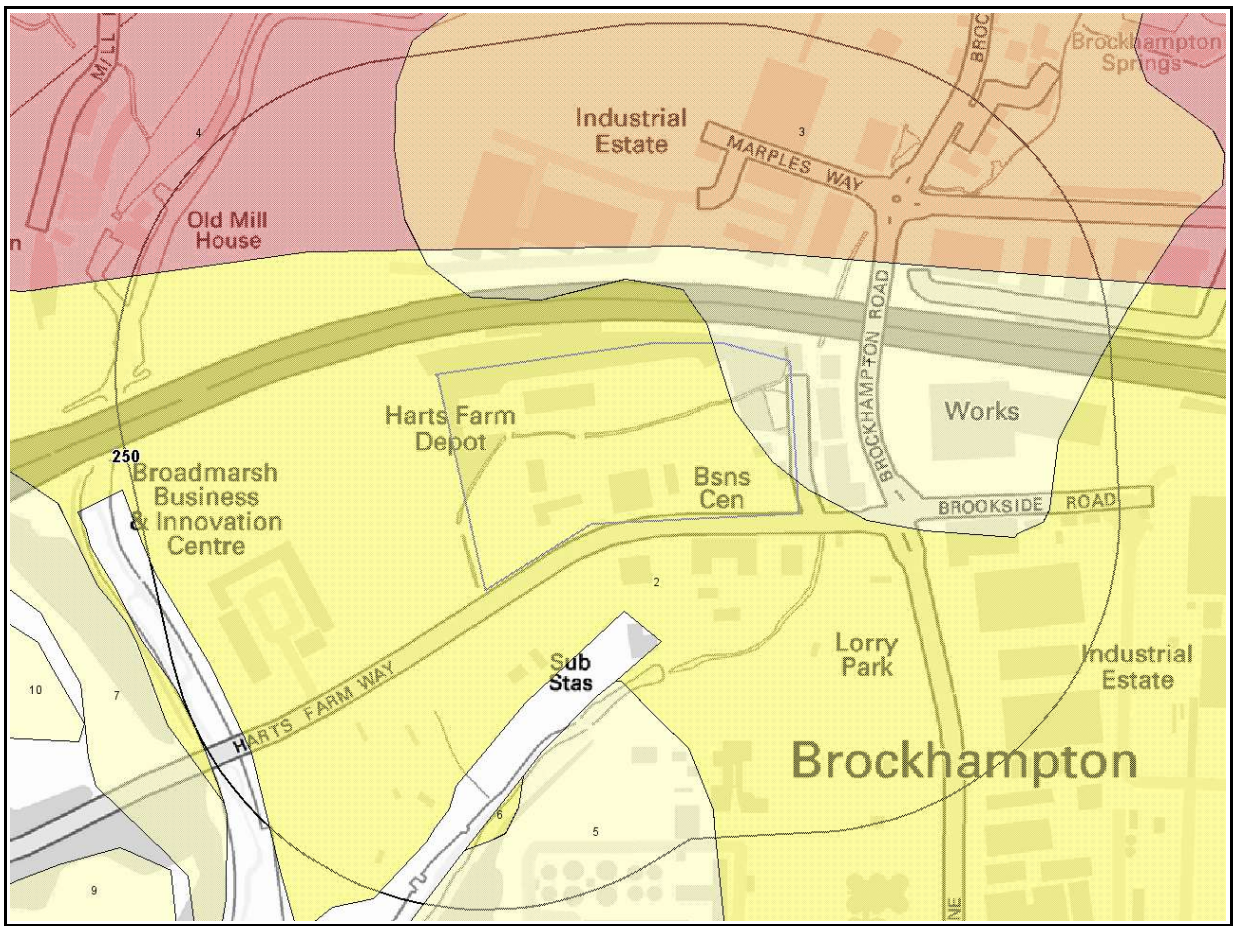
Landslides Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



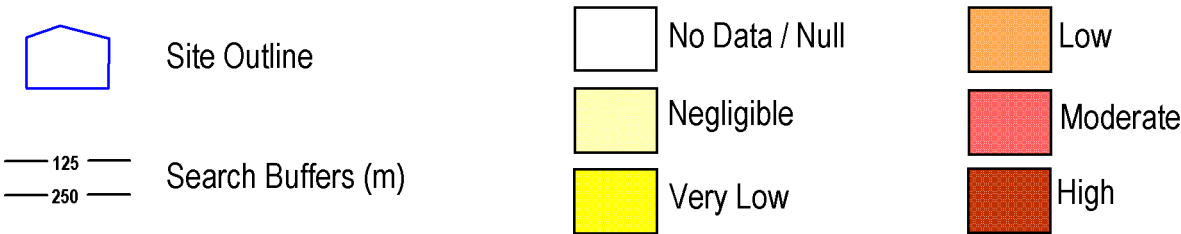
4.3 Ground Dissolution Soluble Rocks Map



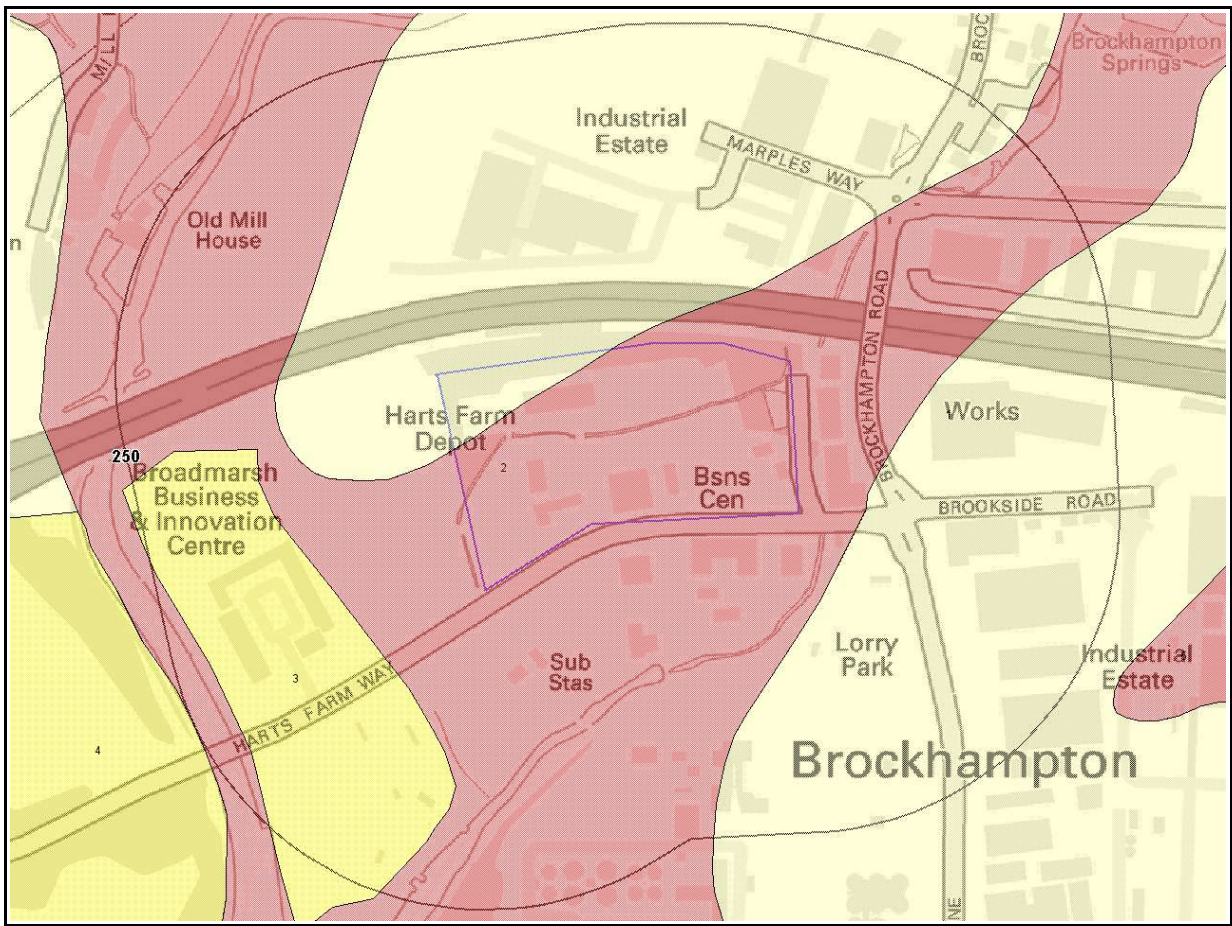
Ground Dissolution Soluble Rocks
Legend



© Crown copyright and database
rights 2013. Ordnance Survey
license 100035207.



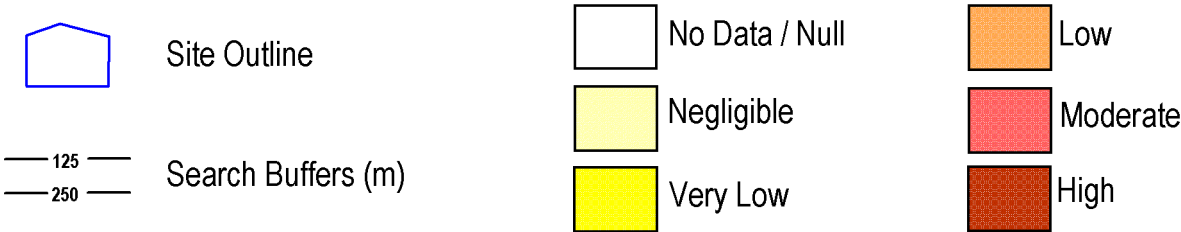
4.4 Compressible Deposits Map



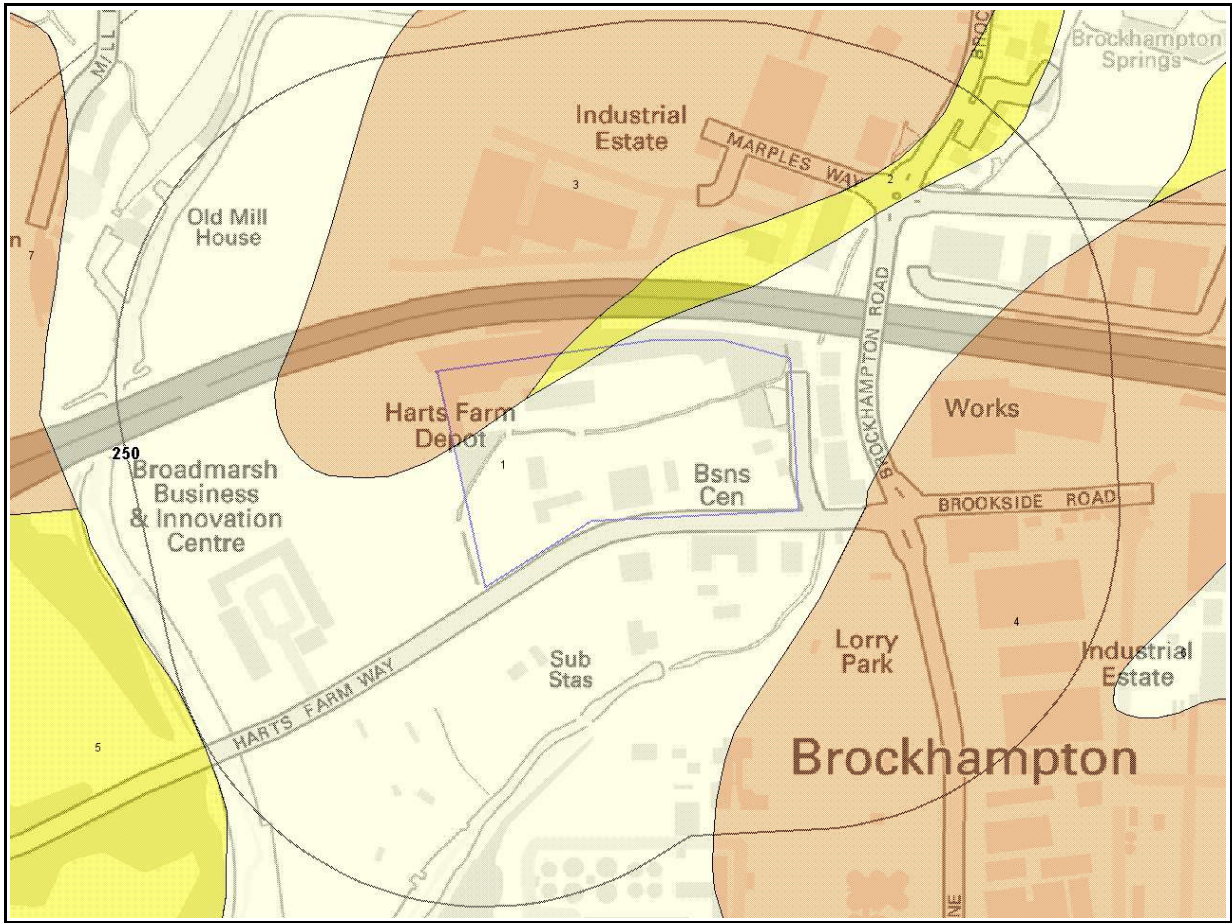
Compressible Deposits Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



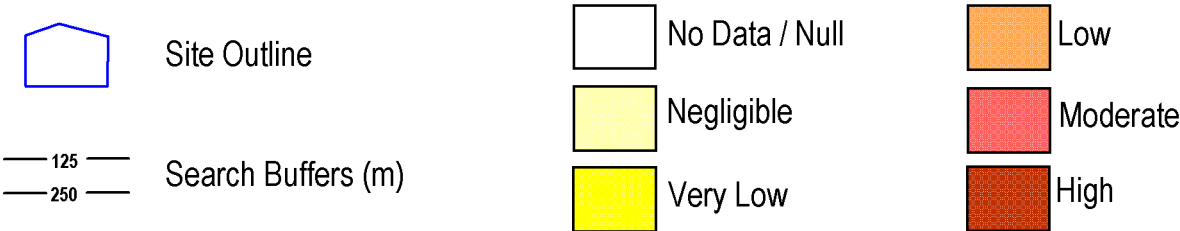
4.5 Collapsible Deposits Map



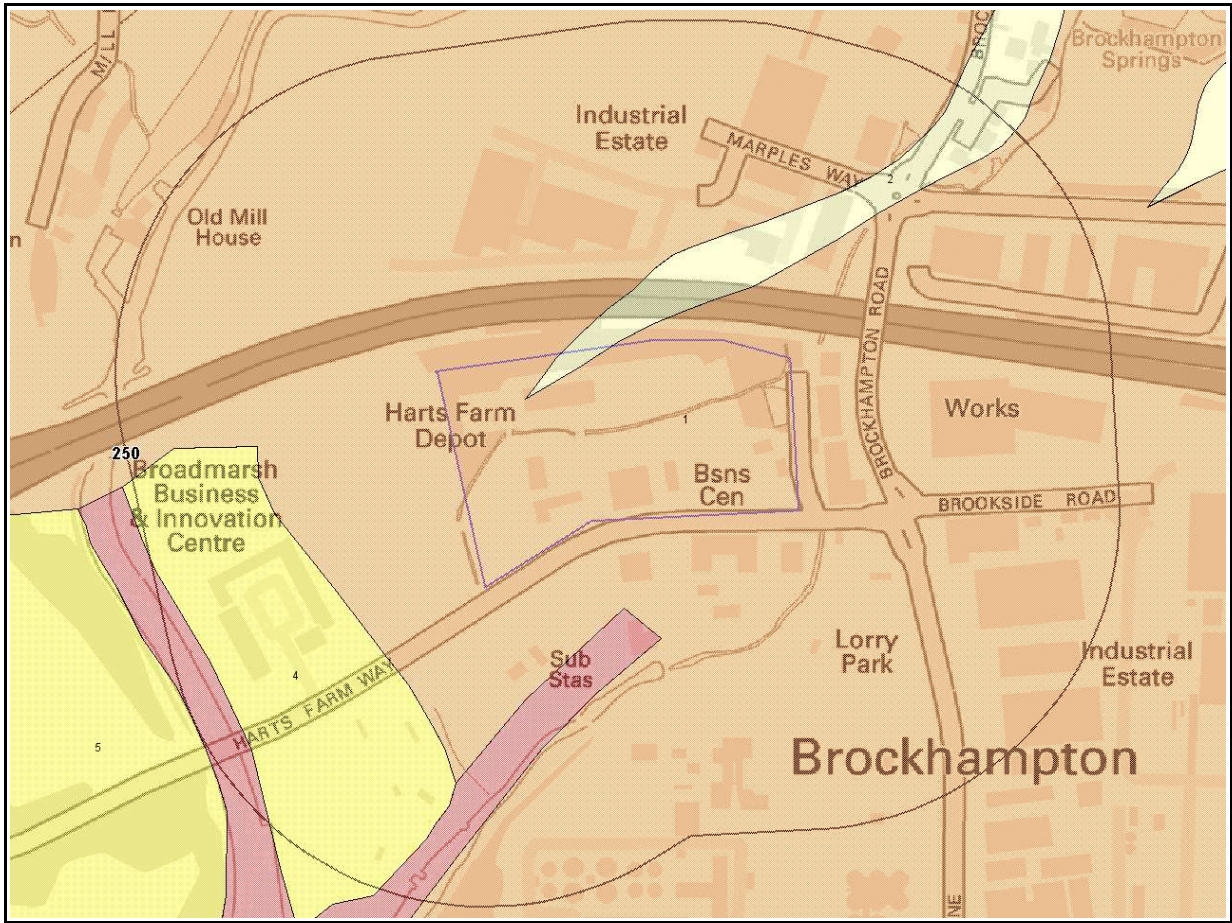
Collapsible Deposits Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



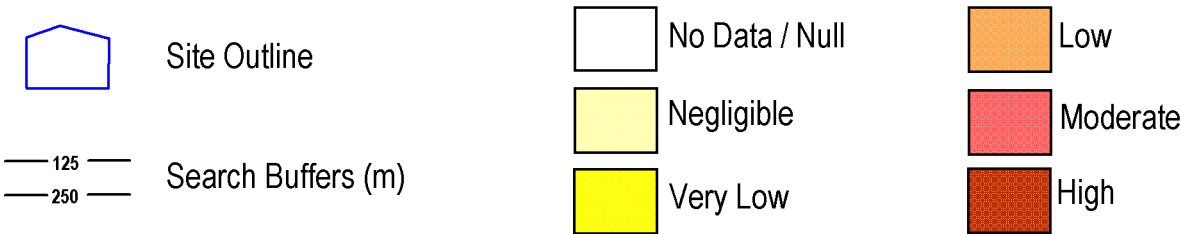
4.6 Running Sand Map



Running Sand Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



4. Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary? **Moderate**

4.1 Shrink – Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m) *	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.
2	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
3	45.0	SE	Low	Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

4.3 Ground Dissolution of Soluble Rocks

The following Soluble Rocks information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
----	---------------	-----------	---------------	---------

*This includes an automatically generated 50m buffer zone around the study site boundary.

1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.
2	0.0	On Site	Very Low	Significant soluble rocks are present. Problems unlikely except with considerable surface or subsurface water flow. No special actions required to avoid problems due to soluble rocks. No special ground investigation required or increased construction costs are likely. An increase in financial risk due to potential problems with soluble rocks is unlikely.

4.4 Compressible Deposits

The following Compressible Ground information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
2	0.0	On Site	Moderate	Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property - possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

4.5 Collapsible Deposits

The following Collapsible Rocks information is provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
3	0.0	On Site	Low	Slight possibility for collapsible deposit problems after major changes in loading or groundwater conditions. Normal maintenance to avoid large amounts of water entering the ground through pipe leakage or soak-aways should reduce the likelihood of problems due to collapsible deposits. For new build, assess the possibility of collapsible (loessic) deposits in ground investigation. For existing property, no significant increase in insurance risk from collapsible deposits is likely.
4	45.0	SE	Low	Slight possibility for collapsible deposit problems after major changes in loading or groundwater conditions. Normal maintenance to avoid large amounts of water entering the ground through pipe leakage or soak-aways should reduce the likelihood of problems due to collapsible deposits. For new build, assess the possibility of collapsible (loessic) deposits in ground investigation. For existing property, no significant increase in insurance risk from collapsible deposits is likely.

4.6 Running Sands

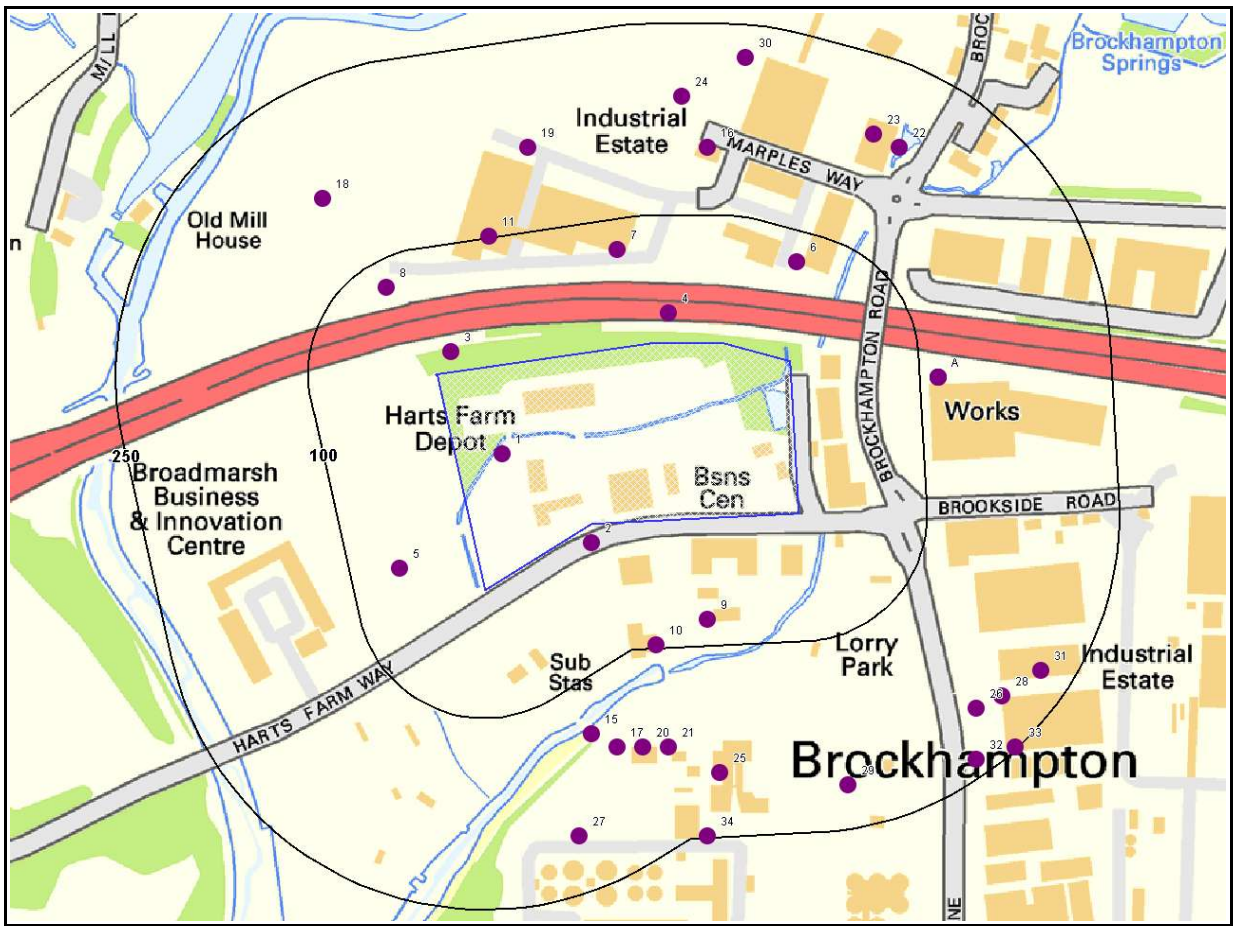
The following Running Sands information is provided by the British Geological Survey:

Report Reference: [EMS-207470_272851](#)

If you would like any further assistance regarding this report then please contact emapsite on (T) 0118 9736883, (F) 0118 9730002 or email: sales@emapsite.com

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property no significant increase in insurance risk due to running sand problems is likely.
2	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

5. Borehole Records Map



Borehole Records Legend



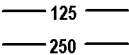
© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



Site Outline



Borehole Locations



Search Buffers (m)

5. Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

34

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length (m)	Borehole Name
1	0.0	On Site	470610,105890	SU70NW98	4.57	CROOKHORN FARM BH85
2	13.0	SE	470680,105820	SU70NW99	4.57	CROOKHORN FARM BH86
3	16.0	N	470570,105970	SU70NW97	6.1	CROOKHORN FARM BH84
4	23.0	N	470740,106000	SU70NW79	4.57	BARNCROFT WAY-BUDDS FARM SEWER BH111
5	62.0	W	470530,105800	SU70NW101	21.8	INCINERATION PLANT BROCKHAMPTON.
6	76.0	N	470840,106040	SU70NW148	11.0	BROCKHAMPTON ROAD DEVELOPMENT BH5
7	76.0	N	470700,106050	SU70NW146	7.5	BROCKHAMPTON ROAD DEVELOPMENT BH3
8	78.0	NW	470520,106020	SU70NW96	6.1	CROOKHORN FARM BH83
9	79.0	S	470770,105760	SU70NW80	4.57	BARNCROFT WAY-BUDDS FARM SEWER BH112
10	97.0	S	470730,105740	SU70NW100	4.57	CROOKHORN FARM BH87
11	101.0	N	470600,106060	SU70NW144	20.0	BROCKHAMPTON ROAD DEVELOPMENT BH1
12A	114.0	E	470950,105950	SU70NW252	8.23	HAVANT BY-PASS NO 7
13A	114.0	E	470950,105950	SU70NW251	15.24	HAVANT BY-PASS NO 6
14A	114.0	E	470950,105950	SU70NW250	9.14	HAVANT BY-PASS NO 5
15	140.0	SE	470680,105670	SU70NW377	20.0	BUDDS FARM STW HAVANT - PROPOSED STORM WATER TANK 201
16	153.0	N	470770,106130	SU70NW147	12.5	BROCKHAMPTON ROAD DEVELOPMENT BH4
17	159.0	SE	470700,105660	SU70NW82	19.0	BARNCROFT WAY-BUDDS FARM SEWER BH114
18	164.0	NW	470470,106090	SU70NW95	4.57	CROOKHORN FARM BH82
19	166.0	N	470630,106130	SU70NW145	11.5	BROCKHAMPTON ROAD DEVELOPMENT BH2
20	170.0	SE	470720,105660	SU70NW81	19.0	BARNCROFT WAY-BUDDS FARM SEWER BH113
21	178.0	S	470740,105660	SU70NW346	9.14	HAVANT SEWERAGE WORKS 1
22	187.0	NE	470920,106130	SU70NW151	11.0	BROCKHAMPTON ROAD DEVELOPMENT BH8
23	189.0	N	470900,106140	SU70NW149	20.0	BROCKHAMPTON ROAD DEVELOPMENT BH6
24	193.0	N	470750,106170	SU70NW78	6.7	BARNCROFT WAY-BUDDS FARM SEWER BH110
25	200.0	S	470780,105640	SU70NW347	4.57	HAVANT SEWERAGE WORKS 2
26	206.0	SE	470980,105690	SU70NW375	3.0	IBM SITE SOUTHMOOR LANE HAVANT TP4
27	206.0	S	470670,105590	SU70NW357	4.57	HAVANT SEWERAGE WORKS 12
28	213.0	SE	471000,105700	SU70NW371	25.0	IBM SITE SOUTHMOOR LANE HAVANT 2
29	216.0	S	470880,105630	SU70NW1	5.18	HAYLING ISLAND MAIN DRAIN BH1
30	224.0	N	470800,106200	SU70NW150	12.5	BROCKHAMPTON ROAD DEVELOPMENT BH7
31	225.0	SE	471030,105720	SU70NW103	3.04	LANTRAX LTD
32	237.0	SE	470980,105650	SU70NW376	2.1	IBM SITE SOUTHMOOR LANE HAVANT TP5

Report Reference: [EMS-207470_272851](#)

If you would like any further assistance regarding this report then please contact emapsite on (T) 0118 9736883, (F) 0118 9730002 or email: sales@emapsite.com

33	248.0	SE	471010,10 5660	SU70NW374	2.1	IBM SITE SOUTHMOOR LANE HAVANT TP3
34	249.0	S	470770,10 5590	SU70NW232	10.55	BUDDS FARM WTW 1

Additional online information is available for the following boreholes listed above:

#1: http://scans.bgs.ac.uk/sobi_scans/boreholes/425480
 #2: http://scans.bgs.ac.uk/sobi_scans/boreholes/425481
 #3: http://scans.bgs.ac.uk/sobi_scans/boreholes/425479
 #4: http://scans.bgs.ac.uk/sobi_scans/boreholes/425461
 #5: http://scans.bgs.ac.uk/sobi_scans/boreholes/425483
 #6: http://scans.bgs.ac.uk/sobi_scans/boreholes/425530
 #7: http://scans.bgs.ac.uk/sobi_scans/boreholes/425528
 #8: http://scans.bgs.ac.uk/sobi_scans/boreholes/425478
 #9: http://scans.bgs.ac.uk/sobi_scans/boreholes/425462
 #10: http://scans.bgs.ac.uk/sobi_scans/boreholes/425482
 #11: http://scans.bgs.ac.uk/sobi_scans/boreholes/425526
 #12A: http://scans.bgs.ac.uk/sobi_scans/boreholes/425634
 #13A: http://scans.bgs.ac.uk/sobi_scans/boreholes/425633
 #14A: http://scans.bgs.ac.uk/sobi_scans/boreholes/425632
 #15: http://scans.bgs.ac.uk/sobi_scans/boreholes/17584988
 #16: http://scans.bgs.ac.uk/sobi_scans/boreholes/425529
 #17: http://scans.bgs.ac.uk/sobi_scans/boreholes/425464
 #18: http://scans.bgs.ac.uk/sobi_scans/boreholes/425477
 #19: http://scans.bgs.ac.uk/sobi_scans/boreholes/425527
 #20: http://scans.bgs.ac.uk/sobi_scans/boreholes/425463
 #21: http://scans.bgs.ac.uk/sobi_scans/boreholes/16024606
 #22: http://scans.bgs.ac.uk/sobi_scans/boreholes/425533
 #23: http://scans.bgs.ac.uk/sobi_scans/boreholes/425531
 #24: http://scans.bgs.ac.uk/sobi_scans/boreholes/425460
 #25: http://scans.bgs.ac.uk/sobi_scans/boreholes/16024609
 #26: http://scans.bgs.ac.uk/sobi_scans/boreholes/17566431
 #27: http://scans.bgs.ac.uk/sobi_scans/boreholes/16024619
 #28: http://scans.bgs.ac.uk/sobi_scans/boreholes/17566427
 #29: http://scans.bgs.ac.uk/sobi_scans/boreholes/425383
 #30: http://scans.bgs.ac.uk/sobi_scans/boreholes/425532
 #31: http://scans.bgs.ac.uk/sobi_scans/boreholes/425485
 #32: http://scans.bgs.ac.uk/sobi_scans/boreholes/17566432
 #33: http://scans.bgs.ac.uk/sobi_scans/boreholes/17566430
 #34: http://scans.bgs.ac.uk/sobi_scans/boreholes/425614

6. Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

7

For further information on how this data is calculated and limitations upon its use, please see the GroundSure GeoInsight User Guide, available on request.

Estimated Geometric Mean Soil Concentrations (mg/kg)							
Distance (m)*	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
23.0	N	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
23.0	N	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
28.0	N	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
45.0	SE	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

7. Contacts

EmapSite

Telephone: 0118 9736883
sales@emapsite.com



British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143. Fax: 0115 936 3276.
Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk
BGS Geological Hazards Reports and general geological enquiries



British Gypsum

British Gypsum Ltd, East Leake, Loughborough, Leicestershire, LE12 6HX
Tel: www.british-gypsum.com



The Coal Authority

200 Lichfield Lane, Mansfield, Notts NG18 4RG
Tel: 0845 762 6848
DX 716176 Mansfield 5 www.coal.gov.uk



Johnson Poole & Bloomer Limited

Harris and Pearson Building, Brettel Lane, Brierley Hill, West Midlands DY5 3LH
Tel: +44 (0) 1384 262 000
Email: enquiries.gs@jpb.co.uk
Website: www.jpb.co.uk



Ordnance Survey

Romsey Road, Southampton SO16 4GU
Tel: 08456 050505



Getmapping PLC

Virginia Villas, High Street, Hartley Witney, Hampshire RG27 8NW
Tel: 01252 845444



Peter Brett Associates

Caversham Bridge House, Waterman Place, Reading Berkshire RG1 8DN
Tel: +44 (0)118 950 0761 E-mail: reading@pba.co.uk



Acknowledgements

PointX © Database Right/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028].

This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

1 Definitions

In these terms and conditions unless the context otherwise requires:

"Beneficiary" means the person or entity for whose benefit the Client has obtained the Services.

"Client" means the party or parties entering into a Contract with GroundSure.

"Commercial" means any building or property which is not Residential.

"Confidential Information" means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than (i) information which the Client can prove was rightfully in its possession prior to disclosure by GroundSure and (ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

"Support Services" means Support Services provided by GroundSure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Contract" means the contract between GroundSure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

"Third Party Data Provider" means any third party providing Third Party Content to GroundSure.

"Data Reports" means reports comprising factual data with no accompanying interpretation.

"Fees" has the meaning set out in clause 5.1.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028.

"GroundSure Materials" means all materials prepared by GroundSure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

"Intellectual Property" means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trademark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

"Mapping" means a map, map data or a combination of historical maps of various ages, time periods and scales.

"Order" means an electronic, written or other order form submitted by the Client requesting Services from GroundSure in respect of a specified Site.

"Ordnance Survey" means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

"Order Website" means the online platform through which Orders may be placed by the Client and accepted by GroundSure.

"Report" means a Risk Screening Report or Data Report for Commercial or Residential property.

"Residential" means any building or property used as or intended to be used as a single dwelling.

"Risk Screening Report" means a risk screening report comprising factual data with an accompanying interpretation by GroundSure.

"Services" means any Report, Mapping and/or Support Services which GroundSure has agreed to provide by accepting an Order pursuant to clause 2.6.

"Site" means the area of land in respect of which the Client has requested GroundSure to provide the Services.

