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ENVIRONMENTAL INVESTIGATION REPORT

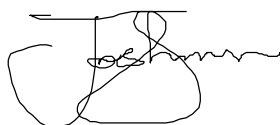
**Trade Park - Phase II
Solent Road, Havant, Hampshire**

Report No: IN12963 CL 002

February 2013

Client: Hargreaves Properties Ltd

Report Prepared By:



James Skinner

Report Reviewed By:



Duncan Eastland

Executive Summary

We have been commissioned by Hargreaves Properties Ltd (Hargreaves) to complete an environmental site assessment at the site of former Units 4 – 10, Solent Road Industrial Estate in Havant. Hargreaves has purchased the freehold of the site and proposes to redevelop for future commercial use in two phases, with Phase II comprising the construction of two commercial units at the eastern part of the site.

Outline planning permission for the Phase II redevelopment has been granted by Havant Borough Council (Planning application ref. APP/12/00491). This report details the investigation findings for the Phase II development area. Our findings for the Phase I development area are reported under separate cover.

We have completed an intrusive borehole investigation across the entire site, with a total of nine boreholes constructed across the Phase II development area. We installed five of these boreholes as groundwater monitoring wells and obtained a groundwater sample from a sixth location as part of our investigation work.

The underlying shallow geology was found to be highly variable, with significant variance in the composition and thickness of the various units encountered and also high variations in the strength of the shallow clay soils (Alluvium or Head Deposits) noted. Chalk was encountered in three, possibly four, of the boreholes constructed at varying depths.

We have identified concentrations of total petroleum hydrocarbons, generally consistent with diesel or fuel oils in shallow soils and groundwater from BH12. No other significant contamination was encountered in any of the soil or groundwater samples analysed.

The results of our Generic Quantitative Risk Assessment indicate that the concentrations of various organic and inorganic compounds identified during our investigation do not pose a potentially unacceptable risk to future commercial site workers.

With regard to environmental receptors, and specifically the underlying shallow River Gravel Deposits aquifer and nearby Broackhampton Stream, our Generic Quantitative Risk Assessment indicates that concentrations of hydrocarbon compounds encountered in groundwater from BH12 (located behind the former Unit 9) exceed relevant generic acceptance criteria.

The hydrocarbons we have identified in soils and groundwater from BH12 are generally consistent with diesel or fuel oils. Based on the information we have reviewed regarding the site, the most likely source of these hydrocarbons is the former above ground fuel tanks that were located behind Unit 9. Other possible sources of the hydrocarbon impact could include waste storage or vehicle repair works being undertaken in this area of hard standing behind Unit 9.

We note that no hydrocarbon impact was identified in either soils or groundwater samples taken from BH10, located immediately to the west of the former tank area. No detectable hydrocarbons were detected in groundwater samples taken from any other wells at the site, including the down gradient wells BH15, BH16 and BH4. We therefore consider the identified contamination to be limited in extent, with no evidence to suggest extensive lateral migration of hydrocarbons has occurred. We do not consider it likely that the identified environmental receptors are at risk of impact from the isolated hydrocarbon impact identified.

Recommendations relating to the proposed redevelopment are included in the body of our report.

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1 Introduction

1.1 The Purpose of This Assessment

We have been commissioned by Hargreaves Properties Ltd (Hargreaves) to complete an environmental site assessment at the site of former Units 4 – 10, Solent Road Industrial Estate in Havant. The majority of the former commercial buildings at the site have been demolished. We understand that Hargreaves have purchased the freehold of the site and propose to redevelop for future commercial use as a new Havant Trade Park development.

The development is proposed to be completed in two phases, with Phase II comprising the construction of two large commercial units across the central and eastern part of the site. This report details the investigation findings for the Phase II development area. Our findings for the Phase I development area are reported under separate cover.

Outline planning permission for the Phase II redevelopment has been granted by Havant Borough Council (Planning application ref. APP/12/00491).

The planning permission granted contains specific conditions relating to potential contamination issues at the site (Condition 4, 5 and 6) and sets out a number of requirements; summarised as follows:

- Condition 4 – No development shall take place until a remediation strategy that includes the following components to deal with risks associated with contamination of the site is submitted and approved by the local planning authority:
 - 4.1 – Completion of a Preliminary Risk Assessment that identifies all previous uses, potential contaminants associated with those uses, conceptual site model and potential unacceptable risks arising from contamination at the site.
 - 4.2 – Completion of site investigation to provide information for a detailed risk assessment for the site.
 - 4.3 – Completion of a remedial options appraisal and remediation strategy for the site, based on the results of the site investigation and risk assessment.
 - 4.4 – Completion of a verification plan showing details of data that will be obtained to demonstrate the remedial works are complete and setting out any long-term monitoring requirements.
- Condition 5 – No occupation of the proposed development shall take place until a verification report demonstrating completion of remediation works at the site has been submitted and approved by the local planning authority. This shall also set out any long term monitoring requirements for the site.
- Condition 6 – If, during the development, contamination not previously identified is found to be present and no further development shall be carried out until a remediation strategy has been submitted to address the unforeseen contamination and approved by the local planning authority.

The purpose of our assessment is to determine whether the quality of soil and/or groundwater underlying the site has been impacted with pollutants associated with past operations and whether any contaminants present might pose an unacceptable (long-term) risk to future site users and/or any environmental receptors.

Our assessment is designed to address the requirements of Planning Condition 4.1 and 4.2 and aims to provide sufficient information to enable the completion of future risk assessment and development of remedial strategies for the Phase II area in support of Conditions 4.2, 4.3 and 4.4.

We have also completed initial geotechnical testing to provide information to assist in determining foundation details for the proposed structures and provide the contractor with details that will enable them to design their excavation support systems.

All the activities comprising this assessment were carried out in accordance with the procedures set out in our Quality Manual. Your attention is drawn to the Notice to Interested Parties included as Attachment One.

1.2 The Scope of This Assessment

Our assessment of the Phase II development area was carried out in the following parts:

- Preliminary Risk Assessment - A desk based study comprising a review of site specific information provided by the client and information that is readily available in the public domain to develop a Conceptual Site Model to assess potential pollutants, pathways and receptors associated with the site. This included a review of historical Ordnance Survey information to determine historical site use;
- An intrusive soil investigation comprising the construction of a total of nine boreholes, five of which were installed as permanent groundwater monitoring wells with a discrete groundwater sample obtained from a sixth location, drilled using a combination of our Geoprobe direct-push environmental sampling system and Terrier dynamic sampling drilling rig;
- Two return visits to the site to complete groundwater monitoring of installed wells;
- Chemical analysis of representative soil and groundwater samples;
- Development of a Conceptual Site Model to assess potential pollutants, pathways and receptors associated with the site and completion of a Generic (Quantitative) Risk Assessment;
- Provision of recommendations relating to the geotechnical conditions and presence of potential pollutants identified during our investigation.

1.3 Previous Work

As part of our environmental assessment we have reviewed the following previous environmental reports, either provided by Hargreaves for information or prepared by us:

- Ref 1 Phase II Environmental Audit – Project Vienna: Units 2-10, Solent Road Industrial Estate, Havant. January 2002 – Completed by WSP Environmental Ltd on behalf of Teeside Group plc, (WSP Report ref. 12020392).
- Ref 2 Environmental Assessment Report – Trade Park Phase I, Solent Road, Havant. February 2013 – Completed by Subadra Consulting Ltd on behalf of Hargreaves (Our Report ref. In12963 CL 001)

Our detailed review of these documents is given provided in Section 3.5.3. However, we have used information from these documents, where relevant, in other sections of this report.

2 **Site Details – Phase II Development Area**

2.1 Site Description, Location and Setting

The Phase II development area occupies approximately 0.8ha and currently comprises a partially cleared plot of land. We understand that the site was previously occupied by industrial units, generally of steel portal frame / brick construction with pitched roofs and offices on the southern end of the building. At the time of our investigation, buildings at the western end of the site had been demolished with all above structures removed. The central buildings had been partially demolished and the eastern buildings remained occupied.

The site is located at National Grid Reference 471091 106032 at approximately 6m above Ordnance Datum. The site is situated off Solent Road (which forms the northern site boundary) and Brockhampton Lane (which used to form an access road along the southern boundaries), approximately 0.75km south of the centre of Havant in Hampshire. The surrounding land use is predominantly a mixture of commercial, industrial and retail properties with occasional terraced residential cottages.

A summary of the surrounding land use is provided as Table One overleaf and a map showing the site's locality is also provided below as Figure One. An aerial photograph showing the basic site layout and Phase I and Phase II development areas, prior to the site clearance, is also included as Figure Two.

Environmental Investigation Report – Trade Park - Phase II, Solent Road, Havant

Direction	Distance	Surrounding Land Uses
North	~50m	Residential properties beyond Solent Road to the north and west. Open fields and a medical practice building to the immediately north, with ponds and the Brockhampton Stream (fed from springs) to the northwest. Medical practice building to the north.
East	~50m	Small terrace of residential cottages, further industrial units and then a supermarket with petrol station beyond (~150m).
South	~50m	A27 dual-carriageway to the immediate south. Commercial / industrial units and warehouses beyond.
West	~10m	Phase I development area to the immediate west with 'Jewsons' builder's merchants beyond (~100m). Further commercial / industrial units beyond Jewsons (~250m)

Table One: Surrounding Land-Use



Reproduced from Ordnance Survey 1:50,000 Sheet by permission the Controller, Crown Copyright Reserved. Not to Scale

Figure One – Map Showing Site Location



Figure Two – General Site Layout and Proposed Development Areas

2.2 Future Development – Phase II

We understand that Hargreaves proposes to redevelop the Phase II area of the site as two separate commercial units (Unit 1 and 2). The proposed layout for these is summarised as Figure Three, below.

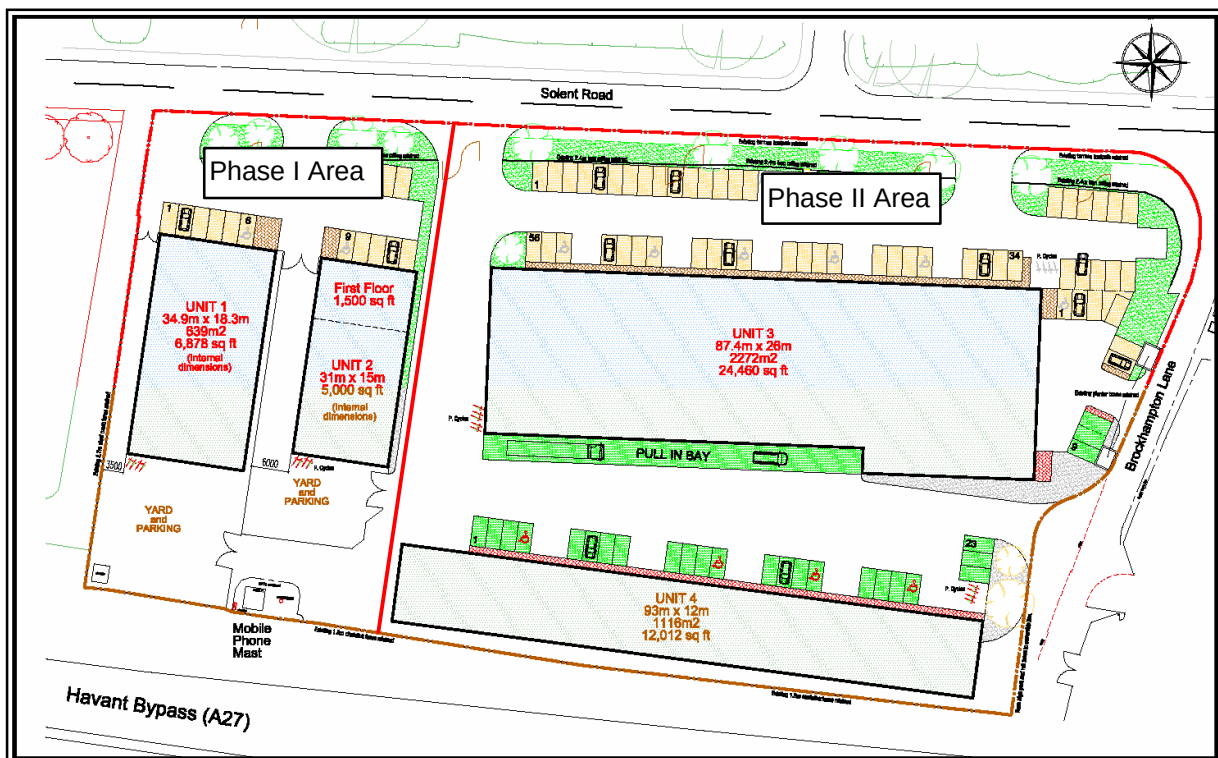


Figure Three – Proposed Future Site Layout

Outline planning permission for the Phase II redevelopment has been granted by Havant Borough Council (Planning application ref. APP/12/00491). The planning permission granted contains specific conditions relating to potential contamination issues at the site (Condition 4, 5 and 6) and sets out a number of requirements. This report is to be submitted in support of the planning application and is designed to address various initial requirements of Condition 4. We note however that further works may be required in order to discharge all environmental conditions imposed.

3 Environmental Desk Study

This section of our report summarises the site's environmental setting based on a review of readily available information for the site. We have used this information to identify potential contaminant sources and sensitive receptors, which we have subsequently used in conjunction with the results of our intrusive investigation to generate a Conceptual Site Model in Section (see Section 5).

3.1 Geology

We have assessed the geology of the site's locality from available BGS maps and memoirs. These show the geology to comprise (in succession, from the surface downward):

Unit Ia: Alluvium – Most likely to comprise soft to firm compressible clays, possibly containing layers of silt, sand, occasional peat and gravel. The estimated thickness of this unit under the site is up to 4m.

Unit Ib: Head Deposits – Composition dependent upon upslope source, although generally comprising poorly sorted and mixed deposits of clay, gravel and sands. The estimated thickness of this unit under the site, if present, is approximately 1-2m.

Unit Ic: River Terrace Deposits (Undifferentiated) – Sand and flint gravel with potential lenses of silt, clay or peat. The estimated thickness of this unit under the site is up to 9m.

Unit II: Upper Chalk: Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) – White Chalk with flints. The estimated thickness of this unit under the site is greater than 60m.

The maps show the shallow geology under the site and surrounding area to be highly variable and due to the nature of the various deposits anticipated (generally alluvial), mixing and localised variance is anticipated. Therefore, the shallow drift geology listed above may not all be present across the site. Expected thicknesses of the units have been derived from existing borehole logs for nearby plots of land that we have reviewed.

3.2 Hydrogeology

3.2.1 Groundwater Sensitivity

The Environment Agency Groundwater Vulnerability Map shows the site location as overlying a Principal Aquifer. These are layers of rock or drift deposits that have high intergranular 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. We interpret this to refer to the Upper Chalk.

The Environment Agency Groundwater Vulnerability Map also shows the site location as overlying a Secondary Aquifer (Class A). These 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. We interpret this to refer to the Alluvium, River Terrace Deposits and Head Deposits.

We consider the site could potentially pose a direct risk of impact to the underlying shallow aquifer units.

3.2.2 Public Water Abstractions and Source Protection Zones

The Environment Agency defines Source Protection Zones around groundwater abstractions used for public water supply. The Zones are defined by the estimated travel time of potential contaminants to the abstractions. This travel time can be influenced by factors such as the underlying geology or the volume of groundwater being abstracted. Source Protection Zones are therefore areas that may be considered to be particularly sensitive to groundwater impact.

The Phase II development area is not located within a defined Source Protection Zone.

However, there is a Zone I Source Protection Zone located approximately 50m to the northeast of the site. This is defined as the area within which contaminants at or below the groundwater table could impact the at risk abstraction within 50 days. The source protection zone relates to a series of public water abstractions located to the north and northwest of the site, as summarised in the table below. These are described as comprising 'springs', as opposed to groundwater abstraction boreholes, located in a line running east west.

Reference / name	Annual Volume (cubic metres)	Distance and Direction from Site	Aquifer	End Use
Bedhampton Ps Spring No. 2	35,770,000	298m N	Upper Chalk	Potable Water Supply
Bedhampton Ps Spring No. 1	35,770,000	526m NW		
Havant Ps	35,770,000	569m W		

Table Two: Licensed Groundwater Abstractions

The geology between the site and the abstractions is likely to be permeable and given the direction of the abstraction springs and the location of the Brockhampton Stream, we would anticipate shallow groundwater flow under the site to be to the west or northwest. The abstractions and stream could therefore be at direct risk of impact from contaminants originating at the site, although risk could be limited depending on the dynamics of the springs.

3.3 Hydrology

The nearest surface water to the site is the Brockhampton Stream, located approximately 50m from the north western corner of the Phase II site area at its closest point and then flowing toward the south and west. The Environment Agency has not published any chemical or biological quality data for the Brockhampton Stream.

We consider the Brockhampton Stream is likely to be in continuity with shallow groundwater underlying the site and, given the permeable nature of the geology, they are considered potentially at-risk from any contamination present under the site.

We have not identified any surface water abstractions that are licensed by the Environment Agency and located within 1km of the site.

3.4 Regulatory Comment

We have obtained the following information relating to the site:

3.4.1 Landfill Sites

The Environment Agency records show that there are no current or past landfill sites within 250m of the site.

The site is therefore unlikely to be at-risk of impact from elevated concentrations of hazardous ground gases that are commonly associated with landfill sites e.g. methane or carbon dioxide. As such we do not consider monitoring or assessment are required as part of any future investigation works and no special precautions are likely required to prevent landfill gas infiltration into the current building or future developments at the site.

3.4.2 Flood Risk

The Phase II development area is not shown to be located in an area that is designated by the Environment Agency as being potentially at risk of flooding. The area to the immediate west and north, however, is classified as being within a Zone Three floodplain.

We understand that a detailed Flood Risk Assessment has been completed for the site and will be submitted as part of the planning application.

3.4.3 Ecology

Langstone Harbour, located approximately 802m south has been designated a Site of Special Scientific Interest, Special Area of Conservation and a Ramsar site.

3.5 Site History Review

Our review of the site history has been carried out through the study of Ordnance Survey Maps dating from the late 1800s to the present day. The review has been used to identify potential historical sources of contamination or contaminative land uses that may have impacted soil or groundwater quality beneath the site. Selected historical maps are reproduced in Attachment Three and are commented on below.

3.5.1 Historic Maps

- 1868 – The site is shown undeveloped and comprises fields. There is a small building (barn?) located immediately northwest of the Phase II area. Beyond this, approximately 50m to the northwest the Brockhampton Stream is shown, fed from several springs that are marked further to the northwest. Approximately 200m to the north is a tannery and beyond this is the Portsmouth Water Works, with a reservoir and engine house shown. To the east is Brockhampton Lane, with some terraced residential cottages beyond the north eastern corner of the site and a 'washing factory' beyond. To the south is farmland and an orchard and to the west is a farm and further fields.
- 1897 – No changes to the site. To the north and east, the washing factory is now marked as a 'chamois leather works' and the tannery to the north has expanded.
- 1909 – No changes to the site use. The water works to the north appears to have expanded and the tannery is not marked.
- 1932 – No changes to the site, which remains fields. Commercial or industrial development is shown to the north east of the site with large buildings marked beyond the leather works.
- 1942 – The Phase II development area of the site is now shown partially developed with three buildings marked and an access road from Brockhampton Lane to the east. Further commercial development is shown further to the east, beyond Brockhampton Lane.
- 1952 – No significant changes to the Phase II area. The buildings and layout remain the same with two pairs of buildings shown off Brockhampton Road, then two series of three buildings and a ramp. Further buildings are shown to the south and east. Residential development is shown to the south and a large sewage treatment plant is shown to the south and east.
- 1960 – No significant changes.
- 1966/68 – The site is shown developed with four large commercial units, three of which occupy the Phase II development area. To the immediate south, the A27 dual-carriageway is shown and large commercial buildings are marked beyond. Further extensive commercial or industrial development is shown to the east and north east with numerous 'works' and engineering factories marked.
- 1969 – The site is shown developed as commercial units with the floor plan layout identical to what remains today. It would appear that this represented the development of the units that have recently been demolished. The buildings shown on the Phase II area are marked as an 'electronics factory' (western boundary), 'engineering works' (western and central area) and 'factory' (central and eastern area). The site to the west is also shown as a 'works' and to the east is a 'depot' and another 'electronics factory', beyond the small terrace of cottages.
- 1987 - 2012 – No significant changes. Further commercial or industrial development is shown to the west. The residential properties to the northwest appear to have been built by 2002.

3.5.2 Regulatory Comment

Information from the Environment Agency's National Incidents Reporting System shows two recorded incidents involving oils and fuels to the north (217m) and northeast (225m) of the site in 2001 and 2002. Both are recorded as "minor" impact with respect water, with the closer of the two also recorded as "minor" impact with respect to land.

Whilst neither incident relate to the site itself, there could be a potential risk of historical soil or groundwater contamination migrating onto the site, depending on groundwater flow direction.

Records show that a Radioactive Substances License (RAS License) was held by Apollo Fire Detectors Ltd for Unit 6 Solent Road (western boundary). This was then revoked / cancelled as Apollo moved to another address in the area. No dates are provided.