"Third Party Content" means data, database information or other information which is provided to GroundSure by a Third Party Data Provider.

"User Guide" means the user guide, as amended from time to time, available upon request from GroundSure and on the website (www.groundsure.com) and forming part of this Contract.

2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 GroundSure agrees to provide the Services in accordance with the Contract.

2.2 GroundSure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. In addition you acknowledge and agree that GroundSure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 GroundSure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by GroundSure. GroundSure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by GroundSure. GroundSure's acceptance of an Order shall be binding only when made in writing and signed by GroundSure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and (i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and (ii) be liable to GroundSure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to GroundSure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as GroundSure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable GroundSure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the GroundSure Materials, or use the GroundSure Materials in a manner for which they were not intended. The Client may make the GroundSure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that GroundSure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1 The Client acknowledges that the Services provided by GroundSure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by GroundSure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents; (i) the Beneficiary, (ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate), (iv) the first purchaser or first tenant of the Site, and (v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by GroundSure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1 GroundSure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by GroundSure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to GroundSure in full without deduction, counterclaim or set off within 30 days of the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of GroundSure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to (i) full payment of all relevant Fees and (ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the GroundSure Materials.

6.2 All Intellectual Property in the GroundSure Materials are and shall remain owned by GroundSure or GroundSure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the GroundSure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this

clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's *OS Street Map*) without first being in possession of a valid *Paper Map Copying Licence* from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the GroundSure Materials in order to advise the Beneficiary in a professional capacity. However, GroundSure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

7. Liability – Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of GroundSure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by GroundSure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 GroundSure shall not be liable for (i) loss of profits; (ii) loss of business; (iii) depletion of goodwill and/or similar losses; (iv) loss of anticipated savings; (v) loss of goods; (vi) loss of contract; (vii) loss of use; (viii) loss or corruption of data or information; (ix) business interruption; (x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses; (xi) loss or damage that arise as a result of the use of all or part of the GroundSure Materials in breach of the Contract; (xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content; (xiii) loss or damage to a computer, software, modem, telephone or other property; and (xiv) loss or damage caused by a delay or loss of use of GroundSure's internet ordering service.

7.5 GroundSure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 GroundSure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of GroundSure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against GroundSure in relation to the Services or other matters arising pursuant to the Contract.

8 GroundSure's right to suspend or terminate

8.1 If GroundSure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, GroundSure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 GroundSure shall be entitled to terminate the Contract immediately on written notice in the event that:

- (i) the Client fails to pay any sum due to GroundSure within 30 days of the Payment Date; or
- (ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or
- (iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or
- (iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9 Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

- (i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon GroundSure's acceptance of the Order; and (ii) the Reports and/or Mapping provided under this Contract are (i) supplied to the Client's specification(s) and in any event (ii) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

- (i) GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in GroundSure's possession or control; and
- (ii) the Client shall pay to GroundSure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

- (i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;
- (ii) comply with such of GroundSure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and
- (iii) promptly report to GroundSure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through GroundSure.

12.3 GroundSure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of GroundSure.

12.4 No failure on the part of GroundSure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

- (i) the Client or Beneficiary's failure to provide facilities, access or information;
- (ii) fire, storm, flood, tempest or epidemic;
- (iii) Acts of God or the public enemy;
- (iv) riot, civil commotion or war;
- (v) strikes, labour disputes or industrial action;
- (vi) acts or regulations of any governmental or other agency;
- (vii) suspension or delay of services at public registries by Third Party Data Providers;
- (viii) changes in law; or
- (ix) any other reason beyond GroundSure's reasonable control.

In the event that GroundSure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then GroundSure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 GroundSure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the *Search Code* administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the *Search Code*.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at GroundSure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law.

GroundSure EnviroInsight

Address: Former Council Depot, Harts Farm Way, Havant, PO9 1HU,

Date: 3 Jun 2013

GroundSure Reference: EMS-207470_272852

Your Reference: EMS_207470_272852

Client: EmapSite



Brought to you by emapsite

emapsite™

Aerial Photograph of Study Site



Aerial photography supplied by Getmapping PLC.
© Copyright Getmapping PLC 2003. All Rights Reserved.

Site Name: Former Council Depot, Harts Farm
Way, Havant, PO9 1HU,
Grid Reference: 470701, 105898
Size of Site: 3.74 ha

Report Reference: [EMS-207470_272852](#)

If you would like any further assistance regarding this report then please contact emapsite on (T) 0118 9736883, (F) 0118 9730002 or email: sales@emapsite.com

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) m of the study site boundary					
1. Environmental Permits, Incidents and Registers	on-site	0-50	51-250	251-500	501-1000	1000-1500
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations						
Records of historic IPC Authorisations	0	0	3	0	-	-
Records of Part A(1) and IPPC Authorised Activities	0	0	0	4	-	-
Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0	-	-
Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	1	0	-	-
Records of List 1 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of List 2 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of Part A(2) and Part B Activities and Enforcements	0	0	2	1	-	-
Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	4	2	-	-
Records of Licensed Discharge Consents	1	8	18	11	-	-
Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0		
1.2 Records of COMAH and NIHHS sites	0	0	0	0	-	-
1.3 Environment Agency Recorded Pollution Incidents						
National Incidents Recording System, List 2	0	0	11	-	-	-
National Incidents Recording System, List 1	0	0	0	-	-	-
1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990	0	0	0	0	-	-
2. Landfill and Other Waste Sites	on-site	0-50	51-250	251-500	501-1000	1000-1500
2.1 Landfill Sites						
Environment Agency Registered Landfill Sites	0	0	0	1	0	-
Landfill Data – Operational Landfill Sites	0	0	0	1	0	-
Environment Agency Historic Landfill Sites	0	0	1	1	0	1
Landfill Data – Non-Operational Landfill Sites	0	0	0	1	0	-
BGS/DoE Landfill Site Survey	0	0	0	0	1	0
GroundSure Local Authority Landfill Sites Data	0	0	0	0	0	0
2.2 Landfill and Other Waste Sites Findings						
Operational Waste Treatment, Transfer and Disposal Sites	0	0	3	1	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	1	1	1	-	-
Environment Agency Licensed Waste Sites	0	6	11	7	0	1

Report Reference: [EMS-207470_272852](#)

If you would like any further assistance regarding this report then please contact emapsite on (T) 0118 9736883, (F) 0118 9730002 or email: sales@emapsite.com

3. Current Land Uses	on-site	0-50	51-250	251-500	501-1000	1000-1500
3.1 Current Industrial Sites Data	0	11	35	-	-	-
3.2 Records of Petrol and Fuel Sites	0	0	1	1	-	-
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0	-	-

4. Geology	Description
4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site? *	No
4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site? *	Yes
4.3 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
Source: Scale: 1:50,000 BGS Sheet 316	

* This includes an automatically generated 50m buffer zone around the site.

5. Hydrogeology and Hydrology	on-site	0-50	51-250	251-500	501-1000	1001-2000
5.1 Are there any records of Productive Strata in the Superficial Geology within 500m of the study site?				Yes		
5.2 Are there any records of Productive Strata in the Bedrock Geology within 500m of the study site?				Yes		
5.3 Groundwater Abstraction Licences (within 2000m of the study site).	0	0	0	3	0	0
5.4 Surface Water Abstraction Licences (within 2000m of the study site).	0	0	0	0	0	0
5.5 Potable Water Abstraction Licences (within 2000m of the study site).	0	0	0	3	0	0
5.6 Are there any Source Protection Zones within 500m of the study site?					Yes	
5.7 River Quality						
Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	Yes	Yes	No
5.8 Detailed River Network entries within 500m of the site	2	4	14	15	-	-
5.9 Surface water features within 250m of the study site	Yes	No	Yes	-	-	-

6. Flooding	
6.1 Are there any Environment Agency indicative Zone 2 floodplains within 250m of the study site?	Yes
6.2 Are there any Environment Agency indicative Zone 3 floodplains within 250m of the study site?	Yes
6.3 Are there any Flood Defences within 250m of the study site?	No
6.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	Yes
6.5 Are there any areas used for Flood Storage within 250m of the study site?	No
6.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Very High
6.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	High

7. Designated Environmentally Sensitive Sites	on-site	0-50	51-250	251-500	501-1000	1001-2000
7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	1	1	2
7.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0

7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	1	1	2
7.3 Records of Local Nature Reserves (LNR)	0	0	0	0	0	3
7.4 Records of Special Areas of Conservation (SAC)	0	0	0	1	1	1
7.5 Records of Special Protection Areas (SPA)	0	0	0	1	1	2
7.6 Records of Ramsar sites	0	0	0	1	1	2
7.7 Records of World Heritage Sites	0	0	0	0	0	0
7.8 Records of Environmentally Sensitive Areas	0	0	0	0	0	0
7.9 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	1
7.10 Records of National Parks	0	0	0	0	0	0
7.11 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
7.12 Records of Nitrate Vulnerable Zones	1	0	0	0	1	1
7.13 Records of Ancient Woodlands	0	0	0	0	0	4

8. Natural Hazards

8.1 What is the maximum risk of natural ground subsidence? Moderate

9. Mining

9.1 Are there any coal mining areas within 75m of the study site? No

9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site? Negligible

9.3 Are there any brine affected areas within 75m of the study site? No

Using this Report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between GroundSure and the Client. The document contains the following sections:

1. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

2. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

3. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure underground oil and gas pipelines.

4. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

5. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

6. Flooding

Provides information on surface water flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

7. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

8. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence.

9. Mining

Provides information on areas of coal and shallow mining.

10. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, GroundSure provide a free Technical Helpline (08444 159000) for further information and guidance.

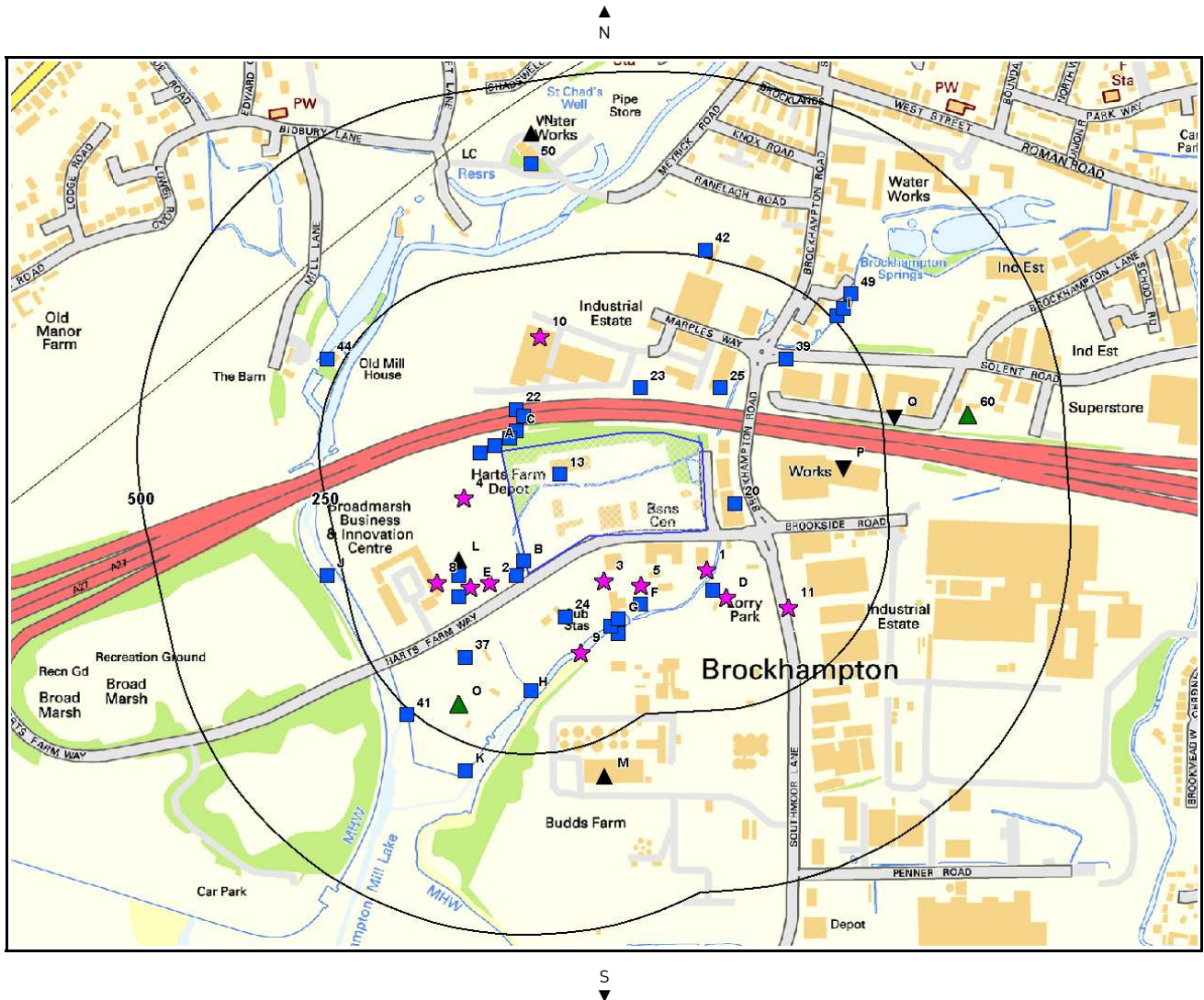
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Environmental Permits, Incidents and Registers Map



Authorisations, Incidents and Registers Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.

	Site Outline		Recorded Pollution Incident		RAS 3 & 4 Authorisations
	Search Buffers (m)		Dangerous Substances (List 1)		Part A(1) Authorised Processes and Historic IPC Authorisations
			Dangerous Substances (List 2)		Part A(2) and Part B Authorised Processes
			Water Industry Referrals		COMAH / NIHHS Sites
			Licensed Discharge Consents		Sites Determined as Contaminated Land
			Red List Discharge Consents		Hazardous Substance Consents and Enforcements

1.Environmental Permits, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

Records of historic IPC Authorisations within 500m of the study site:

3

The following IPC Authorisations are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details
71L	91.0	W	470500, 105800	Operator: Onyx Hampshire Ltd Address: Brockhampton Incinerator, Harts Farm Way, Havant, Hampshire, PO9 1JN Process: Incineration Permit Number: AG8276 Original Permit Number: IPCAIRAPP Date Approved: 13-5-1993 Effective Date: 13-5-1993 Status: Superseded By Variation
72L	91.0	W	470500, 105800	Operator: Onyx Hampshire Ltd Address: Brockhampton Incinerator, Harts Farm Way, Havant, Hampshire, PO9 1JN Process: Incineration Permit Number: AY3199 Original Permit Number: IPCMINVAR Date Approved: 9-4-1997 Effective Date: 14-4-1997 Status: Revoked
73L	91.0	W	470500, 105800	Operator: Onyx Hampshire Ltd Address: Brockhampton Incinerator, Harts Farm Way, Havant, Hampshire, PO9 1JN Process: Incineration Permit Number: AR5260 Original Permit Number: IPCMINVAR Date Approved: 31-5-1995 Effective Date: 1-6-1995 Status: Superseded By Variation

Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

4

The following Part A(1) and IPPC Authorised Activities are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details
67M	301.0	S	470700, 105500	Operator: Southern Water Services Ltd Installation Name: Budds Farm Wastewater Treatment Works Combined Heat And Power Plant Process: ASSOCIATED PROCESS Permit Number: ZP3235XJ Original Permit Number: ZP3235XJ EPR Reference: - Issue Date: 15/10/2008 Effective Date: 15/10/2008 Last date noted as effective: 2013-01-23 Status: Effective
68M	301.0	S	470700, 105500	Operator: Southern Water Services Ltd Installation Name: Budds Farm Wastewater Treatment Works Combined Heat And Power Plant Process: COMBUSTION; WASTE DERIVED FUEL =>3MW BUT <50MW Permit Number: ZP3235XJ Original Permit Number: ZP3235XJ EPR Reference: - Issue Date: 15/10/2008 Effective Date: 15/10/2008 Last date noted as effective: 2013-01-23 Status: Effective
69N	427.0	N	470600, 106390	Operator: Portsmouth Water Ltd Installation Name: Bedhampton Landfill Process: WASTE LANDFILLING; ANY OTHER LANDFILL TO WHICH THE 2002 LANDFILL REGULATIONS APPLY Permit Number: BP3635UL Original Permit Number: NP3439PN EPR Reference: - Issue Date: 6/9/2007 Effective Date: 31/3/2008 Last date noted as effective: 2009-04-01 Status: Revoked

70N	427.0	N	470600, 106390	Operator: Portsmouth Water Ltd Installation Name: Bedhampton Landfill Process: WASTE LANDFILLING; ANY OTHER LANDFILL TO WHICH THE 2002 LANDFILL REGULATIONS APPLY	Permit Number: NP3439PN Original Permit Number: NP3439PN EPR Reference: - Issue Date: 21/4/2005 Effective Date: 21/4/2005 Last date noted as effective: 2013- 01-23 Status: Superseded
-----	-------	---	-------------------	---	---

Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: 0

Database searched and no data found.

Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site: 1

The following Red List Discharge Consent records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details
12H	163.0	S	470600. 0,10562 0.0	Address: Southern Water Services Ltd, Budds Farm Wtw, Budds Farm Wtw, Southmoor Lane, Havant, Hants Permit Number: A00915 Permit Version: 1.0 Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Discharge Type: Sewage Disposal Works - water company Effluent Type: Groundwater - Unspecified Catchment: - Approval Date: 28/10/1999

Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: 3

The following Part A(2) and Part B Activities are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details
580	207.0	SW	470500, 105600	Address: Arc South Harts Fm Way, Havant Process: Concrete & Crushing Process Status: Unknown Permit Type: Part B Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.
590	207.0	SW	470500, 105600	Address: Pioneer Concrete Bedhampton Quay, Harts Fm Way, havant Process: Concrete & Crushing Process Status: Unknown Permit Type: Part B Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.
60	367.0	E	471200, 106000	Address: Tesco Solent Rd, Po9 5ah Process: Petrol Vapour Recovery Process Status: Unknown Permit Type: Part B Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.

Report Reference: EMS-207470_272852

Records of Category 3 or 4 Radioactive Substance Licences within 500m of the study site:

6

The following RAS Licence (3 or 4) records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance [m]	Direction	Address	Operator	Type	Permission Number	Dates	Status
74P	193.0	E	Apollo Fire Detectors Ltd, 36 Brookside Road, Havant, PO9 1JR	Apollo Fire Detector s Ltd	Disposal Of Radioactive Waste (was Rsa60 Section 6).	AW6707	Date of Approval:23/1/2001 Effective from:23/1/2001 Last date of update:2013-01-23	Superseded By Variation
75P	193.0	E	Apollo Fire Detectors Ltd, 36 Brookside Road, Havant, PO9 1JR	Apollo Fire Detector s Ltd	Disposal Of Radioactive Waste (was Rsa60 Section 6).	AW6707	Date of Approval:5/6/2003 Effective from:7/7/2003 Last date of update:2013-01-23	Superseded By Variation
76P	193.0	E	Apollo Fire Detectors Ltd, 36 Brookside Road, Havant, PO9 1JR	Apollo Fire Detector s Ltd	Disposal Of Radioactive Waste (was Rsa60 Section 6).	AW6707	Date of Approval:4/8/2009 Effective from:1/9/2009 Last date of update:2013-01-23	Revoked/ cancelled
77P	193.0	E	Apollo Fire Detectors Ltd, 36 Brookside Road, Havant, PO9 1JR	Apollo Fire Detector s Ltd	Disposal Of Radioactive Waste (was Rsa60 Section 6).	AW6707	Date of Approval:10/10/1996 Effective from:14/10/1996 Last date of update:2013-01-23	Superseded By Variation
78Q	268.0	E	Apollo Fire Detectors Ltd, 6 Solent Road , , Havant, Hampshire, PO91 1JH	Apollo Fire Detector s Ltd	Disposal Of Radioactive Waste (was Rsa60 Section 6).	AC1385	Date of Approval:31/3/1991 Effective from:31/3/1991 Last date of update:2013-01-23	Revoked/ cancelled
79Q	268.0	E	Apollo Fire Detectors Ltd, 6 Solent Road, Havant, Hampshire, PO9 1JH	Apollo Fire Detector s Ltd	Disposal Of Radioactive Waste (was Rsa60 Section 6).	AC1369	Date of Approval:31/3/1991 Effective from:31/3/1991 Last date of update:2013-01-23	Revoked/ cancelled

Records of Licensed Discharge Consents within 500m of the study site:

38

The following Licensed Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details	
13	0.0	On Site	470640, 105920	Address: Brockhampton Incinerator, Brockhampton Incinerator, Harts Farm Way, Havant, Hampshire, PO9 1JN Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: AG8276 Permit Version: 1	Receiving Water: Freshwater River Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: 13/5/1993 Effective Date: 13/5/1993 Revocation Date: 6/3/1998
14B	3.0	W	470590, 105800	Address: Brockhampton Stream, Brockhampton Stream Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: H02821 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 12/4/1957 Effective Date: 12/4/1957 Revocation Date: 1/7/1991
15A	12.0	NW	470550, 105960	Address: High Technology Campus, High Technology Campus, Langstone Gate, Solent Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P00174 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 7/8/1985 Effective Date: 7/8/1985 Revocation Date: -
16A	16.0	N	470570, 105970	Address: High Technology Campus, High Technology Campus, Langstone Gate, Solent Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P00174 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 7/8/1985 Effective Date: 7/8/1985 Revocation Date: -
17B	17.0	W	470580, 105780	Address: Havant Incinerator, Havant Incinerator, Harts Farm Way, Havant, Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01273 Permit Version: 1	Receiving Water: Saline Estuary Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 5/1/1978 Effective Date: 5/1/1978 Revocation Date: 31/3/1997
18C	25.0	N	470580, 105980	Address: High Technology Campus, High Technology Campus, Langstone Gate, Solent Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P00174 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 7/8/1985 Effective Date: 7/8/1985 Revocation Date: -
19A	29.0	W	470530, 105950	Address: High Technology Campus, High Technology Campus, Langstone Gate, Solent Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P00174 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 7/8/1985 Effective Date: 7/8/1985 Revocation Date: -
20	40.0	E	470880, 105880	Address: Boshampton Lane, Boshampton Lane, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01265 Permit Version: 1	Receiving Water: Saline Estuary Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 5/5/1978 Effective Date: 5/5/1978 Revocation Date: -
21C	43.0	N	470590, 106000	Address: High Technology Campus, High Technology Campus, Langstone Gate, Solent Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P00174 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 7/8/1985 Effective Date: 7/8/1985 Revocation Date: -
22	54.0	N	470580, 106010	Address: High Technology Campus, High Technology Campus, Langstone Gate, Solent Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P00174 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 7/8/1985 Effective Date: 7/8/1985 Revocation Date: -

23	63.0	N	470750, 106040	Address: Kingscroft Court, Marples Way, Kingscroft Court, Marples Way, Havant, Hampshire, PO9 1LS Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P00398 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 20/2/1986 Effective Date: 20/2/1986 Revocation Date: -
24	77.0	SE	470647, 105723	Address: 132/133kv Substation, Harts Fm Way, Scottish & Southern Energy Ltd, Harts Farm Way, Havant, Hampshire, PO9 1JN Effluent Type: Trade Discharges - Site Drainage Permit Number: G00517 Permit Version: 1	Receiving Water: Groundwater Via Soakaway Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 14/6/2005 Effective Date: 14/6/2005 Revocation Date: -
25	81.0	N	470860, 106040	Address: Kingscroft Court, Marples Way, Kingscroft Court, Marples Way, Havant, Hampshire, PO9 1LS Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P00398 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 20/2/1986 Effective Date: 20/2/1986 Revocation Date: -
26D	83.0	S	470850, 105760	Address: Nursery Units @ Harts Farm Way, Nursery Units @ Harts Farm Way, (south Side), Brockhampton, Havant, Hampshire Effluent Type: Trade Discharges - Unspecified Permit Number: N01080 Permit Version: 1	Receiving Water: Saline Estuary Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: - Effective Date: - Revocation Date: -
27E	95.0	W	470500, 105780	Address: Havant Hw Recycling Centre, Havant Hw Recycling Centre, Harts Farm Way, Havant, Hampshire Effluent Type: Trade Discharges - Site Drainage Permit Number: P07333 Permit Version: 1	Receiving Water: Saline Estuary Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 12/9/2000 Effective Date: 12/9/2000 Revocation Date: -
28F	98.0	S	470750, 105740	Address: Lorry Park West Of Southmoor Lane, Lorry Park West Of Southmoor Lan, Havant Hampshire Effluent Type: Trade Discharges - Site Drainage Permit Number: P02498 Permit Version: 2	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 18/1/1996 Effective Date: 18/1/1996 Revocation Date: 31/3/1997
29F	98.0	S	470750, 105740	Address: Lorry Park West Of Southmoor Lane, Lorry Park West Of Southmoor Lan, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P02498 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 3/8/1989 Effective Date: 3/8/1989 Revocation Date: 18/1/1996
30F	98.0	S	470750, 105740	Address: Lorry Park West Of Southmoor Lane, Lorry Park West Of Southmoor Lan, Havant Hampshire Effluent Type: Trade Discharges - Site Drainage Permit Number: P07079R Permit Version: 1	Receiving Water: Freshwater River Status: Surrendered Under Epr 2010 Issue date: 13/5/1998 Effective Date: 13/5/1998 Revocation Date: 1/11/2010
31E	102.0	W	470500, 105750	Address: Old Havant Incinerator Site, Old Havant Incinerator Site, Harts Farm Way, Havant, Hampshire Effluent Type: Trade Discharges - Site Drainage Permit Number: P07788 Permit Version: 1	Receiving Water: Saline Estuary Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: - Effective Date: - Revocation Date: -
32G	117.0	S	470720, 105720	Address: Harts Farm Way, Harts Farm Way, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01222 Permit Version: 1	Receiving Water: Saline Estuary Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 30/1/1980 Effective Date: 30/1/1980 Revocation Date: 31/3/1997
33G	122.0	SE	470710, 105710	Address: Harts Farm Way, Harts Farm Way, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P00366 Permit Version: 1	Receiving Water: Freshwater River Status: Consent Revoked - Discharge Ceased (section 37(1)) Issue date: 24/2/1986 Effective Date: 24/2/1986 Revocation Date: 27/9/2005

34G	136.0	SE	470720, 105700	Address: Budds Farm Wwtw, Budds Farm Wwtw, Southmoor Lane, Havant, Hampshire, PO9 1JW Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: A00752 Permit Version: 1	Receiving Water: Brockhampton Creek Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 10/6/2002 Effective Date: 10/6/2002 Revocation Date: -
35G	136.0	SE	470720, 105700	Address: Budds Farm Wwtw, Budds Farm Wwtw, Southmoor Lane, Havant, Hampshire, PO9 1JW Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: A00752 Permit Version: 1	Receiving Water: Brockhampton Creek Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 10/6/2002 Effective Date: 10/6/2002 Revocation Date: -
36G	136.0	SE	470720, 105700	Address: Budds Farm Sewage Disposal Works, Budds Farm Sewage Disposal Works, Havant Hampshire Effluent Type: Sewage Discharges - Unspecified - Not Water Company Permit Number: H01182 Permit Version: 1	Receiving Water: Saline Estuary Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 10/4/1969 Effective Date: 10/4/1969 Revocation Date: 31/3/1997
37	145.0	SW	470510, 105667	Address: Bedhampton Quay, Harts Farm Way, Bedhampton Quay, Harts Farm Way, Havant, Hampshire, PO9 1JN Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: G01127 Permit Version: 1	Receiving Water: Groundwater Via Soakaway Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 2/4/2007 Effective Date: 2/4/2007 Revocation Date: -
38H	163.0	S	470600, 105620	Address: Budds Farm Wtw, Budds Farm Wtw, Southmoor Lane, Havant, Hampshire Effluent Type: Groundwater - Unspecified Permit Number: A00915 Permit Version: 1	Receiving Water: Saline Estuary Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: - Effective Date: - Revocation Date: 7/8/2003
39	164.0	NE	470950, 106080	Address: Manor Court, Manor Court, Brockhampton Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P02242 Permit Version: 1	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 31/7/1989 Effective Date: 31/7/1989 Revocation Date: 31/3/1997
40I	256.0	NE	471020, 106140	Address: Manor Court, Manor Court, Brockhampton Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P02242 Permit Version: 1	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 31/7/1989 Effective Date: 31/7/1989 Revocation Date: 31/3/1997
41	258.0	SW	470429, 105587	Address: Bedhampton Quay, Harts Farm Way, Bedhampton Quay, Harts Farm Way, Havant, Hampshire, PO9 1JN Effluent Type: Trade Discharges - Site Drainage Permit Number: G01141 Permit Version: 1	Receiving Water: Hermitage Stream Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 3/7/2007 Effective Date: 3/7/2007 Revocation Date: -
42	259.0	N	470840, 106230	Address: Seven Springs Ltd, Seven Springs Ltd, The Bottling Plant, Ranelagh Road, Bedhampton, HAVANT Effluent Type: Trade Discharges - Process Effluent - Not Water Company Permit Number: P07982 Permit Version: 1	Receiving Water: Freshwater River Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 2/6/2000 Effective Date: 2/6/2000 Revocation Date: -
43I	270.0	NE	471030, 106150	Address: Manor Court, Manor Court, Brockhampton Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P02242 Permit Version: 1	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 31/7/1989 Effective Date: 31/7/1989 Revocation Date: 31/3/1997
44	271.0	NW	470320, 106080	Address: The Old Mill House, The Old Mill House, Mill Lane, Bedhampton, Havant, Hampshire, PO9 3JH Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: D01551 Permit Version: 1	Receiving Water: Saline Estuary Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 2/7/1987 Effective Date: 2/7/1987 Revocation Date: 18/4/1996

45J	271.0	W	470320, 105780	Address: Land At Bedhampton Quay, Land At Bedhampton Quay, Harts Farm Way, Havant, Hampshire, PO9 1JN Effluent Type: Trade Discharges - Unspecified Permit Number: P03515 Permit Version: 2	Receiving Water: Saline Estuary Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 13/6/1997 Effective Date: 13/6/1997 Revocation Date: -
46J	271.0	W	470320, 105780	Address: Land At Bedhampton Quay, Land At Bedhampton Quay, Harts Farm Way, Havant, Hampshire, PO9 1JN Effluent Type: Trade Discharges - Unspecified Permit Number: P03515 Permit Version: 1	Receiving Water: Saline Estuary Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: 4/6/1991 Effective Date: 4/6/1991 Revocation Date: 13/6/1997
47K	287.0	S	470510, 105510	Address: Bedhampton Plant, Bedhampton Plant, Harts Farm Way, Havant, Hampshire Effluent Type: Trade Discharges - Process Effluent - Not Water Company Permit Number: P04007 Permit Version: 1	Receiving Water: Saline Estuary Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 28/1/1992 Effective Date: 28/1/1992 Revocation Date: 25/2/2009
48K	287.0	S	470510, 105510	Address: Bedhampton Quay, Harts Farm Way, Bedhampton Quay, Harts Farm Way, Havant, Hampshire, PO9 1JN Effluent Type: Trade Discharges - Mineral Workings Permit Number: P03532 Permit Version: 1	Receiving Water: Brockhampton Stream Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: 4/6/1991 Effective Date: 4/6/1991 Revocation Date: -
49	291.0	NE	471040, 106170	Address: Manor Court, Manor Court, Brockhampton Road, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P02242 Permit Version: 1	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 31/7/1989 Effective Date: 31/7/1989 Revocation Date: 31/3/1997
50	388.0	N	470600, 106350	Address: Park Lane, Park Lane, Bedhampton Hampshire Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: A00316 Permit Version: 1	Receiving Water: Freshwater River Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: 1/4/1991 Effective Date: 1/4/1991 Revocation Date: 14/1/1993

Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site: 0

Database searched and no data found.

1.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

1.3 Environment Agency Recorded Pollution Incidents

Records of National Incidents Recording System, List 2 within 250m of the study site: 11

The following NIRS List 2 records are represented as points on the Authorisations, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details
1	55.0	S	470841, 105788	Incident Date: 2/6/2003 Incident Identification: 162427 Pollutant: Oils and Fuel Pollutant Description: Unidentified Oil Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

2	55.0	W	470543, 105771	Incident Date: 9/10/2003 Incident Identification: 195271 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
3	63.0	SE	470699, 105773	Incident Date: 17/6/2003 Incident Identification: 166643 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Dust	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
4	65.0	W	470507, 105888	Incident Date: 26/6/2001 Incident Identification: 11663 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
5	71.0	S	470750, 105767	Incident Date: 20/6/2001 Incident Identification: 10323 Pollutant: Contaminated Water Pollutant Description: Firefighting Run-Off	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
6E	83.0	W	470516, 105764	Incident Date: 11/2/2002 Incident Identification: 57618 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Other General Biodegradable Material or Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
7D	96.0	S	470867, 105750	Incident Date: 18/8/2002 Incident Identification: 101187 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
8	127.0	W	470470, 105770	Incident Date: 17/6/2002 Incident Identification: 85478 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
9	131.0	SE	470668, 105673	Incident Date: 18/7/2001 Incident Identification: 17220 Pollutant: Sewage Materials Pollutant Description: Storm Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
10	149.0	N	470612, 106111	Incident Date: 12/9/2003 Incident Identification: 189281 Pollutant: Atmospheric Pollutants and Effects: Contaminated Water Pollutant Description: Smoke: Firefighting Run-Off	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
11	154.0	SE	470953, 105736	Incident Date: 13/7/2003 Incident Identification: 173189 Pollutant: Oils and Fuel Pollutant Description: Gas and Fuel Oils	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)

Records of National Incidents Recording System, List 1 within 250m of the study site:

0

Database searched and no data found.

1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site?

0

Database searched and no data found.