3.5.3 Previous Environmental Assessment Information

We have been provided with two reports detailing an environmental audit of the former units on the site and also an environmental assessment completed on the adjacent plot to the west (now Jewsons). We have also completed an environmental assessment of the adjacent Phase I development area. These reports provide background information regarding the site setting and also allow a review of any potential sources of contamination that could be present associated with the previous site use and the adjacent plot. The reports are summarised briefly below:

Ref 1 – *Phase II Environmental Audit – Project Vienna: Units 2-10, Solent Road Industrial Estate, Havant. January 2002 – Completed by WSP Environmental Ltd on behalf of Teeside Group plc, (WSP Report ref. 12020392).*

This report details the findings of an environmental audit completed of Units 2 – 10 Solent Road during 2002. We understand that Units 8, 9, 10 and 10a were the buildings that used to occupy the Phase II site area.

Units 4 and 6 are to the immediate west and form the remainder of the Hargreaves site (Phase I site area). Further west was Unit 2 (now redeveloped as Jewsons).

Information relating to the former buildings and operations being carried out in 2002 is summarised as follows:

- Unit 8 occupied by Van Flora (Unit 8), a floral wholesale operation with no identified contaminative substances or activities identified
- Unit 9 was occupied by Robin Sparshatt and Associates Ltd and was used for the assembly of commercial vehicle body parts (welding and painting parts that were fabricated offsite). Paints were stored in a container at the rear of the unit, although only small quantities were stored and this was not considered to pose a contamination risk. Three heating oil fuel tanks were identified on the south eastern wall of the unit contained in a bund.
- Unit 10 was occupied by Autoliv Ltd. No internal inspection was possible at the time of the site visit, although no concerns were raised following an external inspection.
- Unit 10a was used as offices and no concerns were raised with regard contamination.

In terms of the units adjacent to the west the following information was provided:

- Unit 6 was occupied by Marc Precision Engineering Ltd, although was vacant at the time of the inspection. Four above ground fuel tanks were noted on the western side of the building, two within a brick bund and two within a metal bund. 205litres drums were also noted in the tank area. Hard standing was noted across most of the external areas of the unit, although an area of open ground was noted close to the tanks and oil staining and evidence of fires was noted on this area. Environmental housekeeping was noted to be poor, although not considered to represent a significant environmental concern.
- Unit 4 was occupied by 'T&C' and used for metal fabrication, including the welding of aluminium and steel. Operations undertaken are described to be of small scale and only small quantities of cutting / lube oils were being used and stored. No specific environmental concerns were identified.

- The neighbouring Unit 2 was occupied by CPG Packaging Services Ltd at the time, manufacturing cardboard packaging. An above ground fuel tank was noted 'to the rear of the unit' (as the offices to the units were located at the southern end of the building we interpret this to refer to the northern boundary) and hydrocarbon staining was observed on surrounding ground.

Ref 2 - Environmental Assessment Report – Trade Park Phase I, Solent Road, Havant. February 2013 – Completed by Subadra Consulting Ltd on behalf of Hargreaves (Our Report ref. In12963 CL 001)

This report details the findings of our site investigation works across the Phase I development area to the immediate west of the site, completed at the same time as the works reported in this document. We constructed a total of eight boreholes constructed across the adjacent Phase I development area, with five of these boreholes installed as groundwater monitoring wells.

The underlying shallow geology was found to be highly variable, with significant variance in the composition and thickness of the various units encountered and also high variations in the strength of the shallow clay soils (Alluvium or Head Deposits) noted. Chalk was encountered in two of the boreholes constructed at varying depths.

We identified concentrations of total petroleum hydrocarbons, generally consistent with diesel, in shallow Made Ground at 1.1m depths at a location close to the former tank area of Unit 6. No detectable concentrations were identified in shallow soil samples taken from this location, suggesting that no surface source of hydrocarbons remains in this area of the site.

We also identified concentrations of hydrocarbons in soil samples taken from a depth of 1.8m at a location in the north western corner of the site. This was approximately coincident with underlying groundwater which was also found to contain elevated concentrations of hydrocarbons. No detectable concentrations of hydrocarbons were identified in soil samples taken from 1.4m and 2.8m, suggesting the identified contamination is associated with groundwater rather than a shallow onsite source. Hydrocarbons were generally consistent with waste oils, although some diesel component was also present.

No other significant contamination was encountered in any of the soil or groundwater samples analysed.

3.5.4 Aerial Photographs

We have reviewed satellite imagery on the Bing Maps website which shows the units at some point before the demolition of the adjacent Unit 2 (now Jewsons) and therefore pre-2009. The units on site are shown to comprise steel portal frame and brick structures, with pitched roofs. Unit 8 and 10 are shown with offices at the southern end of the buildings, comprising two story brick structures with flat roofs.

Based on layout, Unit 9 appears to comprise an additional, smaller, commercial unit built between the original buildings (Unit 8 and 10) with no offices (although the historical maps indicate this may have been part of the initial development). Lorries are shown parked to the south of this building, in between the other units. Unit 10a is shown built onto the north eastern end of Unit 10 and comprises a brick two story office building with flat roof.

3.5.5 Summary

We have identified the following potential historic sources of contamination or contaminative land uses that may have impacted soil or groundwater quality beneath the site:

- The Phase II site appears to have been first developed in the 1960s as two commercial / light industrial units. At some point after the initial development it appears additional offices were built on the north eastern edge of Unit 10. These buildings remained present until their demolition in 2012. The units were first shown as an electronic factory, engineering works and factory, although it is likely that both buildings are occupied by various businesses over time. The main warehouse area (internally) and majority of the external site areas were paved with concrete hard standing which will have prevented infiltration of any surface contaminants.

- We understand that above ground fuel tanks were present to the south of Unit 9, along the western boundary of Unit 10, contained within a brick bund structure. It is possible that paints were also stored in this area of the site. The most likely potential contamination that may have resulted is most likely to comprise hydrocarbons or possibly solvents.
- Isolated hydrocarbon contamination has been identified in shallow soils and groundwater on the adjacent site to the west.

4 Results of our Investigation – Phase II Development Area

4.1 Buried Utilities Survey

Hargreaves provided us with the results of an underground utilities survey for the site completed using radio detection methods. The majority of underground utilities to the former site buildings had been disconnected prior to the demolition works. The survey completed by Hargreaves showed the location of any remaining known utilities present.

4.2 Borehole Investigation

4.2.1 Description of Works Completed

We undertook an intrusive investigation across available areas of the Phase II site and also the neighbouring Phase I site during the 10th and 11th January 2013. At this time the eastern half of Unit 10 remained occupied and access was not available for the completion of site investigation works.

Prior to drilling any hard standing was broken out using a rotary coring system powered by the drill rig. We investigated the soil and groundwater quality at the site by constructing a total of sixteen boreholes using a combination of our Geoprobe direct-push environmental sampling system and a Terrier dynamic sampling drill rig that was also used to complete in-situ Standard Penetration Tests (SPT) and obtain additional geotechnical information using dynamic probing techniques. We also completed some in-situ CBR testing to provide an initial assessment of the quality of shallow Made Ground.

Representative soil samples were recovered from each borehole in sealed liners and logged onsite by a suitably qualified technician. Sub-samples were preserved in glass jars and stored in cool boxes during transportation to the laboratory for subsequent analysis.

Ten of the boreholes were completed as permanent groundwater monitoring wells. We returned to the site on the 30th January 2013 to carry out groundwater monitoring and collect samples from the permanent wells we installed. We also returned to the site on the 14th February to access BH10, which had been covered by demolition rubble during our initial groundwater monitoring visit.

Prior to sampling, resting groundwater levels were recorded using a water-level meter. Samples were collected, using disposable bailers, once purging of standing water had been completed. Samples obtained were also preserved in amber glass bottles and stored in cool boxes during transportation to the laboratory for subsequent analysis.

4.2.2 Borehole Locations and Rationale – Phase II Area

Of the total of sixteen boreholes constructed during our site investigation works, we have used a total of nine locations to provide the assessment of soil and groundwater conditions under the Phase II development area. A site plan showing borehole locations is shown on the following page. A summary of these borehole locations is provided as follows:

- BH5 – Installed as well. Located on the north eastern corner of the available site area, north of Unit 9/10. Most likely comprising an up-gradient location.
- BH6 – Located in the centre of the former Unit 10 factory building. Targeting the tank bund area.
- BH7 – Western edge of Unit 9/10. General site coverage
- BH9 – Southern site boundary area. General site coverage.



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Proposed Retail Trade Park
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DATE January 2013

SUBADRA ARCHIVE NO IN12963 DR 003

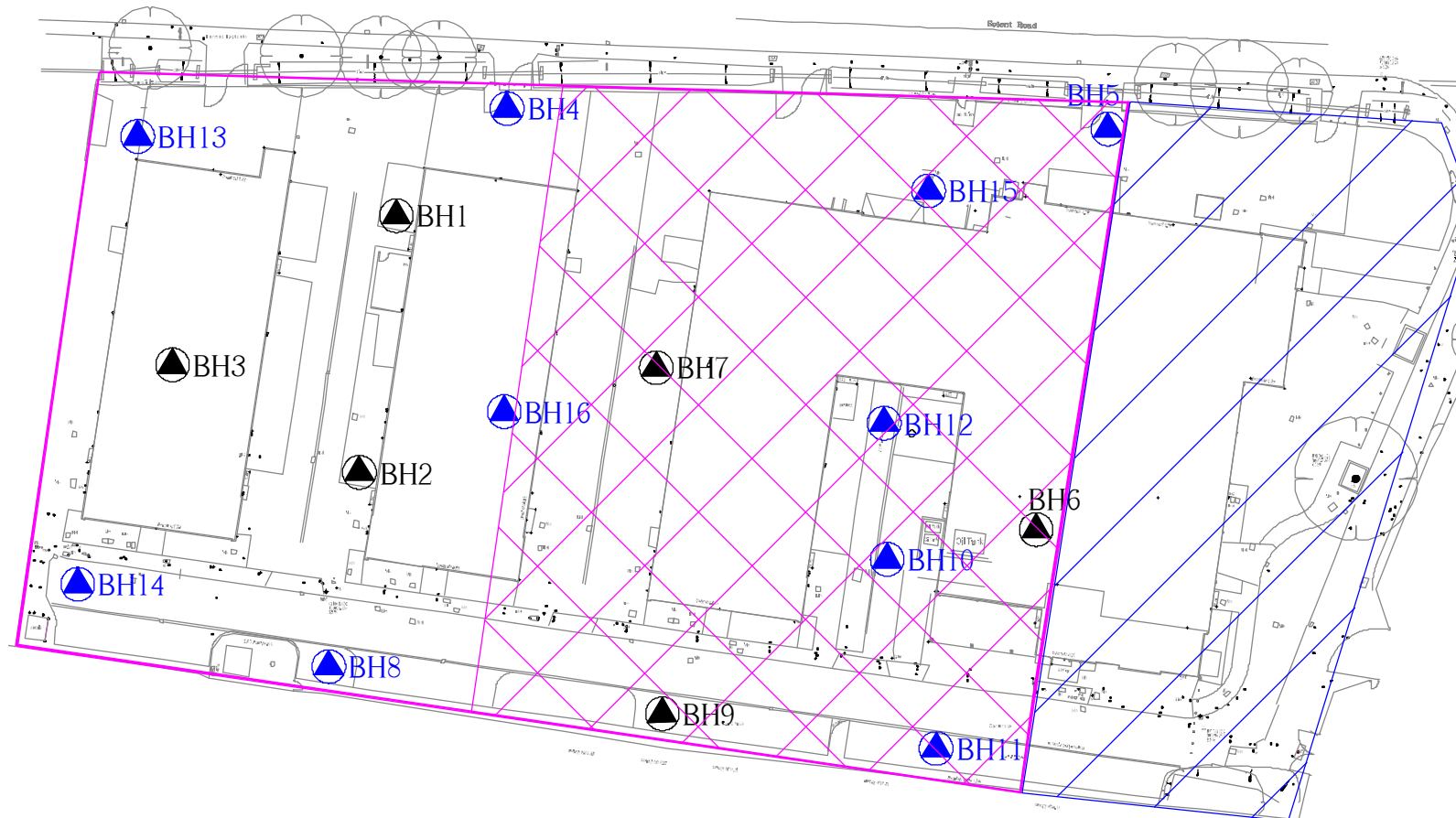
DRAWING BY KM

CHECKED BY JS

KEY

-  AREA OF SITE CURRENTLY OCCUPIED - NO ACCESS
-  INVESTIGATION SITE BOUNDARY
-  PHASE II DEVELOPMENT AREA

-  PERMANENT WELL LOCATION
-  BOREHOLE LOCATION



BOREHOLE LOCATION PLAN

FIGURE TWO

- BH10 – Installed as well. Located adjacent to, and targeting, the former fuel tank area to the rear of Unit 9 / 10.
- BH11– Installed as well. South eastern corner of the available site area. General site coverage.
- BH12 – Installed as well. Located to the immediate south of Unit 9 in the area formally used for truck parking. Targeting waste storage and fuel tank areas predominantly.
- BH15. Installed as well. Located to the north of Unit 9 / 10 and close to an electrical transformer. General site coverage and targeting the engineering workshops associated with Unit 9.
- BH16 – Installed as well. Shared location with the Phase I development area. Located toward the central eastern edge of former Unit 6. Designed as to be a likely down-gradient well location.

4.2.3 Soil Stratigraphy

The following strata were identified by the investigation.

Layer I Made Ground – Either FIRM brown or red brown gravelly CLAY with frequent red brick and concrete fragment, or MEDIUM DENSE grey or grey brown slightly clayey sandy brick, concrete and flint GRAVEL. Also encountered as layers of compacted crushed CHALK.

Layer II Head Deposits / Alluvium – Highly variable in composition and encountered as SOFT or FIRM brown or beige sandy, gravelly or chalky CLAY with occasional wood fragments or LOOSE to MEDIUM DENSE creamy brown clayey gravelly SAND.

Layer III River Terrace Deposits – MEDIUM DENSE brown or orange brown, occasionally creamy brown or beige, clayey sandy flint GRAVEL.

Layer IV Chalk – VERY WEAK structureless creamy white CHALK (Grade V or VI).

The distribution of these strata between boreholes is summarised on the following table and detailed logs for each are included in Attachment Two.

Borehole	Five		Six		Seven		Nine		Ten	
Soil Layer	from	to	from	to	from	to	from	to	from	to
Layer I	-	-	0.2	0.6	0.2	0.5	0.2	0.5	0.2	0.4
Layer II	0.3	1.8	0.6	6.0	0.5	2.0	0.5	2.0	0.4	2.0
Layer III	1.8	3.0	2.3	3.4	2.0	>4.0	2.0	4.4	2.0	>4.8
Layer IV	3.0	>6.0	-	>6.0?	-	-	4.4	>4.8	-	-

Borehole	Eleven		Twelve		Fifteen		Sixteen	
Soil Layer	from	to	from	to	from	to	From	to
Layer I	0.2	0.5	0.2	1.4	0.2	1.4	0.2	1.0
Layer II	0.5	1.1	1.4	>3.6	1.4	>3.6	-	-
Layer III	1.1	>4.0	1.4	3.2	-	-	1.0	3.8
Layer IV	-	-	-	-	-	-	3.8	>4.8

All dimensions in metres below ground level

Table Three: Intrusive Investigation - Soil Stratigraphy

The underlying shallow geology was found to be highly variable, with significant variance in the composition and thickness of the various units encountered and also high variations in the strength of the shallow clay soils (Alluvium or Head Deposits) observed.

We encountered between 0.5 and 1.4m thickness of Made Ground under the site. This appeared to comprise layers of granular material, mixed with clays, and also layers of what appeared to be compacted chalk. We consider it likely that materials were imported to improve the general ground conditions under the site as part of the development of the original units.

Underlying the Made Ground we encountered variable thicknesses of either clays or sands, interpreted as either Alluvium or Head Deposits, or flint gravels that we have interpreted as River Terrace Deposits. In BH6 and BH12 we encountered possible alluvial soils under the river gravels, indicating possible mixing or interbedding of units.

Chalk was encountered in BH5, BH9 and BH16 at varying depths. We consider it likely that we encountered chalk in BH6 also, where the alluvial clay was recorded grading to chalk.

4.2.4 Groundwater

We encountered initial groundwater strike at approximately 1.5m below ground level, either perched in shallow granular fill materials or more generally in the underlying River Terrace Deposits. At rest groundwater levels were recorded at approximately 0.8m below ground level.

Our on-site observations relating to groundwater level and the results of groundwater monitoring visit are summarised in the table below.

Borehole	Groundwater Level – Initial Strike	Groundwater Level – At Rest	Depth to Base of Well	Comment
Five	~1.5	0.79	3.0	-
Ten	~2.0	0.93	Well not installed in error. Sample obtained from open borehole using bailer (14/2/13)	
Eleven	~1.1	1.1	2.5	-
Twelve	~1.4	0.69	3.0	Hydrocarbon odour
Fifteen	~2.0	0.8	3.0	-
Sixteen	~1.5	1.1	3.0	-

All dimensions in metres below ground level

Table Four: Groundwater Data – Phase II Area

We have used our monitoring data of February 2013 and site levels to plot the piezometric surface in order to provide an indication of groundwater flow beneath the site. The results of our survey indicate that the direction of groundwater flow beneath the site is generally towards the west, although locally variable, as shown on the plan below.

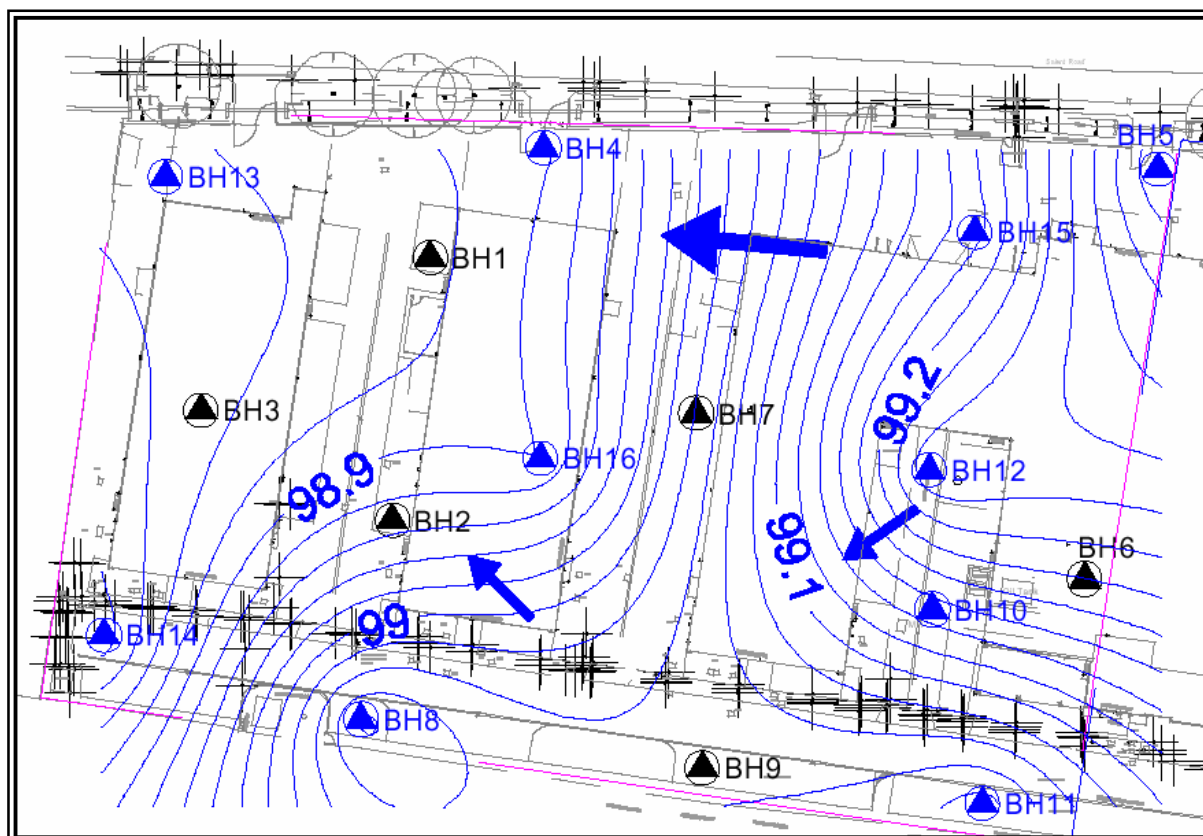


Figure Three – Interpreted Groundwater Flow Direction

4.2.5 Observed Contamination

We recorded the following olfactory and/or visual evidence of contamination:

- Hydrocarbon odours and grey staining was noted in the underlying River Terrace Deposits (clayey flint gravel) encountered in BH12 at approximately 1.8m depths, broadly coincident with underlying groundwater levels.

4.3 Geotechnical Field and Lab Results

We carried out various in-situ geotechnical tests during our investigation, including SPT and dynamic probing. We also completed on site testing of cohesive soil samples using a pocket Penetrometer.

The results of our geotechnical field tests are included in our borehole logs Included in Attachment Two and are summarised in the table below.