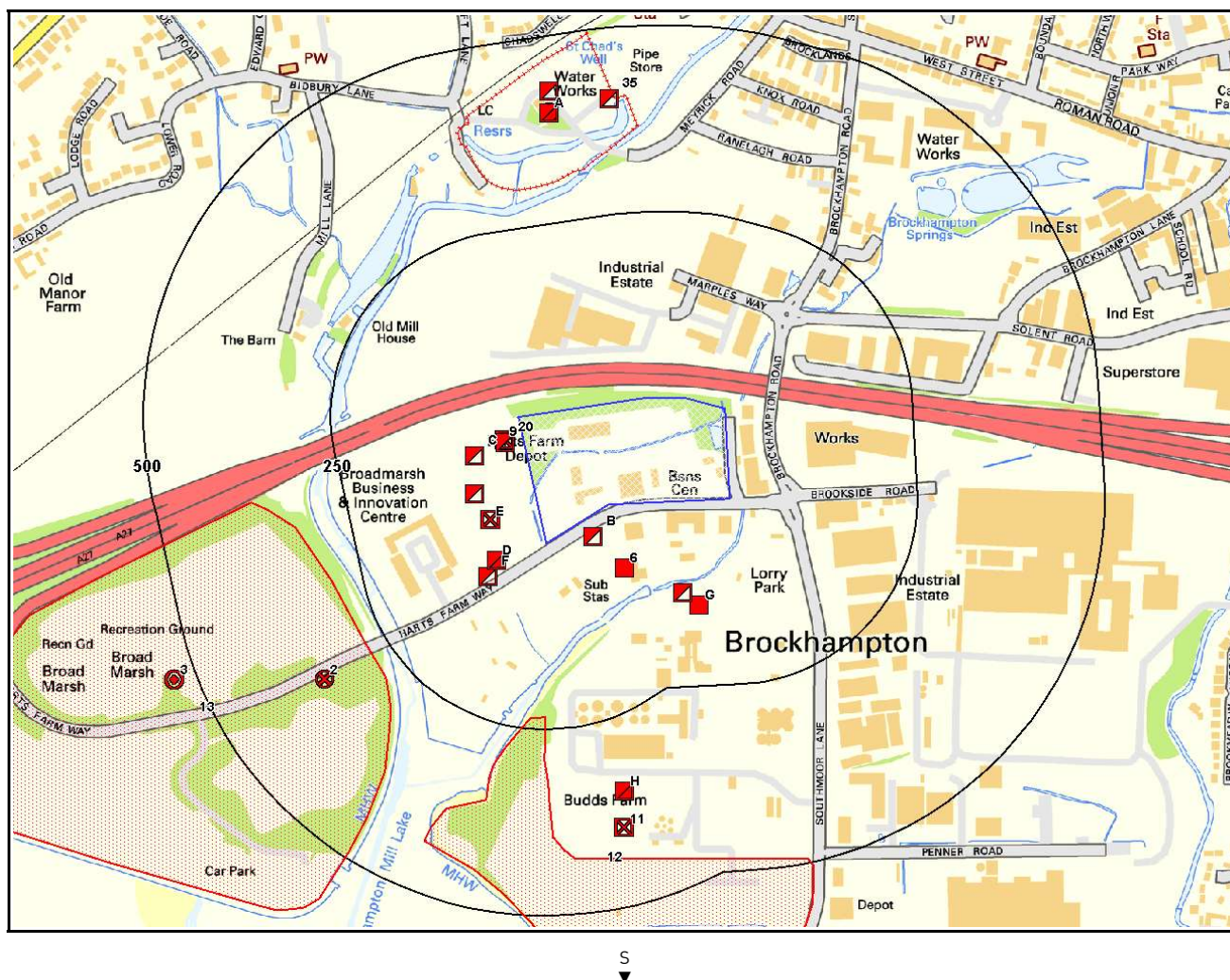
2. Landfill and Other Waste Sites Map

NW

NE

SW

SE



Landfill & Other Waste Sites Legend

Mapping sourced from
Ordnance Survey

© Crown copyright and database rights 2013. Ordnance Survey license 100035207.

	Site Outline		E.A. Active Landfill		Operational Waste Treatment Licence
	Search Buffers (m)		E.A. Historic Landfill (Area Data)		Closed Waste Treatment Licence
	250		E.A. Historic Landfill (Point Data)		REGIS Waste Licence
	500		BGS / DoE Survey Landfill		Operational Landfill
			Local Authority Landfill (Area Data)		Closed Landfill
			Local Authority Landfill (Point Data)		

2. Landfill and Other Waste Sites

2.1 Landfill Sites

Records from Environment Agency landfill data within 1000m of the study site:

1

The following Environment Agency landfill records are represented as polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
4A	302.0	N	470600, 106390	Address: Bedhampton Waterworks, Meyrick Road, Havant, Hampshire, PO9 1NN Operator: Portsmouth Water Ltd Status: IPPC IPPC Reference: EPR Reference: Landfill Reference: 19988.0 Regis Reference: POR008 Landfill Type: A5 : Landfill taking Non- Biodegradeable Wastes

Records of operational landfill sites sourced from Landmark within 1000m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
1A	398.0	N	470600, 106360	Site Address: Bedhampton Waterworks, Meyrick Road, HAVANT, Hampshire, PO9 1LG Record Date: 01-Nov-1991 Transfer Date: Modification Date: 01-Jun-1996 Status: Operational as far as is known Category: LANDFILL Agency Reference: EAWML19988 Waste Type: Inert Waste Description: Inert Landfill Regulator: EA - Southern Region - Hampshire Area (Winchester) Known Restrictions: No known restriction on source of waste Size: Medium (< 75,000 tonnes/year)

Records of Environment Agency historic landfill sites within 1500m of the study site:

3

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
12	234.0	S	470700, 105200	Site Address: Land South Of Budds Farm Sewage Works, Brockhampton, Hampshire Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: - Waste Licence: - Site Reference: FHA10, HAV4 Waste Type: Household Regis Reference: -
13	276.0	SW	470000, 105500	Site Address: Harts Farm Way, Harts Farm Way, Havant Licence Issue: 24-Nov-1978 Licence Surrendered: Licence Hold Address: The Castle, Winchester, Hampshire Operator: - Waste Licence: Yes Site Reference: FHA15, 1760/1/13/6 Waste Type: Household Regis Reference: -
Not shown	1167.0	NW	469800, 107000	Site Address: Scratchface Lane, Bedhampton, Hampshire Licence Issue: 22-Dec-1977 Licence Surrendered: Licence Hold Address: Haredon House, London Road, North Cheam, Sutton, Surrey Operator: - Waste Licence: Yes Site Reference: FHA16, 13/4 Waste Type: Inert Regis Reference: -

Records of non-operational landfill sites sourced from Landmark within 1000m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

Report Reference: [EMS-207470_272852](#)

ID	Distance	Direction	NGR	Details
2	349.0	SW	470300, 105600	Site Address: Harts Farm Way, HAVANT, Hampshire Landfill Licence: 19GAAMAL Agency Reference: Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: No known restriction on source of waste Record Date: 01-May-1977 Transfer Date: Modification Date: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: LANDFILL Regulator: EA - Southern Region - Hampshire Area (Winchester) Size: Undefined

Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
3	530.0	W	470100.0, 105600.0	Address: Storhouse Lake Tip, Havant, Hants BGS Number: 33.0 Risk: Risk not recorded Waste Type: N/A

Records of Local Authority landfill sites within 1500m of the study site:

0

Database searched and no data found.

2.2 Other Waste Sites

Records of operational waste treatment, transfer or disposal sites within 500m of the study site:

4

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
5D	71.0	W	470530, 105760	Site Address: Harts Farm Way C.A.Site, HAVANT, Hampshire, PO9 1JN Landfill Licence: 19GAANAL EA Reference: EAWML19983 Waste Type: Difficult Rating: Difficult Transfer Known Restrictions: No known restriction on source of waste Record Date: 01-Nov-1978 Transfer Date: 01-Nov-1998 Modification Date: 01-May-2000 Status: Operational as far as is known Category: CIVIC AMENITY Regulator: EA - Southern Region - Hampshire Area (Winchester) Size: Small (<25,000 tonnes/year)
6	83.0	SE	470700, 105750	Site Address: Harts Farm Way, Bedhampton, HAVANT, Hampshire, PO9 1JN Landfill Licence: E11ADIAL EA Reference: EAWML10221 Waste Type: Difficult Rating: Difficult Transfer Known Restrictions: No known restriction on source of waste Record Date: 01-Nov-2000 Transfer Date: Modification Date: Status: Operational as far as is known Category: TRANSFER Regulator: EA - Southern Region - Hampshire Area (Winchester) Size: Medium (< 75,000 tonnes/year)
7G	141.0	S	470800, 105700	Site Address: Havant Lorry Park, Southmoor Lane, HAVANT, Hampshire, Landfill Licence: E11ABMAL EA Reference: EAWML19991 Waste Type: Non-Hazardous Rating: Non-Hazardous Transfer Known Restrictions: No known restriction on source of waste Record Date: 01-Sep-1997 Transfer Date: 01-May-2000 Modification Date: 01-May-2000 Status: Operational as far as is known Category: TRANSFER Regulator: EA - Southern Region - Hampshire Area (Winchester) Size: Medium (< 75,000 tonnes/year)
8H	349.0	S	470700, 105450	Site Address: Budds Farm W.T.Works, Southmoor Lane, HAVANT, Hampshire, Landfill Licence: 19GAVLAL EA Reference: EAWML19990 Waste Type: Difficult Rating: Difficult Treatment Known Restrictions: No known restriction on source of waste Record Date: 01-Feb-1996 Transfer Date: Modification Date: 01-Aug-2000 Status: Operational as far as is known Category: TREATMENT - Biological Regulator: EA - Southern Region - Hampshire Area (Winchester) Size: Small (<25,000 tonnes/year)

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site: 3

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
9	26.0	W	470540, 105920	Site Address: Recycling Storage Bays, Havant Incinerator, HAVANT, Hampshire, Landfill Licence: 19GAVJAL EA Reference: EAWML19989 Waste Type: Non-Hazardous Waste Description: Non-Hazardous Known Restrictions: No known restriction on source of waste Record Date: 01-Jun-1993 Transfer Date: Modification Date: 01-Jun-1996 Status: Site dormant Category: TRANSFER Regulator: EA - Southern Region - Hampshire Area (Winchester) Size: Small (<25,000 tonnes/year)
10E	68.0	W	470521, 105813	Site Address: Brockhampton Incinerator, Harts Farm Way, HAVANT, Hampshire, Landfill Licence: 19GADZAL EA Reference: - Waste Type: Difficult Waste Description: - Known Restrictions: No known restriction on source of waste Record Date: 01-May-1977 Transfer Date: 01-Jun-1993 Modification Date: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: INCINERATION Regulator: EA - Southern Region - Hampshire Area (Winchester) Size: Undefined
11	397.0	S	470700, 105400	Site Address: Budds Farm W.T.Works, Southmoor Lane, HAVANT, Hampshire, Landfill Licence: 19GAVHAL EA Reference: - Waste Type: Difficult Waste Description: - Known Restrictions: No known restriction on source of waste Record Date: 01-Nov-1992 Transfer Date: Modification Date: Status: Record superseded Category: TREATMENT Regulator: EA - Southern Region - Hampshire Area (Winchester) Size: Large (< 250,000 tonnes/year)

Records of Environment Agency licensed waste sites within 1500m of the study site: 25

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
15B	25.0	SE	470658, 105792	Site Address: Land/ Premises At, Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Regis Licence Number: TJW005 EPR reference: EA/EPR/NP3695EU/A001 Operator: T J Waste & Recycling Ltd Waste Management licence No: 100089 Annual Tonnage: 124999.0 Issue Date: 17/09/2007 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Havant Waste Transfer Facility Correspondence Address: -, -
16B	25.0	SE	470658, 105792	Site Address: Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Regis Licence Number: TJW005 EPR reference: - Operator: T J Waste And Recycling Limited Waste Management licence No: 100089 Annual Tonnage: 0.0 Issue Date: 17/09/2007 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Havant Waste Transfer Facility Correspondence Address: -, The Pavilion, 2, Sherbourne Road, South Farnborough, Farnborough, Hampshire, GU14 6JT
17B	25.0	SE	470658, 105792	Site Address: Harts Farm Way Transfer Station, Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: DUD004 EPR reference: EA/EPR/DP3095HH/T003 Operator: T J Waste & Recycling Ltd Waste Management licence No: 10221 Annual Tonnage: 74884.0 Issue Date: 23/11/2000 Effective Date: 11/01/2008 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Harts Farm Way Transfer Station Correspondence Address: -, -

18B	25.0	SE	470658, 105792	Site Address: Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: DUD004 EPR reference: - Operator: T J Waste & Recycling Ltd. Waste Management licence No: 10221 Annual Tonnage: 74884.0	Issue Date: 23/11/2000 Effective Date: 11/01/2008 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Harts Farm Way Transfer Station Correspondence Address: -, Charity Farm, 127, Wickham Road, Fareham, Hampshire, PO17 5BP
19B	25.0	SE	470658, 105792	Site Address: Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: DUD001 EPR reference: - Operator: Dudman Waste & Environmental Ltd Waste Management licence No: 10221 Annual Tonnage: 74884.0	Issue Date: 23/11/2000 Effective Date: 02/07/2002 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Harts Farm Way Transfer Station Correspondence Address: -, Unit 6 Rudforf Industrial Estate, Ford, West Sussex, BN18 0BD
20	26.0	W	470541, 105918	Site Address: Havant Incinerator, Harts Farm Way, Havant, Hampshire Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Regis Licence Number: ASS002 EPR reference: EA/EPR/WP3792HZ/S002 Operator: Associated Environmental Projects (hampshire) Ltd Waste Management licence No: 19989 Annual Tonnage: 25000.0	Issue Date: 21/06/1993 Effective Date: - Modified: - Surrendered Date: 26/11/2001 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Recycling Storage Bays Correspondence Address: -, -
21C	70.0	W	470500, 105900	Site Address: Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Regis Licence Number: ONY032 EPR reference: - Operator: Veolia E S Hampshire Ltd Waste Management licence No: 10229 Annual Tonnage: 32.0	Issue Date: 19/12/2002 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Harts Farm Depot Correspondence Address: -, Poles Lane, Winchester, Otterbourne, Hampshire, SO21 1EA
22C	70.0	W	470500, 105900	Site Address: Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Regis Licence Number: ONY032 EPR reference: - Operator: Onyx (hampshire) Ltd Waste Management licence No: 10229 Annual Tonnage: 320.0	Issue Date: 19/12/2002 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Harts Farm Depot Correspondence Address: -, Poles Lane, Winchester, Otterbourne, Hampshire, SO21 1EA
23C	70.0	W	470500, 105900	Site Address: Harts Farm Way Depot, Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Regis Licence Number: HAM039 EPR reference: EA/EPR/FP3594LP/T001 Operator: Hampshire County Council Waste Management licence No: 10229 Annual Tonnage: 32.0	Issue Date: 19/12/2002 Effective Date: 01/02/2010 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Harts Farm Depot Correspondence Address: -, -
24D	71.0	W	470530, 105760	Site Address: Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Regis Licence Number: HAM003 EPR reference: - Operator: Hampshire Recycling Ltd Waste Management licence No: 19983 Annual Tonnage: 0.0	Issue Date: 04/11/1998 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: H W R C At Harts Farm Way Correspondence Address: -, Unit 10, Bridge Farm, Curbridge, Botley, Hampshire, SO30 2HB

25D	71.0	W	470530, 105760	Site Address: Land/ Premises At, Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Regis Licence Number: HOP014 EPR reference: EA/EPR/WP3592HT/V002 Operator: Hopkins Recycling Ltd Waste Management licence No: 19983 Annual Tonnage: 24999.0	Issue Date: 29/06/1993 Effective Date: - Modified: 19/08/2004 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: H W R C Correspondence Address: -, -
26E	80.0	W	470500, 105850	Site Address: Havant H W R C, Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Non-hazardous & hazardous HWA Site Size: < 25000 tonnes Regis Licence Number: HOP043 EPR reference: EA/EPR/BB3538AG/A001 Operator: Hopkins Recycling Limited Waste Management licence No: 103260 Annual Tonnage: 74999.0	Issue Date: 02/03/2012 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Havant Household Waste Recycling Centre Correspondence Address: -, -
27F	91.0	SW	470518, 105738	Site Address: Havant Hwrc, Harts Farm Way, Havant, Hampshire, PO9 1HR Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Regis Licence Number: HOP015 EPR reference: - Operator: Hopkins Recycling Ltd Waste Management licence No: 10275 Annual Tonnage: 21850.0	Issue Date: 18/09/2006 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Havant Household Waste Recycling Centre Correspondence Address: -, Ashburton Court West, The Castle, Winchester, Hampshire, SO23 8UD
28F	91.0	SW	470518, 105738	Site Address: Havant Hwrc, Harts Farm Way, Havant, Hampshire, PO9 1HR Type: Household Waste Amenity Site Size: < 25000 tonnes Regis Licence Number: HOP015 EPR reference: EA/EPR/PP3198HX/A001 Operator: Hopkins Recycling Ltd Waste Management licence No: 10275 Annual Tonnage: 21850.0	Issue Date: 18/09/2006 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Havant Household Waste Recycling Centre Correspondence Address: -, -
29F	91.0	SW	470518, 105738	Site Address: Havant H W R C, Harts Farm Way, Havant, Hampshire, PO9 1JN Type: Household Waste Amenity Site Size: < 25000 tonnes Regis Licence Number: HOP015 EPR reference: EA/EPR/PP3198HX/A001 Operator: Hopkins Recycling Limited Waste Management licence No: 10275 Annual Tonnage: 21850.0	Issue Date: 18/09/2006 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Havant H W R C Correspondence Address: -, -
30G	123.0	S	470778, 105717	Site Address: Havant Lorry Park, Southmoor Lane, Havant, Hampshire, PO9 1JW Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: 000936 EPR reference: - Operator: Sita Solent Ltd Waste Management licence No: 19991 Annual Tonnage: 0.0	Issue Date: 29/09/1997 Effective Date: 31/05/2000 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Havant Lorry Park Correspondence Address: -, Dean Road, Yate, Bristol, South Glouceste, BS37 5ND
31G	123.0	S	470778, 105717	Site Address: Havant Lorry Park, Southmoor Lane, Havant, Hampshire, PO9 1JW Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: 000936 EPR reference: EA/EPR/AP3092HB/S002 Operator: Sita Solent Ltd Waste Management licence No: 19991 Annual Tonnage: 0.0	Issue Date: 29/09/1997 Effective Date: 31/05/2000 Modified: - Surrendered Date: 19/10/2010 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Havant Lorry Park Correspondence Address: -, -

32H	349.0	S	470700, 105450	Site Address: Southmoor Lane, Havant, Hampshire, PO9 1JW Type: Biological Treatment Facility Size: < 25000 tonnes Regis Licence Number: SOU038 EPR reference: - Operator: Southern Water Services Ltd Waste Management licence No: 19990 Annual Tonnage: 0.0	Issue Date: 16/02/1996 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Budds Farm Waste Water Treatment Works Correspondence Address: -, Southern House, Sparrowgrove, Otterbourne, Winchester, Hampshire, SO21 2SW
33H	349.0	S	470700, 105450	Site Address: Budds Farm Water Treatment Works, Southmoor Lane, Budds Farm, Havant, Hampshire, PO9 1JW Type: Biological Treatment Facility Size: < 25000 tonnes Regis Licence Number: SOU038 EPR reference: EA/EPR/AP3392HG/A001 Operator: Southern Water Services Limited Waste Management licence No: 19990 Annual Tonnage: 1200.0	Issue Date: 16/02/1996 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: W T W Correspondence Address: -, -
34A	398.0	N	470600, 106360	Site Address: Bedhampton Waterworks, Meyrick Road, Havant, Hampshire Type: Landfill taking Non-Biodegradable Wastes Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: POR008 EPR reference: - Operator: Portsmouth Water Company Ltd Waste Management licence No: 19988 Annual Tonnage: 0.0	Issue Date: 18/02/1992 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Bedhampton Waterworks Correspondence Address: -, P O Box 8, West Street, Havant, Hampshire, PO9 1LG
35	406.0	N	470680, 106380	Site Address: Bedhampton Waste Works, Meyrick Road, Havant, Hampshire, PO9 1NN Type: Transfer Station taking Non-Biodegradable Wastes Size: < 25000 tonnes Regis Licence Number: POR022 EPR reference: EA/EPR/BP3998HK/A001 Operator: Portsmouth Water Limited Waste Management licence No: 10279 Annual Tonnage: 23000.0	Issue Date: 29/06/2007 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Bedhampton Waste Works Correspondence Address: -, -
36A	427.0	N	470600, 106390	Site Address: Bedhampton Waterworks, Meyrick Road, Havant, Hampshire, PO9 1NN Type: Inert LF Size: < 25000 tonnes Regis Licence Number: POR008 EPR reference: EA/EPR/NP3439SN/A001 Operator: Portsmouth Water Ltd Waste Management licence No: 19988 Annual Tonnage: 1126.0	Issue Date: 2/18/1992 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: IPPC Site Name: Bedhampton Waterworks Landfill Correspondence Address: -, P O Box 8, West Street, Havant, Hampshire, PO9 1LG
37A	427.0	N	470600, 106390	Site Address: Bedhampton Waterworks, Meyrick Road, Havant, Hampshire, PO9 1NN Type: Landfill taking Non-Biodegradable Wastes Size: < 25000 tonnes Regis Licence Number: POR008 EPR reference: EA/EPR/WP3192HB/A001 Operator: Portsmouth Water Ltd Waste Management licence No: 19988 Annual Tonnage: 1126.0	Issue Date: 18/02/1992 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: IPPC Site Name: Bedhampton Waterworks Landfill Correspondence Address: -, -
38A	427.0	N	470600, 106390	Site Address: Bedhampton Waterworks, Meyrick Road, H, Bedhampton, Hampshire, PO9 1NN Type: Inert LF Size: < 25000 tonnes Regis Licence Number: POR044 EPR reference: EA/EPR/NP3439PN/A001 Operator: Portsmouth Water Ltd Waste Management licence No: 210123 Annual Tonnage: 1126.0	Issue Date: 21/04/2005 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Bedhampton Landfill Correspondence Address: -, -

Not shown	1448.0	NE	472130, 106610	Site Address: 8, New Lane, Havant, Hampshire, PO9 2JH Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Regis Licence Number: WES001 EPR reference: EA/EPR/WP3292HL/A001 Operator: Wessex Construction And Plant Ltd Waste Management licence No: 19986 Annual Tonnage: 75000.0	Issue Date: 05/12/1991 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Transfer Station At New Lane Correspondence Address: -, -
-----------	--------	----	----------------	---	--

3. Current Land Use Map

NW

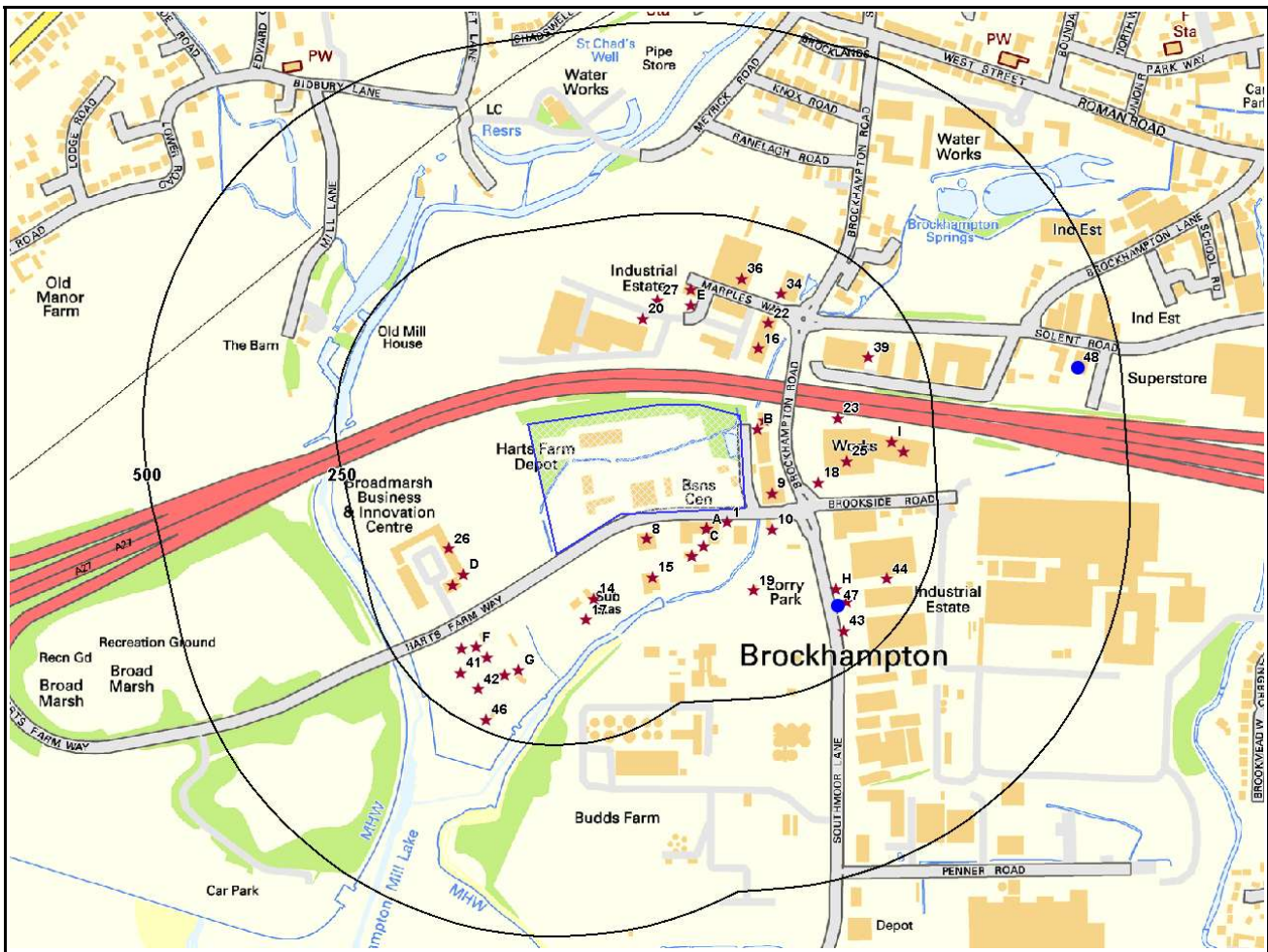
NE

W

E

SW

SE



Current Land Use Legend



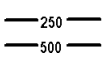
© Crown copyright and database rights 2013. Ordnance Survey license 100035207.

- 

Site Outline
- 

Current Industrial Sites
- 

Petrol & Fuel Sites
- 

Underground High Pressure Oil & Fuel Pipelines
- 

Search Buffers (m)

3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

46

The following records are represented as points on the Current Land Uses map.

ID	Distance	Direction	Company	Address	Activity	Category
1	18.0	S	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
2B	21.0	E	Works	PO9	Unspecified Works Or Factories	Industrial Features
3A	25.0	S	Oberon Performance Ltd	11-12 Havant Business Centre, Harts Farm Way, Havant, PO9 1HU	Vehicle Components	Industrial Products
4A	25.0	S	Drive in MOT Ltd	1 Havant Business Centre, Harts Farm Way, Havant, PO9 1HU	Vehicle Repair, Testing and Servicing	Repair and Servicing
5A	25.0	S	Technical Architectural Lighting UK Ltd	8 Havant Business Centre, Harts Farm Way, Havant, PO9 1HU	Lampshades and Lighting	Consumer Products
6A	25.0	S	Fleet Repair Centre	9-10 Havant Business Centre, Harts Farm Way, Havant, PO9 1HU	Vehicle Repair, Testing and Servicing	Repair and Servicing
7B	30.0	E	The Platers Ltd	Brockhampton Road, Havant, PO9 1JU	Industrial Coatings and Finishings	Industrial Products
8	34.0	S	Deesand Mot's & Tyres	Harts Farm Way, Havant, PO9 1JN	Vehicle Repair, Testing and Servicing	Repair and Servicing
9	36.0	E	Works	PO9	Unspecified Works Or Factories	Industrial Features
10	44.0	SE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
11 C	47.0	S	Havant Business Centre	PO9	Business Parks and Industrial Estates	Industrial Features
12 C	59.0	S	Allied National Group	Harts Farm Way Depot, Harts Farm Way, Havant, PO9 1JN	Packaging	Industrial Products
13 C	59.0	S	T J Waste & Recycling Ltd	Harts Farm Way Depot, Harts Farm Way, Havant, PO9 1JN	Waste Storage, Processing and Disposal	Infrastructure and Facilities
14	75.0	SE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
15	85.0	S	Works	PO9	Unspecified Works Or Factories	Industrial Features
16	92.0	N	Havant Signs & Plastics	Unit 1 Kingscroft Court, Ridgway, Havant, PO9 1LS	Rubber, Silicones and Plastics	Industrial Products
17	94.0	SE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
18	96.0	E	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
19	109.0	S	Atlas Trailers Ltd	Havant Lorry Park, Southmoor Lane, Havant, PO9 1JW	Vehicle Hire and Rental	Hire Services
20	115.0	N	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
21 D	125.0	W	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
22	127.0	N	Macvere Engineering	Unit 2-3 Kingscroft Court, Ridgway, Havant, PO9 1LS	Precision Engineers	Engineering Services
23	127.0	E	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
24E	131.0	N	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
25	134.0	E	Works	PO9	Unspecified Works Or Factories	Industrial Features

26	136.0	W	Raft Systems Ltd	49 Broadmarsh Business & Innovation Centre, Harts Farm Way, Havant, PO9 1HS	Radar and Telecommunications Equipment	Industrial Products
27	137.0	N	Industrial Estate	PO9	Business Parks and Industrial Estates	Industrial Features
28 D	142.0	W	Basepoint Business Centre	1 Broadmarsh Business & Innovation Centre, Harts Farm Way, Havant, PO9 1HS	Business Parks and Industrial Estates	Industrial Features
29E	151.0	N	Solent Motor Services	2, Ridgway, Havant, PO9 1QJ	Vehicle Repair, Testing and Servicing	Repair and Servicing
30 H	159.0	SE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
31 G	160.0	S	Tanks	PO9	Tanks (Generic)	Industrial Features
32F	161.0	SW	Hopper	PO9	Hoppers and Silos	Farming
33F	163.0	SW	Tanks	PO9	Tanks (Generic)	Industrial Features
34	168.0	N	Spectrum Workplace	2, Marples Way, Havant, PO9 1UH	Office and Shop Equipment	Industrial Products
35 G	173.0	SW	Hanson Concrete	Hanson Aggregates Ltd, Harts Farm Way, Havant, PO9 1JN	Concrete Products	Industrial Products
36	174.0	N	Wartsila UK Ltd	4, Marples Way, Havant, PO9 1NX	Seals, Tapes, Taps and Valves	Industrial Products
37F	175.0	SW	Tank	PO9	Tanks (Generic)	Industrial Features
38 H	180.0	SE	Industrial Estate	PO9	Business Parks and Industrial Estates	Industrial Features
39	183.0	NE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
40I	194.0	E	Apollo Fire Detectors Ltd	36, Brookside Road, Havant, PO9 1JR	Electronic Equipment	Industrial Products
41	201.0	SW	Works	PO9	Unspecified Works Or Factories	Industrial Features
42	205.0	SW	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
43	205.0	SE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
44	206.0	SE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
45I	209.0	E	Works	PO9	Unspecified Works Or Factories	Industrial Features
46	236.0	SW	Hopper	PO9	Hoppers and Silos	Farming

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

2

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance	Direction	NGR	Company	Address	LPG	Status
47	175.0	SE	470962, 105715	Unbranded	Havant Lorry Park, Southmoor Lane, Southmoor Lane, Havant, Hampshire, PO9 1JW	Not Applicable	Obsolete
48	443.0	E	471274, 106026	Tesco	Tesco Havant Langstone Harbour, Solent Road, Solent Road, Havant, Hampshire, PO9 1TR	No	Open

3.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site:

0

Report Reference: EMS-207470_272852

Database searched and no data found.

4. Geology

4.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

4.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
RTDU-SSCL	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
HEAD-CLGR	HEAD	CLAYEY GRAVEL
RTDU-SSCL	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

4.3 Bedrock and Solid Geology

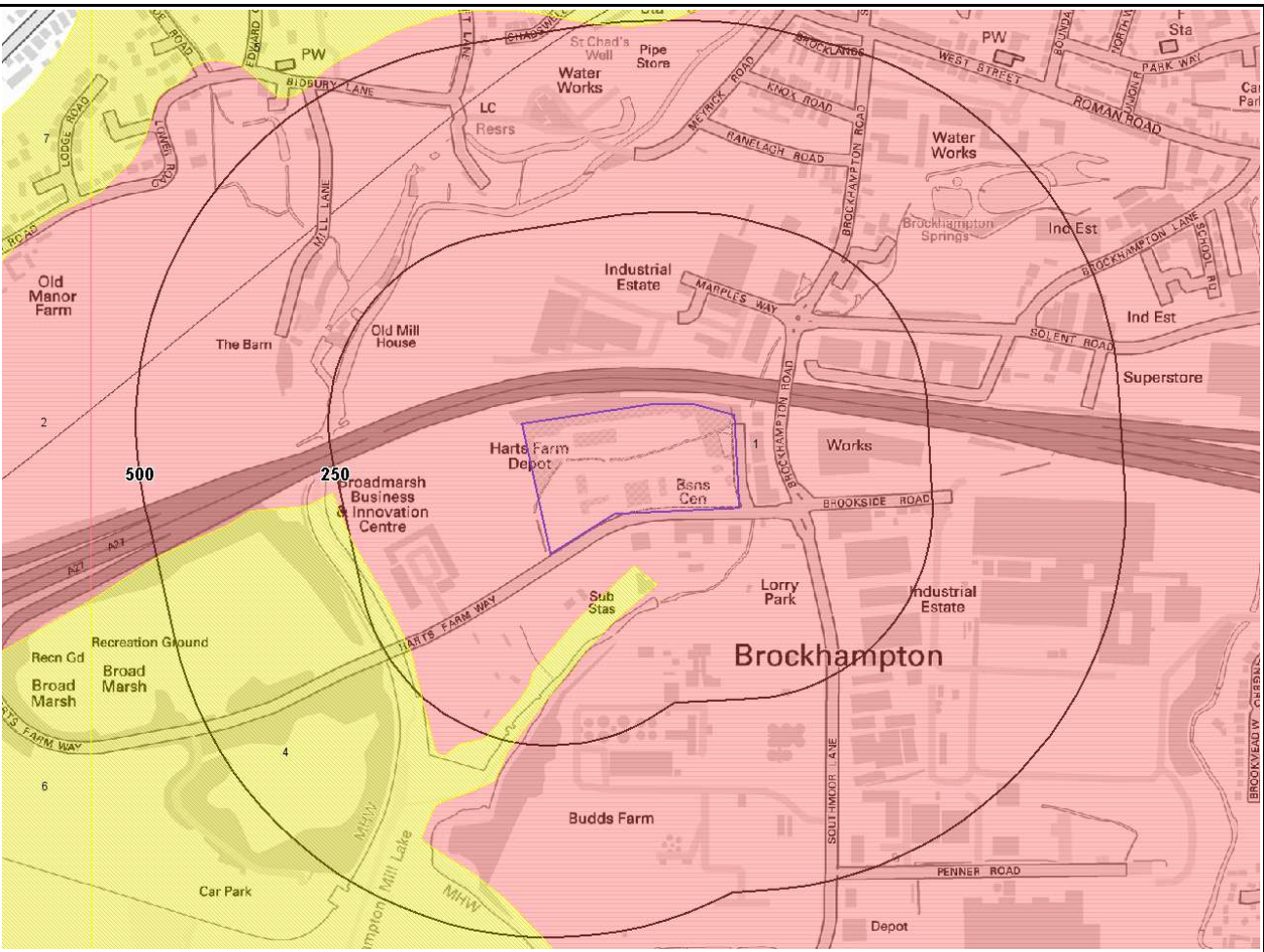
The database has been searched on site, including a 50m buffer.