Borehole	Depth (m)	Testing Method	Geological Unit	SPT (N) or Su value (kPa)	Soil Strength
BH5	0.4	Pocket Penetrometer	Alluvium / Head	Su = 100	Stiff
	0.8			Su = 75	Firm / Stiff
	1.2			Su = 50	Firm
	1.4			Su = 30	Soft / Firm

Table Five: Results of In-Situ Geotechnical Testing (continued overleaf)

Continued from previous page:

Continued from previous page.					
Borehole	Depth (m)	Testing Method	Geological Unit	SPT (N) or Su value (kPa)	Soil Strength
BH6	0.8	Pocket Penetrometer	Alluvium / Head	Su = 60	Firm
	1.2			Su = 95	Stiff
	1.6			Su = 105	Stiff
	1.9			Su = <25	Very Soft / Soft
	3.6			Su = 60	Firm
	4.0			Su = 50	Firm
	4.4			Su = 80	Firm / Stiff
	4.7			Su = 50	Firm
	5.0			Su = 50	Firm
BH7	0.7	Pocket Penetrometer	Alluvium / Head	Su = <25	Very Soft / Soft
	1.0	SPT		N = 11	Loose / Medium Dense
	1.4	Pocket Penetrometer		Su = <25	Very Soft / Soft
	1.7			Su = <25	Very Soft / Soft
	1.9			Su = <25	Very Soft / Soft
	2.0	SPT	River Gravel Deposits	N = 6	Loose
	3.0	SPT		N = 13	Loose / Medium Dense
	4.0	SPT		N = 10	
	4.6-6.0	Dynamic Probe	-	N = 15*	Medium Dense
	6.0-8.0	Dynamic Probe	-	N = 12*	Medium Dense
BH9	0.9	Pocket Penetrometer	Alluvium / Head	Su = 100	Stiff
	1.3			Su = 45	Soft / Firm
	1.7			Su = 45	Soft / Firm
	1.9			Su = 125	Stiff
	4.3		River Gravel	Su = 110	Stiff
BH10	0.6	Pocket Penetrometer	Alluvium / Head	Su = >150	Stiff
	0.8			Su = 90	Stiff
	1.0			Su = 90	Stiff
	1.4			Su = <25	Very Soft / Soft

Notes: * Dynamic probe relationship with SPT based on published data and empirical experience

Table Five: Results of In-Situ Geotechnical Testing (continued)

Continued from previous page:

Borehole	Depth (m)	Testing Method	Geological Unit	SPT (N) or Su value (kPa)	Soil Strength
BH11	0.6	Penetrometer	Alluvium / Head	Su = 115	Stiff
	1.0	SPT	Alluvium / Head	N = 4	Loose
	1.3	Penetrometer	River Gravel Deposits	Su = <25	Very Soft / Soft
	2.0	SPT		N = 10	Loose / Medium Dense
	3.0	SPT		N = 11	
	4.0	SPT		N = 8	
	5.0-8.0	Dynamic Probe	-	12-18*	Medium Dense
BH12	0.6	Pocket Penetrometer	Made Ground	Su = 90	Stiff
	3.4		Alluvium / Head	Su = <25	Very Soft / Soft
	3.6			Su = <25	Very Soft / Soft
BH15	0.5	Pocket Penetrometer	Made Ground	Su = 25	Soft
	1.0		Made Ground	Su = 50	Firm
	1.4		River Gravel Deposits	Su = 40	Soft / Firm
	1.9			Su = <25	Very Soft / Soft
	3.6-8.0	Dynamic Probe	-	12*	Medium Dense
BH16	0.5	Pocket Penetrometer	Made Ground	Su = 40	Firm
	0.9			Su = 35	Soft / Firm

Notes: * Dynamic probe relationship with SPT based on published data and empirical experience

Table Five: Results of In-Situ Geotechnical Testing (continued)

	CBR 2 (Phase II area)	CBR 3 (Phase II area)	CBR (Phase II area)
Primary Soil Type	Between Unit 6 and 8 – Made Ground (sandy gravel)	North of Unit 9/10 – Made Ground (soft clay)	Under floor slab of Unit 6 – Made Ground (chalk)
CBR Value (%)	3.7	4.6	11.6

Table Six: CBR Test Results

Additionally, a soil sample was selected for geotechnical testing from BH6 and one from BH9 and analysed by GEO Site & Testing Services Ltd. The results of our geotechnical soil classification tests are summarised in the following table and analysis certificates included within Attachment Five.

Borehole	Depth (m)	Soil Type	Passing 0.425mm sieve (%)	Moisture Content (%)	Atterberg Limits		
					Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
BH6	1.0-1.6	Clay	100	21	47	24	23
BH9	1.2-1.7	Clay	90	22	43	20	23

Table Seven: Results of Geotechnical Analyses – Phase II Area

4.4 Chemical Analysis Results

Based upon the results of our desk-top assessment, understanding of identified contamination issues on adjacent sites and understanding of the historical site uses we have completed the following analysis on representative soil and groundwater samples collected from the site:

Analysis	Rationale	No of samples	
		Soil	Water
Total petroleum hydrocarbons (TPH) - reported by carbon range	Representative of compounds present in petrol, diesel and lube oils.	7	6
Total petroleum hydrocarbons (TPH) reported by carbon range with aliphatic/aromatic speciation.	As above, with more detailed analysis of hydrocarbon breakdown.	1	1
Volatile organic compounds (VOCs) (includes BTEX compounds)	Representative of compounds present in petrol and paints / solvents often associated with electronics or engineering workshops.	4	3
Polycyclic aromatic hydrocarbons (PAHs)	Representative of compounds present in diesel and lube oil	3	3
Inorganic Contaminants Suite (including heavy metals).	Typical of compounds found in fill materials and associated with engineering / foundry site uses.	6	2
Sulphates and pH	For use in identifying hazardous ground conditions that could impact on the proposed redevelopment.	3	-
Total Organic Carbon	Site-specific data used within risk assessment process	1	-

Table Eight: Schedule of Analysis – Phase II Site Area

The results of the analyses are summarised below. Chemical Analysis Certificates are included in Attachment Four.

4.4.1 Chemical Analysis Results - Soil Samples

Sampling Location	Depth (m)	Total Petroleum Hydrocarbon Concentration (mg/kg)				
		>C ₈ -C ₁₀	>C ₁₀ -C ₁₂	>C ₁₂ -C ₁₆	>C ₁₆ -C ₂₁	>C ₂₁ -C ₃₅
BH5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5
BH7	1.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH9	1.8	<0.5	<0.5	<0.5	<0.5	<0.5
BH10	1.7	<0.5	<0.5	<0.5	<0.5	<0.5
BH11	1.9	<0.5	<0.5	<0.5	<0.5	<0.5
BH12	2.3	14.3	28.7	20.9	3.31	<0.5
BH15	1.9	<0.5	<0.5	<0.5	<0.5	<0.5

Table Nine: TPH Analysis Results – Soil

Sampling Location	TPH Fraction	Total Petroleum Hydrocarbon Concentration (mg/kg)				
		>C ₈ -C ₁₀	>C ₁₀ -C ₁₂	>C ₁₂ -C ₁₆	>C ₁₆ -C ₂₁	>C ₂₁ -C ₃₅
Borehole 12 Depth: 1.8	Aliphatic	24	79	271	449	163
	Aromatic	5	15	71	127	41
	Total	29	94	342	576	204

Table Ten: TPH Analysis (aliphatic/aromatic speciation) Results – Soil

Sampling Location	Depth	Concentration (mg/kg)							
		Benzene	Toluene	Ethyl-benzene	Total Xylenes	Isopropyl-benzene	n-Propyl-benzene	Sec-Butylbenzene	n-Butylbenzene
BH5	6.0	<0.005	<0.005	<0.005	<0.005	0.015	0.038	0.023	0.069
BH6	5.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH12	1.8	<0.002	<0.005	<0.010	<0.020	-	-	-	-
BH16	4.4	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Table Eleven: BTEX and Volatile Organic Compounds – Soil

Sampling Location	Depth (m)	Polycyclic Aromatic Hydrocarbon Concentration (mg/kg)*		
		Naphthalene	Benzo(a)pyrene	Total PAHs
BH6	3.4	<0.1	<0.1	<1.6
BH10	0.7	<0.1	<0.1	<1.6
BH16	0.9	<0.1	<0.1	<1.6

Note: * - See analysis certificate for full EPA16 speciated PAH data.

Table Twelve: PAH Analysis Results – Soil

Sampling Location	Depth (m)	Inorganic Element Concentration (mg/kg)					
		Arsenic	Beryllium	Cadmium	Chromium III	Chromium VI	Copper
BH5	0.5	5	<0.5	<0.5	23	<2	15
BH7	0.2-0.5	5	<0.5	<0.5	20	<2	12
BH11	0.6	8	<0.5	<0.5	32	<2	16
BH12	0.7	10	<0.5	<0.5	24	<2	35
BH15	0.4-0.9	3	<0.5	<0.5	36	<2	12
BH16	1.2-2.0	3	0.6	<0.5	30	<2	9
		Lead	Mercury	Nickel	Selenium	Vanadium	Zinc
BH5	0.5	31	<1	19	<3	36	46
BH7	0.2-0.5	106	<1	13	<3	28	32
BH11	0.6	33	<1	33	<3	50	50
BH12	0.7	135	<1	23	<3	38	228
BH15	0.4-0.9	22	<1	28	<3	49	74
BH16	1.2-2.0	12	<1	21	<3	33	44

Table Thirteen: Inorganic Compounds Analysis Results - – Soil Samples

Sampling Location	Depth (m)	Total Organic Carbon (%)
BH6	1.7	0.3

Table Fourteen: Total Organic Carbon Analysis Results - Soil Samples

Sampling Location	Depth (m)	Sulphates (g/l)	pH
BH7	0.6	0.03	7.6
BH9	2.8	<0.01	7.9
BH15	3.6	<0.01	7.8

Table Fifteen: Sulphate and pH Analysis Results - Soil Samples

4.4.2 Chemical Analysis Results – Groundwater Samples

Sampling Location	Total Petroleum Hydrocarbon Concentration (µg/l)				
	>C ₈ -C ₁₀	>C ₁₀ -C ₁₂	>C ₁₂ -C ₁₆	>C ₁₆ -C ₂₁	>C ₂₁ -C ₃₅
BH5	<10	<10	<10	<10	<10
BH10	<10	<10	<10	<10	<10
BH11	<10	<10	<10	<10	<10
BH12	602	1,470	3,360	3,720	1,150
BH15	<10	<10	<10	<10	<10
BH16	<10	<10	<10	<10	<10

Table Sixteen: TPH Analysis Results – Groundwater

Sampling Location	TPH Fraction	Total Petroleum Hydrocarbon Concentration (µg/l)				
		>C ₈ -C ₁₀	>C ₁₀ -C ₁₂	>C ₁₂ -C ₁₆	>C ₁₆ -C ₂₁	>C ₂₁ -C ₃₅
Borehole 12 Depth: 1.8	Aliphatic	27	42	229	485	163
	Aromatic	17	2,772	1,456	359	120
	Total	44	2,814	1,685	844	283

Table Seventeen: TPH Analysis (aliphatic/aromatic speciation) Results – Groundwater

Sampling Location	Concentration (µg/l)			
	Benzene	Toluene	Ethyl-benzene	Total Xylenes
BH5	<5	<5	<5	<15
BH12	<5	<5	<5	<15
BH15	<5	<5	<5	<15
BH16	<5	<5	<5	<15

Table Eighteen: BTEX Compounds – Groundwater

No detectable concentrations of any of the other Volatile Organic Compounds, including chlorinated solvents, were identified in groundwater samples taken from BH5, BH15 or BH16.

Sampling Location	Polycyclic Aromatic Hydrocarbon Concentration (µg/l)*		
	Naphthalene	Benzo(a)pyrene	Total PAHs
BH12	7.52	<0.01	20.17
BH15	<0.01	<0.01	<0.01
BH16	<0.01	<0.01	<0.01

Note: * - See analysis certificate for full EPA16 speciated PAH data.

Table Nineteen: Selected PAH Analysis Results – Groundwater

Sampling Location	Inorganic Element Concentration (µg/l)					
	Arsenic (dissolved)	Beryllium (dissolved)	Cadmium (dissolved)	Chromium III (dissolved)	Chromium VI (dissolved)	Copper (dissolved)
BH11	<10	<1	<0.5	<5	<5	<10
BH15	<10	<1	<0.5	<5	<5	<10
	Lead (dissolved)	Mercury (dissolved)	Nickel (dissolved)	Selenium (dissolved)	Vanadium (dissolved)	Zinc (dissolved)
BH11	<5	<0.05	<7	<5	<5	<5
BH15	<5	<0.05	<7	<5	<5	<5

Table Twenty: Inorganic Compounds Analysis Results - - Groundwater Samples

5 Conceptual Site Model

5.1 Summary of Potential Sensitive Receptors

Based upon the results of our desk study and subsequent investigation we consider potentially at-risk human receptors include:

- Commercial workers onsite (in the two future commercial units);
- Neighbouring commercial and residential properties.

We consider potentially at-risk environmental receptors include:

- Underlying groundwater (both shallow Secondary A aquifers and deeper Principal chalk aquifer);
- The public water abstractions to the north and northwest;
- The Brockhampton Stream, approximately 50m to the northwest (at its closest point);

5.2 Summary of Identified Contaminant Sources

Based upon the results of our intrusive investigation we have identified the following contaminants at the site:

- We have identified concentrations of total petroleum hydrocarbons, generally consistent with diesel or fuel oils in shallow soils and groundwater from BH12.

No other significant contamination was encountered in any of the soil or groundwater samples analysed.

5.3 Data Gaps and Uncertainties

We note the following data gaps/uncertainties that have arisen during the course of our desktop survey and subsequent investigation:

- We have little information regarding the detailed historical uses of the various buildings on site following their development on the site during the 1960s.

5.4 Conceptual Site Model

We have used the information presented in the previous sections of this report to create a Conceptual Site Model. We have reviewed potential contaminants and their receptors together with any possible pathways that may link them. The resulting pollutant linkages are summarised in the table below.

Contaminant	Pathway	Receptor	Viable Pollutant Linkage
Heavy metals and inorganic compounds	Ingestion and dermal contact	On site commercial workers	No – no heavy metal contamination encountered. Any residual risk mitigated as the proposed development comprises either buildings or hardstanding – no contact possible
Isolated low concentrations of hydrocarbons identified – most likely associated with former fuel tanks (associated with Unit 9/10)	Ingestion and dermal contact	On site commercial workers	
	Permeation of contaminants, particularly hydrocarbons, into drinking water supply service pipes	On site commercial workers	Possible – depending on final location of buildings and/or services.
	Volatilisation of hydrocarbons to indoor/outdoor air (either direct from soils or dissolved in groundwater)	On site commercial workers	Unlikely – due to low concentrations and isolated nature of hydrocarbons encountered.
	Off-site migration of hydrocarbons: volatilisation to indoor/outdoor air (vapours from on-site soils or via lateral migration of dissolved compounds)	Off-site commercial workers	Unlikely - due to the variable nature and generally high clay content of the drift geology.
	Downward migration of contaminants to groundwater	Underlying Secondary A Aquifer in the Drift Geology	Yes – hydrocarbons found within groundwater samples show isolated impact to drift aquifer.
		Underlying Principal Aquifer in the Upper Chalk	Possible – dependent upon the consistency of the barrier between the clay drift geology layers and the productive chalk.
	Off-site migration of contaminants dissolved in groundwater leading to direct impact of environmental receptors	Brockhampton Stream located ~50m NW.	Unlikely – no lateral migration of isolated contaminants identified in down-gradient wells.
		Public water abstraction springs to N / NW.	
		The Langstone Harbour SSSI (802m south)	

Table Twenty One: Conceptual Site Model – Assessment of Viable Pollutant Linkages

Our qualitative assessment has confirmed that viable pollutant linkages do exist at the site. We have therefore carried out a Generic Quantitative Risk Assessment to confirm whether the concentrations of potential contaminants identified during our investigation pose an unacceptable risk to the long-term health (chronic) of future site users and/or environmental receptors.

6 Generic Quantitative Risk Assessment

6.1 Methodology

We have completed our Quantitative Risk Assessment by comparing the concentrations of compounds identified during our site investigation with Generic Acceptance Criteria (GAC). We have used Generic Acceptance Criteria from a variety of sources within our assessment, as specified in the tables below. In carrying out these risk assessments we have adhered to the following assumptions and methodologies:

- Based upon our understanding of the site's future use and absence of potential at-risk off-site human receptors we have limited our assessment of human receptors to future employees working in the new commercial building.
- Organic contaminants of concern are limited to total petroleum hydrocarbons by carbon group. As we did not find concentrations of BTEX or PAH above method detection limits in the soil or groundwater samples analysed, we have not included these in our human health risk assessment.
- Inorganic contaminants of concern are limited to arsenic, beryllium, cadmium, chromium, lead, mercury, nickel and selenium, copper, vanadium and zinc. Chromium has been assessed on the basis of a combined value of Chromium III and Chromium VI.
- The results of the chemical analyses carried out on soil and groundwater samples have been used to determine concentrations of these contaminants at the site.
- We have used a value of 1% soil organic matter in calculating GACs.
- Generic Assessment Criteria for total petroleum hydrocarbons (TPH) bands is based upon lowest value from published/calculated aliphatic and aromatic concentrations. The recorded maximum concentrations for TPH compared to the GACs include both aliphatic and aromatic concentrations.
- In the assessment of risk posed to environmental receptors, we have limited our assessment to the underlying Secondary A aquifer in the shallow drift geology as this is considered the primary receptor, being encountered directly under the site at shallow depths and most likely in continuity with the Brockhampton Stream.

6.2 Risk to Human Health

Contaminant	Max. concentration recorded in soil (mg/kg)	GAC for Commercial Land Use (mg/kg)	Source of GAC	Does maximum concentration exceed GAC?
TPH C ₈₋₁₀ (aliphatic)	24	2,100**	LQM CIEH	No
TPH C ₁₀₋₁₂ (aromatic)	28.7	17,000		No
TPH C ₁₂₋₁₆ (aromatic)	71	36,000		No
TPH C ₁₆₋₂₁ (aromatic)	127	28,000**		No
TPH C ₂₁₋₃₅ (aromatic)	41	28,000**		No

Note: * - Former SGV value

** - GAC exceeds solubility limit

Table Twenty Two: Results of Generic Risk Assessment - Human Health/Soil (continued overleaf)

Environmental Investigation Report – Trade Park - Phase II, Solent Road, Havant

Contaminant	Max. concentration recorded in soil (mg/kg)	GAC for Commercial Land Use (mg/kg)	Source of GAC	Does maximum concentration exceed GAC?
Arsenic	10	640	EA SGV	No
Cadmium	<0.5	230		No
Nickel	33	1,800		No
Selenium	<3	13,000		No
Mercury	<1	26		No
Lead*	135	750		No
Beryllium	0.6	420	LQM CIEH	No
Chromium	36	30435		No
Copper	35	71,700		No
Zinc	228	665,000		No

Table Twenty Two: Results of Generic Risk Assessment - Human Health/Soil (continued)

Contaminant	Max concentration in groundwater (µg/l)	GAC for Commercial Land Use (µg/l)	Source of Generic Acceptance Criteria.	Does maximum concentration exceed GAC?
Total petroleum hydrocarbons	10,302 (BH12)	Free-phase product	In-house derived GACs calculated using Risk-Integrated Software for Clean-ups (RISC)	No

Table Twenty Three: Results of Generic Risk Assessment - Human Health/Groundwater6.3 Risk Posed to Environmental Receptors

Contaminant	Max. concentration recorded in groundwater (µg/l)	GAC for Secondary A Aquifer (µg/l)	Source of Generic Acceptance Criteria.	Does maximum concentration exceed GAC?
TPH	10,302 (BH12)	50	Environment Agency - Environmental Quality Standard (EQS) (Actual or proposed)	Yes
Benzene	<5	10		No
Xylene*	<15	30		No
Toluene	<5	50		No
Ethylbenzene	<5	20		No
Naphthalene	7.54	2.4		Yes
Benzo(a)pyrene	<0.01	0.05		No

Notes: * - Maximum Allowable Concentration

Table Twenty Four: Generic Acceptance Criteria for Environmental Receptors

7 Environmental Assessment Conclusions and Recommendations

The results of our Generic Quantitative Risk Assessment indicate that the concentrations of various organic and inorganic compounds identified during our investigation do not pose a potentially unacceptable risk to future commercial site workers.

With regard to environmental receptors, specifically the underlying shallow River Gravel Deposits aquifer and nearby Brockhampton Stream, our Generic Quantitative Risk Assessment indicates that concentrations of hydrocarbon compounds encountered in groundwater from BH12 (located to the rear of Unit 9) exceed relevant generic acceptance criteria.

The hydrocarbons we have identified in soils and groundwater from BH12 are generally consistent with diesel or fuel oils. Based on the information we have reviewed regarding the site, the most likely source of these hydrocarbons is the former above ground fuel tanks that were located behind Unit 9. Other possible sources of the hydrocarbon impact could include waste storage or vehicle repair works being undertaken in this area of hard standing behind Unit 9.

We note that no hydrocarbon impact was identified in either soils or groundwater samples taken from BH10, located immediately to the west of the former above ground tank area. No detectable hydrocarbons were detected in groundwater samples taken from any other wells at the site, including the down gradient wells BH15, BH16 and BH4.

We therefore consider the identified contamination to be limited in extent, with no evidence to suggest extensive lateral migration of hydrocarbons has occurred. We do not consider it likely that the identified environmental receptors are at risk of impact from the isolated hydrocarbon impact identified.

We would recommend that further inspection and verification sampling of this area of the site is completed when the existing buildings are demolished and the hard standing removed. Any hydrocarbon impacted soils encountered should be excavated and removed from the site to reduce any residual contaminant mass at the site and further reduce any potential long term risk posed to the underlying aquifer and Brockhampton Stream.

8 Geotechnical Assessment and Recommendations for Redevelopment

8.1 Preliminary Geotechnical Profile

We have assessed the underlying ground conditions encountered across the site in order to compile a preliminary geotechnical profile for the site to be used for initial foundation design purposes. These values are conservative. We recommend that the following geotechnical profile be used for initial foundation design purposes:

Soil Layer	Primary Soil Type	Depth (m)		SPT 'N' Value	Undrained Shear Strength (kPa)	Comments
		All except BH3 and BH4	BH3 and BH4			
Made Ground				No engineering properties		
Alluvium/ Head	Clay	<2m	6m	-	<25 - 150	Very variable stratum – too variable to provide reliable bearing properties.
River Gravels	Gravel	2m – 8m	6m+	12	-	Top of stratum should be confirmed visually on site at each foundation location.
Chalk	Chalk	8m+	-	6	-	Limited data available. Parameter values interpreted from dynamic probing data only.

Table Twenty Five: Idealised Geotechnical Design Profile

8.2 Foundation Design Recommendations

We have not been provided with design drawings for the new commercial units and therefore we are unable to provide specific foundation design recommendations for any new buildings and/or infrastructure. However, we make the following general comments regarding foundation designs at the site, which may be applicable to the proposed development scheme.

The shallow Made Ground (clay and gravel) and the Alluvium/Head (clay) are too variable in consistency to provide reliable bearing strata for foundations. We therefore recommend that all foundations be constructed to bear directly on the underlying River Gravels.

The data from our boreholes and in situ testing splits in to two areas:

- Area 1 – Characterised by all boreholes except boreholes BH3 and BH4:

The River Gravels comprise medium dense sandy gravels and were proven to be at least 5m in thickness. They provide reliable bearing strata for spread foundations such as pads, strip footings. The top of the River Gravels should be visually confirmed on site at each foundation location by a suitably qualified geotechnical engineer prior to foundation construction.

If shallow raft foundations are required, then we recommend that any Made Ground and/or Alluvium/Head be removed from under the slab location and replaced with clean, granular backfill, rolled and compacted in layers prior to construction of the slab.

For preliminary foundation design/selection we recommend that an allowable bearing capacity of 200kN/m² be assigned to the River Gravels. However this figure should be reviewed by a suitably qualified geotechnical engineer once structural loads/spacing and likely foundation type has been selected.

➤ **Area 2 – Characterised by boreholes BH3 and BH4.**

In Area 2 the Made Ground/Alluvium/Head Deposits were considerably thicker (more than 6m in borehole BH3 and 4m in borehole BH4). If possible significant foundations should be avoided in these areas. If this is not possible then consideration should be given to using ground improvement methods and/or designing foundations with low bearing pressures such as raft foundations. In the latter case, we recommend that Made Ground be removed from under the slab location and replaced with clean, granular backfill, rolled and compacted in layers prior to construction of the slab

8.2.1 Pavement Design

The results of our CBR tests indicate the CBR value of the Made Ground varies between 1.2% (CBR 1) and 11.6% (CBR 4). These results indicate that the shallow Made Ground is highly variable in composition and quality. We would recommend that the shallow soils are inspected following the removal of the hard standing and formation of site levels. Additional CBR testing is recommended prior to the final formation of site access roads.

8.3 Recommendations Relating to the Proposed Development Works

We make the following additional general recommendation relating to the forthcoming development:

8.3.1 Temporary Works and Dewatering

Foundation excavations are likely to be formed within loose gravel or soft to firm clay. Side slopes constructed in these soils are unlikely to remain stable for short periods without support or being battered back. However we recommend that a detailed inspection of the side slopes be carried out in order to assess fully any support measures required.

Perched water was encountered in granular soils at between 1 and 1.5m across most of the site. The soil permeability is likely to be relatively high although the volume of perched water present will be influenced by recent rainfall. We therefore recommend that provision be made for dewatering of all excavations below 1m.

8.3.2 Protection of Buried Concrete

The sulphate concentrations and pH values indicate that the site falls within 'Class One' with respect to buried concrete (BRE Digest 1:2005). This indicates that the concentrations of sulphates in the underlying soils will not have an adverse affect on buried concrete. The ground beneath the site is classed as 'non-aggressive' and we consider standard Portland cement will be suitable for use.

8.3.3 Verification Sampling During Construction Works

If, during the proposed redevelopment works, contamination is encountered or suspected, we recommend that additional verification sampling of excavations be undertaken to delineate potential contamination and determine an appropriate course of action. A detailed verification sampling methodology will be submitted as part of the final outline remedial strategy for the site.

8.3.4 Water Supply Pipework

Hydrocarbons present in shallow soils can permeate standard PVC water supply pipework and leach into drinking water leading to tainting and in extreme cases can pose a risk to human health. Whilst we have not identified hydrocarbons at depths consistent with the likely depth of new service pipes under the site, we would still recommend that any new water supply pipework that is installed during the forthcoming development works be constructed from a hydrocarbon impervious material (e.g. ductile steel or plastic/aluminium composite) and installed within clean fill material as precautionary measure.

8.3.5 Waste Classification of Soils

Based on the results of our investigation we consider that excavated soils that are sent to landfill are likely to be classified as either inert or non-hazardous waste. Careful segregation of the various waste streams will minimise disposal costs. We are able to supervise these works if required.

We recommend that we classify all potentially impacted soils prior to disposal. All waste soils and fill must be disposed of at an appropriately licensed disposal site. A licence exempt site is unlikely to be acceptable for disposal of wastes from this site. A registered waste haulage contractor must transport all waste soils. It is the responsibility of the site owner to ensure that wastes are safely transported and disposed of.

8.3.6 Protection of Construction Workers

Construction and maintenance workers, particularly those working on below ground utilities, should be made aware of the hydrocarbon concentrations encountered in soil. Strict hygiene practices should be followed during any below ground works. To minimise potential exposure of workers to potential hydrocarbon contaminants, site clothing should be removed after each working period. A clean area should be made available with washing facilities for use after each shift. Changing and washing areas should be positioned to ensure that no field equipment enters the clean area. Eating, drinking and smoking should be restricted to the clean area.

Your attention is drawn to the Notice to Interested Parties included as Attachment One.

9 References

HSE (1991) "Protection of Workers and the General Public During the Development of Contaminated Land" HMSO, London

Construction (Design and Management) Regulations 1994. SI 1994/3140. The Stationery Office.

DEFRA and Environment Agency (2002a) "Priority Contaminants for the Assessment of Contaminated Land" Report CLR8, R&D Dissemination Centre, WRc plc, Swindon.

DEFRA and Environment Agency (2002b) "Assessment of Risks to Human Health from Land Contamination: An Overview of the Development of Soil Guideline Values and Related Research.", Report CLR 7 R&D Dissemination Centre, WRc plc, Swindon.

DEFRA and Environment Agency (2004) "Model Procedures for the Management of Land Contamination" Report CLR 11 Environment Agency, Bristol.

ATTACHMENT ONE: NOTICE TO INTERESTED PARTIES

NOTICE TO INTERESTED PARTIES

The purpose of our site assessment is to provide general information on the environmental and/or geotechnical conditions existing at the site and related to soil or groundwater. Where the Client or others specified the scope of the investigation, the validity of our conclusions may be limited by the scope of work completed. We are not responsible for any such limitations imposed by the scope of work.

Where stated in this report, we have used information supplied by third parties. While we have evaluated as far as possible the validity of this information, we cannot guarantee its accuracy in any way whatsoever.

No investigation technique is capable of completely identifying all of the contaminants that might be present in the soil or groundwater under a site. Where specified in our report, we have examined the ground by constructing a number of boreholes and/or trial pits. We recovered samples of soil and/or groundwater from available exposures.

The depth and spacing of our sampling locations were selected to ensure with a reasonable probability that they would be representative of the actual conditions across the whole site. However, safety considerations relating to existing site infrastructure may have restricted our ability to investigate all potential contaminant sources. Specifically, we were unable to investigate the soil and groundwater condition immediately adjacent to buried services. These limitations must be borne in mind when considering the conclusions reached in this report.

Soil is intrinsically variable and the spread of contaminants within the soil is therefore subject to a degree of non-uniformity. For these reasons no sampling technique can completely eliminate the possibility of obtaining samples that are not representative of the actual conditions. Our sampling techniques are intended to reduce the possibility to an acceptable level.

Groundwater levels and soil vapour levels that we report were accurate at the time of the investigation. Groundwater and soil vapour levels are variable. Long term monitoring may be required to ensure that the levels recorded during our investigation are representative of long term and possible 'worst case' conditions.

This investigation was carried out to assess the significance of contamination resulting from use of the site as identified in this report. Unless we have indicated otherwise, no assessment of the potential impact of any other previous uses has been made. No investigation was carried out to determine whether or not any deleterious or hazardous materials have been used in the construction of the buildings present on the site.

We do not accept any responsibility for the cost of remedial works or other costs incurred in whatever way whatsoever as a result of any omissions, errors or other shortcomings in this report unless we have been given reasonable opportunity to verify ourselves that such faults exist and we have been given a reasonable opportunity to carry out works to remedy such faults ourselves using the most practicable means available to us. We do not accept liability for any consequential losses incurred by you while we carry out any remedial works we deem necessary.

This report has been prepared for Hargreaves Properties Ltd. Use of, and reliance on, this report by other third parties will be at such third parties own risk, and we are unable to accept any liability or responsibility to third parties.

Neither the whole nor any part of this report, or any reference to it, may be included in any published document circular or statement or published in any way without our prior written approval.

This report and its contents, together with any supporting correspondence or other documentation, remain the property of Subadra Consulting Limited until paid for in full.

ATTACHMENT TWO: BOREHOLE LOGS

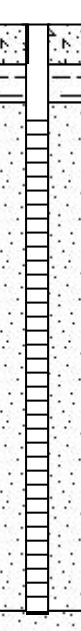
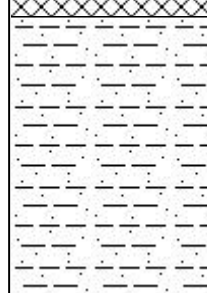
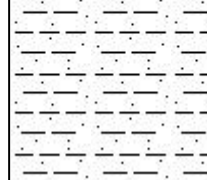
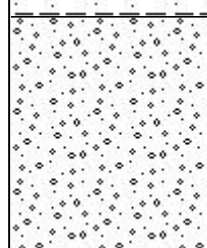
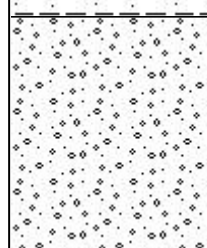
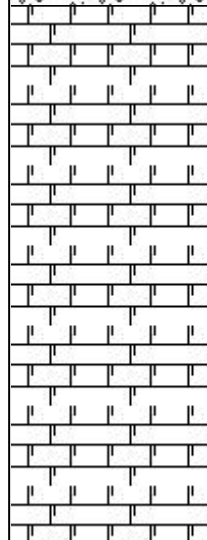
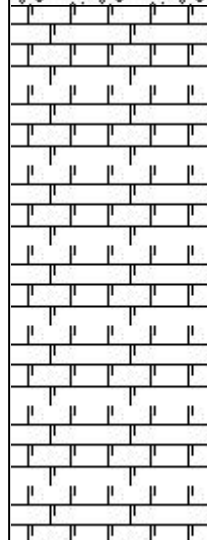
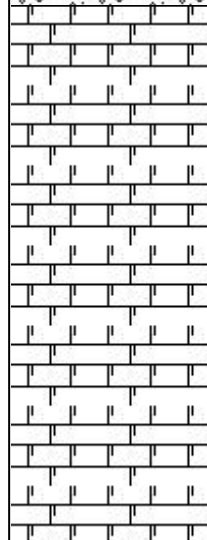
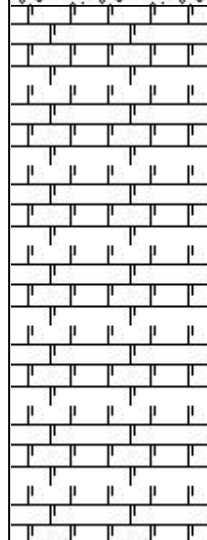
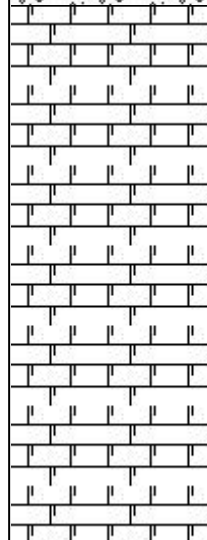
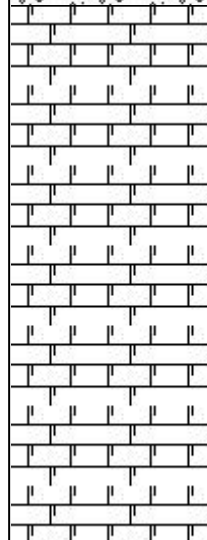
Borehole No. BH5

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Trade Park	Date	10th January 2013
Project Code	In12963	Ground Level	n/a
Coordinates	471018 106032 (centre of site)	Equipment	Geoprobe Direct Push

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0						Su = 100 Su = 75 Su = 50 Su = 30	CONCRETE over layer of flint gravel
				S1	Metals		0.3 to 1.8m STIFF becoming SOFT orange brown slightly gravelly CLAY HEAD DEPOSITS / ALLUVIUM
1				S2	TPH		
				S3	PAH		
2							1.8 to 3.0m MEDIUM DENSE orange brown or creamy beige slightly clayey flint GRAVEL. . RIVER GRAVEL DEPOSITS
				S4			3.0 to 6.0m VERY WEAK structureless creamy white with orange brown staining Grade VI CHALK. No flints noted. CHALK
3							
				S5	VOC		
4							
5							
6							

Borehole terminated at: 6.0m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: 3.0m

Groundwater encountered at: ~1.5m

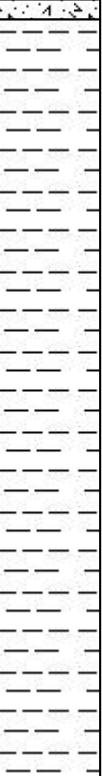
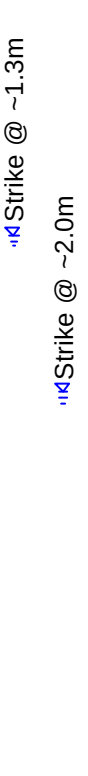
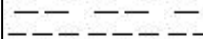
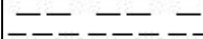
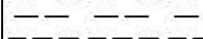
Dwn: KM

Ckd: JS

Borehole No. BH6					SUBADRA Consultants in the Earth Sciences Unit 13, Triangle Business Park, Stoke Mandeville Tel. 01296 739400 Fax. 01296 739401.			
Project Name		Retail Trade Park			Date	11th January 2013		
Project Code		In12963			Ground Level	n/a		
Coordinates		471018 106032 (centre of site)			Equipment	Geoprobe Direct Push		
Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description	
0							Concrete	
						0.2 to 0.6m FIRM grey brown slightly gravelly CLAY MADE GROUND		
1				S1		Su = 60	0.6 to 2.3m FIRM orange brown or light brown slightly gravelly CLAY becoming SOFT to FIRM beige or creamy white chalky CLAY. HEAD DEPOSITS / ALLUVIUM	
				S2	Atterberg	Su = 95		
				S3	TOC	Su = 105		
2						Su = <25		
3								2.3 to 3.4m LOOSE to MEDIUM DENSE brown or orange brown slightly clayey slightly sandy flint wet GRAVEL RIVER GRAVEL DEPOSITS
4				S4	PAH	Su = 60	3.4 to 6.0m FIRM to STIFF brown or grey CLAY with occasional flint gravel or gravel band. Grading into CHALK at 6.0m possibly. HEAD DEPOSITS / ALLUVIUM?	
						Su = 50		
						Su = 80		
5				S5	VOC	Su = 50		
						Su = 50		
6								

Borehole terminated at: 6.0m
Hydrocarbon odour/staining: None noted
Groundwater monitoring well installed to: None installed
Groundwater encountered at: ~2.3m

Dwn: KM
Ckd: JS

Borehole No. BH7				SUBADRA Consultants in the Earth Sciences Unit 13, Triangle Business Park, Stoke Mandeville Tel. 01296 739400 Fax. 01296 739401.					
Project Name		Retail Trade Park		Date		11th January 2013			
Project Code		In12963		Ground Level		n/a			
Coordinates		471018 106032 (centre of site)		Equipment		Terrier Dynamic Sampling			
Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description		
0				S1	Metals	Su = <25 N = 11	Concrete		
				S2	SO4		Su = <25 Su = <25 Su = <25 N = 6	0.2 to 0.5m MEDIUM DENSE brown grey or black slightly sandy slightly clayey GRAVEL. Gravel comprising flint and red brick fragments with rubber MADE GROUND	
								0.5 to 2.0m SOFT brown or orange brown CLAY becoming beige or creamy brown chalky CLAY with occasional flint gravel HEAD DEPOSITS / ALLUVIUM	
				S3	TPH	N = 13		2.0 to >4.0m MEDIUM DENSE light grey or orange brown slightly sandy to sandy clayey flint GRAVEL. Becoming increasing clayey with depth RIVER GRAVEL DEPOSITS	
							N = 10	Dynamic probing completed from 4.0m to 8.0m	
				S4	Metals				
									
						S5			

Borehole No. BH9

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Trade Park	Date	11th January 2013
Project Code	In12963	Ground Level	n/a
Coordinates	471018 106032 (centre of site)	Equipment	Geoprobe Direct Push

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0							Concrete
				S1		Su = 75	0.2 to 0.5m MEDIUM DENSE brown, red brown or black sandy slightly clayey GRAVEL.
				S2		Su = 100	MADE GROUND
1						Su = 70	0.5 to 2.0m SOFT to STIFF brown or orange brown CLAY with occasional flint gravel.
				S3	Atterberg	Su = 45	HEAD DEPOSITS / ALLUVIUM
				S4	TPH	Su = 45	
2						Su = 125	2.0 to 4.4m MEDIUM DENSE creamy brown or beige clayey or very clayey GRAVEL with STIFF very gravelly CLAY at base.
				S5	SO4		RIVER GRAVEL DEPOSITS
3							
4				S6		Su = 110	4.4 to 4.8m VERY WEAK structureless creamy white Grade V or VI CHALK
5							CHALK
6							

Borehole terminated at: 4.8m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: None installed

Groundwater encountered at: ~2.0m

Dwn: KM

Ckd: JS

Borehole No. BH10

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Trade Park	Date	11th January 2013
Project Code	In12963	Ground Level	n/a
Coordinates	471018 106032 (centre of site)	Equipment	Geoprobe Direct Push

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0							Concrete
				S1	PAH/PCB	Su = 75 Su = 100	0.2 to 0.4m Layer of compacted chalk over MEDIUM DENSE brown, red brown or black sandy slightly clayey GRAVEL. MADE GROUND
1						Su = 70 Su = 45 Su = 30	0.4 to 2.0m STIFF becoming SOFT brown or orange brown gravelly CLAY. HEAD DEPOSITS / ALLUVIUM
				S2	TPH	Su = 45 Su = 125	
2							2.0 to 4.8m MEDIUM DENSE creamy brown or beige clayey or very clayey GRAVEL RIVER GRAVEL DEPOSITS
				S3			
3							
				S4	PSD		
4				S5		Su = 110	
5							
6							

Borehole terminated at: 4.8m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: 3.0m

Groundwater encountered at: ~2.0m

Dwn: KM

Ckd: JS

Borehole No. BH11

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Trade Park	Date	11th January 2013
Project Code	In12963	Ground Level	n/a
Coordinates	471018 106032 (centre of site)	Equipment	Terrier Dynamic Sampling

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0							Concrete
				S1	Metals	Su = 115 Su = 140	0.2 to 0.5m MEDIUM DENSE brown, red brown or black sandy slightly clayey GRAVEL with layer of compacted chalk at 0.4m.
1						N = 4 Su = <25	MADE GROUND 0.5 to 1.1m STIFF brown or orange brown gravelly CLAY.
2				S2	TPH	N = 10	1.1 to >4.0m SOFT orange brown very gravelly CLAY grading to MEDIUM DENSE creamy brown or beige clayey flint GRAVEL
3				S3	PSD	N = 11	RIVER GRAVEL DEPOSITS
4				S4		N = 8	Dynamic probing completed to 8m
5							
6							

Borehole terminated at: 4.0m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: 2.5m

Groundwater encountered at: ~1.1m

Dwn: KM

Ckd: JS

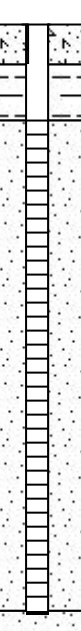
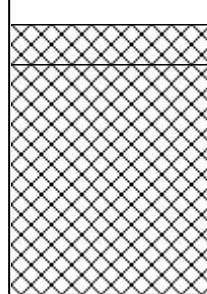
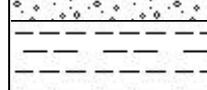
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SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Trade Park	Date	11th January 2013
Project Code	In12963	Ground Level	n/a
Coordinates	471018 106032 (centre of site)	Equipment	Geoprobe Direct Push