LEX Code	Description	Rock Type
LPCK-CHLK	LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED)	CHALK

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

For more detailed geological and ground stability data please refer to the "GroundSure GeoInsight". Available from our website.

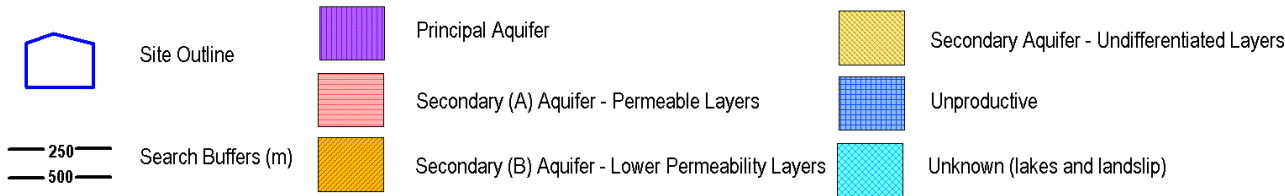
5a. Hydrogeology - Aquifer Within Superficial Geology



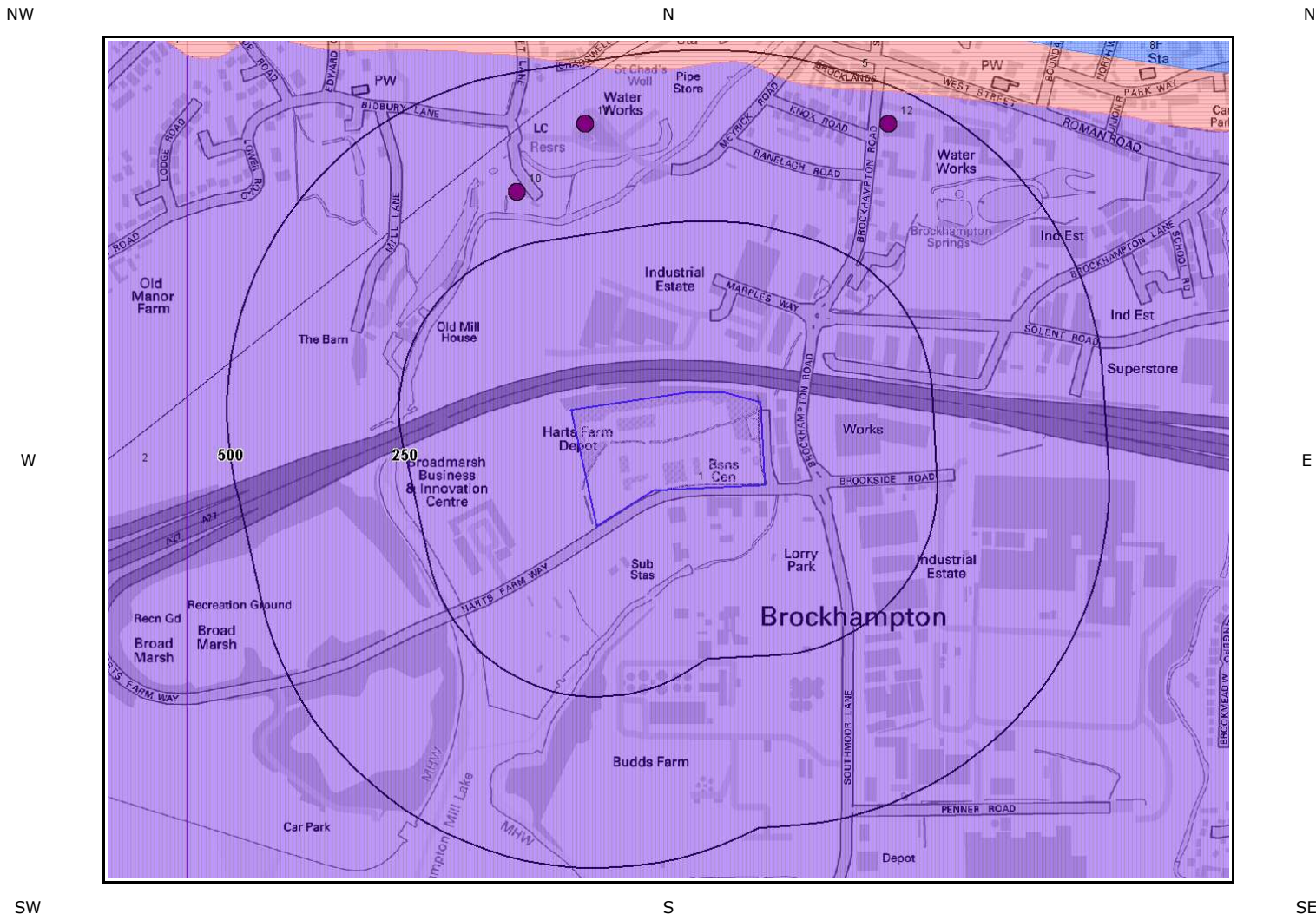
Aquifer Within Superficial Geology Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



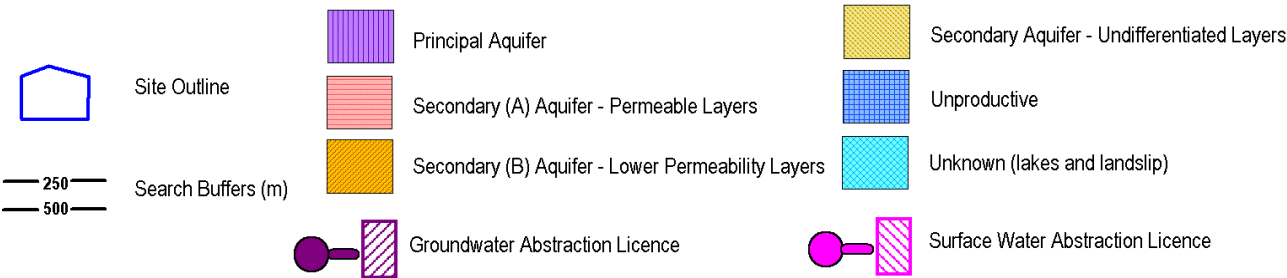
5b. Hydrogeology - Aquifer Within Bedrock Geology and Abstraction Licenses



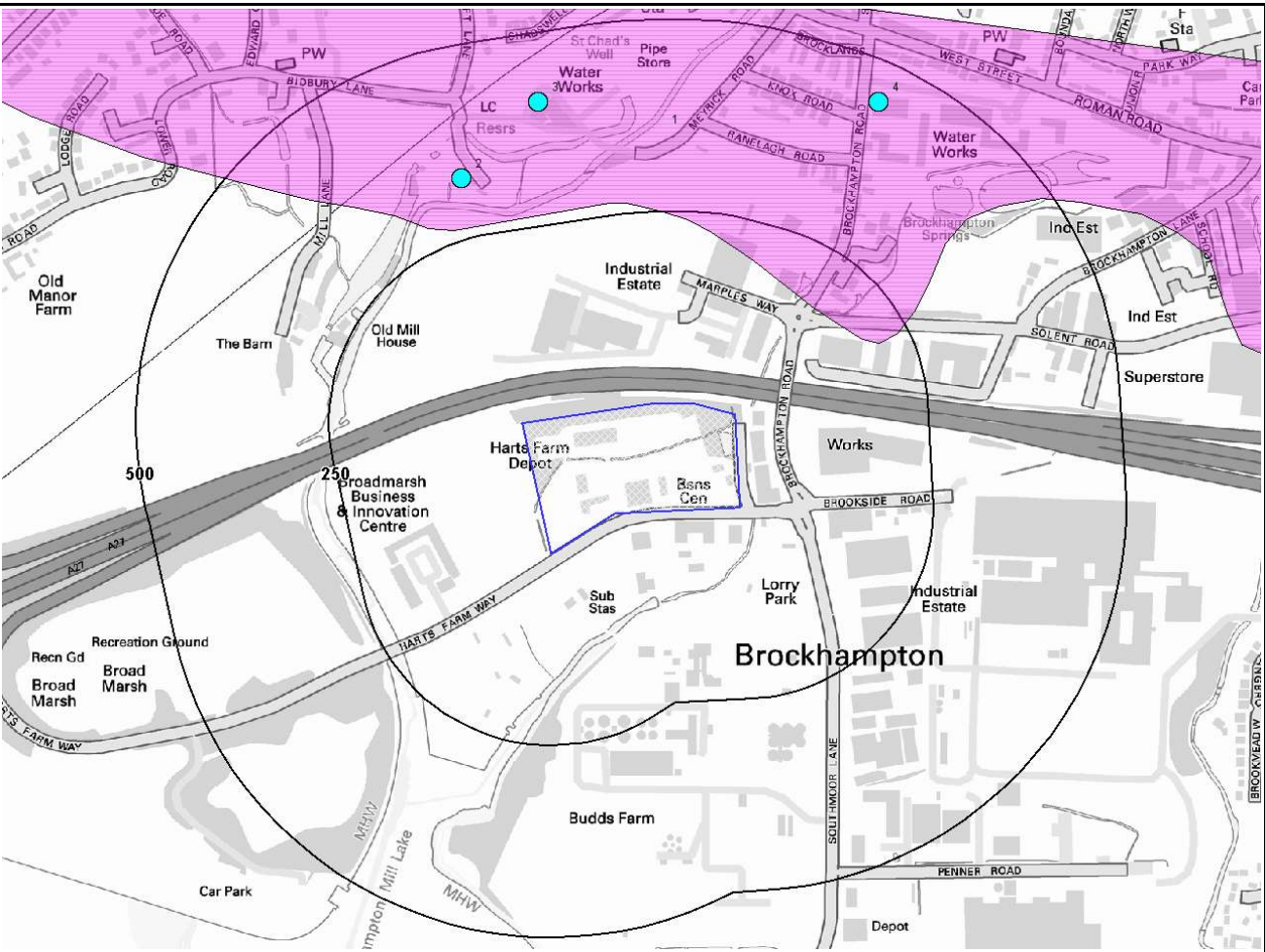
Aquifer Within Bedrock Geology Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



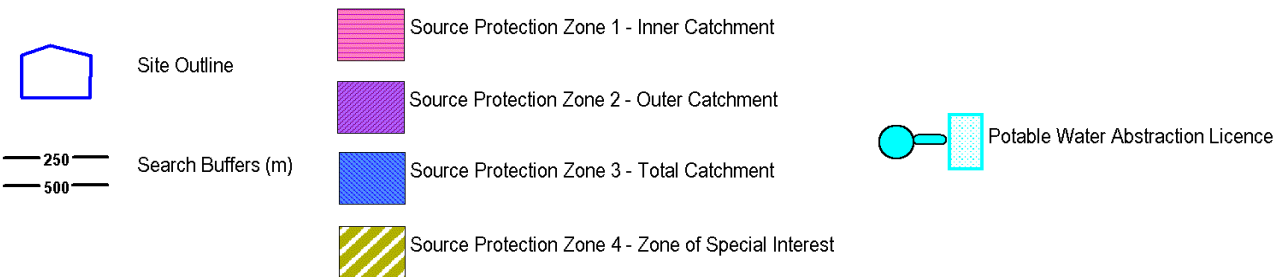
5c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



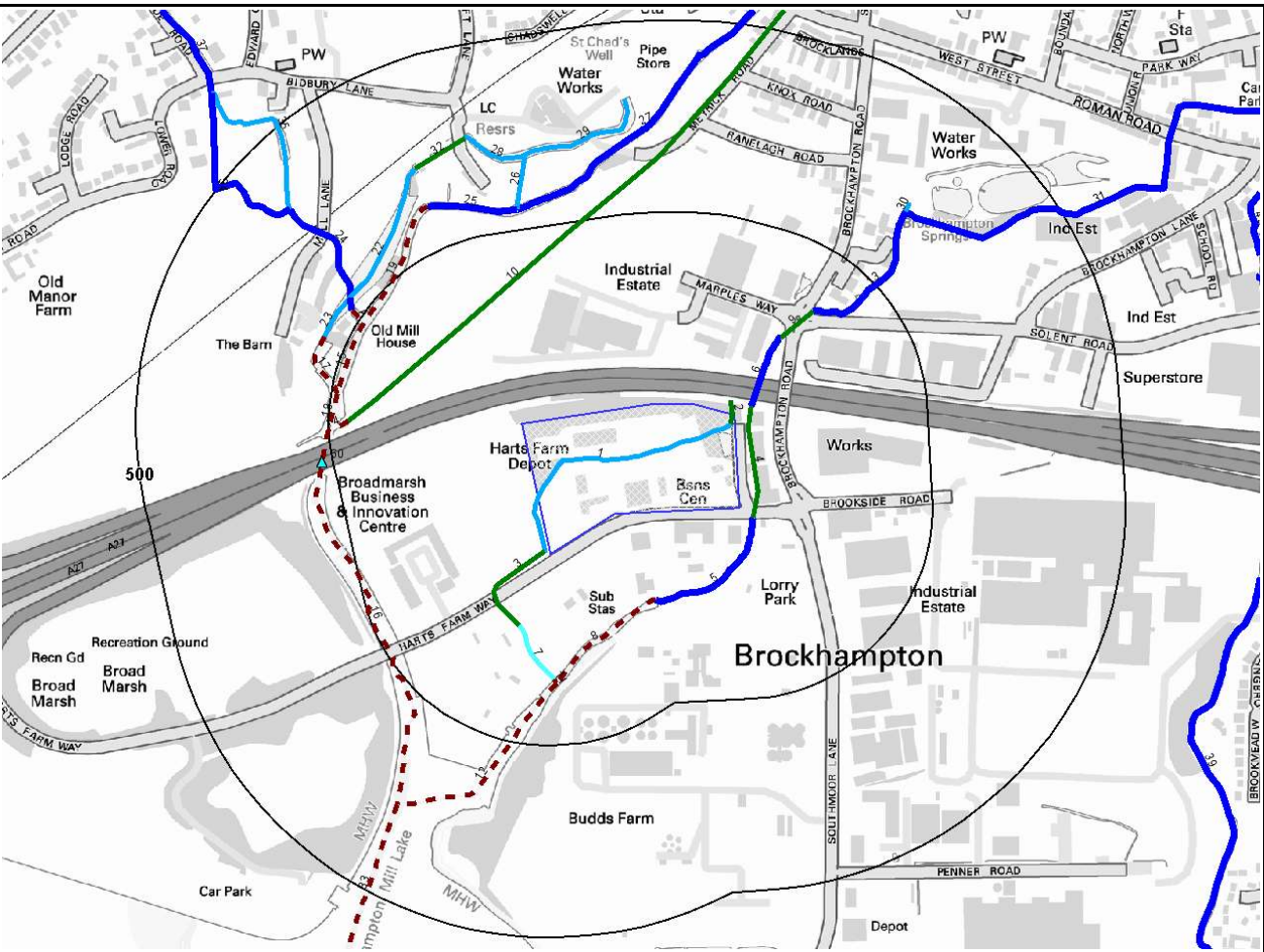
SPZ and Potable Water Abstraction Licenses
Legend



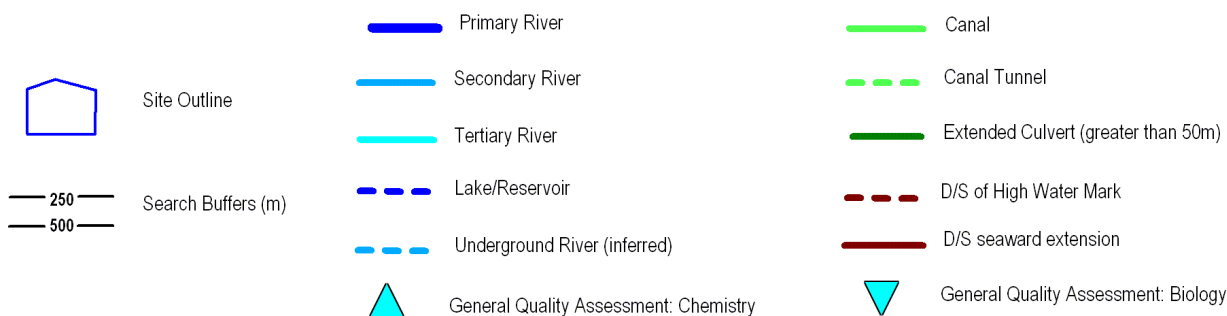
© Crown copyright and database
rights 2013. Ordnance Survey
license 100035207.



5d. Hydrology – Detailed River Network and River Quality



Hydrology Legend



Mapping sourced from
Ordnance Survey

© Crown copyright and database rights 2013. Ordnance Survey license 100035207.

5. Hydrogeology and Hydrology

5.1 Aquifer within Superficial Deposits

Are there records of productive strata within the superficial geology at or in proximity to the property?

Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (5a):

ID	Distance [m]	Direction	Designation	Description
1	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	69.0	S	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
5	495.0	N	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

5.2 Aquifer within Bedrock Deposits

Are there records of productive strata within the bedrock geology at or in proximity to the property? **Yes**

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (5b):

ID	Distance [m]	Direction	Designation	Description
1	0.0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
5	466.0	N	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

5.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site?

Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance	Direction	NGR	Details
----	----------	-----------	-----	---------

Report Reference: EMS-207470_272852

10	328.0	N	470480, 106270	Licence No: 11/42/36.2/1 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: Havant Ps Data Type: Point	Annual Volume (m³): 35770000 Max Daily Volume (m³): 137000 Original Application No: NPS/WR/003341 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 9/6/2009 Version End Date:
11	410.0	N	470580, 106370	Licence No: 11/42/36.2/1 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: Bedhampton Ps Spring No 1 Data Type: Point	Annual Volume (m³): 35770000 Max Daily Volume (m³): 137000 Original Application No: NPS/WR/003341 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 9/6/2009 Version End Date:
12	447.0	NE	471020, 106370	Licence No: 11/42/36.2/1 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: Bedhampton Ps Spring No 2 Data Type: Point	Annual Volume (m³): 35770000 Max Daily Volume (m³): 137000 Original Application No: NPS/WR/003341 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: 9/6/2009 Version End Date:

5.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site?

No

Database searched and no data found.

5.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site?

Yes

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (5c):

ID	Distance	Direction	NGR	Details	
2	328.0	N	470480, 106270	Licence No: 11/42/36.2/1 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: Havant Ps Data Type: Point	Annual Volume (m³): 35770000 Max Daily Volume (m³): 137000 Original Application No: NPS/WR/003341 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
3	410.0	N	470580, 106370	Licence No: 11/42/36.2/1 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: Bedhampton Ps Spring No 1 Data Type: Point	Annual Volume (m³): 35770000 Max Daily Volume (m³): 137000 Original Application No: NPS/WR/003341 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
4	447.0	NE	471020, 106370	Licence No: 11/42/36.2/1 Details: Potable Water Supply - Direct Direct Source: Southern Region Groundwater Point: Bedhampton Ps Spring No 2 Data Type: Point	Annual Volume (m³): 35770000 Max Daily Volume (m³): 137000 Original Application No: NPS/WR/003341 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: Version End Date:

5.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site?

Yes

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (5c):

ID	Distance	Direction	Type	Description
1	173.0	NE	1	Inner Catchment

5.7 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site?

Yes

Biological Quality:

Database searched and no data found.

Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAH). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (5d):

ID	Distance [m]	Direction	NGR	River Details	Chemical Quality Grade (Headline Indicator)				
					2005	2006	2007	2008	2009
60	264.0	W	470300, 105900	River Name: Hermitage Stream Reach: Tidal Limit - Source End/Start of Stretch: End of Stretch NGR	B	B	B	B	B
Not shown	849.0	N	471073, 106778	River Name: Hermitage Stream Reach: Tidal Limit - Source End/Start of Stretch: Sample Point NGR	B	B	B	B	B

5.8 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site?

Yes

The following Detailed River Network records are represented on the Hydrology Map (5d):

ID	Distance	Direction	Details	
1	0.0	On Site	River Name: - Water Course Name: Harts Farm Way Stream Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
2	0.0	On Site	River Name: - Water Course Name: Harts Farm Way Stream Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
3	7.0	W	River Name: - Water Course Name: Harts Farm Way Stream Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined

Report Reference: EMS-207470_272852

4	17.0	E	River Name: - Water Course Name: Brockhampton Stream Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
5	21.0	SE	River Name: Brockhampton Water Course Name: Brockhampton Stream Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
6	25.0	NE	River Name: Brockhampton Water Course Name: Brockhampton Stream Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
7	102.0	SW	River Name: Drain Water Course Name: Harts Farm Way Stream (tidal) Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NA Main River Status: Currently Undefined
8	115.0	S	River Name: - Water Course Name: Brockhampton Stream (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
9	117.0	NE	River Name: - Water Course Name: Brockhampton Stream Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
10	147.0	NW	River Name: - Water Course Name: Hermitage Stream Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
11	163.0	S	River Name: - Water Course Name: Brockhampton Stream (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
12	169.0	S	River Name: - Water Course Name: Brockhampton Stream (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
13	169.0	NE	River Name: Brockhampton Stream Water Course Name: Brockhampton Stream Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
14	225.0	W	River Name: - Water Course Name: Hermitage Lake (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
15	240.0	W	River Name: - Water Course Name: Hermitage Lake (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
16	240.0	W	River Name: - Water Course Name: Hermitage Lake (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
17	242.0	W	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
18	242.0	W	River Name: - Water Course Name: Hermitage Lake (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
19	243.0	NW	River Name: - Water Course Name: Hermitage Lake (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
20A	243.0	NW	River Name: - Water Course Name: Hermitage Lake (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
21A	265.0	NW	River Name: - Water Course Name: Bedhampton Brook Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
22	274.0	NW	River Name: Old Mill Dam Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined

23	276.0	NW	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
24	276.0	NW	River Name: - Water Course Name: Bedhampton Brook Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
25	277.0	N	River Name: - Water Course Name: Hermitage Lake (Tidal) Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
26	277.0	N	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
27	277.0	N	River Name: Hermitage Water Course Name: Hermitage Stream Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
28	345.0	N	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
29	346.0	N	River Name: Blue Hole Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
30	346.0	NE	River Name: - Water Course Name: Brockhampton Stream Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
31	346.0	NE	River Name: - Water Course Name: Brockhampton Stream Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
32	360.0	NW	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
33	383.0	SW	River Name: - Water Course Name: Hermitage Lake (Tidal) Welsh River Name: - Alternative Name: -	River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined
34	410.0	NW	River Name: - Water Course Name: Bedhampton Brook Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
35	410.0	NW	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined

5.9 Surface Water Features

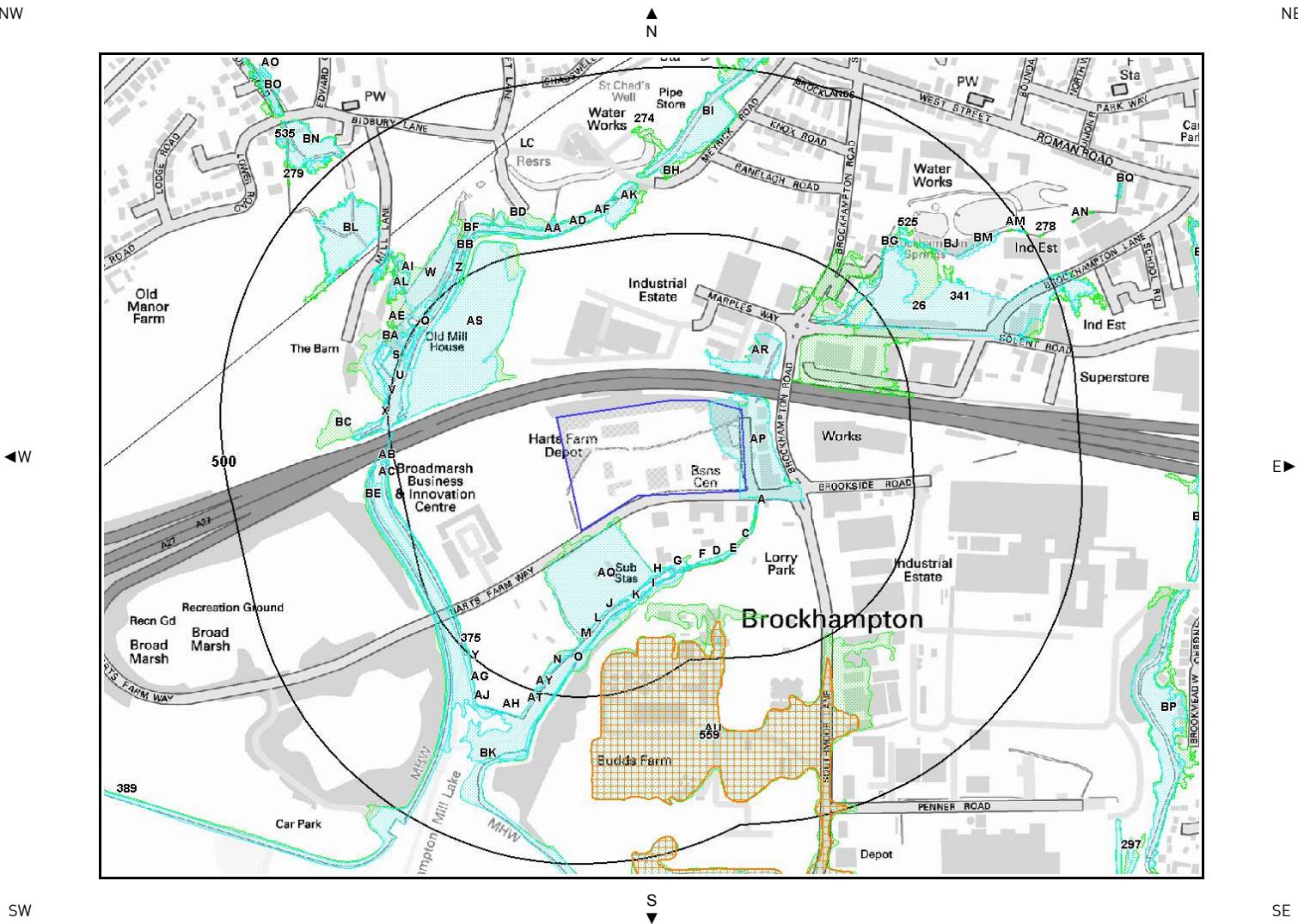
Are there any surface water features within 250m of the study site?

Yes

The following surface water records are not represented on mapping:

Distance to Surface Water (m)	on-site	0-50	51-250
Surface water features within 250m of the study site	Yes	No	Yes

6. Environment Agency Flood Map

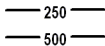


Environment Agency Flood Legend



© Crown copyright and database rights 2013. Ordnance Survey license 100035207.

- 

Site Outline
- 

Search Buffers (m)
- 

Zone 2 Floodplain
- 

Zone 3 Floodplain
- 

Flood Storage Area
- 

Area Benefiting from Flood Defences
- 

Flood Defences

6. Flooding

6.1 Zone 2 Flooding

Zone 2 floodplain estimates the annual probability of flooding as one in one thousand (0.1%) or greater from rivers and the sea but less than 1% from rivers or 0.5% from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 2 floodplain?

Yes

The following floodplain records are represented as green shading on the Flood Map:

ID	Distance	Direction	Update	Type
1AP	0.0	On Site	13-Mar-2013	Zone 2 - (Fluvial Models)
2AQ	10.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
3A	23.0	SE	13-Mar-2013	Zone 2 - (Fluvial Models)
4A	34.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
5A	36.0	SE	13-Mar-2013	Zone 2 - (Tidal Models)
6A	39.0	SE	13-Mar-2013	Zone 2 - (Fluvial Models)
7A	40.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
8B	44.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
9B	47.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
10B	47.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
11AR	49.0	N	13-Mar-2013	Zone 2 - (Fluvial Models)
12B	51.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
13B	56.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
14B	57.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
15B	58.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
16B	58.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
17B	61.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
18B	62.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
19B	68.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
20B	68.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
21C	69.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
22C	78.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
23D	78.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
24C	82.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
25C	84.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
26	85.0	NE	13-Mar-2013	Zone 2 - (Fluvial Models)
27AS	86.0	NW	13-Mar-2013	Zone 2 - (Tidal Models)
28C	88.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
29C	88.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
30C	89.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)

31C	90.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
32C	90.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
33D	91.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
34D	92.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
35D	93.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
36D	93.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
37D	93.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
38C	93.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
39D	94.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
40D	94.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
41D	95.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
42D	95.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
43E	95.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
44E	95.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
45E	96.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
46D	99.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
47D	99.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
48D	100.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
49D	100.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
50D	100.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
51D	101.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
52E	101.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
53D	101.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
54D	101.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
55D	102.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
56D	102.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
57D	103.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
58F	104.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
59F	105.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
60F	105.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
61F	107.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
62G	109.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
63G	111.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
64G	111.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
65G	111.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
66H	112.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
67H	115.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
68H	115.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
69H	115.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
70H	115.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)

71H	117.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
72G	120.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
73G	120.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
74H	120.0	SE	13-Mar-2013	Zone 2 - (Fluvial Models)
75AT	121.0	SE	13-Mar-2013	Zone 2 - (Fluvial Models)
76J	125.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
77H	129.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
78H	129.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
79I	129.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
80I	129.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
81K	130.0	SE	13-Mar-2013	Zone 2 - (Fluvial Models)
82J	131.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
83K	133.0	SE	13-Mar-2013	Zone 2 - (Fluvial Models)
84K	133.0	SE	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
85K	133.0	SE	13-Mar-2013	Zone 2 - (Tidal Models)
86J	138.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
87J	139.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
88L	143.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
89L	145.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
90AU	147.0	SE	13-Mar-2013	Zone 2 - (Tidal Models)
91M	166.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
92N	178.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
93M	180.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
94N	188.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
95N	201.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
96O	203.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
97O	205.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
98O	207.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
99O	208.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
100N	210.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
101N	213.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
102N	213.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
103N	216.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
104N	217.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
105N	217.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
106N	218.0	S	13-Mar-2013	Zone 2 - (Tidal Models)
107N	219.0	S	13-Mar-2013	Zone 2 - (Fluvial Models)
108AV	219.0	W	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
109A W	222.0	SW	13-Mar-2013	Zone 2 - (Tidal Models)
110N	222.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)

111AX	224.0	SW	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
112N	224.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
113N	226.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
114AZ	227.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
115AY	231.0	S	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
116U	232.0	W	13-Mar-2013	Zone 2 - (Fluvial Models)
117R	233.0	SW	13-Mar-2013	Zone 2 - (Fluvial Models)
118P	234.0	W	13-Mar-2013	Zone 2 - (Tidal Models)
119P	240.0	NW	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
120Q	241.0	NW	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
121Q	242.0	NW	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
122T	242.0	NW	13-Mar-2013	Zone 2 - (Fluvial Models)
123P	242.0	NW	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
124R	250.0	SW	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
125S	250.0	W	13-Mar-2013	Zone 2 - (Fluvial / Tidal Models)
126S	250.0	W	13-Mar-2013	Zone 2 - (Tidal Models)

6.2 Zone 3 Flooding

Zone 3 estimates the annual probability of flooding as one in one hundred (1%) or greater from rivers and a one in two hundred (0.5%) or greater from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 3 floodplain?

Yes

The following floodplain records are represented as blue shading on the Flood Map:

ID	Distance	Direction	Update	Type
302AP	0.0	On Site	13-Mar-2013	Zone 3 - (Fluvial Models)
303AQ	13.0	SE	13-Mar-2013	Zone 3 - (Tidal Models)
304A	23.0	SE	13-Mar-2013	Zone 3 - (Fluvial Models)
305B	47.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)
306AR	49.0	N	13-Mar-2013	Zone 3 - (Fluvial Models)
307D	78.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)
308AS	106.0	NW	13-Mar-2013	Zone 3 - (Tidal Models)
309G	109.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
310F	109.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
311G	111.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
312G	111.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)
313G	111.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
314F	112.0	S	13-Mar-2013	Zone 3 - (Tidal Models)
315F	112.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)

316H	112.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
317I	115.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
318I	115.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)
319G	115.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
320G	115.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
321I	117.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
322G	120.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)
323G	120.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
324I	120.0	SE	13-Mar-2013	Zone 3 - (Fluvial Models)
325AT	121.0	SE	13-Mar-2013	Zone 3 - (Fluvial Models)
326J	125.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
327I	129.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
328I	129.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
329I	129.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
330I	129.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
331I	130.0	SE	13-Mar-2013	Zone 3 - (Fluvial Models)
332J	131.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
333K	133.0	SE	13-Mar-2013	Zone 3 - (Fluvial Models)
334K	133.0	SE	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
335K	133.0	SE	13-Mar-2013	Zone 3 - (Tidal Models)
336J	138.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
337J	139.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
338L	143.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
339L	145.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
340M	164.0	S	13-Mar-2013	Zone 3 - (Tidal Models)
341	174.0	NE	13-Mar-2013	Zone 3 - (Fluvial Models)
342M	180.0	S	13-Mar-2013	Zone 3 - (Tidal Models)
343M	180.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
344N	180.0	S	13-Mar-2013	Zone 3 - (Tidal Models)
345AU	184.0	SE	13-Mar-2013	Zone 3 - (Tidal Models)
346N	188.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
347N	201.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
348O	203.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
349O	205.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
350O	207.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
351N	208.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
352N	210.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
353N	213.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
354N	213.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
355N	216.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)

356N	216.0	S	13-Mar-2013	Zone 3 - (Tidal Models)
357N	217.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)
358N	217.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
359N	219.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)
360AV	219.0	W	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
361N	220.0	S	13-Mar-2013	Zone 3 - (Tidal Models)
362N	221.0	S	13-Mar-2013	Zone 3 - (Tidal Models)
363N	222.0	S	13-Mar-2013	Zone 3 - (Fluvial Models)
364A W	222.0	SW	13-Mar-2013	Zone 3 - (Tidal Models)
365N	222.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
366	223.0	S	13-Mar-2013	Zone 3 - (Tidal Models)
367AX	224.0	SW	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
368AY	224.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
369N	226.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
370AZ	227.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
371AY	231.0	S	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
372U	232.0	W	13-Mar-2013	Zone 3 - (Fluvial Models)
373R	233.0	SW	13-Mar-2013	Zone 3 - (Fluvial Models)
374P	234.0	W	13-Mar-2013	Zone 3 - (Tidal Models)
375	235.0	SW	13-Mar-2013	Zone 3 - (Tidal Models)
376X	238.0	W	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
377BA	240.0	NW	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
378Q	241.0	NW	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
379Q	242.0	NW	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
380T	242.0	NW	13-Mar-2013	Zone 3 - (Fluvial Models)
381P	242.0	NW	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
382R	250.0	SW	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
383S	250.0	W	13-Mar-2013	Zone 3 - (Fluvial / Tidal Models)
384S	250.0	W	13-Mar-2013	Zone 3 - (Tidal Models)

6.3 Flood Defences

Are there any Flood Defences within 250m of the study site?