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0						Su = 90	Concrete
				S1	Metals		0.2 to 1.4m MEDIUM DENSE brown, red brown or black sandy slightly clayey GRAVEL MADE GROUND
1							
				S2	TPH aro/ali	Su = <25 Su = <25	1.4 to 3.2m MEDIUM DENSE creamy brown or beige clayey flint GRAVEL RIVER GRAVEL DEPOSITS - hydrocarbon odours at ~1.8m
2				S3	TPH		
3				S4			3.2 to >3.6m SOFT or VERY SOFT brown CLAY. ALLUVIUM
4							
5							
6							

Borehole terminated at: 3.6m

Hydrocarbon odour/staining: 1.8m (diesel)

Groundwater monitoring well installed to: 3.0

Groundwater encountered at: ~1.4m

Dwn: KM

Ckd: JS

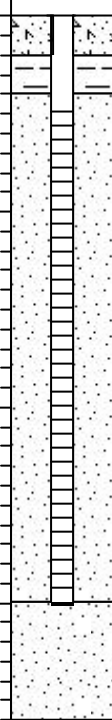
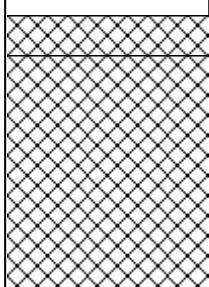
Borehole No. BH15

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Trade Park	Date	11th January 2013
Project Code	In12963	Ground Level	n/a
Coordinates	471018 106032 (centre of site)	Equipment	Geoprobe Direct Push

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description		
0		 Strike @ ~2.0m				Su = 25 Su = 35 Su = 50 Su = 65 Su = 40 Su = <25 Su = <25	Concrete		
							0.2 to 1.4m SOFT to FIRM brown or grey brown slightly gravelly CLAY MADE GROUND		
				S1	Metals				
1				S2	PCB				
									1.4 to 3.6m SOFT beige or creamy brown very gravelly CLAY grading to MEDIUM DENSE creamy brown or beige clayey flint GRAVEL. RIVER GRAVEL DEPOSITS
2							S3		
3									
				S4	TOC		Dynamic probing used to 8.0m		
4									
5									
6									

Borehole terminated at: 3.6m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: ~3.0m

Groundwater encountered at: ~2.0m

Dwn: KM

Ckd: JS

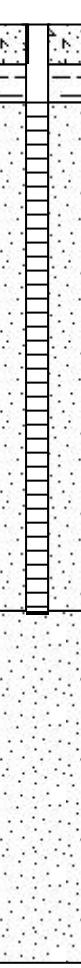
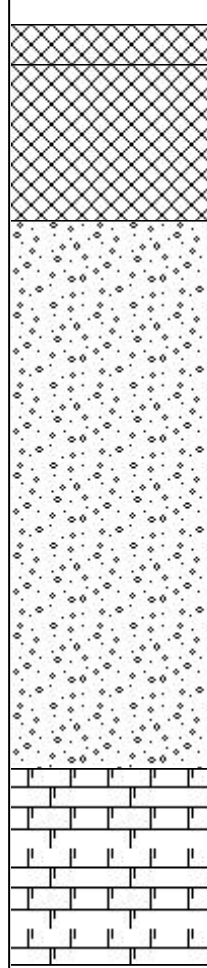
Borehole No. BH16

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Trade Park	Date	11th January 2013
Project Code	In12963	Ground Level	n/a
Coordinates	471018 106032 (centre of site)	Equipment	Geoprobe Direct Push

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0						Su = 40 Su = 35	Concrete
				S1			0.2 to 1.0m Layer of compacted chalk over SOFT orange brown or grey brown gravelly CLAY with red brick and flint MADE GROUND
1				S2	PAH		1.0 to 3.8m MEDIUM DENSE creamy brown or beige clayey flint GRAVEL. RIVER GRAVEL DEPOSITS
				S3	Metals		
2							3.8 to >4.8m VERY WEAK structureless creamy white CHALK (Grade V or VI) CHALK
				S4			
3							
				S5			
4				S6	VOC		
5							
6							

Borehole terminated at: 4.8m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: ~3.0m

Groundwater encountered at: ~1.5m

Dwn: KM

Ckd: JS

ATTACHMENT THREE:
MAP DATA AND ENVIRONMENTAL DATA REPORT

Site Details:

Solent Road

Client Ref: EMS_190457_278571

Report Ref: EMS-190457_278571

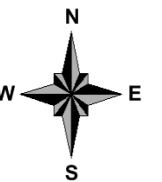
Grid Ref: 471091, 106032

Map Name: National Grid

Map date: 1969-1973

Scale: 1:1,250

Printed at: 1:2,500



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



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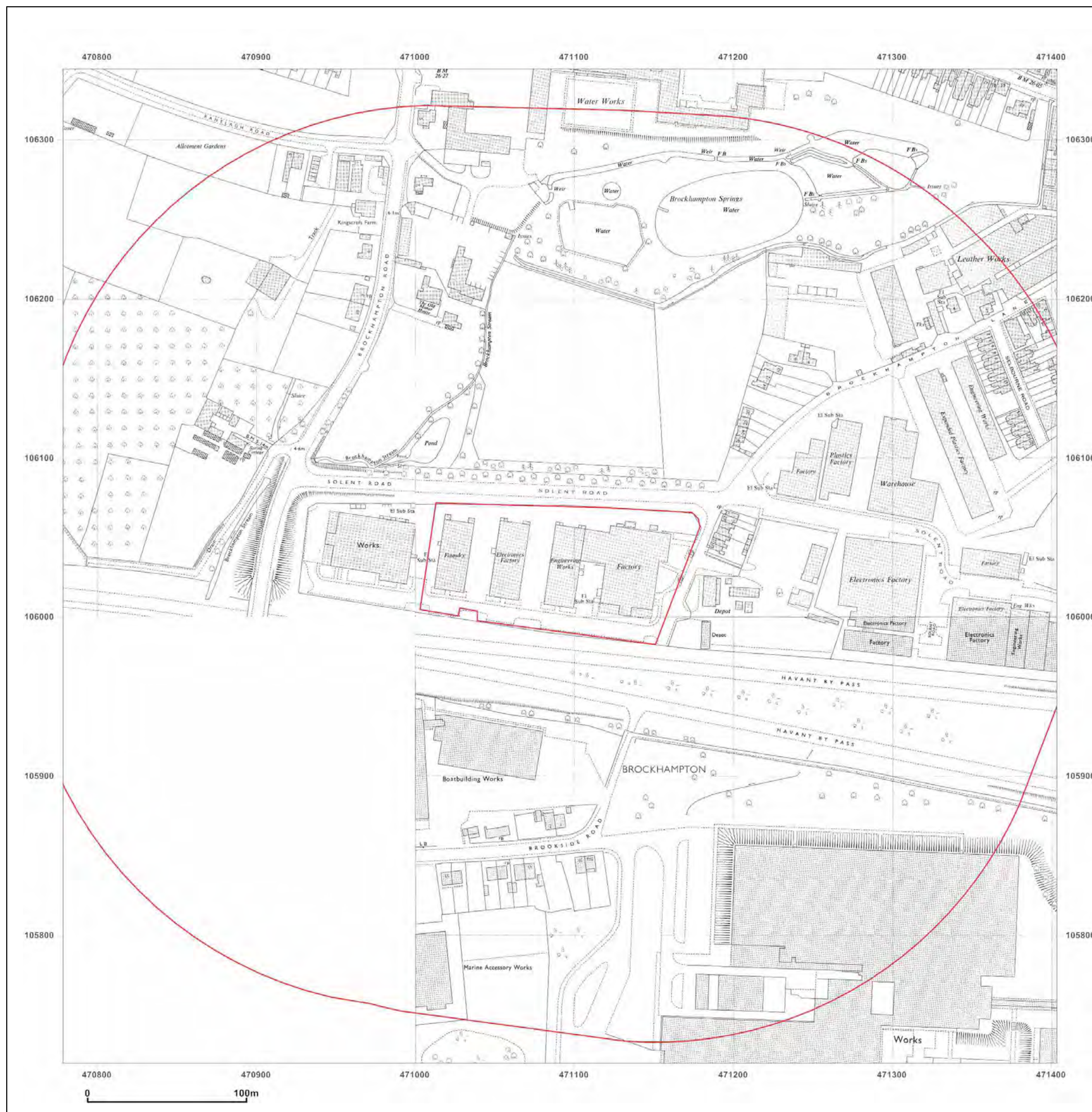


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Production date: 09 January 2013

To view map legend click here [Legend](#)



Site Details:

Solent Road

Client Ref: EMS_190457_278571

Report Ref: EMS-190457_278571

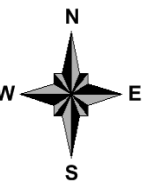
Grid Ref: 471091, 106032

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



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Production date: 09 January 2013

To view map legend click here [Legend](#)



Site Details:

Solent Road

Client Ref: EMS_190457_278571

Report Ref: EMS-190457_278571

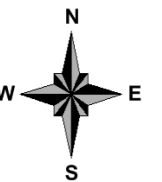
Grid Ref: 471091, 106032

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



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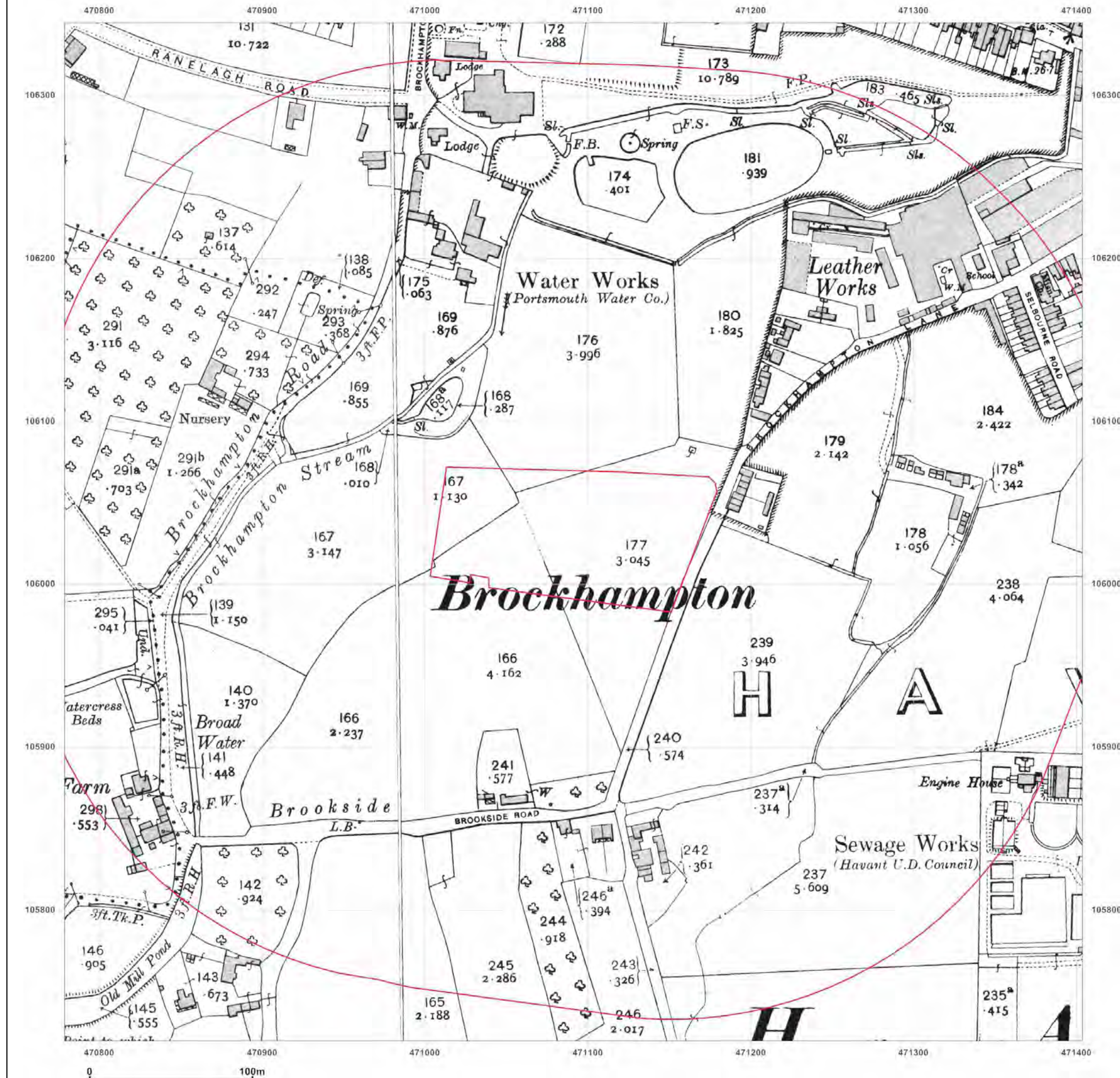


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Production date: 09 January 2013

To view map legend click here [Legend](#)



GroundSure EnviroInsight

Address: Solent Road

Date: Jan 9, 2013

GroundSure Reference: EMS-190457_278572

Your Reference: EMS_190457_278572

Client: EmapSite



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emapsite™

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	0	2	-	-
Records of Part A(1) and IPPC Authorised Activities	0	0	0	0	-	-
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	0	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	1	0	1	-	-
Records of Category 3 or 4 Radioactive Substances Authorisations	2	0	4	0	-	-
Records of Licensed Discharge Consents	0	0	7	27	-	-
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	2	-	-	-
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	0	1	-
Environment Agency Historic Landfill Sites	0	0	0	0	2	1
Landfill Data – Non-Operational Landfill Sites	0	0	0	0	1	-
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	0	2	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	1	1	-	-
Environment Agency Licensed Waste Sites	0	0	0	9	15	1

3. Current Land Uses	on-site	0-50	51-250	251-500	501-1000	1000-1500
3.1 Current Industrial Sites Data	2	4	46	-	-	-
3.2 Records of Petrol and Fuel Sites	0	0	1	2	-	-
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	1	2	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	1	2	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	No	Yes	No
5.8 Detailed River Network entries within 500m of the site	0	1	8	14	-	-
5.9 Surface water features within 250m of the study site	No	Yes	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?	No
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	0	1	3
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	0	1	3
7.3 Records of Local Nature Reserves (LNR)	0	0	0	0	0	1
7.4 Records of Special Areas of Conservation (SAC)	0	0	0	0	1	2
7.5 Records of Special Protection Areas (SPA)	0	0	0	0	1	2
7.6 Records of Ramsar sites	0	0	0	0	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	1	0
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	0	2
7.13 Records of Ancient Woodlands	0	0	0	0	0	3

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. These searches are conducted using radii of up to 500m.

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.

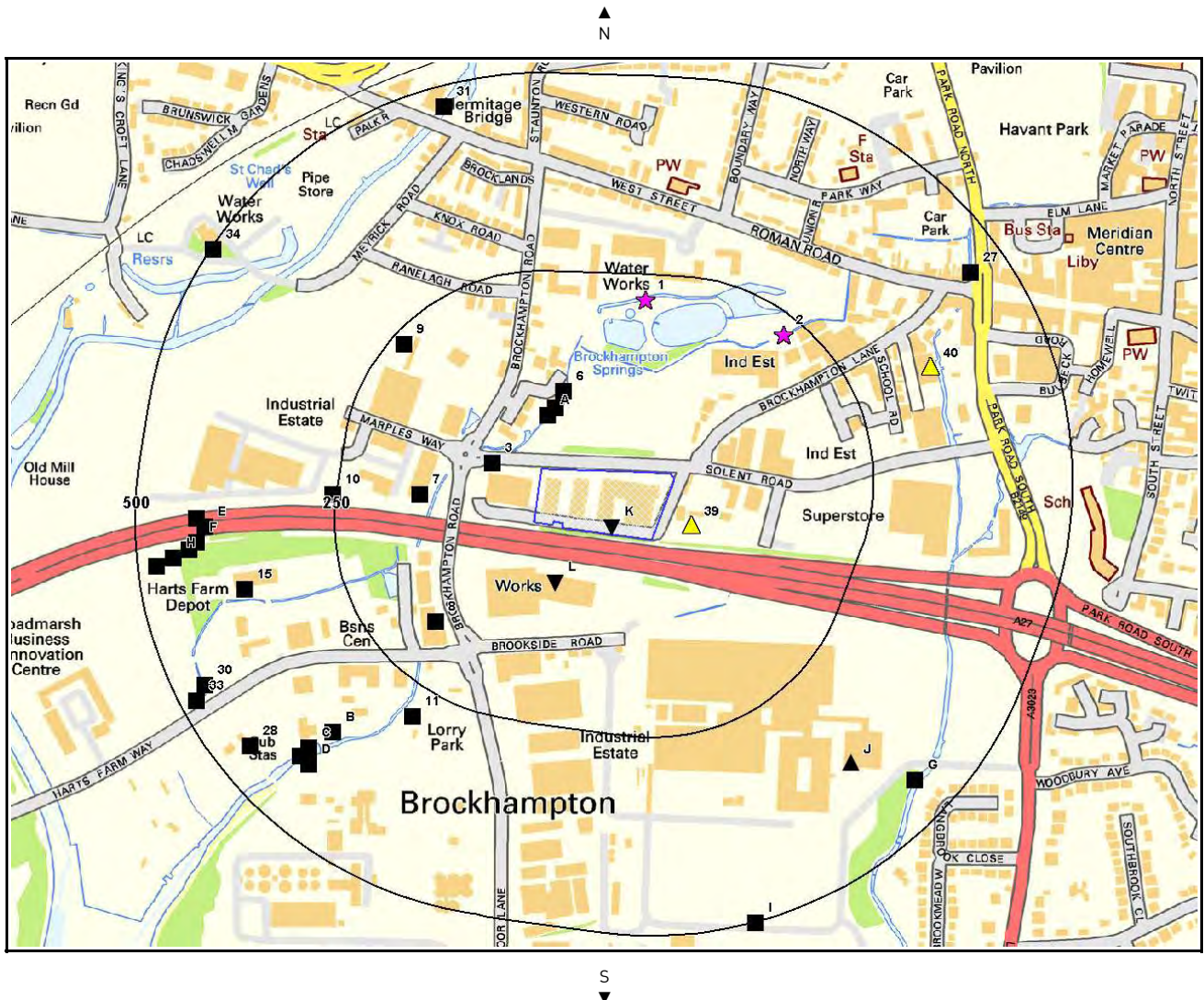
Note: Maps

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

Enabled by Ordnance Survey

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- | | |
|--|--|
| Recorded Pollution Incident | RAS 3 & 4 Authorisations |
| 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 |
| Site Outline | COMAH / NIHHS Sites |
| Search Buffers (m)
— 250 —
— 500 — | Sites Determined as Contaminated Land |
| Water Industry Referrals | Hazardous Substance Consents and Enforcements |
| Licenced Discharge Consents | |
| Red List Discharge Consents | |

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:

2

The following IPC Authorisations are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details
47J	377.0	SE	471400, 105700	Operator: Adflex Solutions Ltd (dissolved) Address: PO Box 6, Havant, Hampshire, PO9 1SA Process: Processes Involving Halogens Permit Number: AU8741 Original Permit Number: IPCMINVAR Date Approved: 17-1-1997 Effective Date: 17-1-1997 Status: Revoked
48J	377.0	SE	471400, 105700	Operator: Adflex Solutions Ltd (dissolved) Address: PO Box 6, Havant, Hampshire, PO9 1SA Process: Processes Involving Halogens Permit Number: AP1131 Original Permit Number: IPCAPP Date Approved: 29-3-1995 Effective Date: 1-4-1995 Status: Superseded By Variation

Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

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:

0

Database searched and no data found.

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:

2

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	
39	40.0	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.
40	350.0	NE	471500, 106200	Address: Shell Havant Park Rd, Po9 1ha 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.