No

6.4 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site?

Yes

6.5 Areas used for Flood Storage

Are there any areas used for Flood Storage within 250m of the study site?

No

6.6 Groundwater Flooding Susceptibility Areas

Are there any British Geological Survey groundwater flooding susceptibility flood areas within 50m of the boundary of the study site?

Yes

What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Very High

6.7 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result?

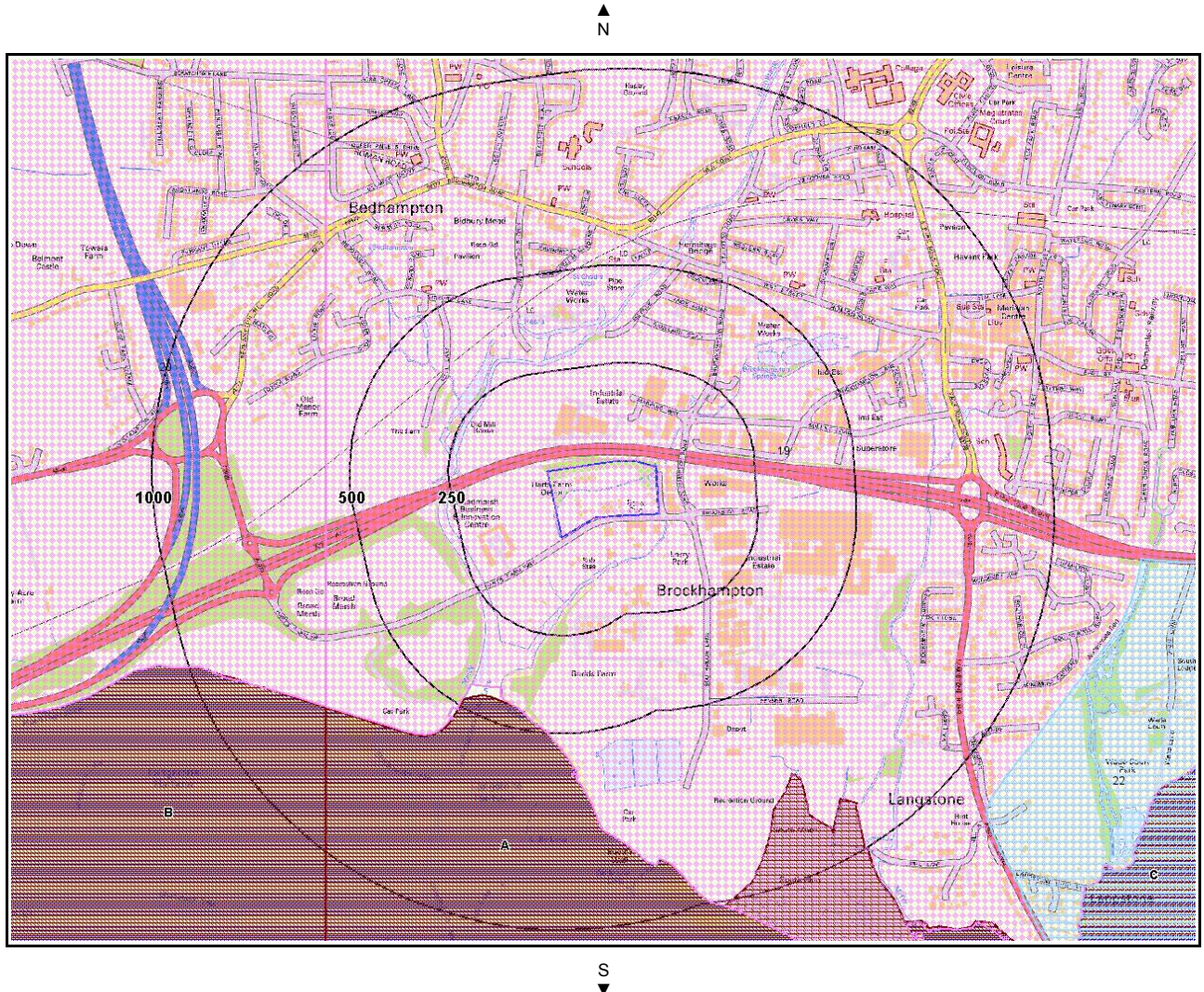
High

Notes:

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The **confidence rating** is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

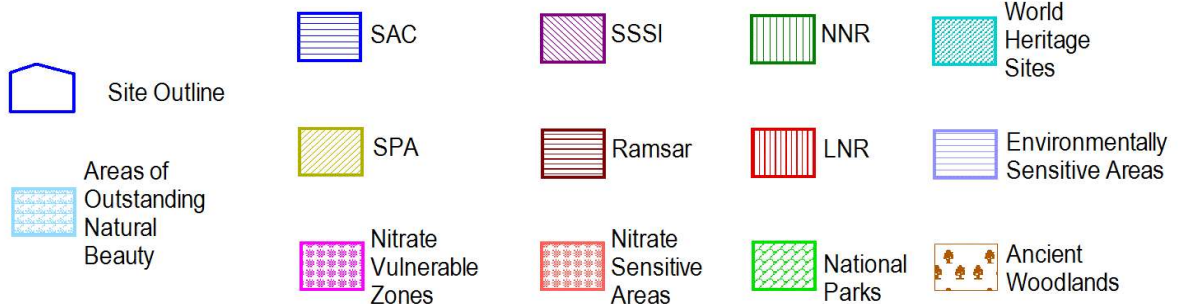
7.Designated Environmentally Sensitive Sites Map



Designated Environmentally Sensitive Sites Legend

Mapping sourced from
Ordnance Survey

© Crown copyright and database rights 2013. Ordnance Survey license 100035207.



7. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site?

Yes

Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

4

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Countryside Council for Wales and Scottish Natural Heritage are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	SSSI Name	Data Source
8A	444.0	S	Langstone Harbour	Natural England
9B	738.0	SW	Langstone Harbour	Natural England
10C	1438.0	SE	Chichester Harbour	Natural England
Not shown	1636.0	W	Langstone Harbour	Natural England

Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

Records of Special Areas of Conservation (SAC) within 2000m of the study site:

3

The following Special Area of Conservation (SAC) records provided by Natural England/Countryside Council for Wales and Scottish Natural Heritage are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	SAC Name	Data Source
1A	444.0	S	Solent Maritime	Natural England
2	738.0	SW	Solent Maritime	Natural England
3	1438.0	SE	Solent Maritime	Natural England

Records of Special Protection Areas (SPA) within 2000m of the study site:

4

The following Special Protection Area (SPA) records provided by Natural England/Countryside Council for Wales and Scottish Natural Heritage are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	SPA Name	Data Source
4A	444.0	S	Chichester and Langstone Harbours	Natural England
5B	738.0	SW	Chichester and Langstone Harbours	Natural England
6C	1438.0	SE	Chichester and Langstone Harbours	Natural England
Not shown	1636.0	W	Chichester and Langstone Harbours	Natural England

Records of Ramsar sites within 2000m of the study site:

4

The following Ramsar site records provided by Natural England/Countryside Council for Wales and Scottish Natural Heritage are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	Ramsar Site Name	Data Source
12A	444.0	S	Chichester and Langstone Harbours	Natural England
13B	738.0	SW	Chichester and Langstone Harbours	Natural England
14C	1438.0	SE	Chichester and Langstone Harbours	Natural England
Not shown	1636.0	W	Chichester and Langstone Harbours	Natural England

Records of Local Nature Reserves (LNR) within 2000m of the study site:
3

The following Local Nature Reserve (LNR) records provided by Natural England/Countryside Council for Wales and Scottish Natural Heritage are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	LNR Name	Data Source
Not shown	1636.0	W	Farlington Marshes	Natural England
Not shown	1780.0	SW	Farlington Marshes	Natural England
Not shown	1835.0	SE	West Hayling	Natural England

Records of World Heritage Sites within 2000m of the study site:
0

Database searched and no data found.

Records of Environmentally Sensitive Areas within 2000m of the study site:
0

Database searched and no data found.

Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:
1

The following Area of Outstanding Natural Beauty (AONB) records and Scottish National Scenic Area (NSA) records provided by Natural England/Countryside Council for Wales/Scottish Government are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	AONB/NSA Name	Data Source
22	1106.0	SE	Chichester Harbour	Natural England

Records of National Parks (NP) within 2000m of the study site:
0

Database searched and no data found.

Records of Nitrate Sensitive Areas within 2000m of the study site:
0

Database searched and no data found.

Records of Nitrate Vulnerable Zones within 2000m of the study site:
3

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	NVZ Type	Data Source
19	0.0	On Site	NVZ Area	DEFRA
20	559.0	W	NVZ Area	DEFRA
Not shown	1963.0	SE	NVZ Area	DEFRA

Records of Ancient Woodland within 2000m of the study site:
4

The following Ancient Woodland records are supplied by English Nature/Scottish Natural Heritage/Countryside Council for Wales and are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	Ancient Woodland Name	Type
23	1450.0	NW	UNKNOWN	Ancient Replanted Woodland
Not shown	1587.0	NW	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1648.0	NW	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1814.0	NW	UNKNOWN	Ancient and Semi-Natural Woodland

8. Natural Hazards Findings

8.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a GroundSure GeoInsight, available from our website. The following information has been found:

8.1.1 Shrink Swell

What is the maximum Shrink-Swell* hazard rating identified on the study site?

Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

8.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site?

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

8.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site?

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant soluble rocks are present. Problems unlikely except with considerable surface or subsurface water flow. No special actions required to avoid problems due to soluble rocks. No special ground investigation required or increased construction costs are likely. An increase in financial risk due to potential problems with soluble rocks is unlikely.

8.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site?

Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Report Reference: EMS-207470_272852

Hazard

Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

8.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site?

Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Slight possibility for collapsible deposit problems after major changes in loading or groundwater conditions. Normal maintenance to avoid large amounts of water entering the ground through pipe leakage or soak-aways should reduce the likelihood of problems due to collapsible deposits. For new build, assess the possibility of collapsible (loessic) deposits in ground investigation. For existing property, no significant increase in insurance risk from collapsible deposits is likely.

8.1.6 Running Sand

What is the maximum Running Sand* hazard rating identified on the study site?

Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property no significant increase in insurance risk due to running sand problems is likely.

* This indicates an automatically generated 50m buffer and site.

9. Mining

9.1 Coal Mining

Are there any coal mining areas within 75m of the study site?

No

Database searched and no data found.

9.2 Shallow Mining

What is the subsidence hazard relating to shallow mining on-site*?

Negligible

*Please note this data is searched with a 150m buffer.

9.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site?

No

Guidance: No Guidance Required.

10. Contacts

EmapSite

Telephone: 0118 9736883
sales@emapsite.com



British Geological Survey (England & Wales)

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143. Fax: 0115 936 3276. Email:
enquiries@bgs.ac.uk
Web: www.bgs.ac.uk
BGS Geological Hazards Reports and general geological enquiries



Environment Agency

National Customer Contact Centre
PO Box 544
Rotherham
S60 1BY
Tel: 08708 506 506
Web: www.environment-agency.gov.uk
Email: enquiries@environment-agency.gov.uk



Health Protection Agency

Chilton, Didcot, Oxon, OX11 0RQ
Tel: 01235 822622 www.hpa.org.uk/radiation
Radon measures and general radon information and guidance



The Coal Authority

200 Lichfield Lane, Mansfield, Notts NG18 4RG
Tel: 0845 762 6848
DX 716176 Mansfield 5
Web: www.groundstability.com



Ordnance Survey

Romsey Road
Southampton SO16 4GU
Tel: 08456 050505



Local Authority

Authority: Havant Borough Council
Phone: 023 9247 4174
Web: www.havant.gov.uk
Address: Civic Centre Road, Havant, Hampshire, PO9 2AX

Get Mapping PLC

Virginia Villas, High Street, Hartley Witney, Hampshire RG27 8NW
Tel: 01252 845444



Acknowledgements

This product includes map data licensed from Landmark Information Group Limited®.
© Crown Copyright 2003 and Landmark Information Group Limited® 2003. All Rights Reserved.

Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, English Nature who retain the Copyright and Intellectual Property Rights for the data.

PointX © Database Right/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028].
This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

1 Definitions

In these terms and conditions unless the context otherwise requires:

"Beneficiary" means the person or entity for whose benefit the Client has obtained the Services.

"Client" means the party or parties entering into a Contract with GroundSure.

"Commercial" means any building or property which is not Residential.

"Confidential Information" means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than (i) information which the Client can prove was rightfully in its possession prior to disclosure by GroundSure and (ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

"Support Services" means Support Services provided by GroundSure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Contract" means the contract between GroundSure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

"Third Party Data Provider" means any third party providing Third Party Content to GroundSure.

"Data Reports" means reports comprising factual data with no accompanying interpretation.

"Fees" has the meaning set out in clause 5.1.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028.

"GroundSure Materials" means all materials prepared by GroundSure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

"Intellectual Property" means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trademark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

"Mapping" means a map, map data or a combination of historical maps of various ages, time periods and scales.

"Order" means an electronic, written or other order form submitted by the Client requesting Services from GroundSure in respect of a specified Site.

"Ordnance Survey" means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

"Order Website" means the online platform through which Orders may be placed by the Client and accepted by GroundSure.

"Report" means a Risk Screening Report or Data Report for Commercial or Residential property.

"Residential" means any building or property used as or intended to be used as a single dwelling.

"Risk Screening Report" means a risk screening report comprising factual data with an accompanying interpretation by GroundSure.

"Services" means any Report, Mapping and/or Support Services which GroundSure has agreed to provide by accepting an Order pursuant to clause 2.6.

"Site" means the area of land in respect of which the Client has requested GroundSure to provide the Services.

"Third Party Content" means data, database information or other information which is provided to GroundSure by a Third Party Data Provider.

"User Guide" means the user guide, as amended from time to time, available upon request from GroundSure and on the website (www.groundsure.com) and forming part of this Contract.

2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 GroundSure agrees to provide the Services in accordance with the Contract.

2.2 GroundSure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. In addition you acknowledge and agree that GroundSure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 GroundSure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by GroundSure. GroundSure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by GroundSure. GroundSure's acceptance of an Order shall be binding only when made in writing and signed by GroundSure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and (i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and (ii) be liable to GroundSure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to GroundSure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as GroundSure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable GroundSure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the GroundSure Materials, or use the GroundSure Materials in a manner for which they were not intended. The Client may make the GroundSure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that GroundSure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1 The Client acknowledges that the Services provided by GroundSure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by GroundSure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents; (i) the Beneficiary, (ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate), (iv) the first purchaser or first tenant of the Site, and (v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by GroundSure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1 GroundSure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by GroundSure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to GroundSure in full without deduction, counterclaim or set off within 30 days of the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of GroundSure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to (i) full payment of all relevant Fees and (ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the GroundSure Materials.

6.2 All Intellectual Property in the GroundSure Materials are and shall remain owned by GroundSure or GroundSure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the GroundSure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this

clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's *OS Street Map*) without first being in possession of a valid *Paper Map Copying Licence* from Ordnance Survey.

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the GroundSure Materials in order to advise the Beneficiary in a professional capacity. However, GroundSure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

7. Liability – Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of GroundSure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by GroundSure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 GroundSure shall not be liable for (i) loss of profits; (ii) loss of business; (iii) depletion of goodwill and/or similar losses; (iv) loss of anticipated savings; (v) loss of goods; (vi) loss of contract; (vii) loss of use; (viii) loss or corruption of data or information; (ix) business interruption; (x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses; (xi) loss or damage that arise as a result of the use of all or part of the GroundSure Materials in breach of the Contract; (xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content; (xiii) loss or damage to a computer, software, modem, telephone or other property; and (xiv) loss or damage caused by a delay or loss of use of GroundSure's internet ordering service.

7.5 GroundSure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 GroundSure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of GroundSure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against GroundSure in relation to the Services or other matters arising pursuant to the Contract.

8 GroundSure's right to suspend or terminate

8.1 If GroundSure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, GroundSure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 GroundSure shall be entitled to terminate the Contract immediately on written notice in the event that:

- (i) the Client fails to pay any sum due to GroundSure within 30 days of the Payment Date; or
- (ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or
- (iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or
- (iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9 Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

- (i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon GroundSure's acceptance of the Order; and (ii) the Reports and/or Mapping provided under this Contract are (i) supplied to the Client's specification(s) and in any event (ii) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

- (i) GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in GroundSure's possession or control; and
- (ii) the Client shall pay to GroundSure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

- (i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;
- (ii) comply with such of GroundSure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and
- (iii) promptly report to GroundSure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through GroundSure.

12.3 GroundSure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of GroundSure.

12.4 No failure on the part of GroundSure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

- (i) the Client or Beneficiary's failure to provide facilities, access or information;
- (ii) fire, storm, flood, tempest or epidemic;
- (iii) Acts of God or the public enemy;
- (iv) riot, civil commotion or war;
- (v) strikes, labour disputes or industrial action;
- (vi) acts or regulations of any governmental or other agency;
- (vii) suspension or delay of services at public registries by Third Party Data Providers;
- (viii) changes in law; or
- (ix) any other reason beyond GroundSure's reasonable control.

In the event that GroundSure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then GroundSure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 GroundSure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the *Search Code* administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the *Search Code*.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at GroundSure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law.

Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: MasterMap

Map date: 2012

Scale: 1:1,250

Printed at: 1:2,500



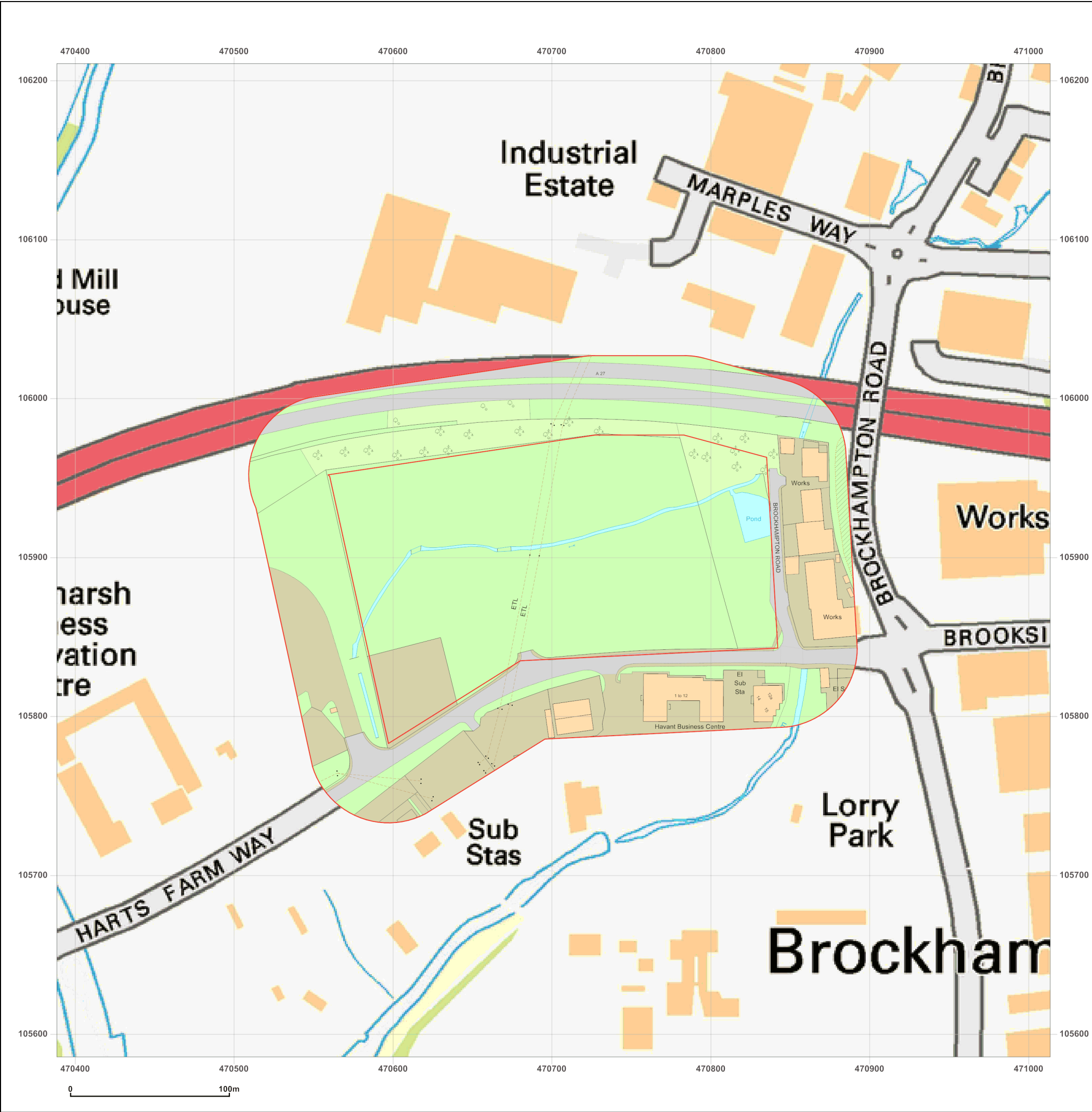
Produced by
GroundSure Environmental Insight
www.groundsure.com

Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

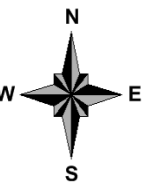
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1993
Revised 1993
Edition N/A
Copyright N/A
Levelled N/A



Produced by
GroundSure Environmental Insight
www.groundsure.com

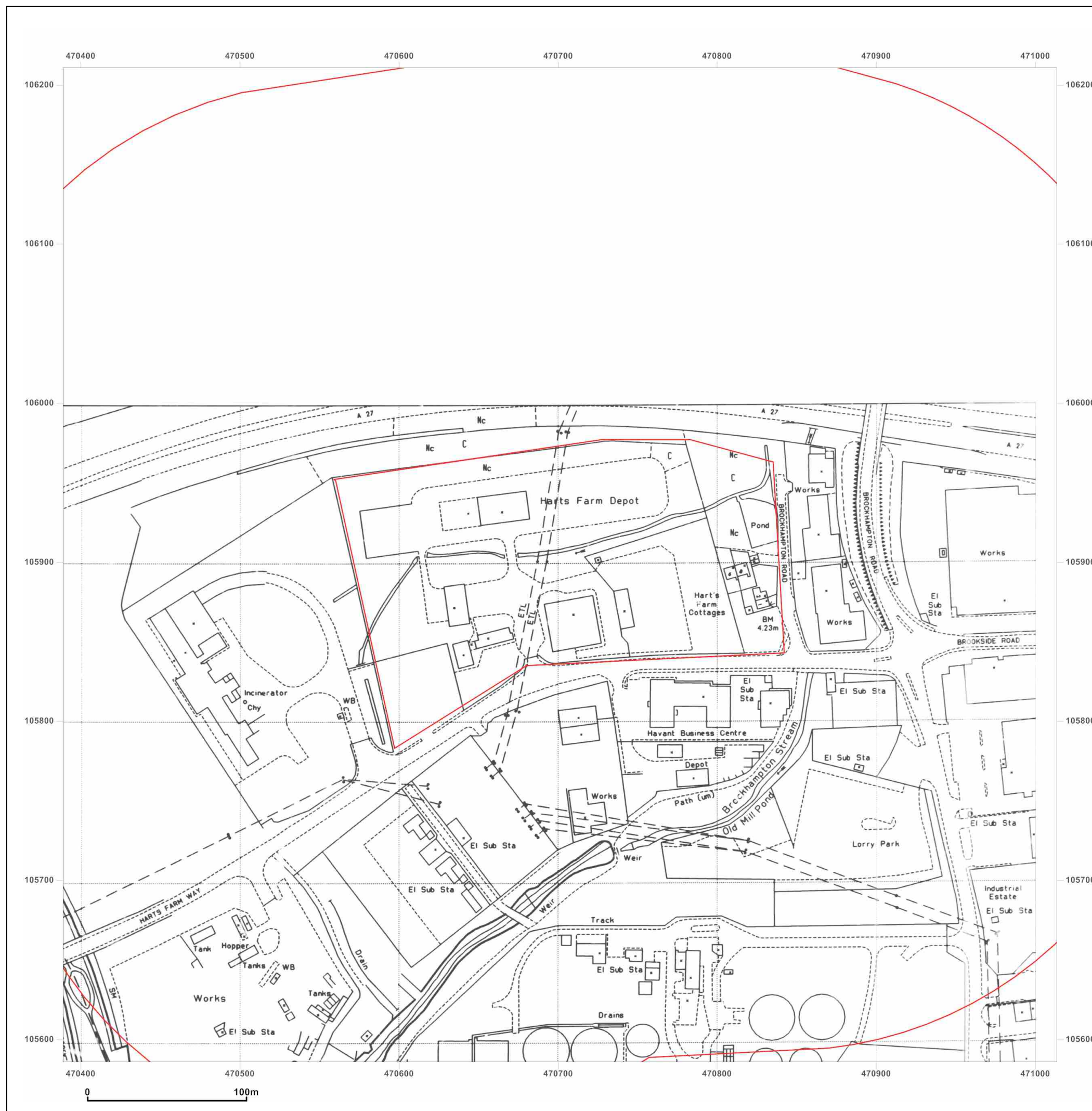


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1987-1989

Scale: 1:1,250

Printed at: 1:2,500



Surveyed 1958
Revised 1987
Edition N/A
Copyright 1987
Levelled 1958

Surveyed 1957
Revised 1989
Edition N/A
Copyright 1989
Levelled 1957

Surveyed 1957
Revised 1987
Edition N/A
Copyright 1987
Levelled 1957



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

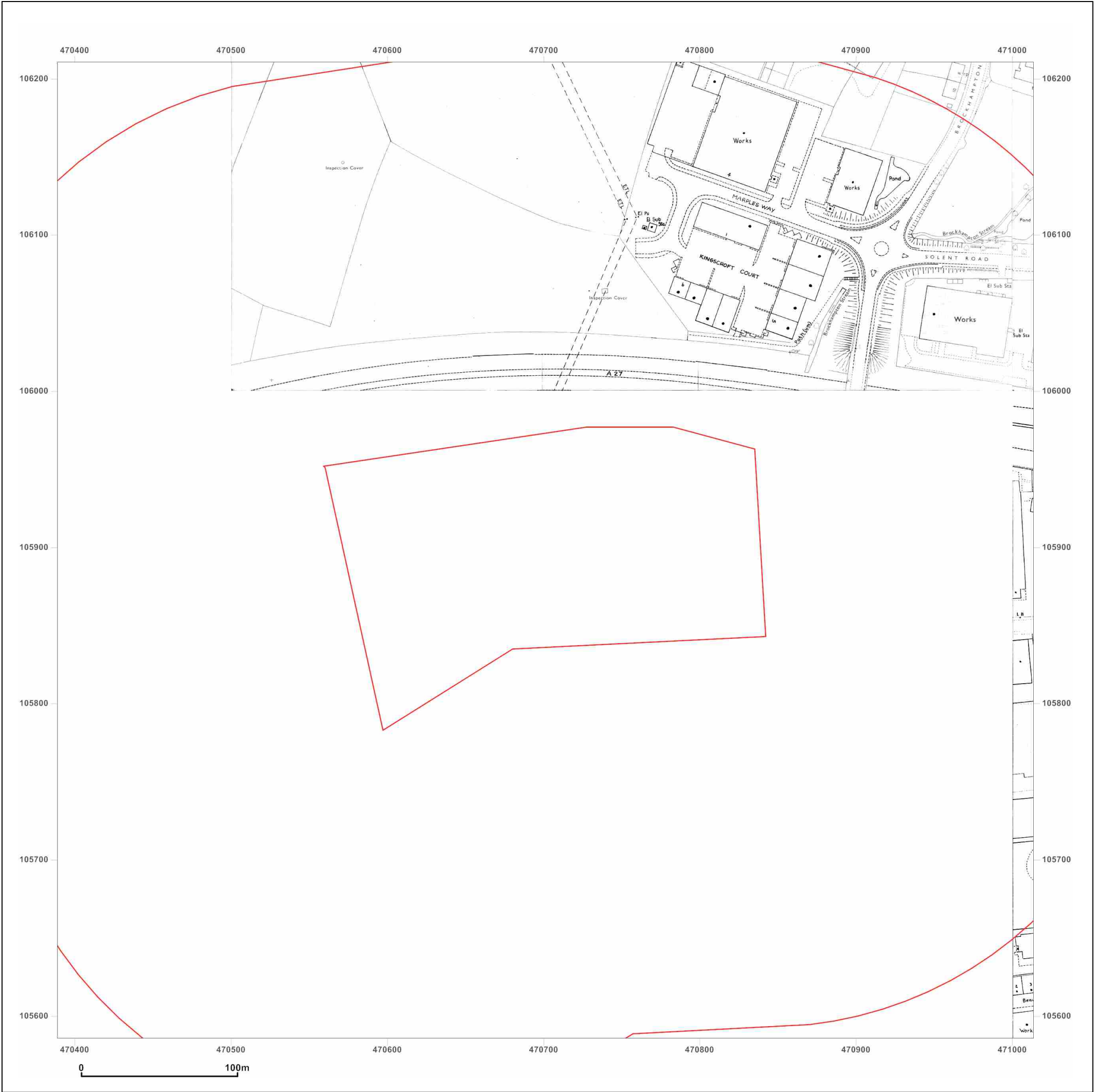


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

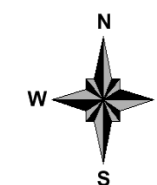
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1984-1987

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1957
Revised 1987
Edition N/A
Copyright 1987
Levelled 1957

Surveyed 1957
Revised 1984
Edition N/A
Copyright 1984
Levelled 1957



Produced by
GroundSure Environmental Insight
www.groundsure.com

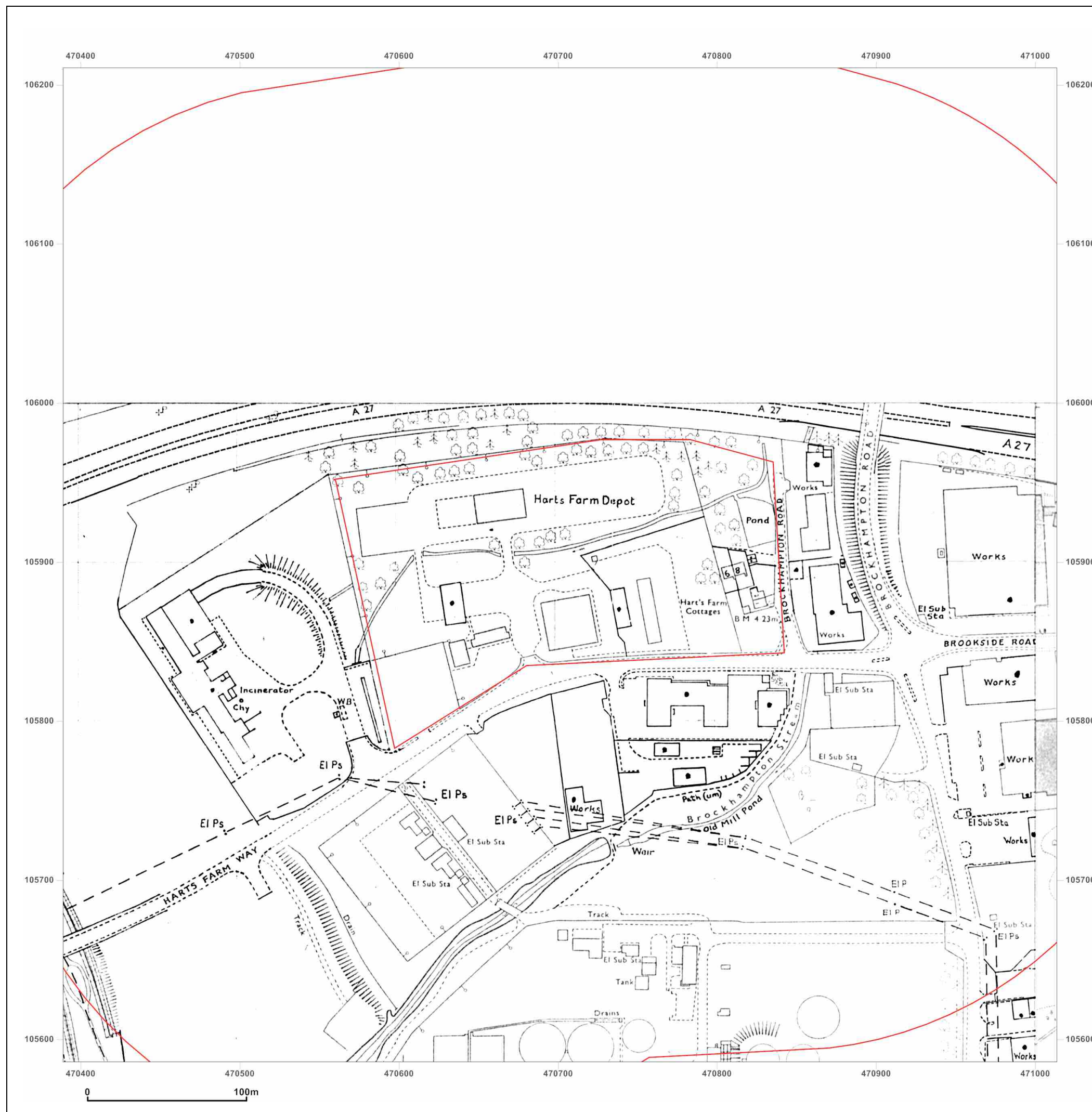


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1969-1973

Scale: 1:1,250

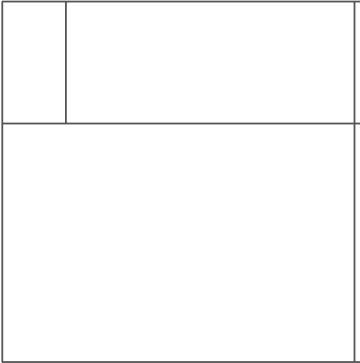
Printed at: 1:2,500



Surveyed 1958
Revised 1972
Edition N/A
Copyright 1973
Levelled 1958

Surveyed 1958
Revised 1969
Edition N/A
Copyright 1969
Levelled 1957

Surveyed 1960
Revised 1968
Edition N/A
Copyright 1969
Levelled 1957



Surveyed 1972
Revised 1972
Edition N/A
Copyright 1973
Levelled 1957



Produced by
GroundSure Environmental Insight
www.groundsure.com

Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)

Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

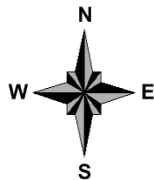
Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1973

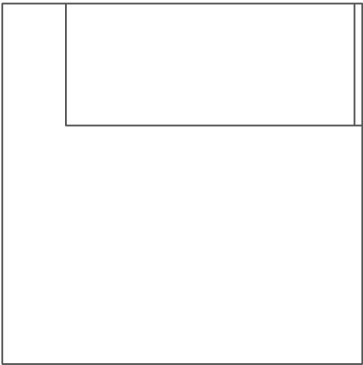
Scale: 1:1,250

Printed at: 1:2,500



Surveyed 1958
Revised 1972
Edition N/A
Copyright 1973
Levelled 1957

Surveyed 1960
Revised 1972
Edition N/A
Copyright 1973
Levelled 1957



Produced by
GroundSure Environmental Insight
www.groundsure.com

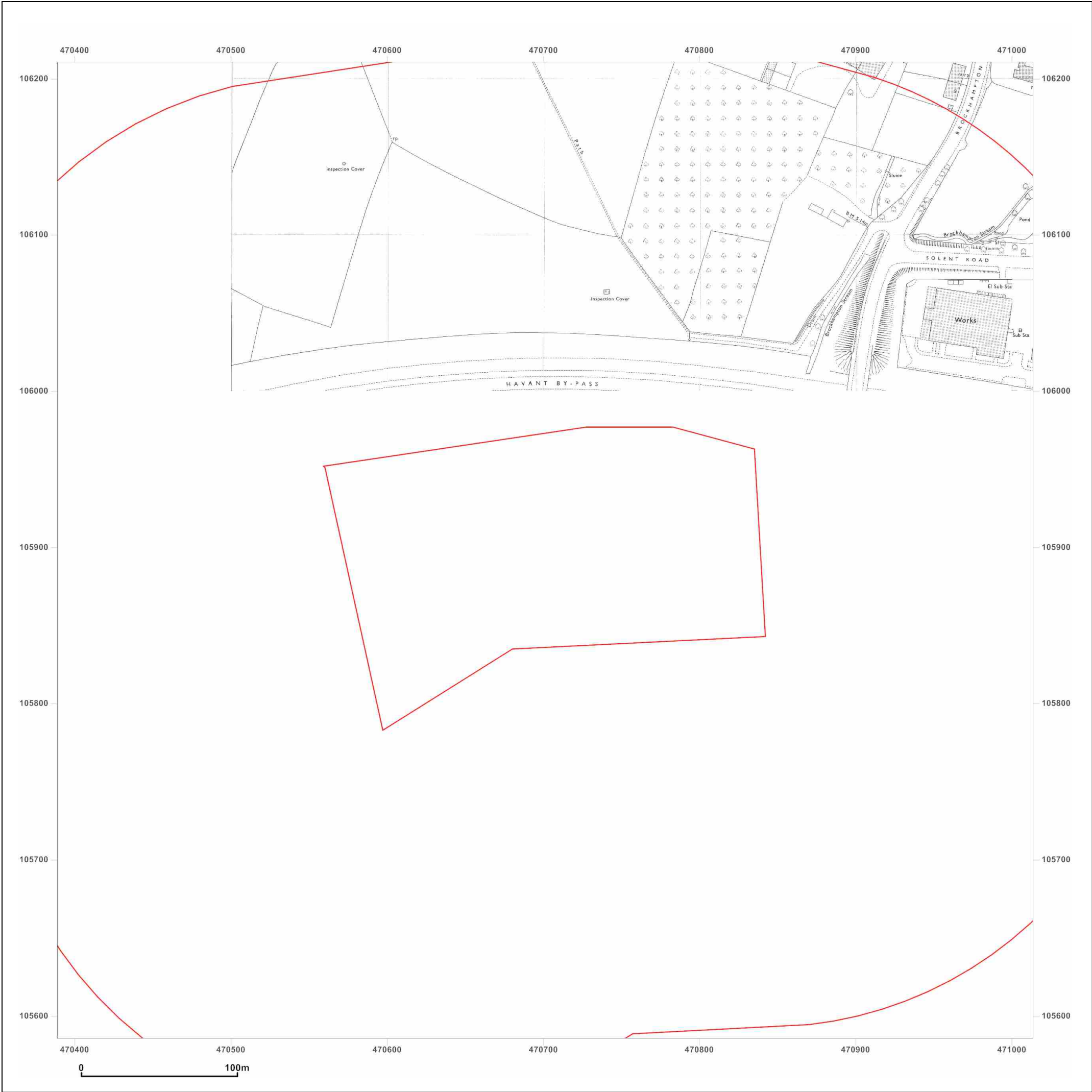


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

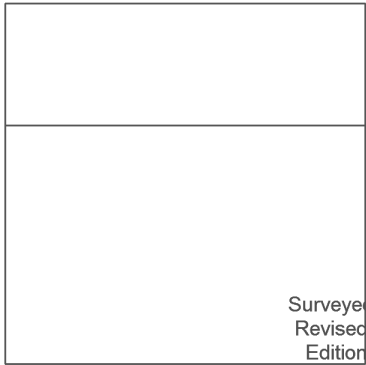
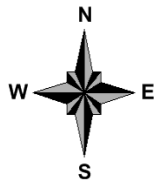
Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1972

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1972
Revised 1972
Edition N/A
Copyright 1974
Levelled 1957



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

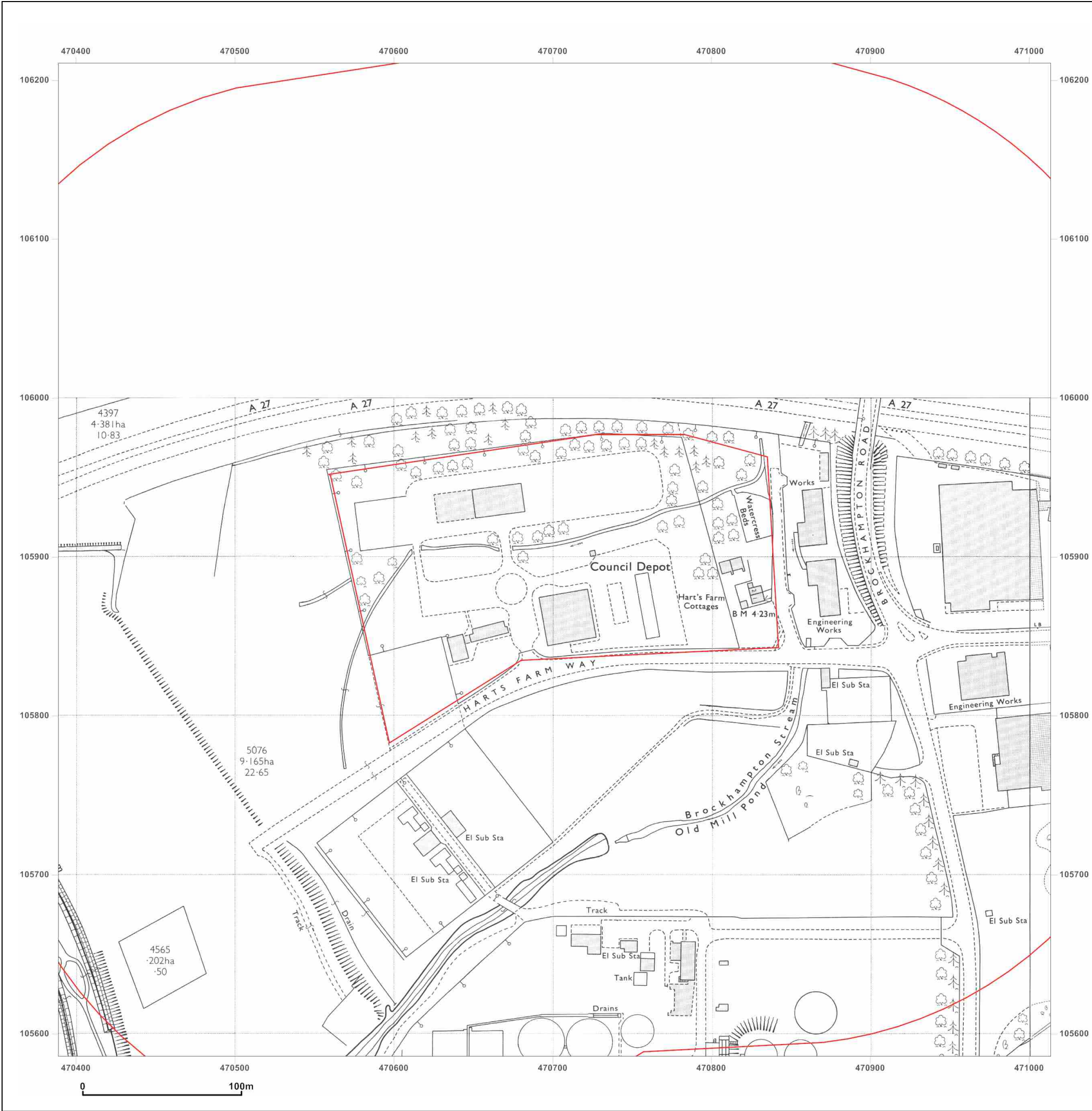


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

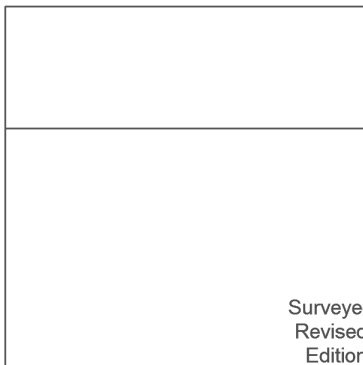
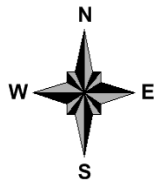
Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1968

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1968
Revised 1968
Edition N/A
Copyright 1969
Levelled 1957



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

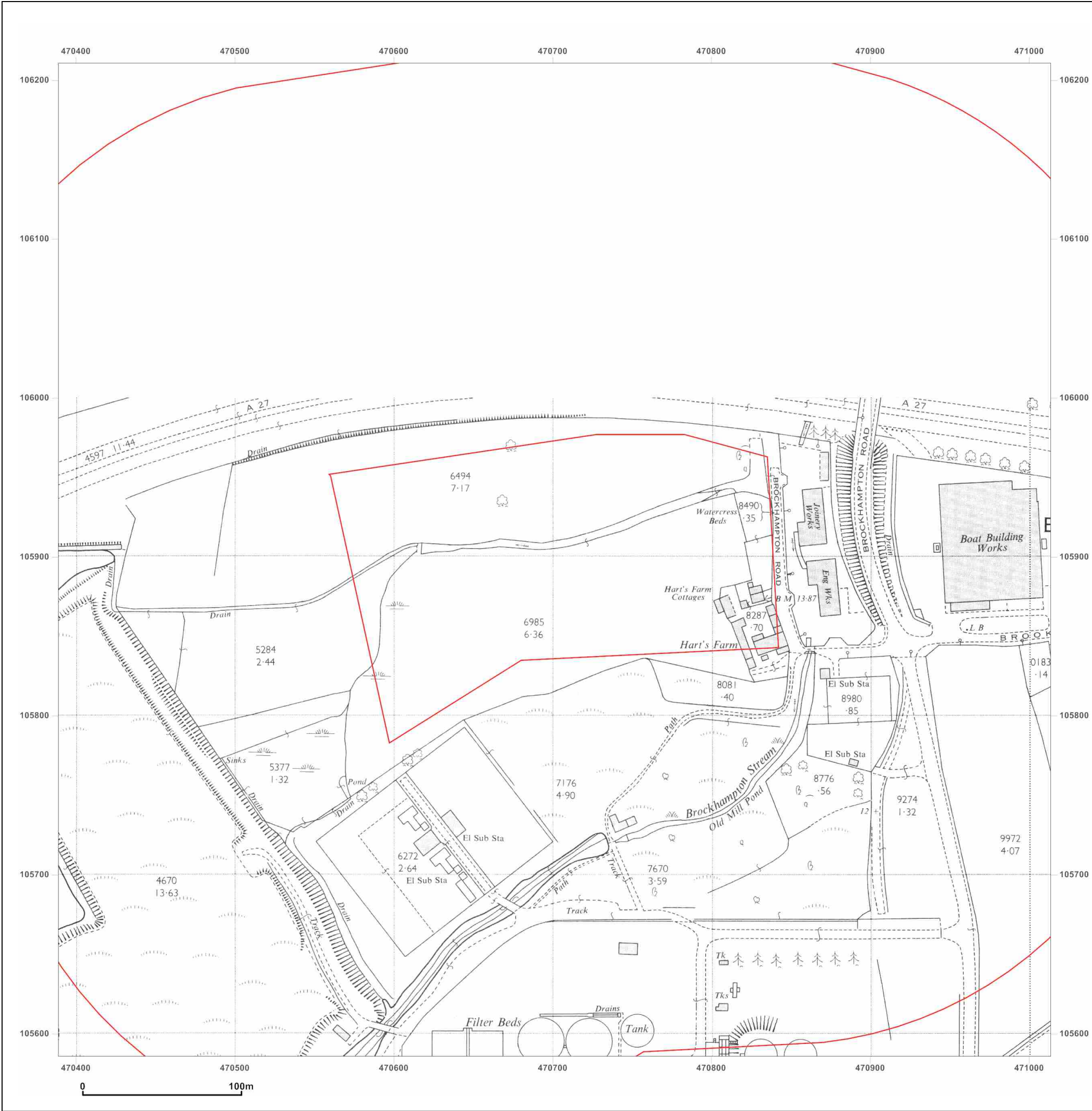


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1959-1960

Scale: 1:1,250

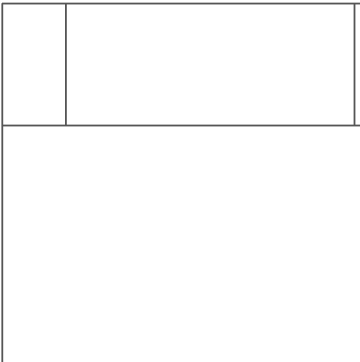
Printed at: 1:2,500



Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1946

Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1946

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1960
Levelled 1957



GroundSure



Ordnance
Survey
Licensed Partner

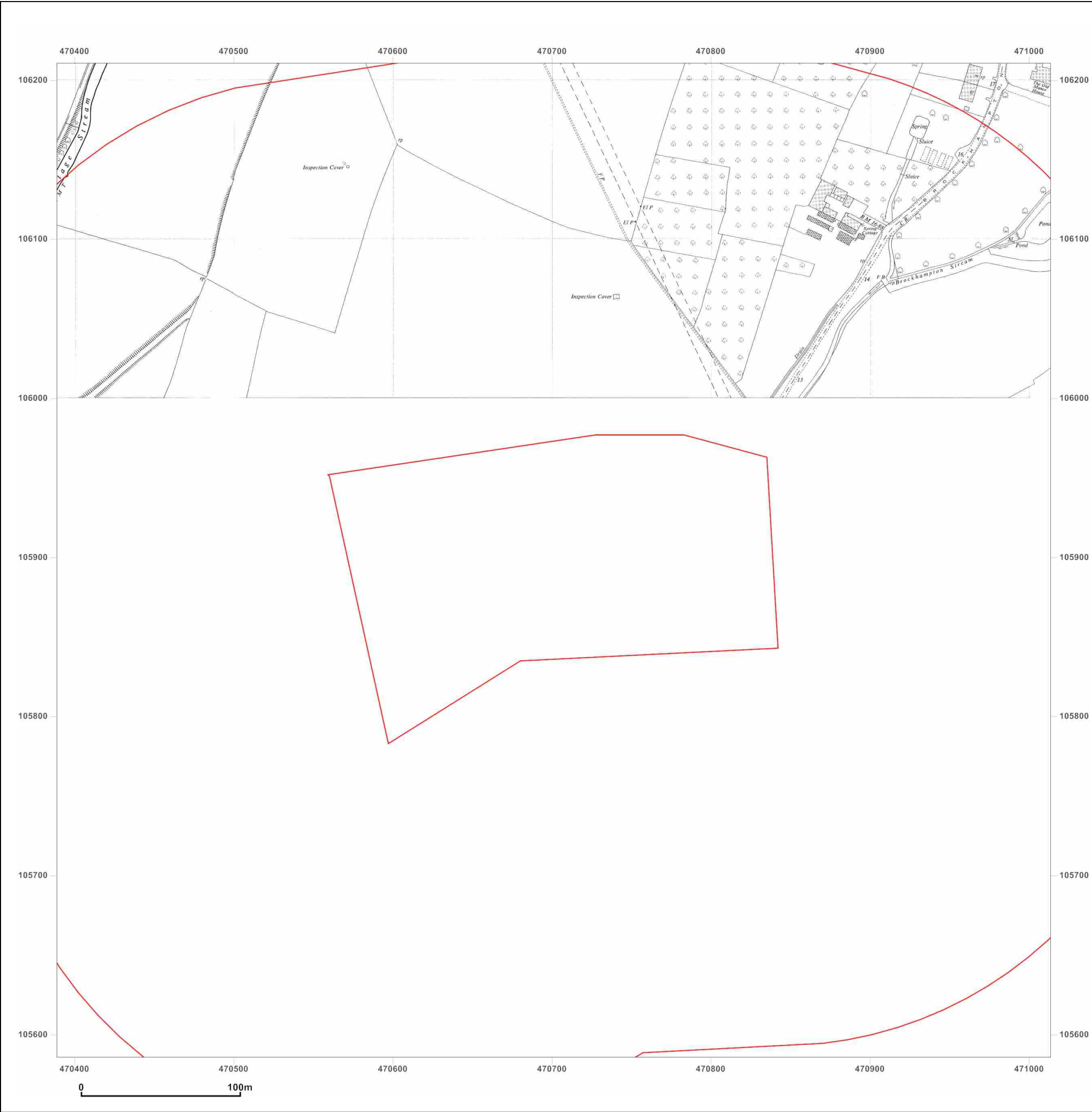
Produced by
GroundSure Environmental Insight
www.groundsure.com

Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: National Grid

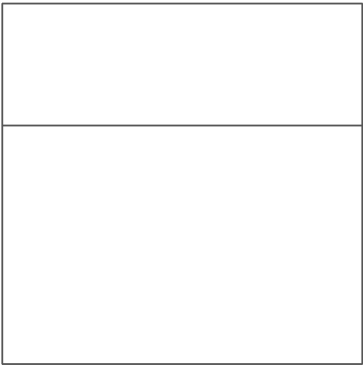
Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition 1961
Copyright 1961
Levelled 1957



Produced by
GroundSure Environmental Insight
www.groundsure.com

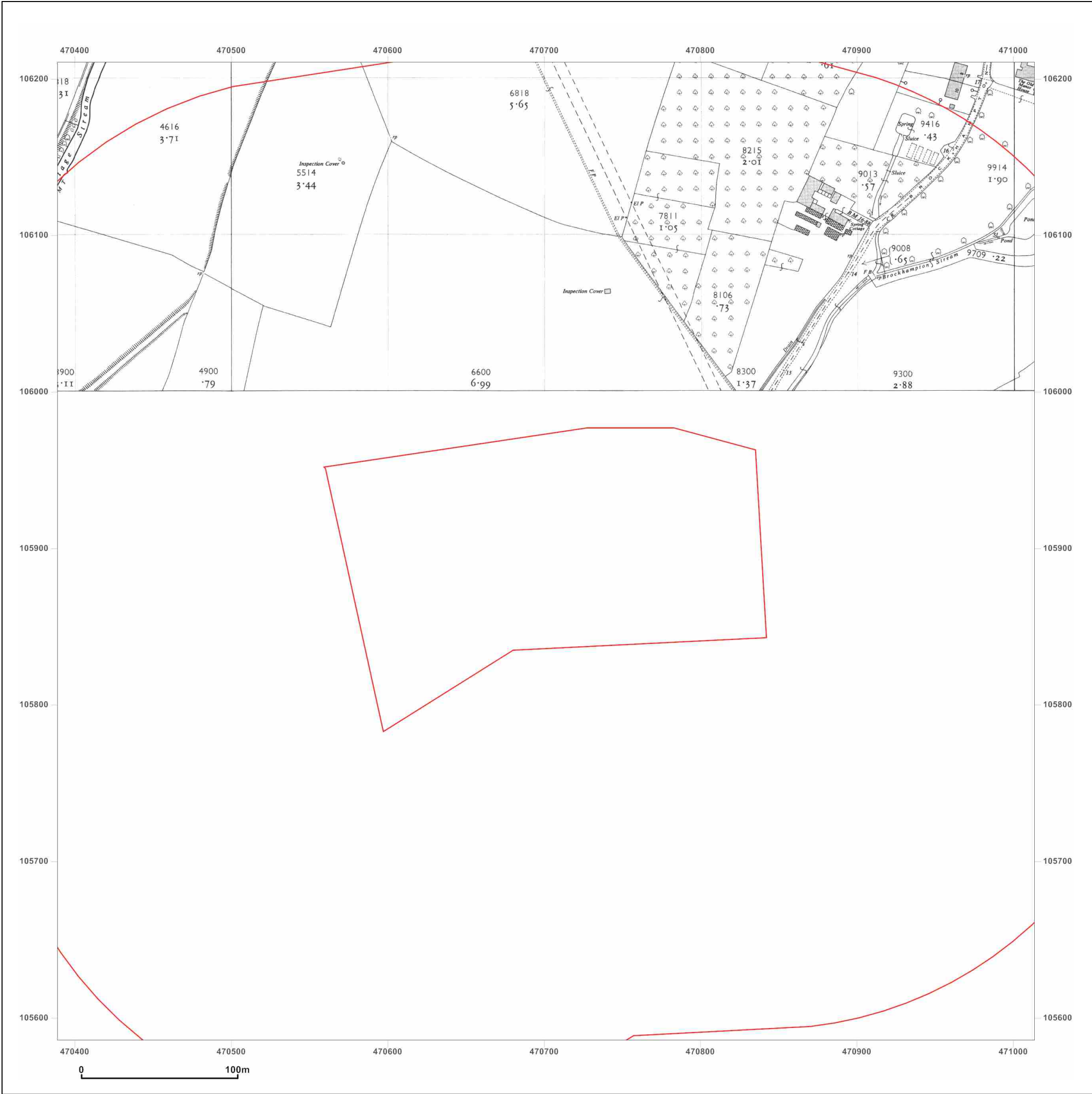


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

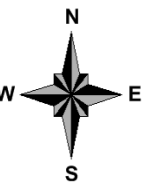
Grid Ref: 470701, 105898

Map Name: National Grid

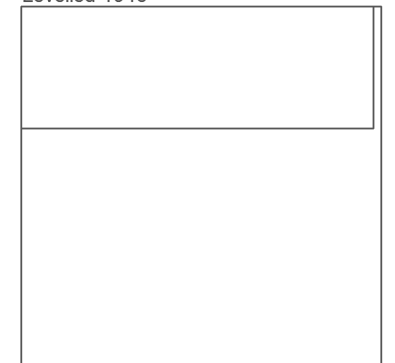
Map date: 1953

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1951
Revised 1953
Edition N/A
Copyright N/A
Levelled 1946



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

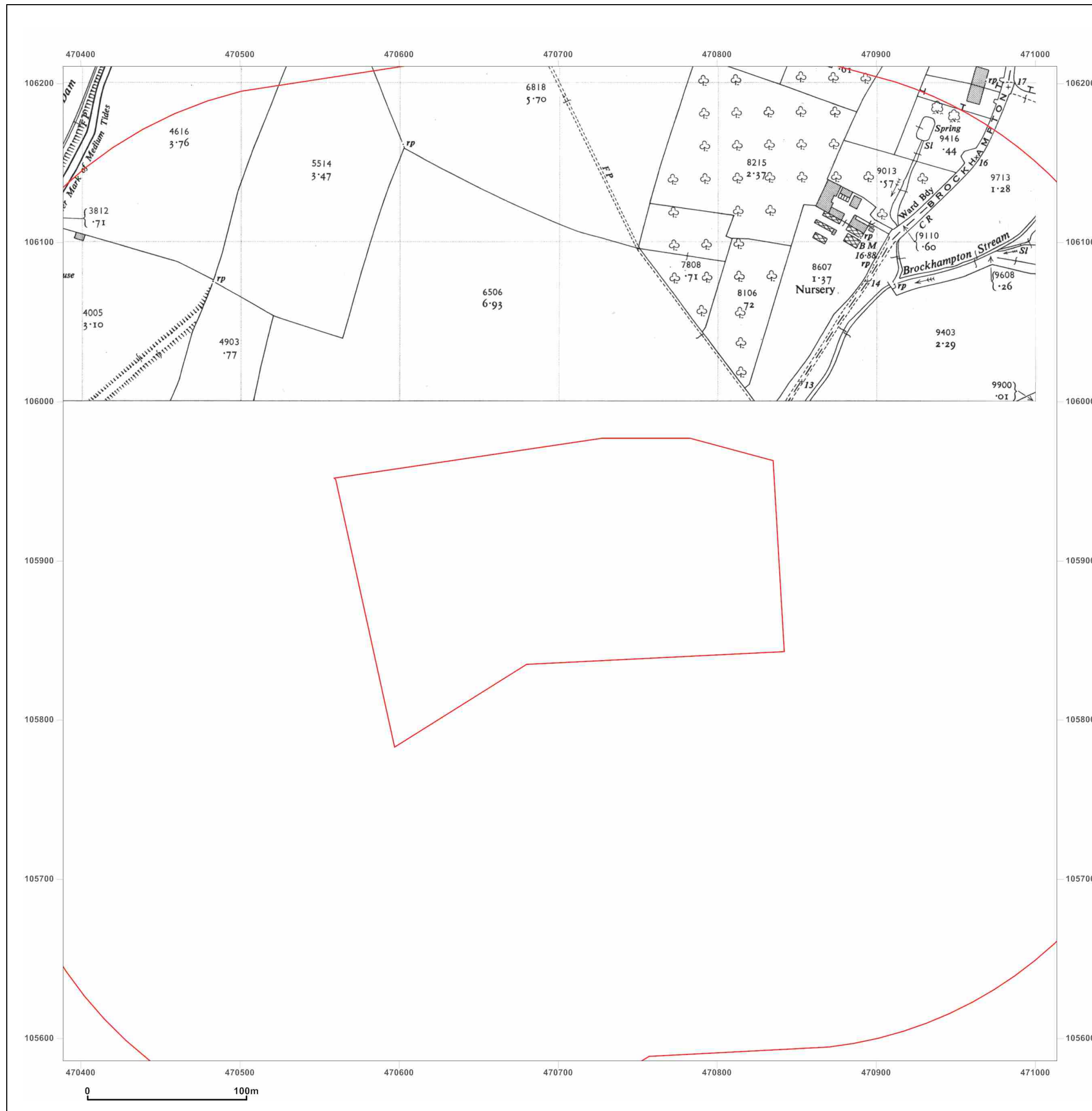


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

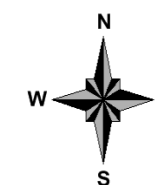
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1951-1952

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled 1946

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1946

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1946



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

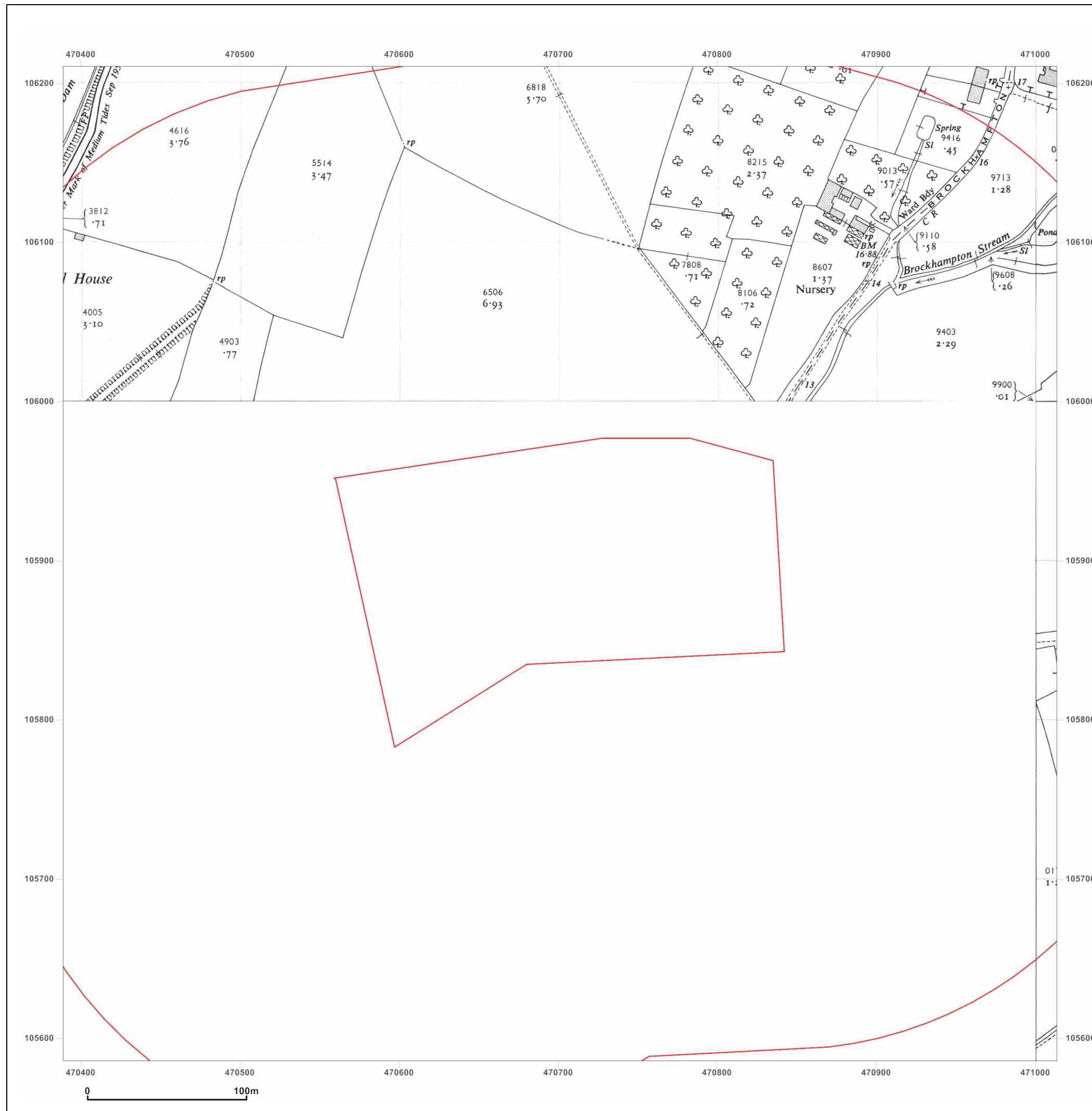


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

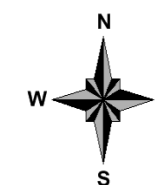
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1939

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1939
Revised 1939
Edition N/A
Copyright N/A
Levelled N/A