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
49K	0.0	On Site	Apollo Fire Detectors Ltd, 6 Solent Road, Havant, Hampshire, PO9 1JH	Apollo Fire Detectors 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: 2012-10-01	Revoked/cancelled
50K	0.0	On Site	Apollo Fire Detectors Ltd, 6 Solvent Road, Havant, Hampshire, PO91 1JH	Apollo Fire Detectors 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: 2012-10-01	Revoked/cancelled
51L	69.0	S	Apollo Fire Detectors Ltd, 36 Brookside Road, Havant, PO9 1JR	Apollo Fire Detectors 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: 2012-10-01	Superseded By Variation
52L	69.0	S	Apollo Fire Detectors Ltd, 36 Brookside Road, Havant, PO9 1JR	Apollo Fire Detectors 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: 2012-10-01	Superseded By Variation
53L	69.0	S	Apollo Fire Detectors Ltd, 36 Brookside Road, Havant, PO9 1JR	Apollo Fire Detectors 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: 2012-10-01	Superseded By Variation

54L	69.0	S	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: 20 12-10-01	Revoked/ cancelled
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Records of Licensed Discharge Consents within 500m of the study site:

34

The following Licensed Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details	
3	63.0	W	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
4A	68.0	N	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
5A	78.0	N	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
6	99.0	N	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
7	147.0	W	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: -
8	175.0	SW	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: -
9	234.0	NW	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: -
10	255.0	W	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: -
11	289.0	SW	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: -

12B	366.0	SW	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
13B	366.0	SW	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
14B	366.0	SW	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
15	373.0	W	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
16C	402.0	SW	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
17E	413.0	W	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: -
18C	416.0	SW	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
19D	416.0	SW	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: -
20D	416.0	SW	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: -
21D	416.0	SW	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
22E	423.0	W	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: -

23F	424.0	W	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: -
24F	434.0	W	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: -
25G	447.0	SE	471480, 105680	Address: Langstone Road, Langstone Road, Havant, Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01162 Permit Version: 2	Receiving Water: Freshwater River Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: 17/3/1995 Effective Date: 17/3/1995 Revocation Date: -
26G	447.0	SE	471480, 105680	Address: Langstone Road, Langstone Road, Havant, Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01162 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: - Effective Date: - Revocation Date: 17/3/1995
27	453.0	NE	471550, 106320	Address: 62-66 West Street, 62-66 West Street, Havant Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01171 Permit Version: 1	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 4/6/1982 Effective Date: 4/6/1982 Revocation Date: 31/3/1997
28	454.0	SW	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: -
29H	455.0	W	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: -
30	461.0	SW	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
31	474.0	N	470890, 106530	Address: Millington Fields Site, Millington Fields Site, West Street, Havant, Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01098 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 18/5/1983 Effective Date: 18/5/1983 Revocation Date: -
32H	476.0	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: -
33	479.0	SW	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

34	498.0	NW	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
35I	500.0	S	471280, 105500	Address: Office Car Park, Office Car Park, Phase 6, Langstone Road, Havant, Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01268 Permit Version: 2	Receiving Water: Freshwater River Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: 17/3/1995 Effective Date: 17/3/1995 Revocation Date: -
36I	500.0	S	471280, 105500	Address: Office Car Park, Office Car Park, Phase 6, Langstone Road, Havant, Hampshire Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: N01268 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 13/4/1978 Effective Date: 13/4/1978 Revocation Date: 17/3/1995

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: 2

The following NIRS List 2 records are represented as points on the Authorisations, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details
1	217.0	N	471142, 106285	Incident Date: 22/11/2001 Incident Identification: 44445 Pollutant: Oils and Fuel Pollutant Description: Diesel Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2	225.0	NE	471316, 106241	Incident Date: 2/5/2002 Incident Identification: 76228 Pollutant: Oils and Fuel Pollutant Description: Mixed/Waste Oils Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

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

Report Reference: EMS-190457_278572

Database searched and no data found.

2. Landfill and Other Waste Sites Map

NW

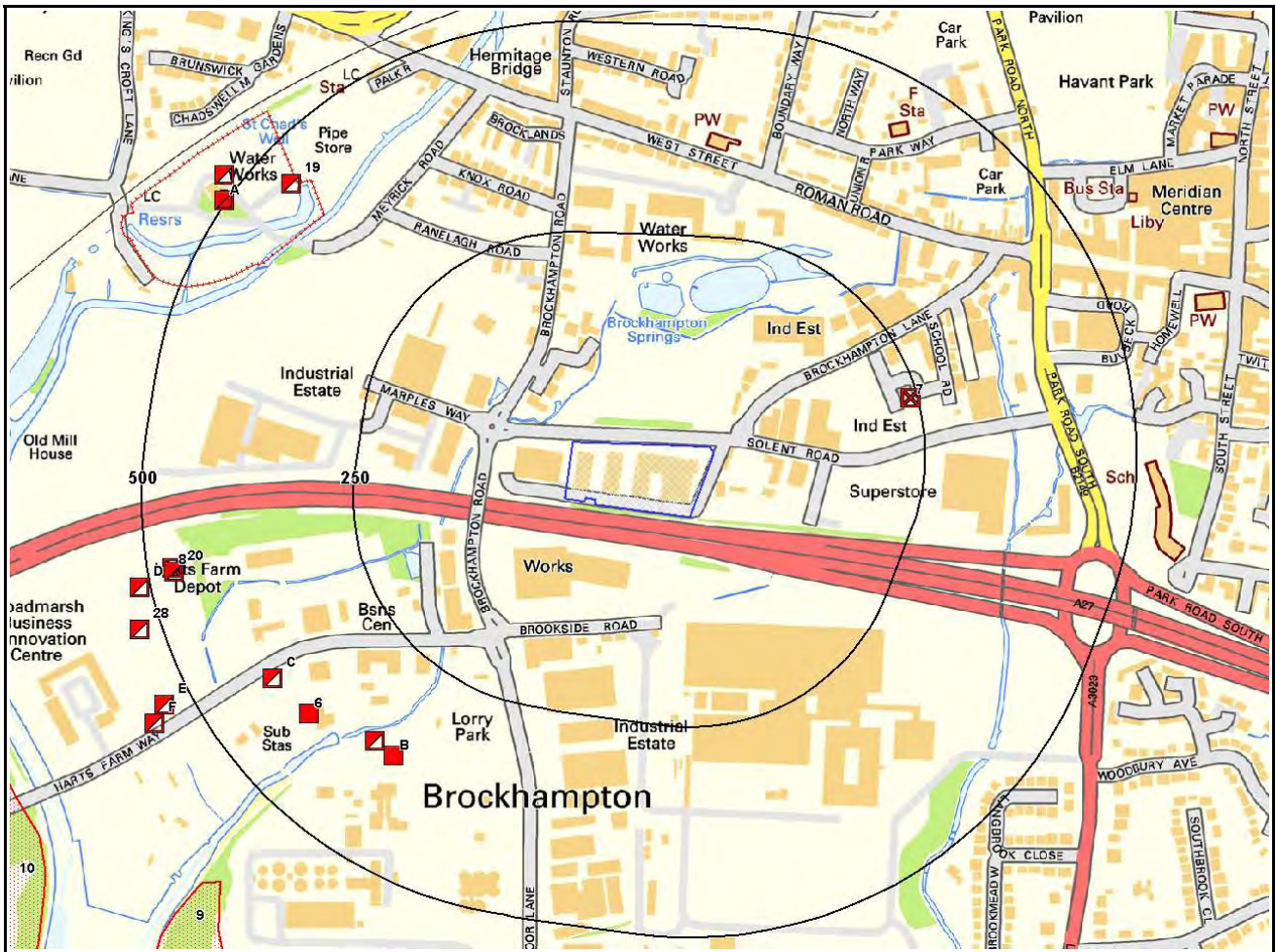
N

NE

SW

S

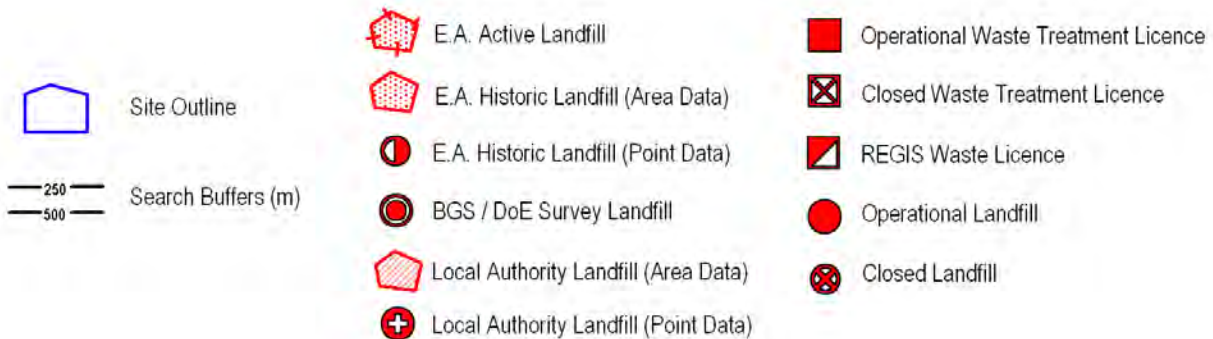
SE



Landfill & Other Waste Sites Legend

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Ordnance Survey

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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	401.0	NW	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	504.0	NW	470600, 106360	Site Address: Bedhampton Waterworks, Meyrick Road, HAVANT, Hampshire, PO9 1LG Record Date: 01-Nov-1991 Transfer Date: Modification Date: 01-Jun-1996 Agency Reference: EAWML19988 Status: Operational as far as is known Waste Type: Inert Category: LANDFILL 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
9	611.0	SW	470700, 105200	Site Address: Land South Of Budds Farm Sewage Works, Brockhampton, Hampshire Licence Issue: Licence Surrendered: Licence Hold Address: - Waste Licence: - Operator: - Site Reference: FHA10, HAV4 Waste Type: Household Regis Reference: -
10	739.0	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 Waste Licence: Yes Operator: - Site Reference: FHA15, 1760/1/13/6 Waste Type: Household Regis Reference: -
Not shown	1366.0	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 Waste Licence: Yes Operator: - 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-190457_278572

ID	Distance	Direction	NGR	Details
Not shown	811.0	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
Not shown	990.0	SW	470100, 105600	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:

2

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
5B	366.0	SW	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)
6	396.0	SW	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)

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site:

2

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
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7	241.0	E	471411, 106123	Site Address: 12B Clarendon Road, HAVANT, Hampshire, Landfill Licence: 19GAVDAL EA Reference: - Waste Type: Difficult Waste Description: - Known Restrictions: No known restriction on source of waste	Record Date:01-Aug-1990 Transfer Date: Modification Date: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: SCRAPYARD Regulator: EA - Southern Region - Hampshire Area (Winchester) Size: Undefined
8	471.0	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)

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:

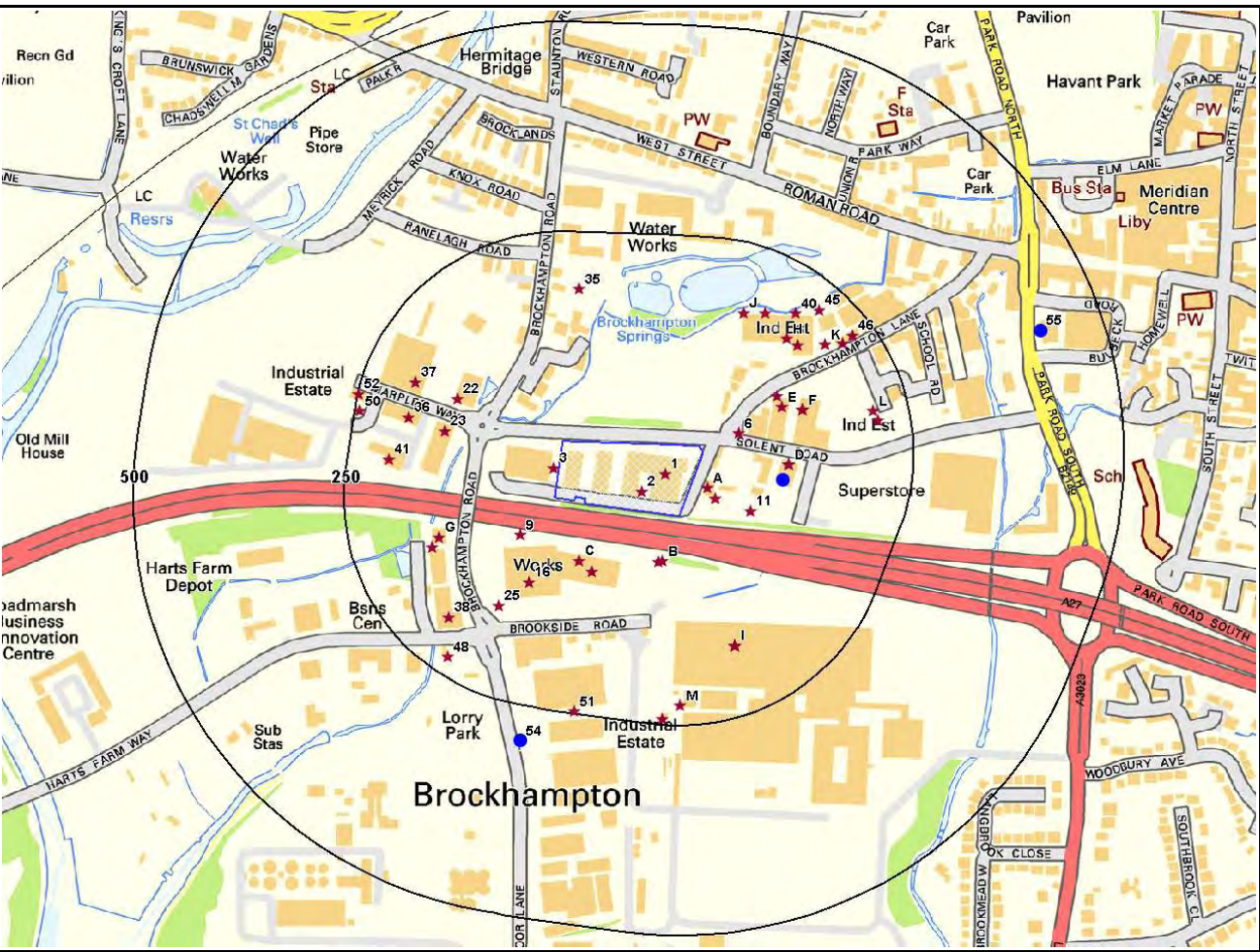
ID	Distance	Direction	NGR	Details
12B	365.0	SW	470778, 105717	Site Address: Havant Lorry Park, Southmoor Lane, Havant, Hampshire, PO9 1JW Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: 000936 EPR reference: - Operator: Sita Solent Ltd Waste 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
13B	365.0	SW	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: -, -
14C	405.0	SW	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
15C	405.0	SW	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

16C	405.0	SW	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 Rudfor Industrial Estate, Ford, West Sussex, BN18 0BD
17C	405.0	SW	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: -, -
18C	405.0	SW	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: -, -
19	454.0	NW	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: -, -
20	470.0	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: -, -
21A	504.0	NW	470600, 106360	Site Address: Bedhampton Waterworks, Meyrick Road, Havant, Hampshire Type: Landfill taking Non-Biodegradeable 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
22D	514.0	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

23D	514.0	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
24D	514.0	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: -, -
25A	521.0	NW	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: -, -
26A	521.0	NW	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
27A	521.0	NW	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: -, -
28	526.0	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: -, -
29E	533.0	SW	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

30E	533.0	SW	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: -, -
31F	554.0	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
32F	554.0	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: -, -
33F	554.0	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: -, -
Not shown	632.0	SW	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
Not shown	632.0	SW	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: -, -
Not shown	1098.0	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



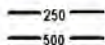
Current Land Use Legend

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Site Outline



Search Buffers (m)



Current Industrial Sites



Petrol & Fuel Sites



Underground High Pressure Oil & Fuel Pipelines

3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

52

The following records are represented as points on the Current Land Uses map.

ID	Distance	Direction	Company	Address	Activity	Category
1	0.0	On Site	South Hants Glass Ltd	Unit 10, Solent Road, Havant, PO9 1JH	Glass	Industrial Products
2	0.0	On Site	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
3	7.0	W	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
4A	19.0	E	Cosham Plant Hire Ltd	41, Brockhampton Lane, Havant, PO9 1LX	Construction and Tool Hire	Hire Services
5A	32.0	E	Depot	PO9	Container and Storage	Transport, Storage and Delivery
6	47.0	NE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
7B	56.0	S	Gas Governor	PO9	Gas Features	Infrastructure and Facilities
8B	58.0	S	Gas Governor Station	PO9	Gas Features	Infrastructure and Facilities
9	61.0	SW	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
10 C	69.0	S	Apollo Fire Detectors Ltd	36, Brookside Road, Havant, PO9 1JR	Electronic Equipment	Industrial Products
11	76.0	E	Industrial Estate	PO9	Business Parks and Industrial Estates	Industrial Features
12 C	80.0	S	Works	PO9	Unspecified Works Or Factories	Industrial Features
13 D	102.0	E	Tesco Havant Langstone Harbour	Solent Road, Havant, Hampshire, PO9 1TR	Petrol and Fuel Stations	Road and Rail
14 D	102.0	E	Tesco Havant Langstone Harbour	Solent Road, Havant, PO9 1TR	Petrol and Fuel Stations	Road and Rail
15 D	102.0	E	Tesco Havant Langstone Harbour	Solent Road, Havant, PO9 1TR	Vehicle Cleaning Services	Personal, Consumer and Other Services
16	105.0	S	Works	PO9	Unspecified Works Or Factories	Industrial Features
17E	107.0	NE	Shore Laminates Ltd	25D, Brockhampton Lane, Havant, PO9 1JD	Industrial Coatings and Finishings	Industrial Products
18E	110.0	NE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
19F	127.0	E	Navitron Systems Ltd	25a, Brockhampton Lane, Havant, PO9 1JT	Marine Equipment Including Boats and Ships	Industrial Products
20F	127.0	E	Havant Motor Factors	25c, Brockhampton Lane, Havant, PO9 1JT	Vehicle Parts and Accessories	Motoring
21F	127.0	E	Mitchell & James Caravans Ltd	Unit 3 25c, Brockhampton Lane, Havant, PO9 1JT	Sports and Leisure Equipment Repair	Repair and Servicing
22	135.0	W	Spectrum Workplace	2, Marples Way, Havant, PO9 1UH	Office and Shop Equipment	Industrial Products
23	141.0	W	Macvere Engineering	Unit 2-3 Kingscroft Court, Ridgway, Havant, PO9 1LS	Precision Engineers	Engineering Services
24 G	145.0	W	The Platers Ltd	Brockhampton Road, Havant, PO9 1JU	Industrial Coatings and Finishings	Industrial Products
25	145.0	SW	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
26 G	157.0	W	Works	PO9	Unspecified Works Or Factories	Industrial Features

27 H	166.0	NE	Andair Ltd	15 The Tanneries, Brockhampton Lane, Havant, PO9 1JB	Aeroplanes	Industrial Products
28 H	167.0	NE	Hourglass Mirrors & Decorative Glass	14 The Tanneries, Brockhampton Lane, Havant, PO9 1JB	Glass	Industrial Products
29J	168.0	N	Tank	PO9	Tanks (Generic)	Industrial Features
30I	168.0	SE	Teleplan	Langstone Technology Park 2b, Langstone Road, Havant, PO9 1SA	Electrical Equipment Repair and Servicing	Repair and Servicing
31I	168.0	SE	Lockheed Martin UK Ltd	Building 7000, Langstone Road, Langstone, Havant, PO9 1SW	Armed Services	Central and Local Government
32I	168.0	SE	Saacke Combustion Services Ltd	Langstone Technology Park 2b, Langstone Road, Havant, PO9 1SA	Industrial Engineers	Engineering Services
33I	168.0	SE	Fasset Ltd	Langstone Technology Park 2b, Langstone Road, Havant, PO9 1SA	Business Parks and Industrial Estates	Industrial Features
34J	177.0	NE	Tank	PO9	Tanks (Generic)	Industrial Features
35	181.0	N	Tank	PO9	Tanks (Generic)	Industrial Features
36	186.0	W	H S P Plastics Ltd	Unit C Kingscroft Court, Ridgway, Havant, PO9 1LS	Rubber, Silicones and Plastics	Industrial Products
37	189.0	W	Wartsila UK Ltd	4, Marples Way, Havant, PO9 1NX	Seals, Tapes, Taps and Valves	Industrial Products
38	191.0	SW	Works	PO9	Unspecified Works Or Factories	Industrial Features
39 K	192.0	NE	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
40	195.0	NE	Tank	PO9	Tanks (Generic)	Industrial Features
41	201.0	W	Acorn Engineering	Unit G Kingscroft Court, Ridgway, Havant, PO9 1LS	General Purpose Machinery	Industrial Products
42L	208.0	E	Tank	PO9	Tanks (Generic)	Industrial Features
43 K	208.0	NE	Oden Services UK Ltd	23 The Tanneries, Brockhampton Lane, Havant, PO9 1JB	Recycling, Reclamation and Disposal	Recycling Services
44L	211.0	E	Industrial Estate	PO9	Business Parks and Industrial Estates	Industrial Features
45	216.0	NE	The Tanneries Industrial Estate	PO9	Business Parks and Industrial Estates	Industrial Features
46	224.0	NE	A C Redman Metal Spinnings Ltd	13 The Tanneries, Brockhampton Lane, Havant, PO9 1JB	Metals Manufacturers, Fabricators and Stockholders	Industrial Products
47 M	226.0	S	Chimney	PO9	Chimneys	Industrial Features
48	229.0	SW	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
49 M	243.0	S	Tank	PO9	Tanks (Generic)	Industrial Features
50	245.0	W	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
51	248.0	S	Electricity Sub Station	PO9	Electrical Features	Infrastructure and Facilities
52	249.0	W	Solent Motor Services	2, Ridgway, Havant, PO9 1QJ	Vehicle Repair, Testing and Servicing	Repair and Servicing

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

3

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
----	----------	-----------	-----	---------	---------	-----	--------