Produced by
GroundSure Environmental Insight
www.groundsure.com

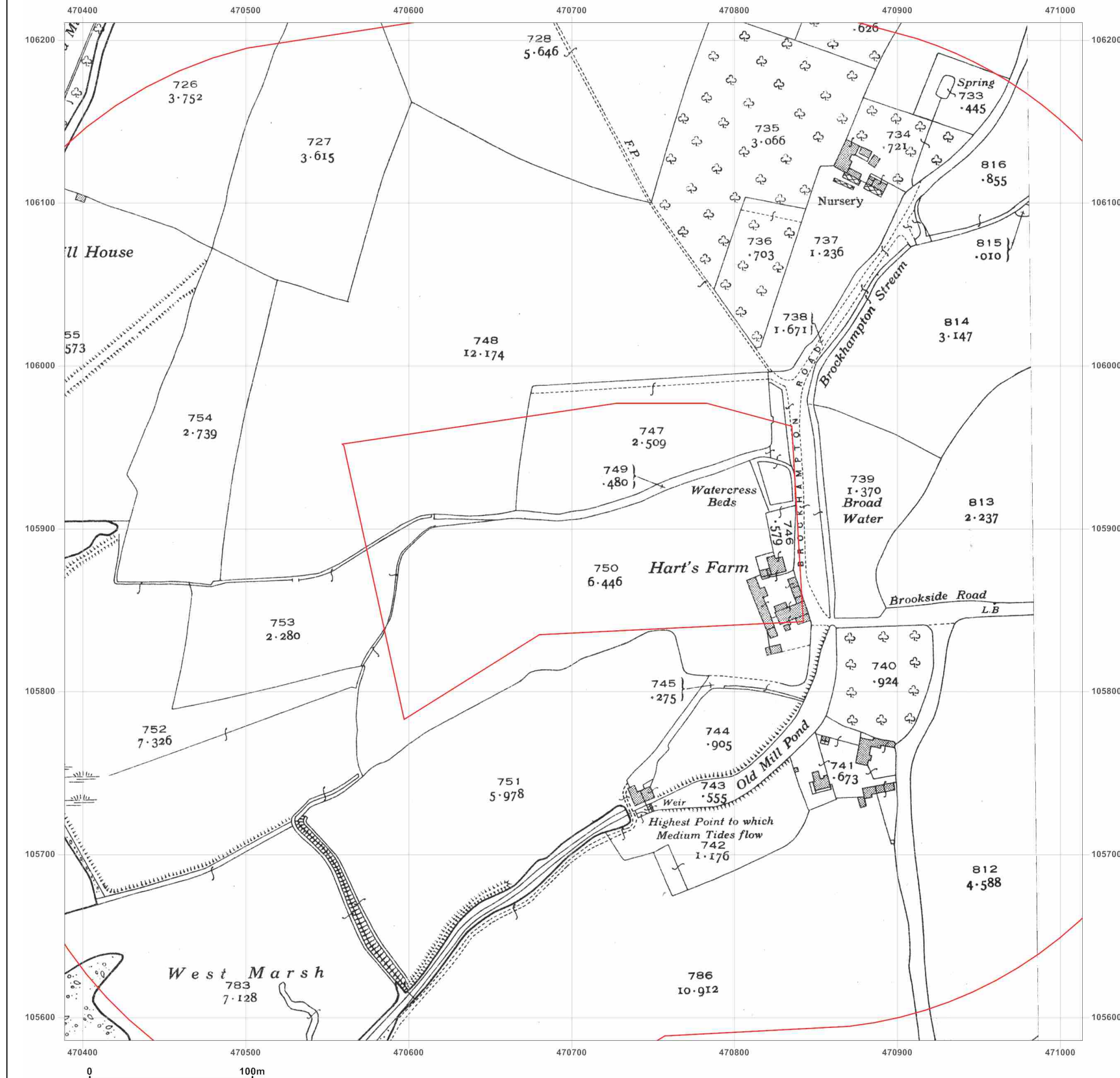


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

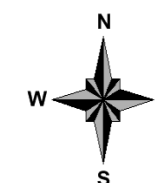
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1932

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

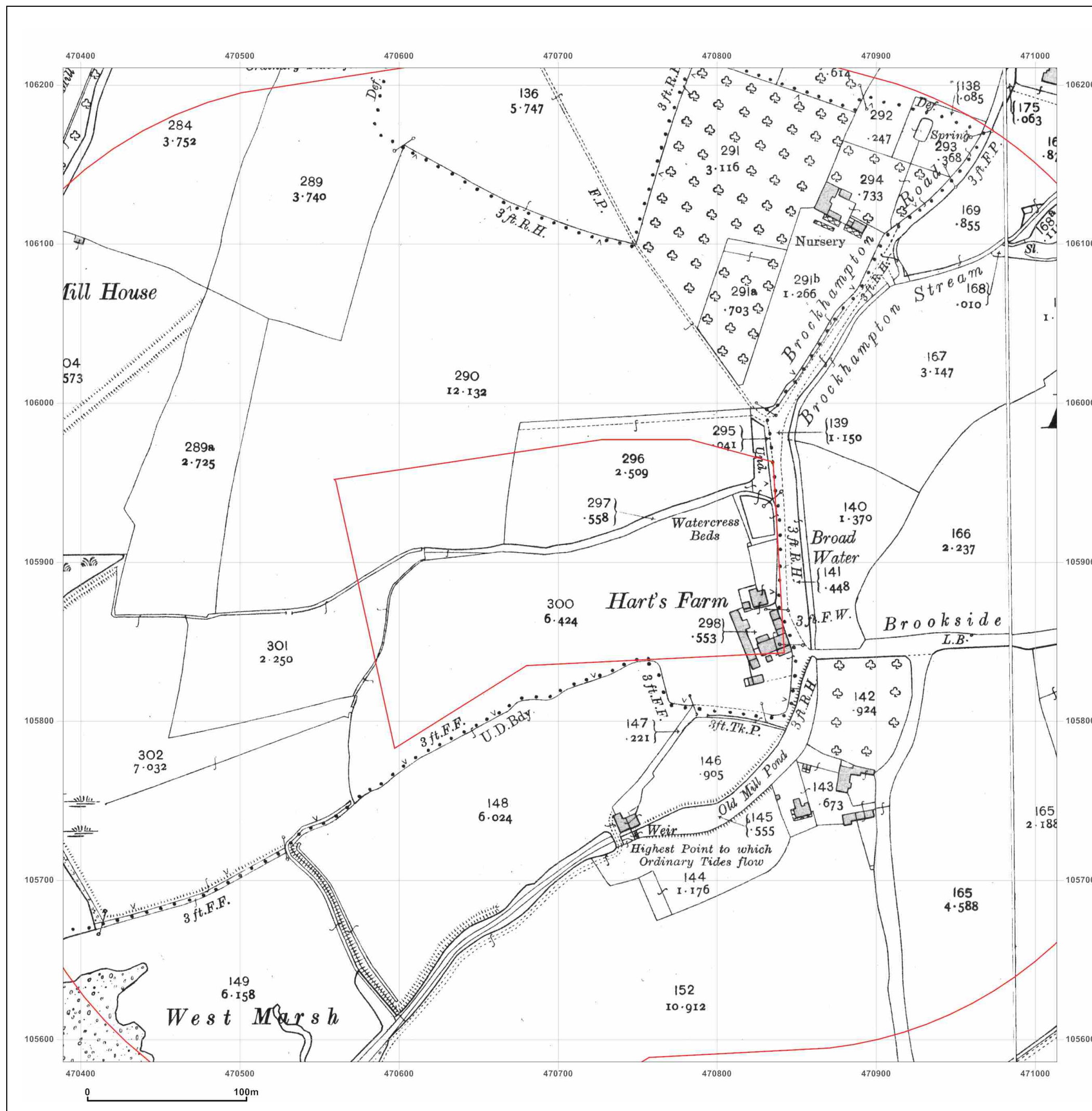


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1909

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1909
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1909
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

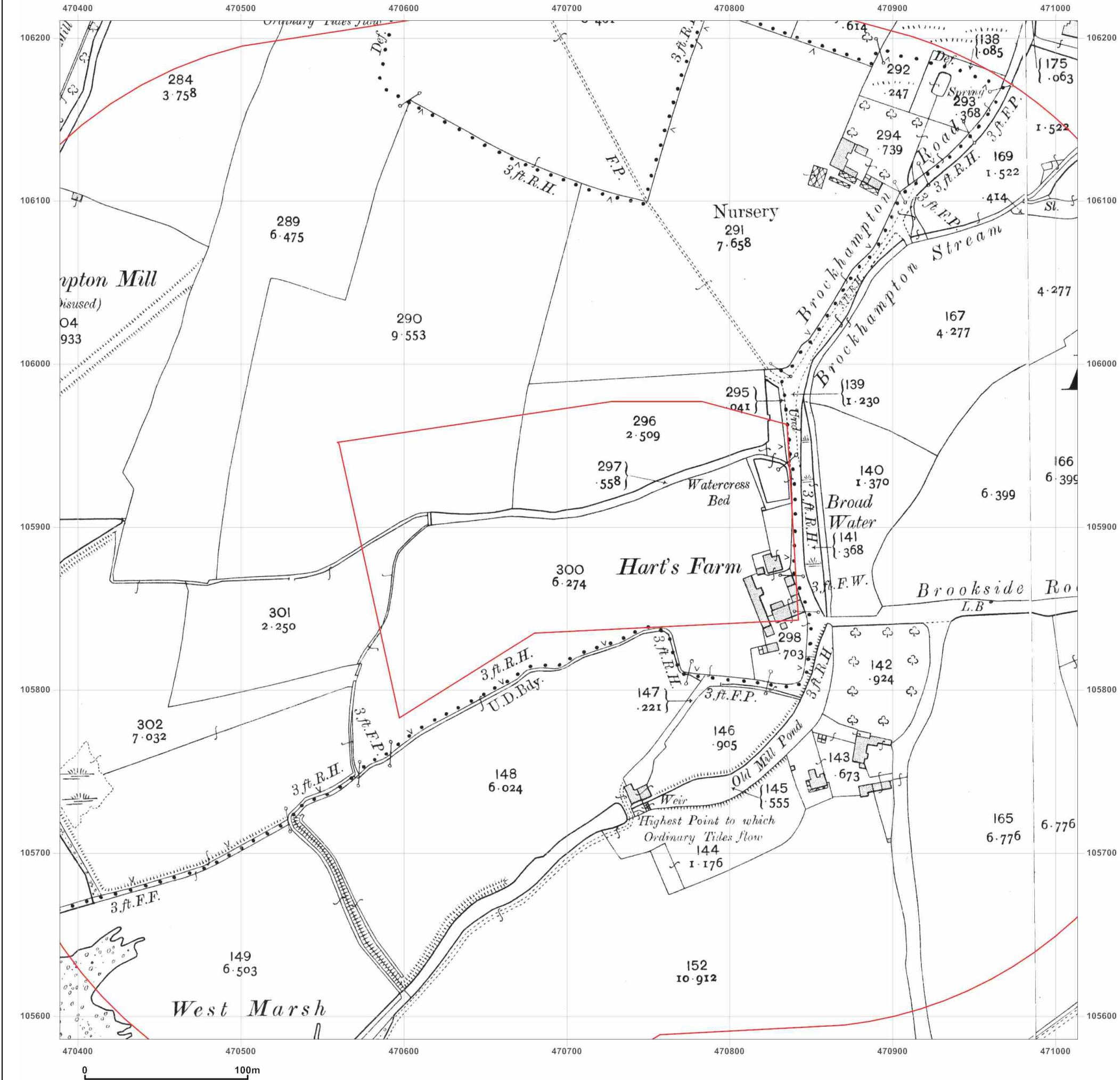


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

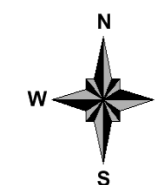
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1897

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

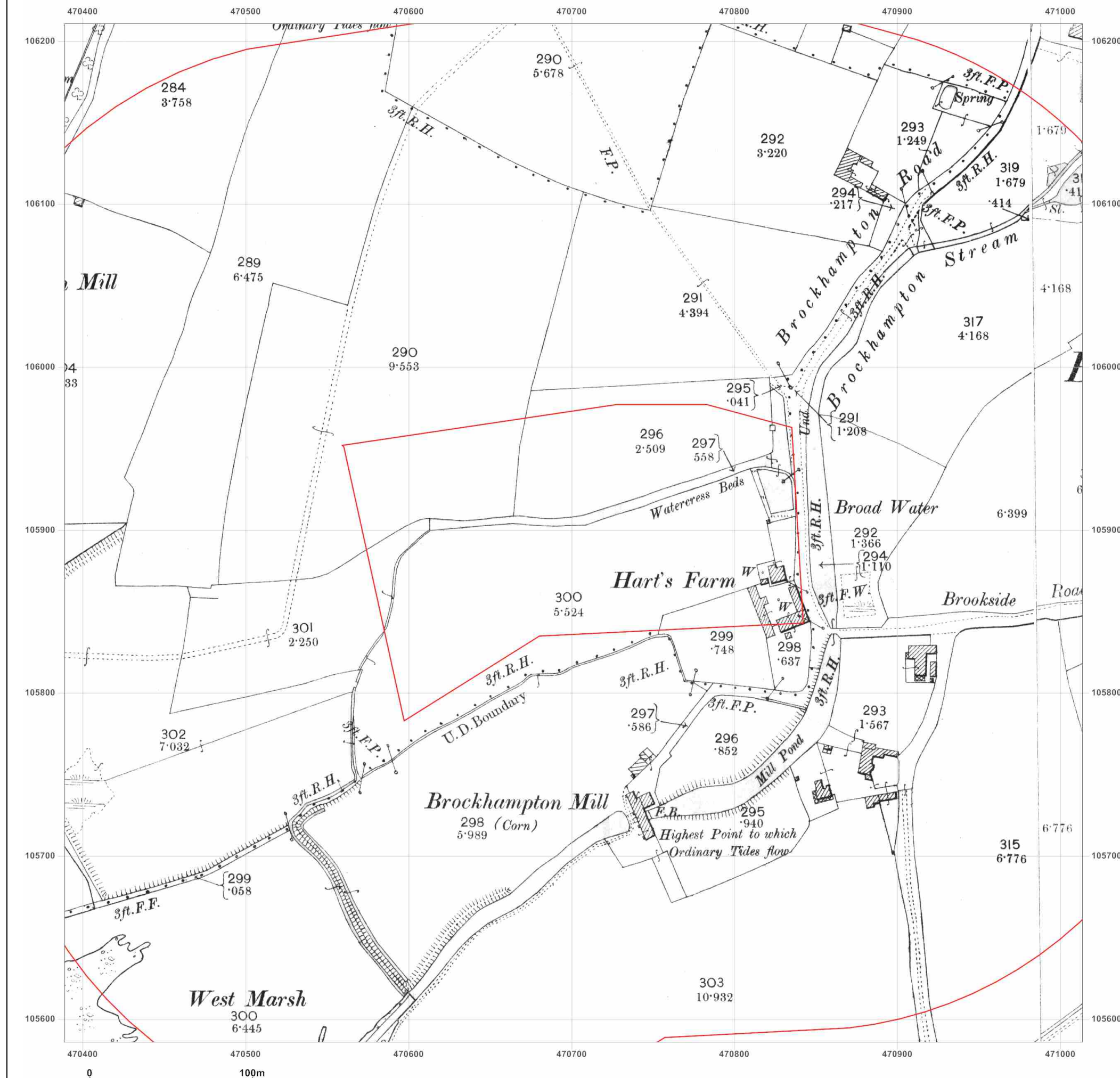


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

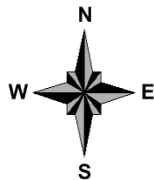
Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1867

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1867
Revised 1867
Edition N/A
Copyright N/A
Levelled N/A



Produced by
GroundSure Environmental Insight
www.groundsure.com



Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

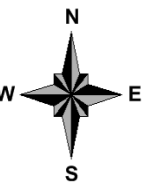
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 2012

Scale: 1:10,000

Printed at: 1:10,000



2012



Produced by
GroundSure Environmental Insight
www.groundsure.com

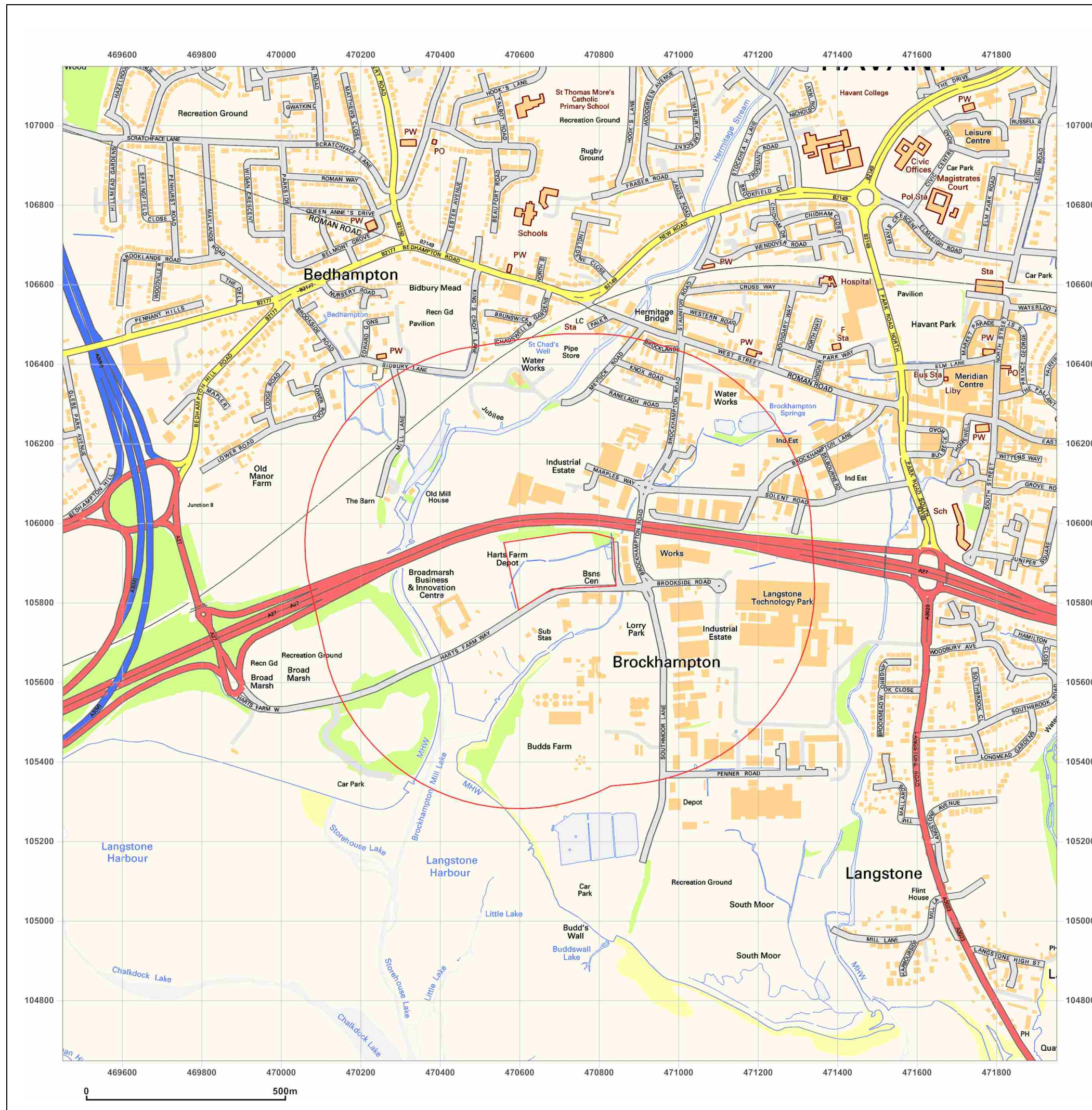


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

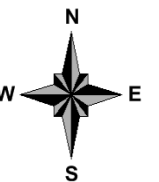
Grid Ref: 470701, 105898

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002



Produced by
GroundSure Environmental Insight
www.groundsure.com



Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: National Grid

Map date: 1970-1973

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
Revised 1973
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1970
Revised 1970
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1970
Revised 1970
Edition N/A
Copyright N/A
Levelled N/A



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com



Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: Provisional

Map date: 1963-1966

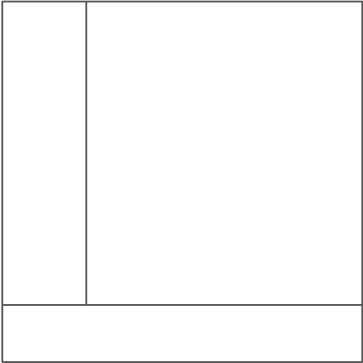
Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1865
Revised 1957
Edition N/A
Copyright 1963
Levelled N/A

Surveyed 1873
Revised 1966
Edition N/A
Copyright N/A
Levelled N/A



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com



Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: Provisional

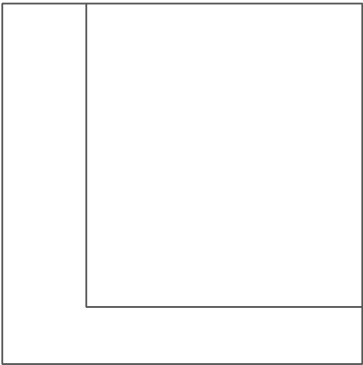
Map date: 1963

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1957
Edition N/A
Copyright 1963
Levelled N/A



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com



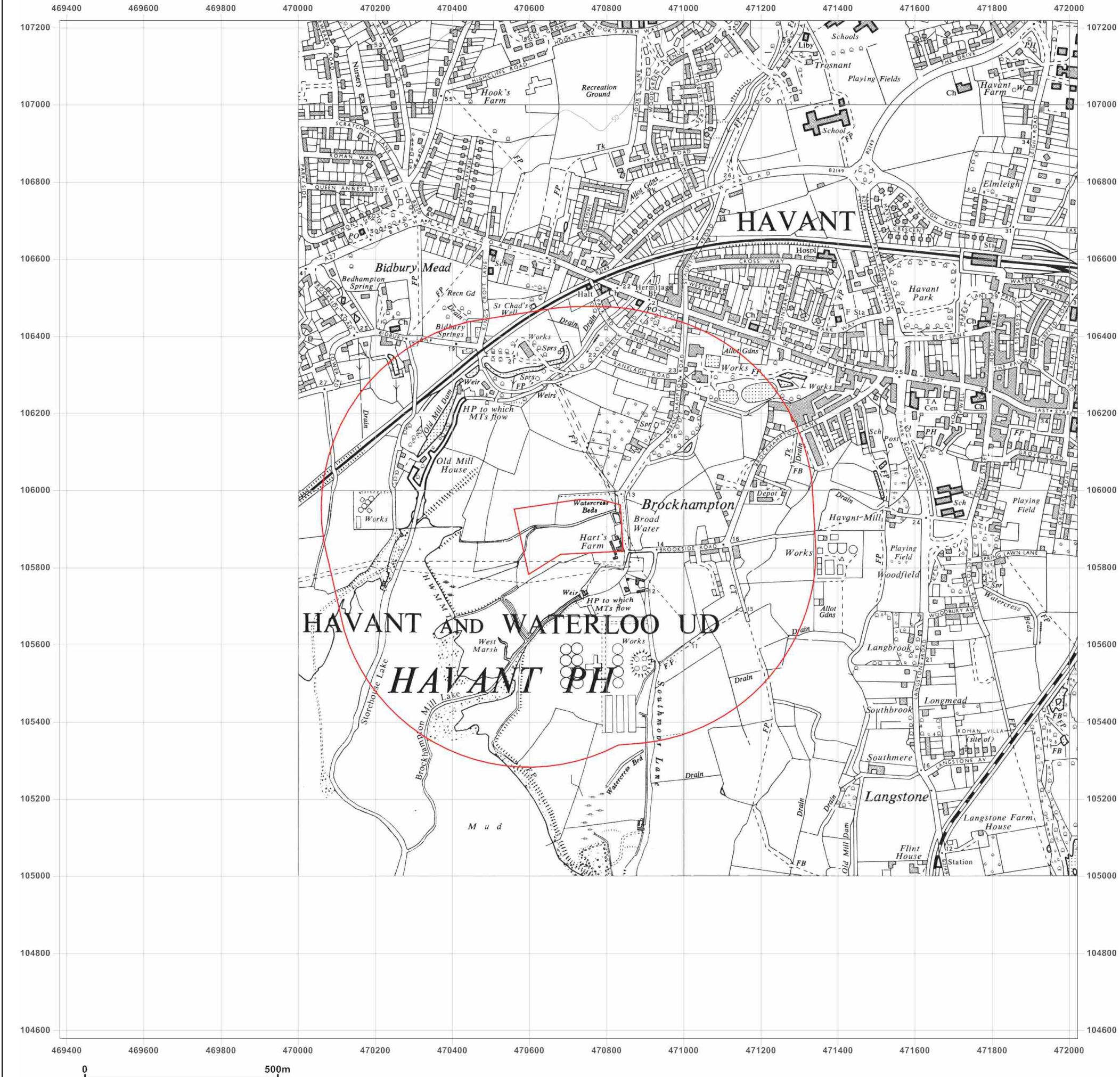
Ordnance
Survey
Licensed Partner

Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

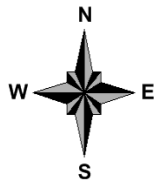
Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1938-1942

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1859
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1858
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1942
Edition N/A
Copyright N/A
Levelled N/A



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

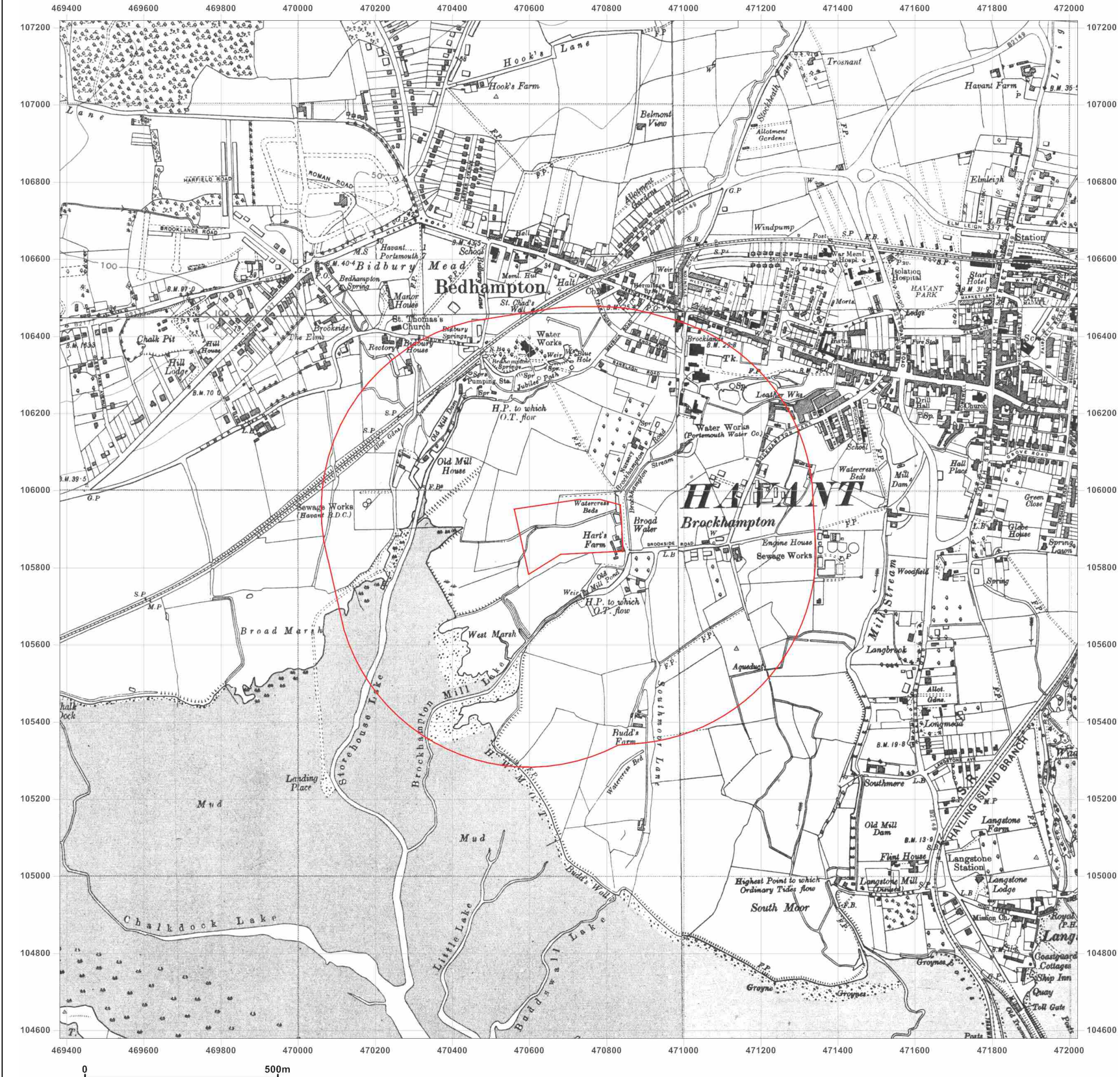


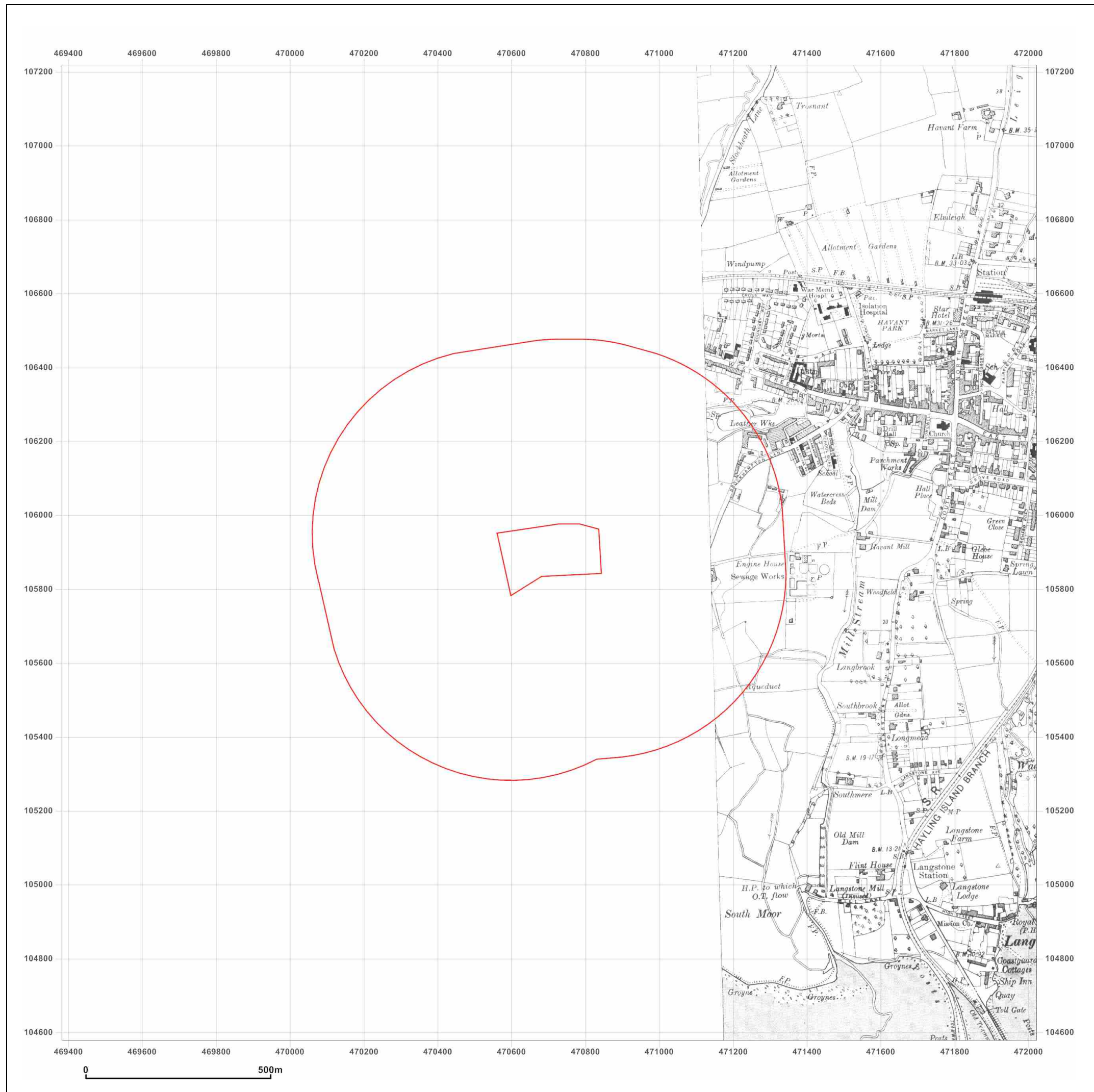
Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)





emapsite™

Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

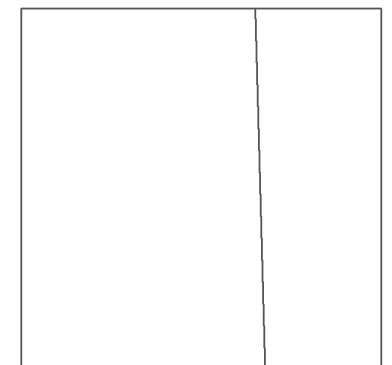
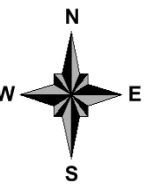
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1932

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A



Produced by
GroundSure Environmental Insight
www.groundsure.com

Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)

Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

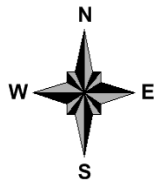
Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1932

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A



Produced by
GroundSure Environmental Insight
www.groundsure.com

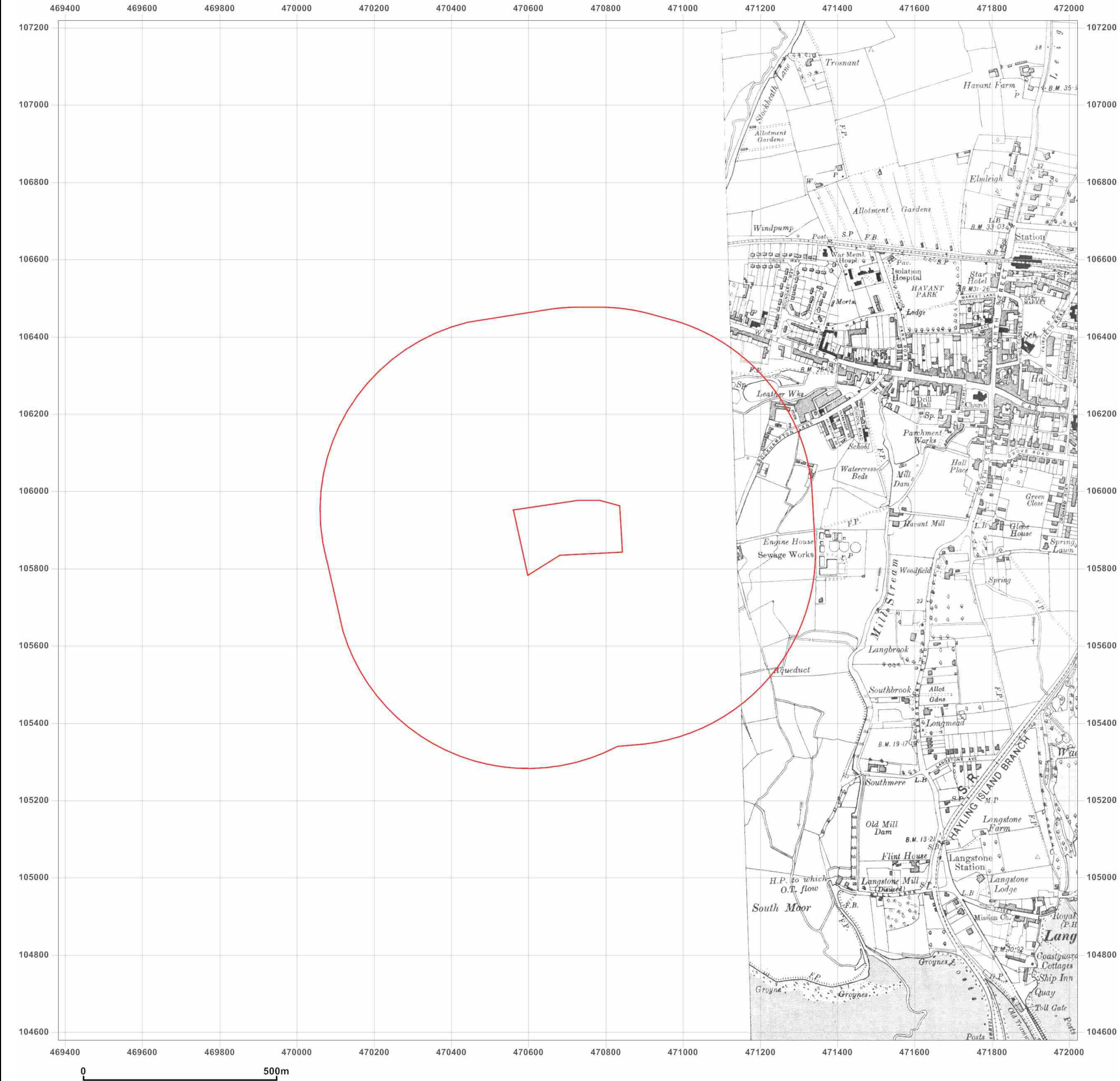


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1930-1931

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1859
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1858
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A