53D	100.0	E	471274, 106026	Tesco	Tesco Havant Langstone Harbour, Solent Road, Solent Road, Havant, Hampshire, PO9 1TR	No	Open
54	293.0	S	470962, 105715	Unbranded	Havant Lorry Park, Southmoor Lane, Southmoor Lane, Havant, Hampshire, PO9 1JW	Not Applicable	Obsolete
55	425.0	E	471579, 106204	Texaco	Park Road South Service Station, Park Road South, Park Road South, Bulbeck Road, Havant, Hampshire, PO9 1HA	Not Applicable	Obsolete

3.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site:

0

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

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

4.3 Bedrock and Solid Geology

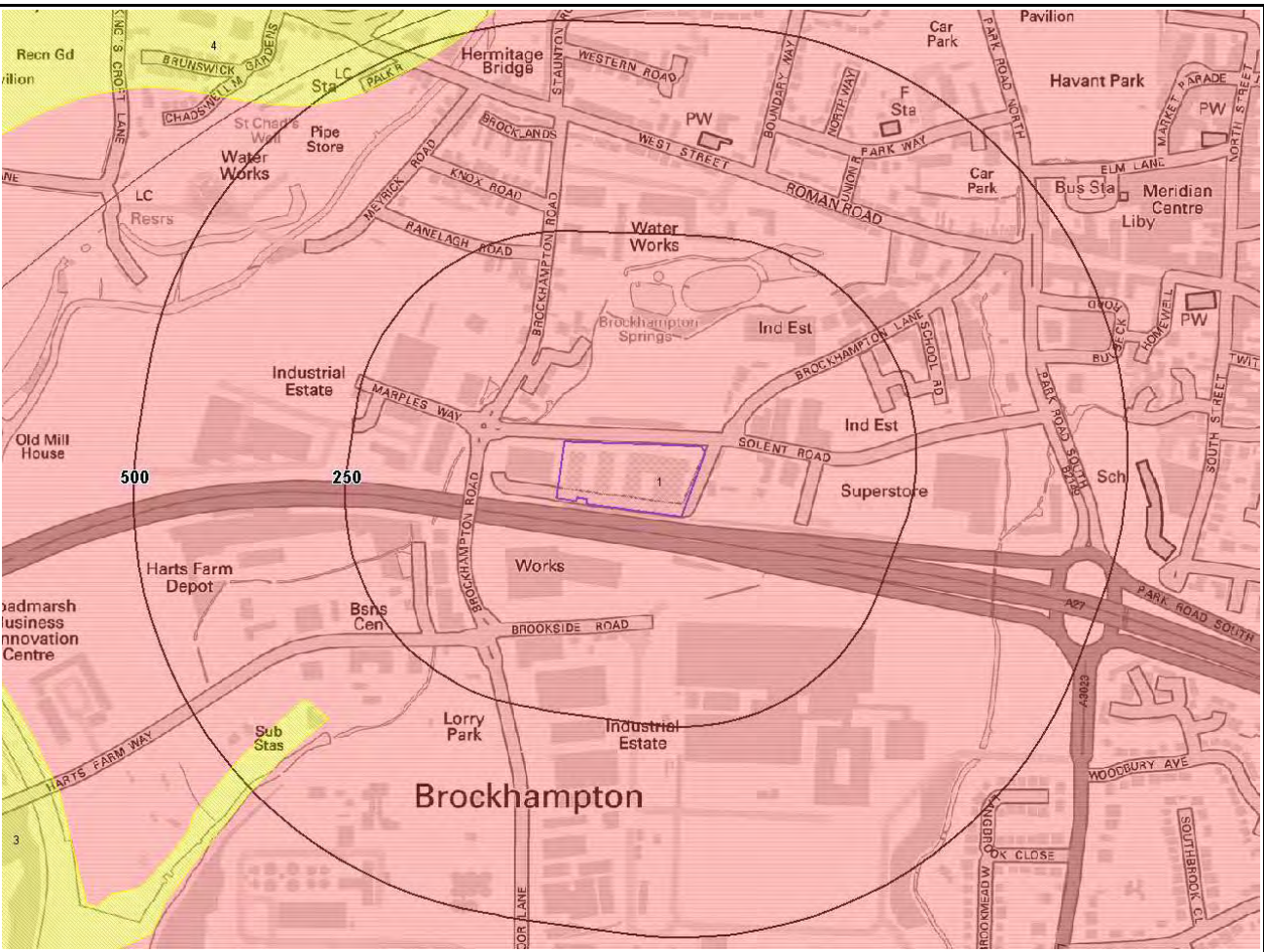
The database has been searched on site, including a 50m buffer.

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.

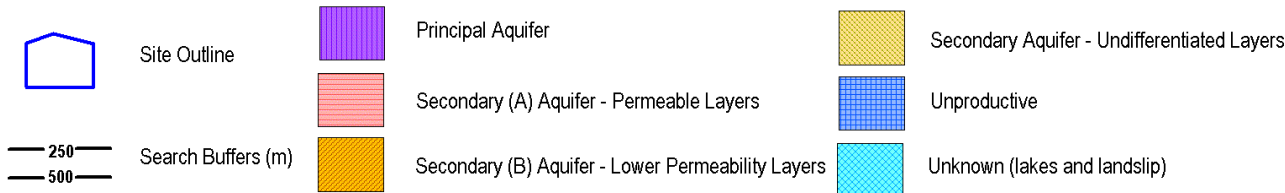
5a. Hydrogeology - Aquifer Within Superficial Geology



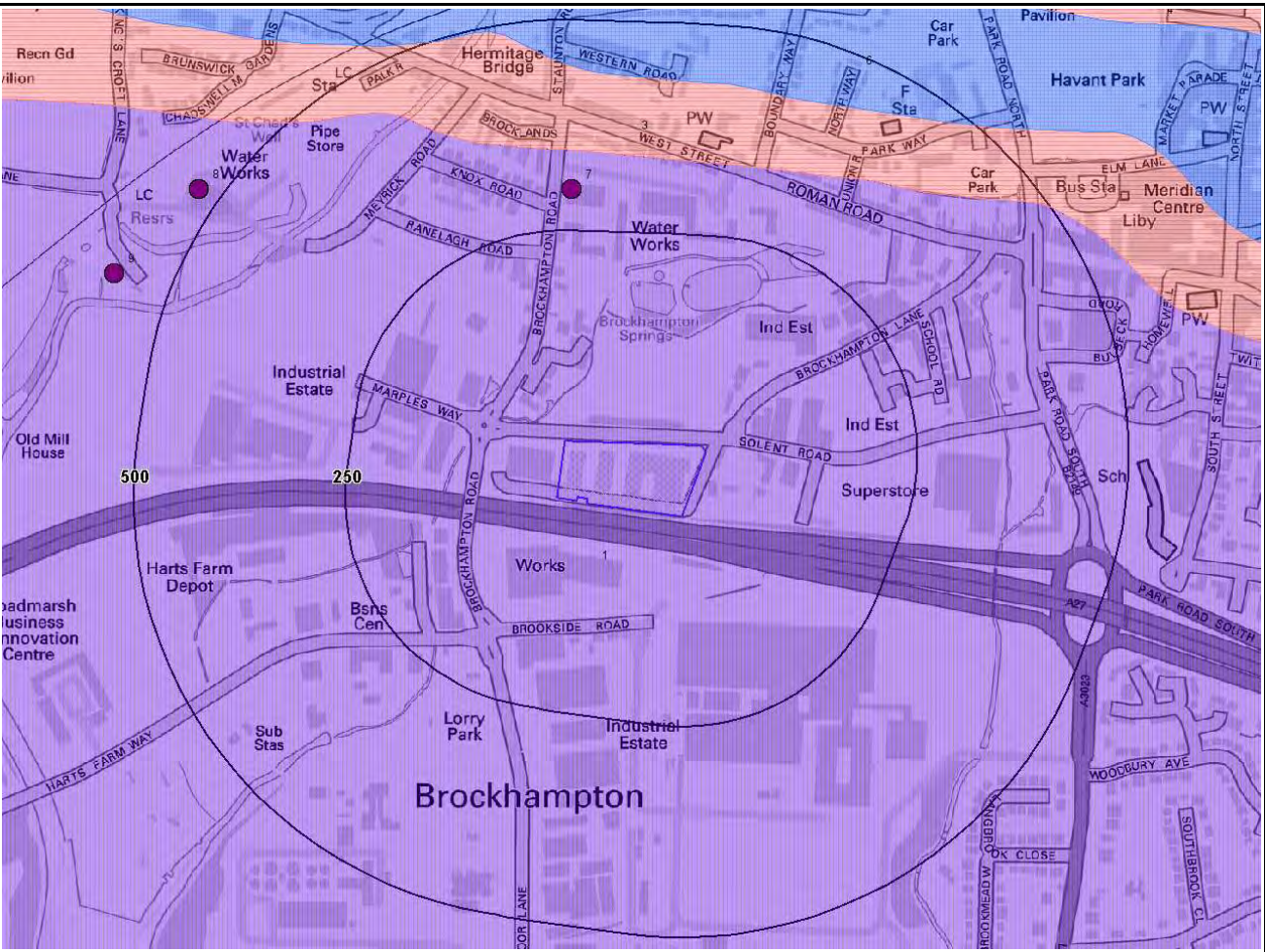
Aquifer Within Superficial Geology Legend



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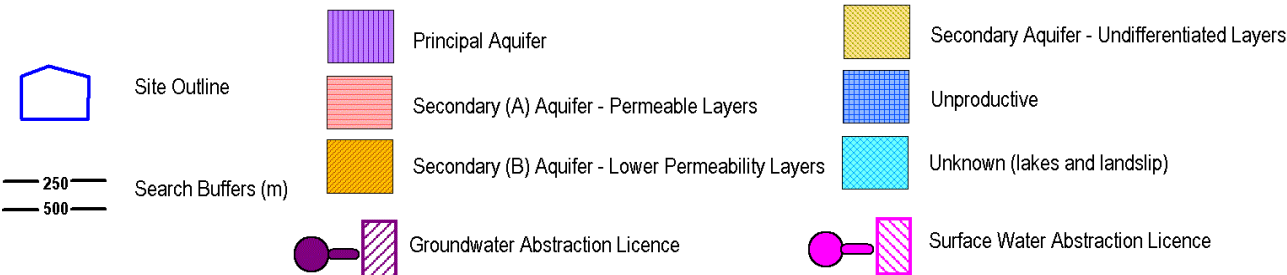
5b. Hydrogeology - Aquifer Within Bedrock Geology and Abstraction Licenses



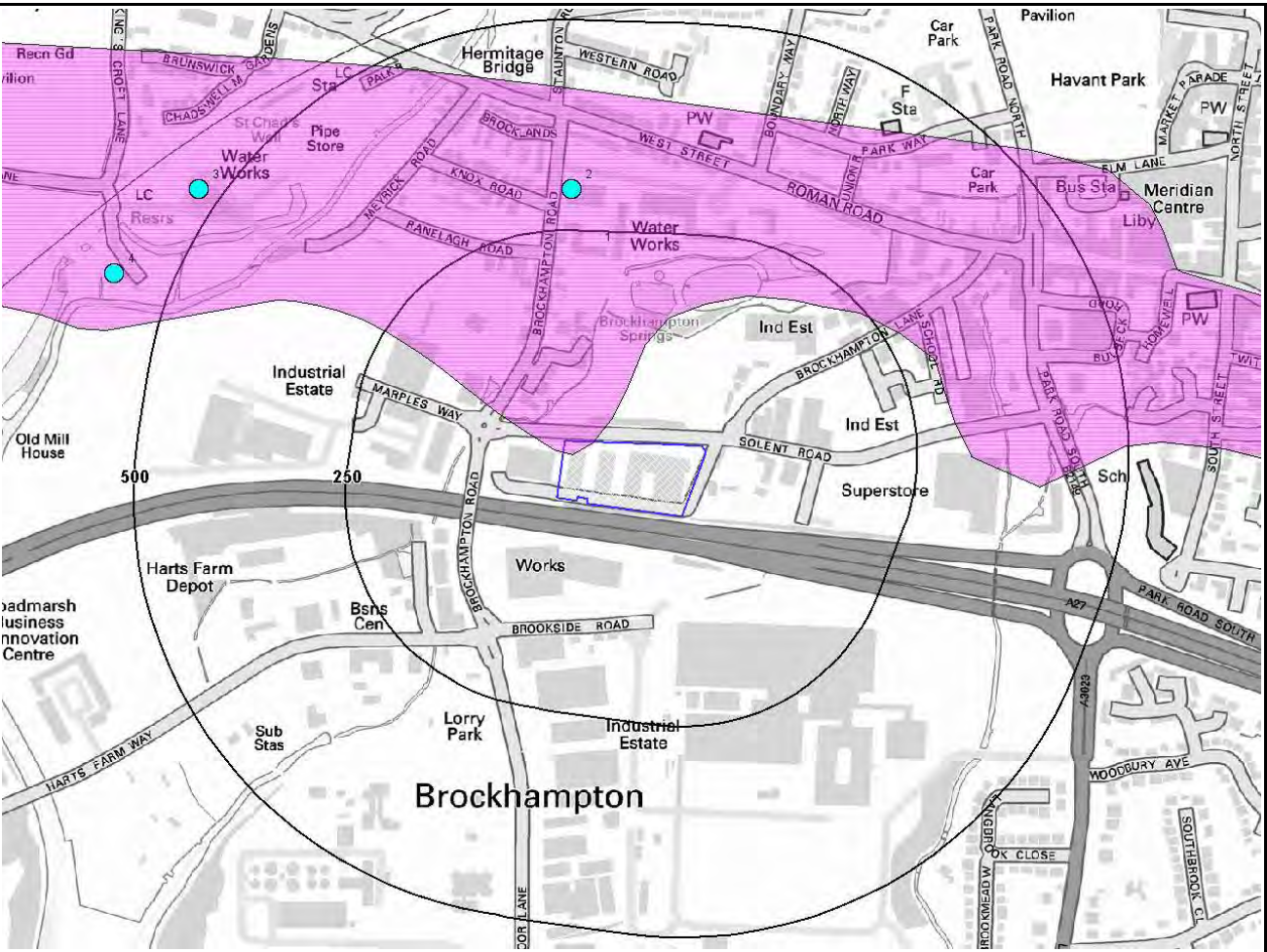
Aquifer Within Bedrock Geology Legend

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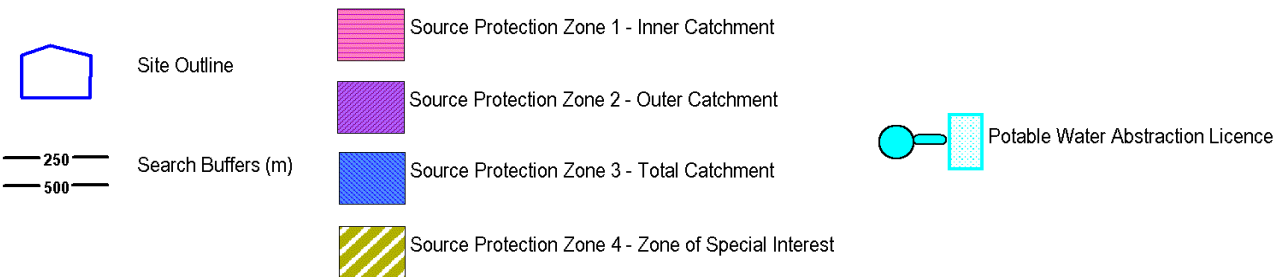
5c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



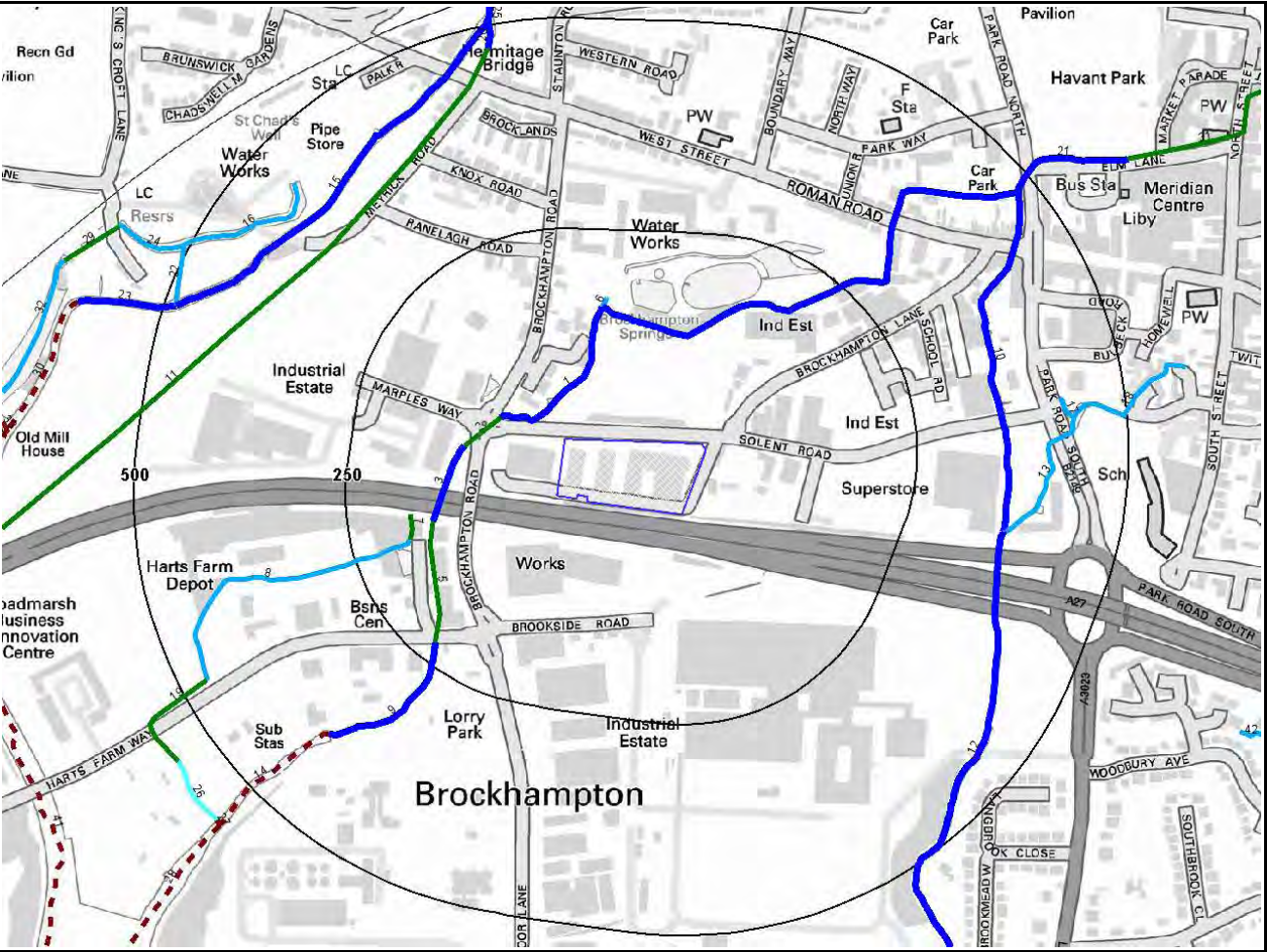
SPZ and Potable Water Abstraction Licenses
Legend

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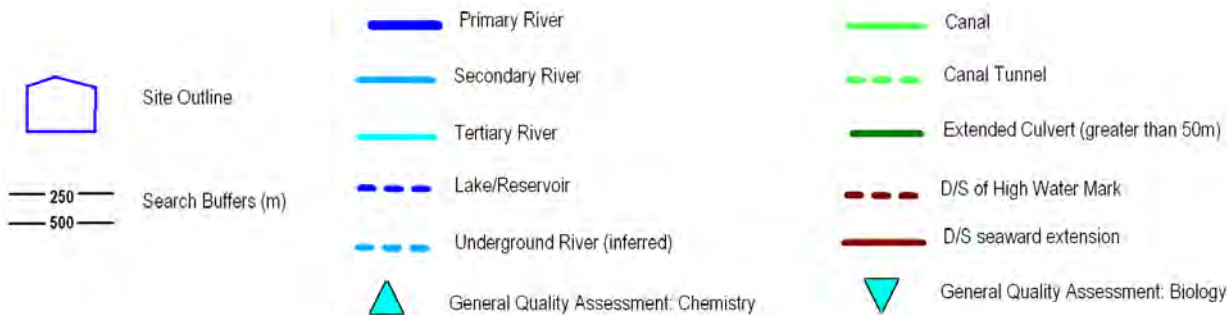
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5d. Hydrology – Detailed River Network and River Quality



Hydrology Legend



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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
3	376.0	SW	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
4	476.0	NW	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
3	336.0	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
6	427.0	N	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

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	
7	298.0	N	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:
8	526.0	NW	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:
9	569.0	W	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:

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	298.0	N	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:
3	526.0	NW	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	569.0	W	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 (m ³): 35770000 Max Daily Volume (m ³): 137000 Original Application No: NPS/WR/003341 Original Start Date: - Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
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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	0.0	On Site	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 (GQAHI). 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
Not shown	707.0	N	471073, 106778	River Name: Hermitage Stream Reach: Tidal Limit - Source End/Start of Stretch: Sample Point NGR	B	B	B	B	B
Not shown	711.0	W	470300, 105900	River Name: Hermitage Stream Reach: Tidal Limit - Source End/Start of Stretch: End of Stretch NGR	B	B	B	B	B

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
----	----------	-----------	---------