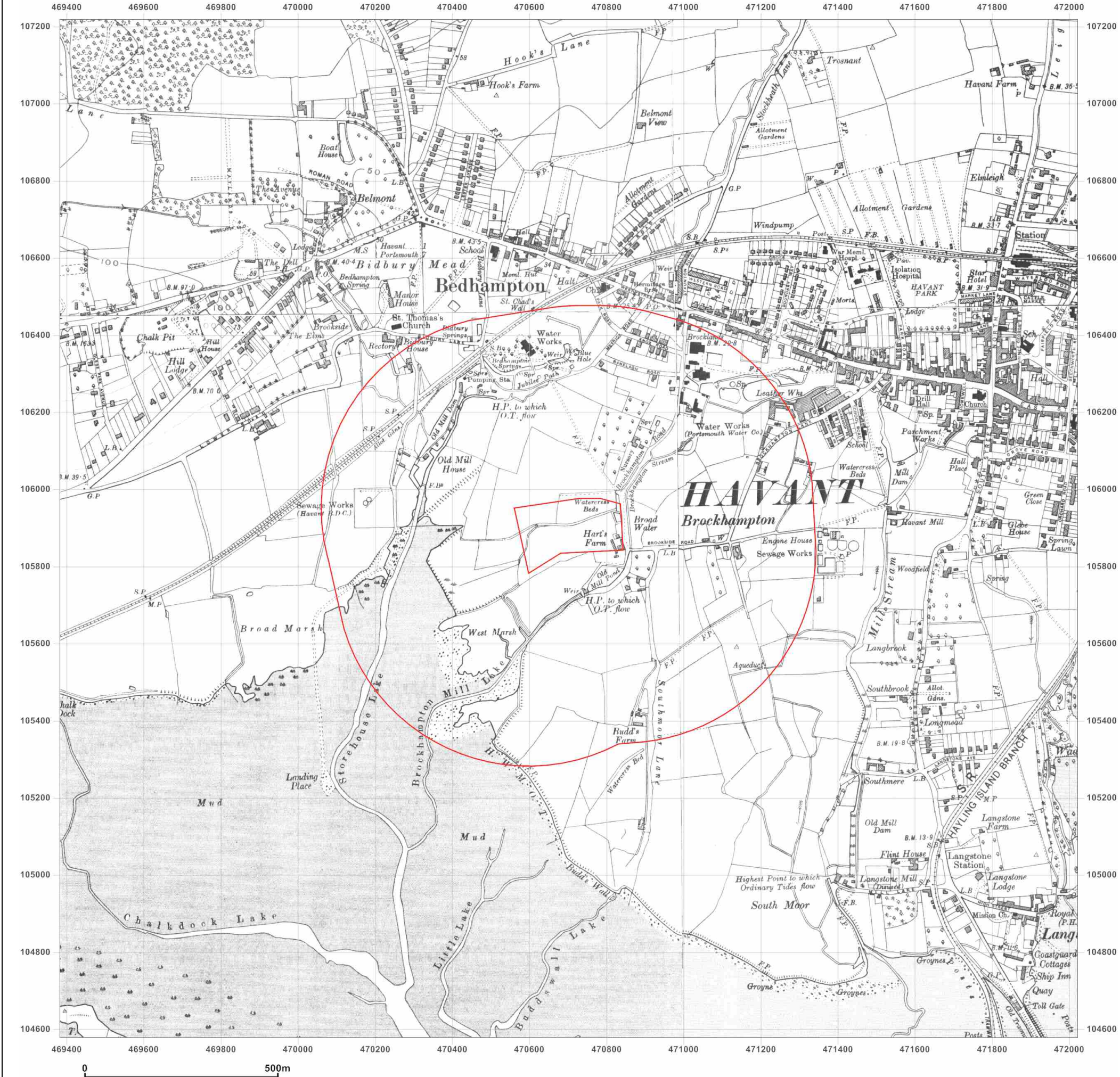
Produced by
GroundSure Environmental Insight
www.groundsure.com

Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1930-1931

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1859
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1858
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1931
Edition N/A
Copyright N/A
Levelled N/A



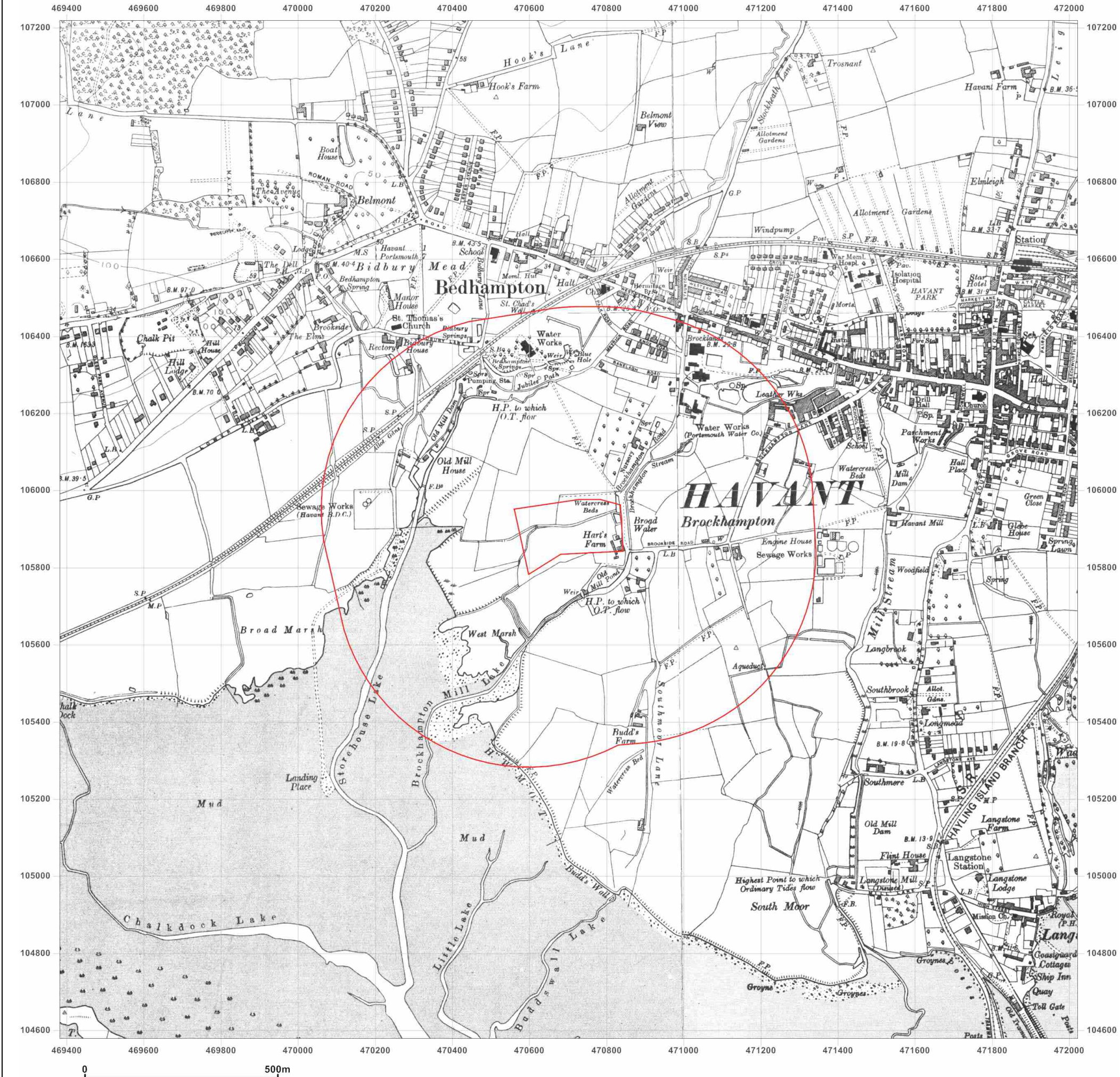
Produced by
GroundSure Environmental Insight
www.groundsure.com

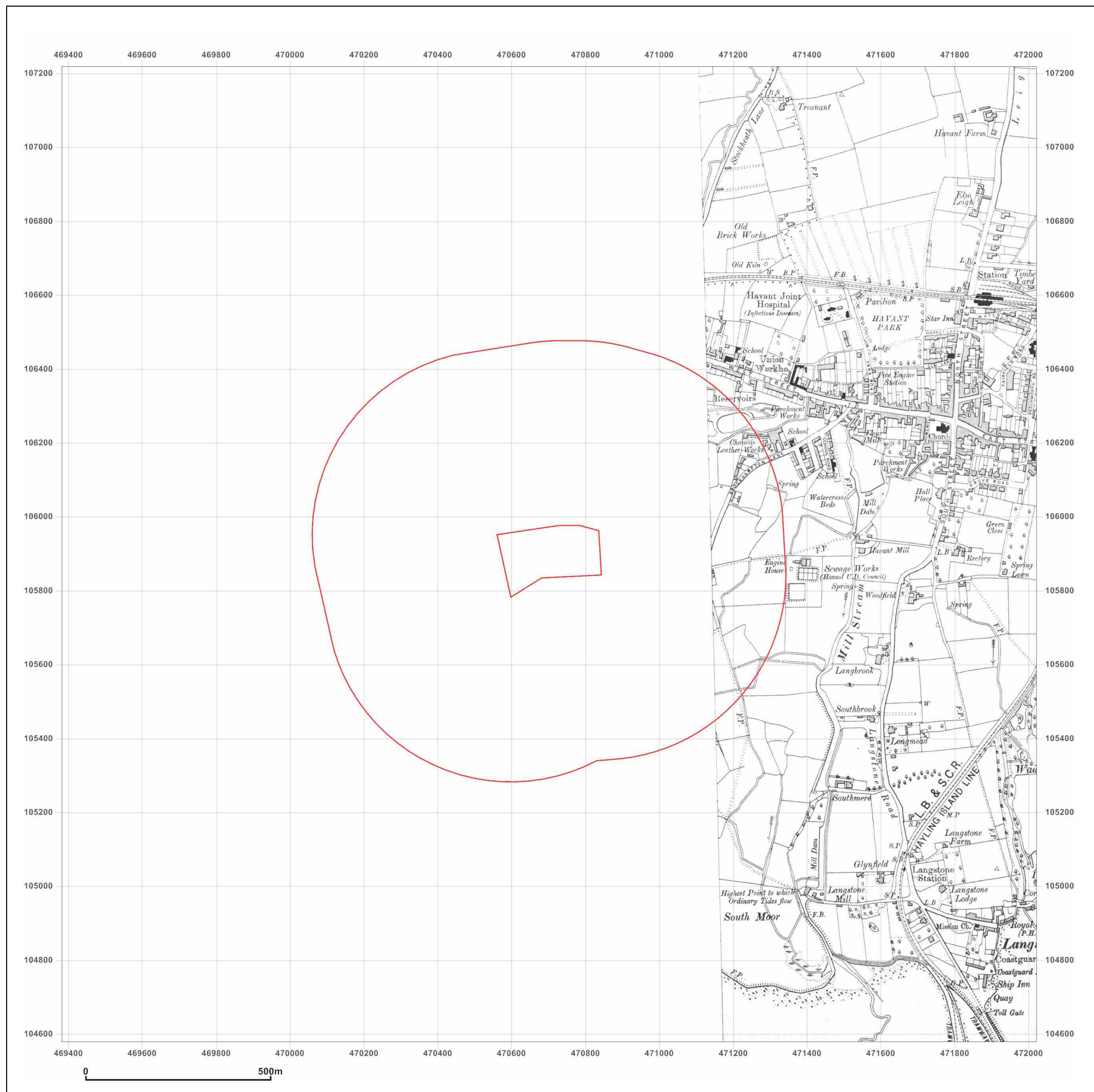
Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)





emapsite™

Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

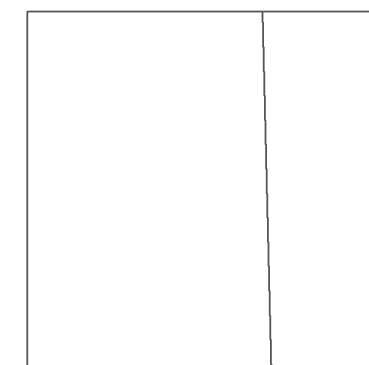
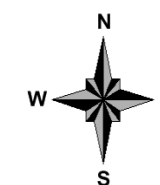
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1914

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1914
Edition N/A
Copyright N/A
Levelled N/A



Produced by
GroundSure Environmental Insight
www.groundsure.com

Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)

Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1907

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1859
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1858
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A



Produced by
GroundSure Environmental Insight
www.groundsure.com



Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



Site Details:

Former Council Depot,Harts
Farm Way,Havant,PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1895-1898

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1867
Revised 1895
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1873
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1868
Revised 1895
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1866
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A



GroundSure



Ordnance
Survey
Licensed Partner

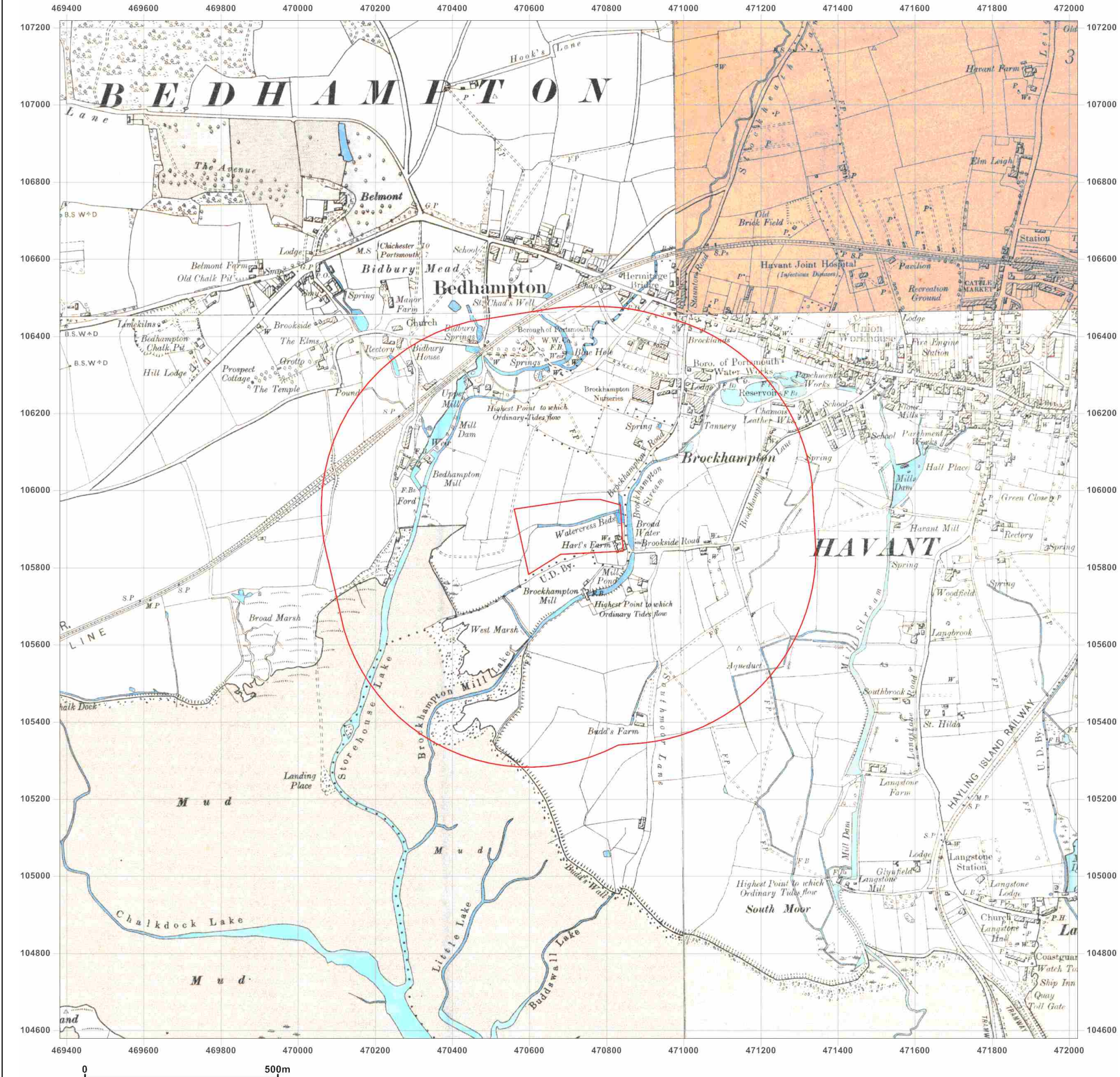
Produced by
GroundSure Environmental Insight
www.groundsure.com

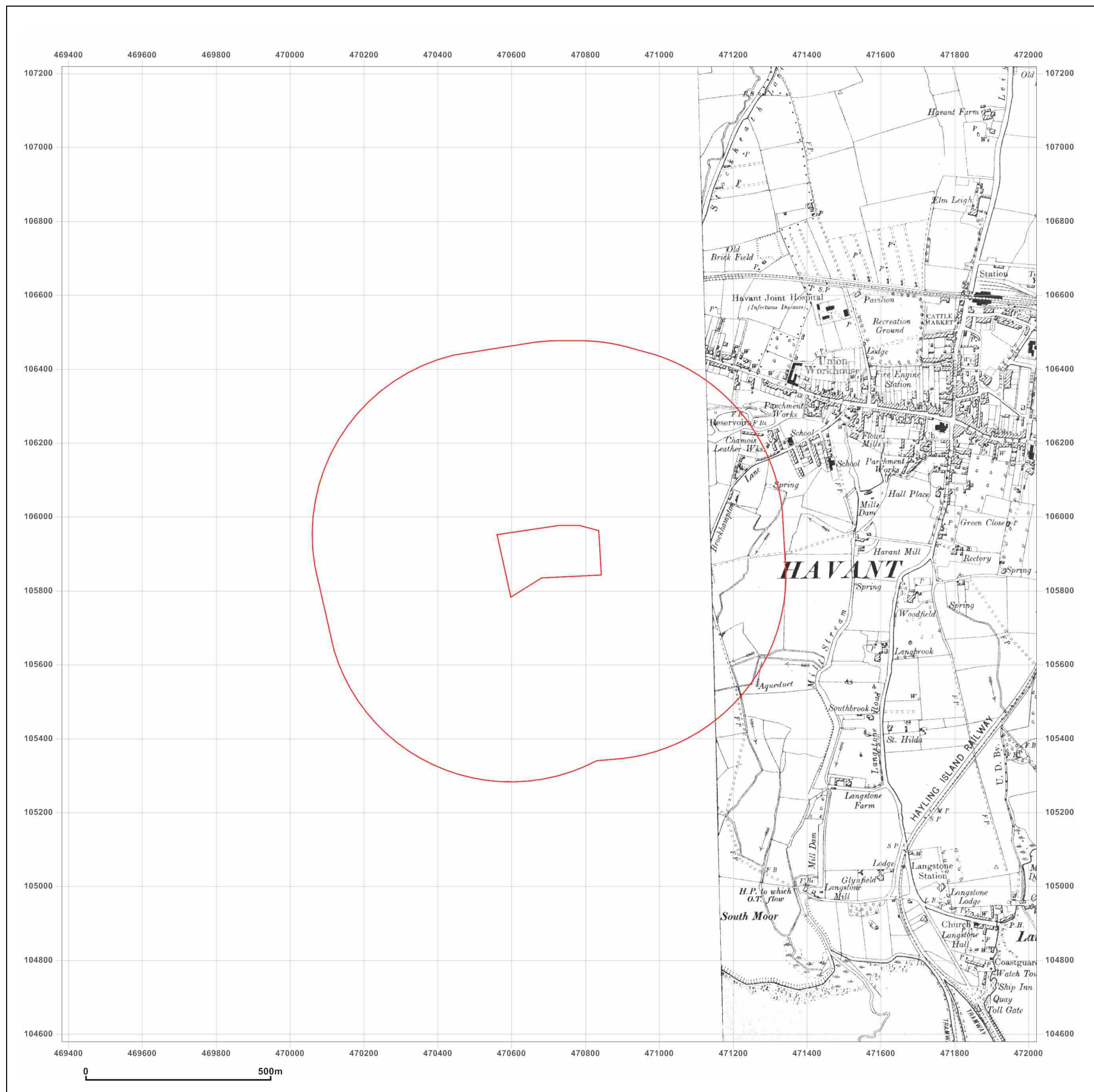
Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)





emapsite™

Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850

Report Ref: EMS-207470_272850

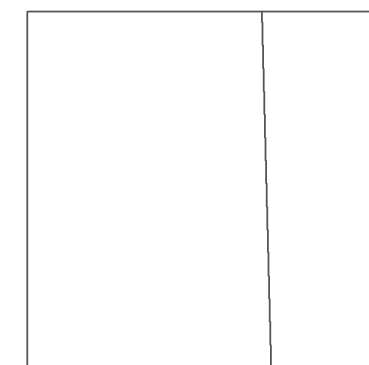
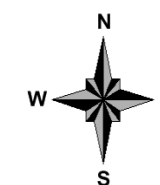
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1896

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A



Produced by
GroundSure Environmental Insight
www.groundsure.com

Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)

Site Details:

Former Council Depot, Harts
Farm Way, Havant, PO9 1HU,

Client Ref: EMS_207470_272850
Report Ref: EMS-207470_272850
Grid Ref: 470701, 105898

Map Name: County Series

Map date: 1866

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1866
Revised 1866
Edition N/A
Copyright N/A
Levelled N/A



GroundSure

Produced by
GroundSure Environmental Insight
www.groundsure.com

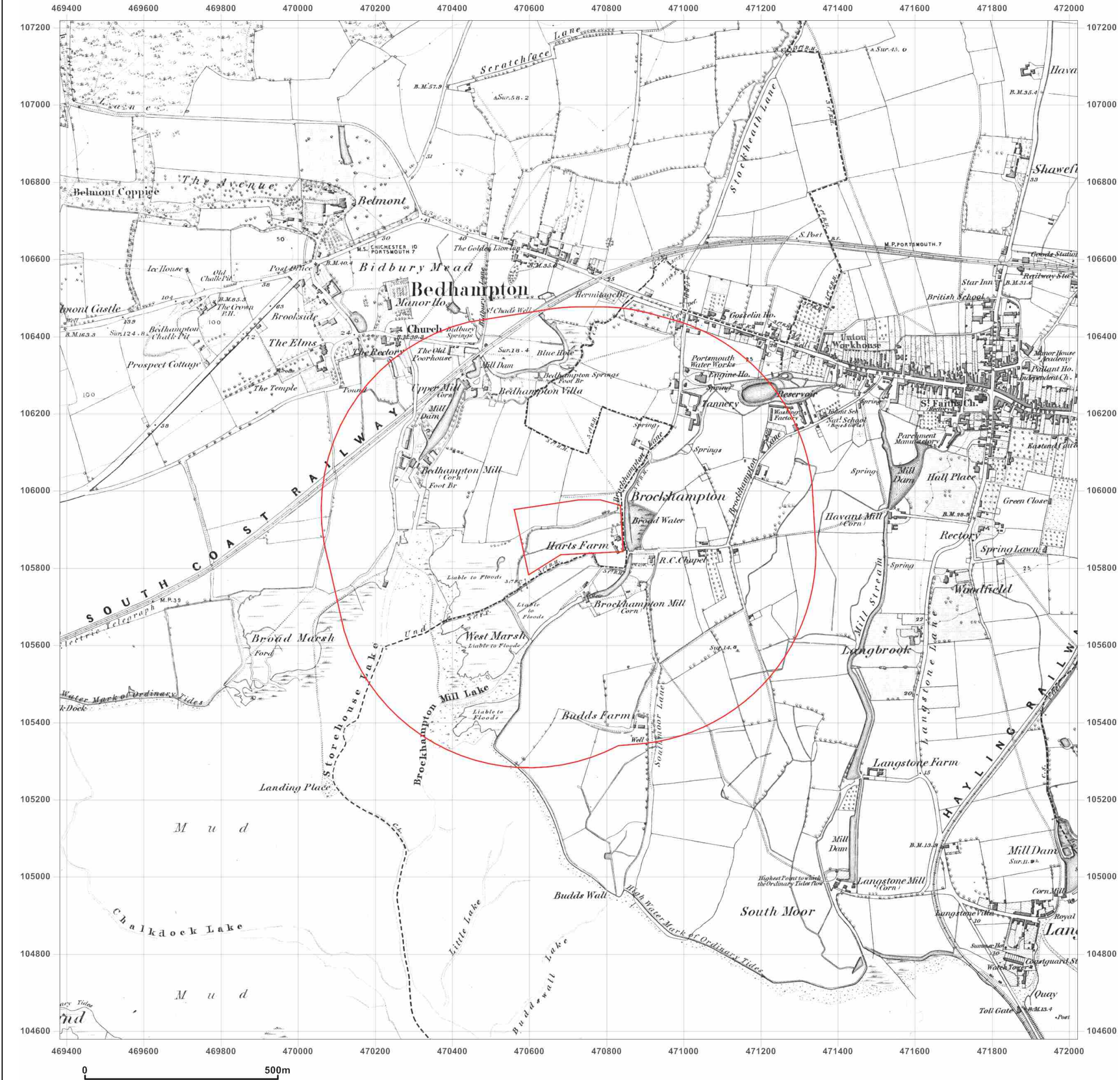


Supplied by:
www.emapsite.com
sales@emapsite.com

© Crown copyright and database rights 2013 Ordnance Survey 100035207

Production date: 03 June 2013

To view map legend click here [Legend](#)



County Series 1:10,560 scale

VEGETATION



Fir Wood



Deciduous Wood



Mixed Wood



Brushwood



Orchard



Reeds



Rough Pasture



Furze



Marsh



Osiers

ROADS



Railway over Road



Road over Railway



Road over River or Canal



Level Crossing



Railway over River



Road over Stream



Road over Stream



Sunken Road

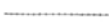


Raised Road

RAILWAYS



Double Lines of Railway



Single Lines of Railway and Tramway

GENERAL FEATURES



Gravel Pit



Sand Pit



Quarry



Shingle



Other Pits



Antiquities, Site of



Arrow, showing direction of flow of water



Trigonometrical Station

BOUNDARIES



County Boundary



Parish Boundary



Contours



Parliamentary Division Boundary



Union Boundary



Rural District Boundary

National Grid 1:10,000 scale

HEIGHTS (METRES)

Values are given in metres above mean sea level at Newlyn.

Surface heights determined by ground survey 163m
air survey 163m

Bench marks and their values are shown on large scale maps, and bench mark lists containing fuller and possibly later levelling information are obtainable from the Director General, Ordnance Survey.

Contours are at 5 metres vertical interval.

ROCK FEATURES

Loose rock

Boulders

Outcrop

Scree

Vertical face

CONVERSION SCALE

Metres - Feet

2000 Metres 6500 Feet

1500 5000

1000 3000

500 1500

0 0

4000

ABBREVIATIONS

BP,BS Boundary Post or Stone

Ch Church

CH Club House

F Sta Fire Station

FB Foot Bridge

Fn Fountain

GP Guide Post

MP,MS Mile Post or Stone

P Pole or Post

Pol Sta Police Station

PO Post Office

PC Public Convenience

PH Public House

S Stone

Spr Spring

TCB Telephone Call Box

TCP Telephone Call Post

TH Town Hall

W Well

Y Youth hostel

ROADS

== Road

== Track

Where unfenced shown by pecked lines.

--- Path

RAILWAYS

Cutting

Embankment

Multiple track

Single track

Standard gauge

Siding, tramway or mineral line

Narrow gauge

GENERAL FEATURES

+ Antiquity, (site of)

o Boulders

□ Building

— Pylon

— Pole

Electricity transmission line

□ Glasshouse

Δ Triangulation station

○ Lake, loch or pond

▨ Sloping masonry

○ = Chalk pit, clay pit or quarry

○ = Gravel pit

○ = Sand pit

○ Refuse or slag heap

Direction of flow of water

Shingle

Sand

VEGETATION

Bracken, rough grassland

Scrub

Heath

Marsh

Saltings

Reeds

Coppice

Orchard

Coniferous trees

Non-coniferous trees

In some areas bracken () and rough grassland () are shown separately.



GroundSure

Historical Map Pack Legend

County Series & National Grid

1:10,560 scale & 1:10,000 scale

Information present on these legends is sourced from the same Ordnance Survey mapping as the maps used in this product.

If you have a query regarding any of the maps provided please contact GroundSure's technical helpline. We will endeavour to answer any queries you may have.

Technical Helpline

Tel:01273 819 700
maps&data@groundsurre.com
www.groundsure.com

County Series 1:2,500 scale

National Grid 1:2,500 / 1:1,250 scale



Historical Map Pack Legend

GENERAL FEATURES

Wood	Marsh	Reeds
Fir	Mixed Wood	Brush Wood
Orchard	Bush	Rough Pasture
Ford	Stepping Stones	Ferry
Lock	Waterfall	Quarry
Shingle	Gravel Pit	
Trigonometrical Station	SL Sluice	
507 Altitude at Trigonometrical Station	Tr. Trough	
B.M. 325.9 Bench Mark	Sp. Spring	
342 Surface Level	M.R. Mooring Ring	
Permanent Traverse Station	M.P. Mooring Post	
Antiquities (site of)	B.S. Boundary Stone	
Arrow denotes flow of water	B.P. Boundary Post	

ROADS

Road over single stream	Road crossing railway
Road over River or Canal	

RAILWAYS

Railway crossing River or Canal	Railway crossing Road
Level Crossing	Embankment
Cutting	

ABBREVIATIONS

Trigonometrical Station	SL Sluice
507 Altitude at Trigonometrical Station	Tr. Trough
B.M. 325.9 Bench Mark	Sp. Spring
342 Surface Level	M.R. Mooring Ring
Permanent Traverse Station	M.P. Mooring Post
Antiquities (site of)	B.S. Boundary Stone
Arrow denotes flow of water	B.P. Boundary Post

GENERAL FEATURES

Non-coniferous Trees	Slopes	Antiquity (site of)
Coniferous Trees	Cliff	Culvert
Surveyed Trees	Cave Entrance	Direction of water flow
Orchard Trees	Rock	Electricity Pylon
Coppice, Osier	Boulders	Electricity Transmission Line
Scrub	Sloping Masonry	Triangulation Station
Bracken	Rooft Building	Traverse Station (permanent)
Heath	Glasshouse	Bench Mark
Rough Grassland	Archway	Surface Level
Marsh, Saltings	Change of boundary mering	Revision Point (instrumentally fixed)
Reeds	see AREAS notes	Revision Point & Bench Mark coincident

Top	Slopes	Quarry	Refuse Heap	Sloping Masonry
Flat Rock	Sand	Sand Pit	Culvert	Archway
Shingle	Boulders	Gravel Pit	Cliff Face	Glazed Roof Building

BOUNDARIES

England & Wales

County Boundary (geographical)
County & Civil Parish Boundary coterminous
Admin County or County Borough Boundary
London Borough Boundary
County District Boundaries based on civil parish

England, Wales & Scotland

Civil Parish Boundary
Parly & Ward Boundaries based on civil parish
Parly & Ward Boundaries not based on civil parish

Scotland

County Boundary (geographical)
County Council Boundary
County of the City Boundary
Burgh Boundary
District Council Boundary

* Not with parish † Coincident with parish

ABBREVIATIONS

Beer House	Fire Station	Mail Pick-up	Signal Light
Bench Mark	Guide Post	Mile Stone	Sluice
Boundary Post	Gas Valve Compound	National Trust	Signal Post
Boundary Stone	Hydrant or Hydraulic	Normal Tidal Limit	Spring
Crane	Hectares	National Trust for Scotland	Signal Station
Club House	Letter Box	Pillar, Pole or Post	Telephone Call Box
Chimney	Lifeboat Station	Public Convenience	Telephone Call Post
Capstan	Level Crossing	Police Call Box	Tank or Track
Drinking Fountain	Loading Gauge	Public House	Trough
Dock	Lighthouse	Post Office	Traverse Station
Electricity Pillar or Post	Lighting Tower	Pump	Well
Electricity Transmission Line	Metres	Police Telephone Pillar	Weighbridge
Fire Alarm	Mean High Water	Reservoir	Wind Pump
Fire Alarm Pillar	Mean High Water Springs	Road House	Works
Filter Bed, Foot Bridge	Mean Low Water	Revision Point	Water Point
Fundamental Bench Mark	Mean Low Water Springs	Stone	Water Tap
Flagstaff	Mile or Mooring Post	Signal Box	

County Series

1:1,250 scale

~

County Series & National Grid

1:2,500 scale

Information present on these legends is sourced from the same Ordnance Survey mapping as the maps used in this product.

If you have a query regarding any of the maps provided within this map pack, please contact GroundSure's technical helpline. We will endeavour to answer any queries you may have.

Technical Helpline:

Tel:01273 819 700
maps&data@groundsurre.com
www.groundsure.com