Report Reference: EMS-190457_278572

1	40.0	NW	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
2	81.0	W	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
3	116.0	W	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
4	127.0	N	River Name: - Water Course Name: Brockhampton Stream Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
5	149.0	W	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
6	158.0	N	River Name: - Water Course Name: Brockhampton Stream Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
7	174.0	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
8	181.0	W	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
9	227.0	SW	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
10	348.0	E	River Name: - Water Course Name: Lavant Stream Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
11	358.0	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
12	363.0	E	River Name: - Water Course Name: Langstone Mill Channel Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
13	364.0	E	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
14	390.0	SW	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
15	394.0	NW	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
16	418.0	NW	River Name: Blue Hole Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
17	424.0	E	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
18	437.0	E	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
19	468.0	SW	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
20	473.0	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

21	478.0	NE	River Name: - Water Course Name: Lavant Stream Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
22	486.0	W	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
23	486.0	W	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

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	No	Yes	Yes

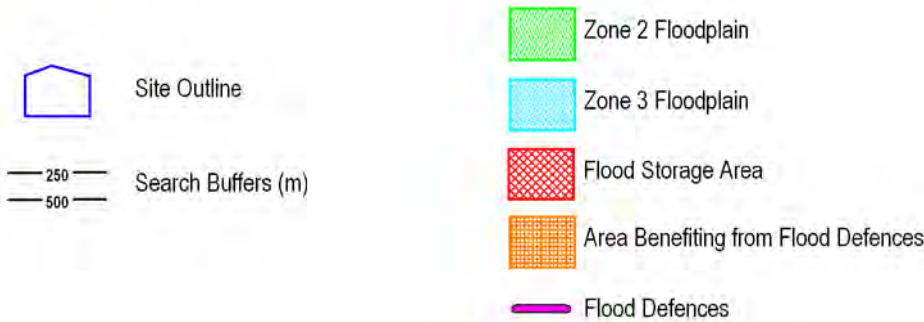
6. Environment Agency Flood Map



Environment Agency Flood Legend



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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
1	0.0	On Site	30-Nov-2012	Zone 2 - (Fluvial Models)
2AI	115.0	W	30-Nov-2012	Zone 2 - (Fluvial Models)
3AJ	123.0	N	30-Nov-2012	Zone 2 - (Fluvial Models)
4AK	129.0	N	30-Nov-2012	Zone 2 - (Fluvial Models)
5AL	130.0	W	30-Nov-2012	Zone 2 - (Fluvial Models)
6AO	176.0	N	30-Nov-2012	Zone 2 - (Fluvial Models)
7	180.0	NE	30-Nov-2012	Zone 2 - (Fluvial Models)
8	188.0	NE	30-Nov-2012	Zone 2 - (Fluvial Models)
9A	230.0	SW	30-Nov-2012	Zone 2 - (Fluvial Models)
10B	236.0	NE	30-Nov-2012	Zone 2 - (Fluvial Models)
11A	242.0	SW	30-Nov-2012	Zone 2 - (Fluvial / Tidal Models)
12A	243.0	SW	30-Nov-2012	Zone 2 - (Tidal Models)
13A	245.0	SW	30-Nov-2012	Zone 2 - (Fluvial Models)
14A	247.0	SW	30-Nov-2012	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
300	7.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
301AI	115.0	W	30-Nov-2012	Zone 3 - (Fluvial Models)
302AJ	123.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
303AK	130.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
304A M	130.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
305AL	132.0	W	30-Nov-2012	Zone 3 - (Fluvial Models)

306AK	133.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
307A M	135.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
308AK	137.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
309A M	140.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
310AN	143.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
311AN	149.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
312AN	156.0	N	30-Nov-2012	Zone 3 - (Fluvial Models)
313AO	180.0	NE	30-Nov-2012	Zone 3 - (Fluvial Models)
314A	231.0	SW	30-Nov-2012	Zone 3 - (Fluvial 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?

No

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

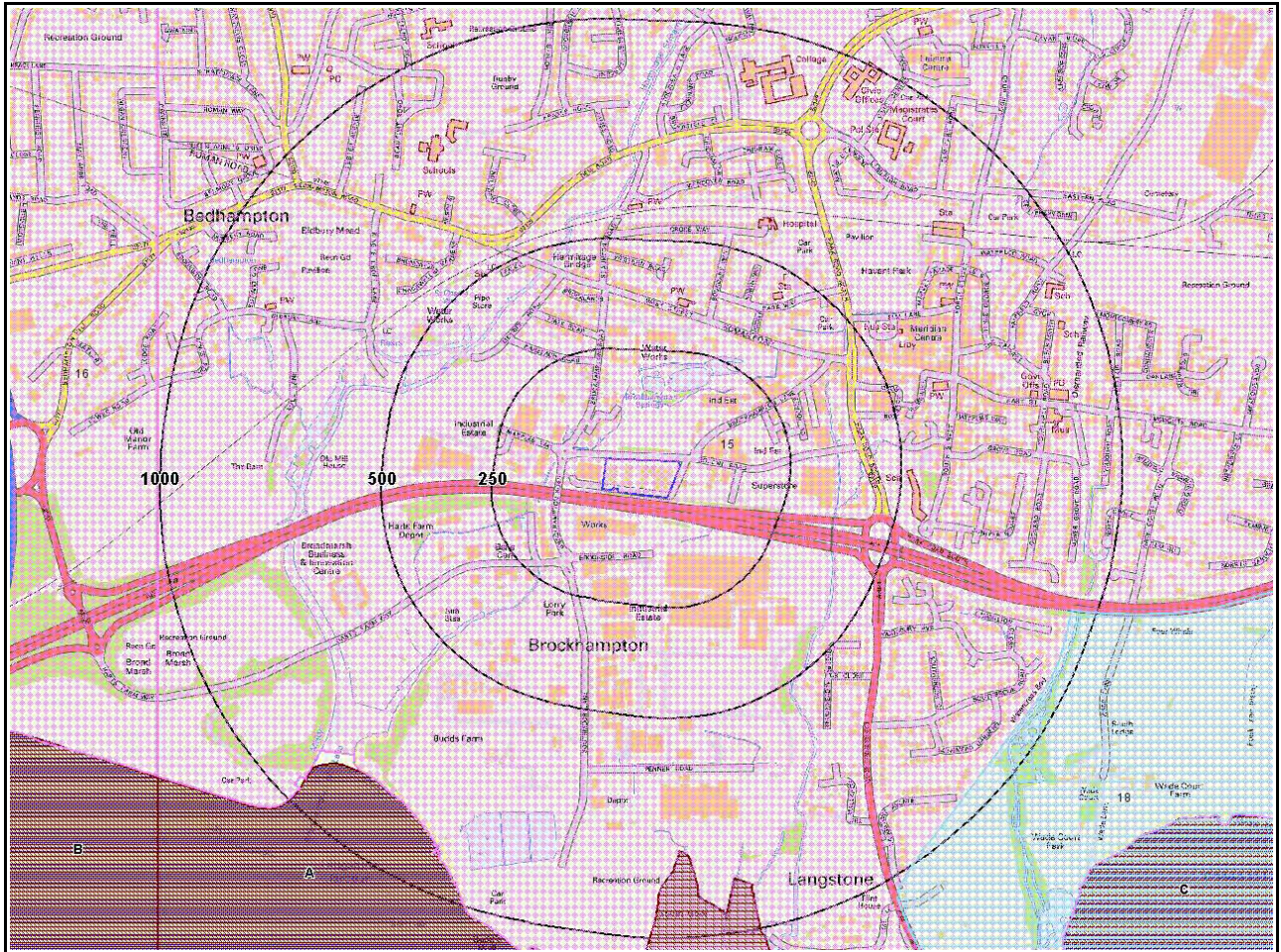
NW

▲
N

NE

◀W

▶E



SW

▼
S

SE

Designated Environmentally Sensitive Sites Legend

Enabled by Ordnance Survey

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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
7A	802.0	S	Langstone Harbour	Natural England
8B	1199.0	SW	Langstone Harbour	Natural England
9C	1275.0	SE	Chichester Harbour	Natural England
Not shown	1886.0	SE	Warblington Meadow	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	836.0	SW	Solent Maritime	Natural England
2	1199.0	SW	Solent Maritime	Natural England
3	1275.0	SE	Solent Maritime	Natural England

Records of Special Protection Areas (SPA) within 2000m of the study site:

3

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	802.0	S	Chichester and Langstone Harbours	Natural England
5B	1199.0	SW	Chichester and Langstone Harbours	Natural England
6C	1275.0	SE	Chichester and Langstone Harbours	Natural England

Records of Ramsar sites within 2000m of the study site:

3

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
11A	802.0	S	Chichester and Langstone Harbours	Natural England
12B	1199.0	SW	Chichester and Langstone Harbours	Natural England
13C	1275.0	SE	Chichester and Langstone Harbours	Natural England

Records of Local Nature Reserves (LNR) within 2000m of the study site:

1

Report Reference: EMS-190457_278572

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	1840.0	S	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
18	943.0	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
15	0.0	On Site	NVZ Area	DEFRA
16	1003.0	W	NVZ Area	DEFRA
Not shown	1961.0	S	NVZ Area	DEFRA

Records of Ancient Woodland within 2000m of the study site: 3

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
Not shown	1735.0	NW	UNKNOWN	Ancient Replanted Woodland

Not shown	1823.0	NW	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1926.0	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?

Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Very significant soluble rocks are present, with a moderate possibility of local natural subsidence due to high surface or subsurface water flow. Do not load the land or undertake building work before obtaining specialist advice. Do not dispose of drainage to the ground. Some possibility groundwater pollution. Maintain drainage infrastructure. For new build specialist site investigation and stability assessment may be necessary before construction. Construction work may cause subsidence. Increased construction costs are likely. For existing property probable increase in insurance risk due to soluble rocks.

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:

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

Database searched and no data found.

ATTACHMENT FOUR: CHEMICAL ANALYSIS DATA

Laboratory Analysis Report

Report Number 003723

Sampling Date 14th January 2013

Report Date 17th January 2013

Client	Site Name/Address
Hargreaves Properties Ltd Rustington House Worthing Road Rustington West Sussex BN16 3PS	Retail Trade Park

Number of Samples	Sample Type	Analysis Completed	Blind Testing	UKAS	MCERTS
14	Soil	IH QM:E9.5 based on TNRCC 1005 by GC-FID	RT Corp	Yes	No

QM E9.5: IH TPH Banded method C8 - C35 - Solvent (pentane) extraction then Liquid injection into GC-FID.
Samples were received 14-1-13
Samples were prepared and analysed 15-1-13

Analysis Report Approved By

Katherine Clark
Duty Reporting Manager



Glossary of Terms Used in This Report

Blank - A sample known to contain none of the compounds being analysed, and used to confirm that the analytical instrument is not giving false positives during analysis.

Blind Testing: Name of any blind testing scheme participated in. The laboratory's accuracy is reported as a Z score; the lower the Z score the more accurate the analysis, with a score of less than 2 considered excellent.

CRM - Certified Reference Material. A sample prepared by an accredited source and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Duplicate - A duplicate sample, used to give a measure of the repeatability of a given analysis.

External Calibration - External calibration samples are samples containing a known concentration of the compounds being analysed. They are added to the analysis sequence after every nth sample being analysed and provide confirmation that the instrument remains within its calibration range.

IRM - In house reference material. A sample prepared by our laboratory and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Linearity - The linearity of a given analytical method is the range of concentrations between which the analytical instrument's response is directly proportional to the concentration being analysed, and hence the range of concentrations that the instrument can be said to give quantitative results.

LOD - The lowest response for any given compound generated at the instrument's detector, that can be differentiated from the instrument's baseline noise.

LOQ - Limit of quantification. This is the lowest concentration that a given compound can be both detected and its concentration accurately measured in a sample.

MCERTS - An accreditation scheme created by the Environment Agency for the analysis of soil samples used to determine land quality. The scheme does not apply to analysis of soil samples used for waste classification purposes or to the analysis of water samples.

Method Calibration - The means by which an analytical method is calibrated. Usually this involves analysing a number of external calibration samples, containing different concentrations of the compounds to be analysed.

Precision - A measure of the repeatability of the analysis.

Sample - The material provided by the client to the laboratory for analysis.

Sensitivity - The smallest increment in analytical result that can be reliably quantified.

Spike - Also known as an internal calibration, a spike sample is a sample to be analysed which has a known concentration of another compound added. This provides a check on that the compounds being analysed are being correctly extracted from the sample matrix.

UKAS - The UK's implementation of ISO17025, the international standard accreditation for laboratory analysis

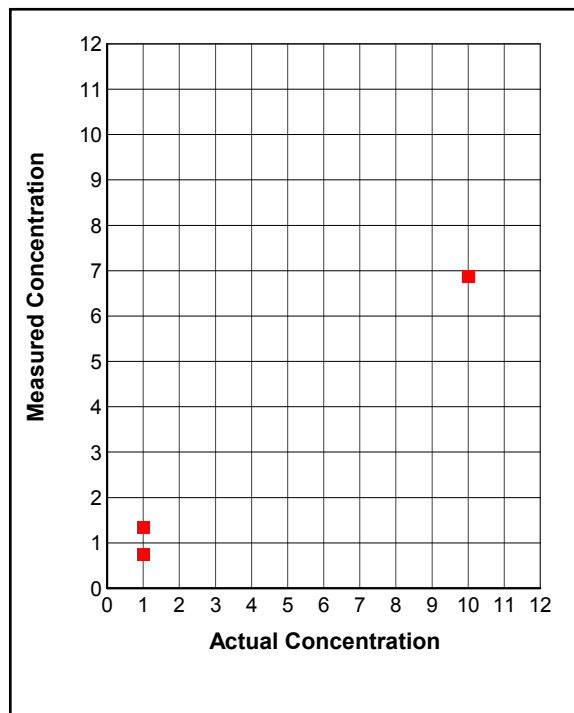
Quality Control/Quality Assurance Information

TPH Banded - Soil

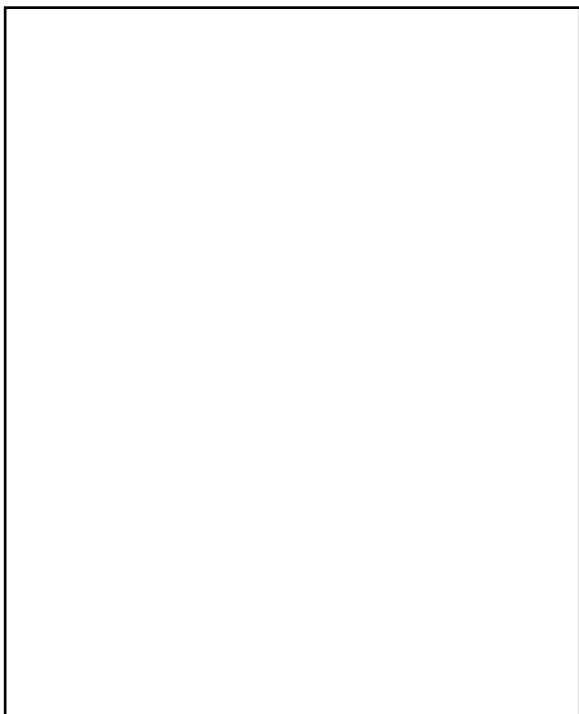
Our laboratory carries out a wide variety of verification analyses in order to ensure the validity of the analysis results we produce.

Samples are analysed in batches, usually according to the sample chain of custody form we receive. However, we also add additional samples into the sample sequence. These additional samples may include blanks, calibration samples, in-house reference material samples and duplicate samples. In addition to this, each sample is 'spiked' with a known concentration of a compound. In the case of this analysis, we use a combination of 2-fluorobiphenyl and 1-chlorooctadecane. The results of the analyses we have carried out on the additional quality assurance samples during the ten days prior to the samples reported here are shown in the accompanying graphs. Results are reported in mg/kg for the C8-C10 band.

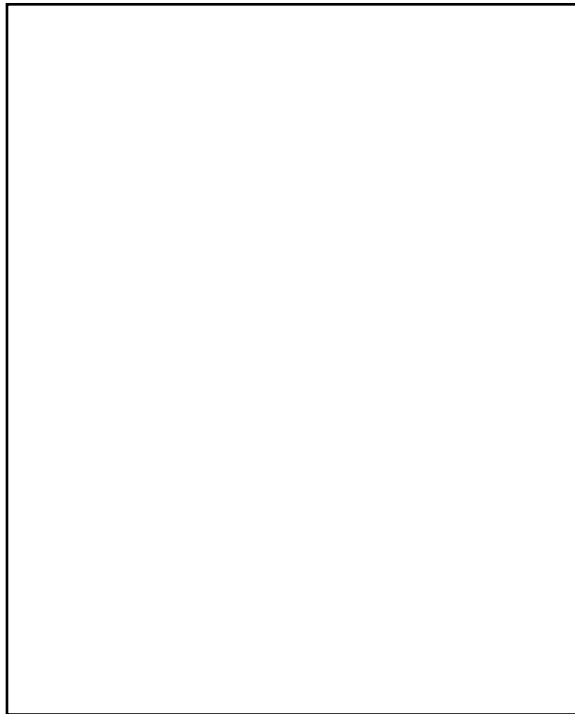
These provide a visual indication of the stability of our laboratory analysis.



Calibration Samples - Previous 10 days



Spike Samples - Previous 10 days



Reference Material - Previous 10 days

Retail Trade Park

Summary of Results

TPH Banded - Soil

Accreditation	UKAS	Blind Testing	RT Corp		
Results Reported As	Dry Weight	Last Three Z Scores	-1.18	-1.24	-0.36

Analysis Method Parameters			
Reporting Units	mg/kg	Limit of Detection	0.05mg/kg
Linearity	2,000mg/kg	Limit of Quantification	0.1mg/kg
Sensitivity	0.1mg/kg	Precision	+/-0.1mg/kg

Sample Location	Sample	Depth	Total Petroleum Hydrocarbons				
			C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
BH1/1	sIn12963.001001	0.70	<0.5	<0.5	<0.5	<0.5	<0.5
BH1/2	sIn12963.001002	1.10	23.9	55.4	239	248	14.9
BH2/3	sIn12963.001003	1.80	<0.5	<0.5	<0.5	<0.5	<0.5
BH3/5	sIn12963.001004	3.60	<0.5	<0.5	<0.5	<0.5	<0.5
BH4/1	sIn12963.001005	0.70	<0.5	<0.5	<0.5	<0.5	<0.5
BH5/2	sIn12963.001006	1.20	<0.5	<0.5	<0.5	<0.5	<0.5
BH7/3	sIn12963.001007	1.50	<0.5	<0.5	<0.5	<0.5	<0.5
BH9/4	sIn12963.001008	1.80	<1.5	<0.5	<0.5	<0.5	<0.5
BH10/2	sIn12963.001009	1.70	<0.5	<0.5	<0.5	<0.5	<0.5
BH11/2	sIn12963.001010	1.90	<0.5	<0.5	<0.5	<0.5	<0.5
BH12/3	sIn12963.001011	2.30	14.3	28.7	20.9	3.31	<0.5
BH13/2	sIn12963.001012	1.40	<0.5	<0.5	<0.5	<0.5	<0.5
BH13/4	sIn12963.001013	2.80	<0.5	<0.5	<0.5	<0.5	<0.5
BH15/3	sIn12963.001014	1.90	<0.5	<0.5	<0.5	<0.5	<0.5

Retail Trade Park

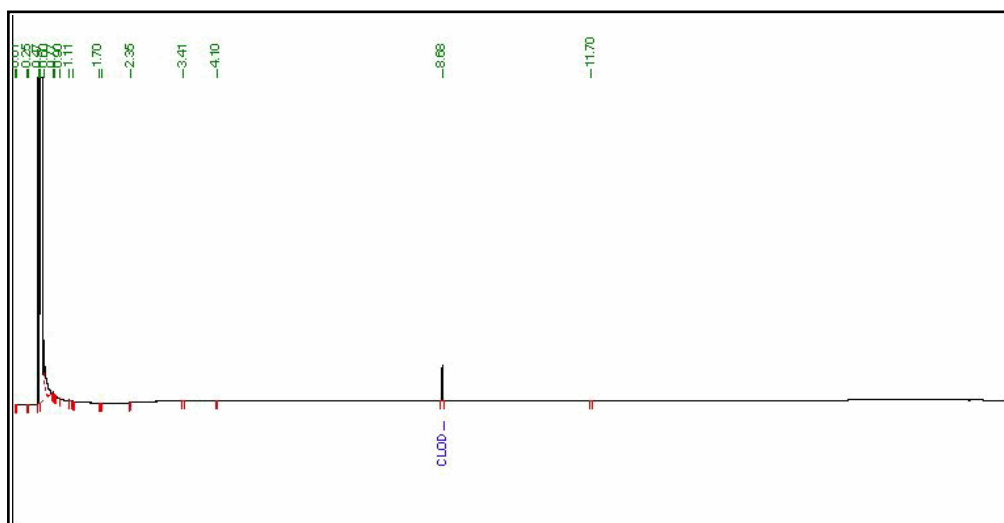
Individual Sample Results

TPH Banded - Soil

Sample Location	BH1/1	Results Reported As	Dry Weight
Sample	sln12963.001001	Reporting Units	mg/kg
Depth(m)	0.70	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
42.41	38.74	31.39	10	10.4	0.71	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

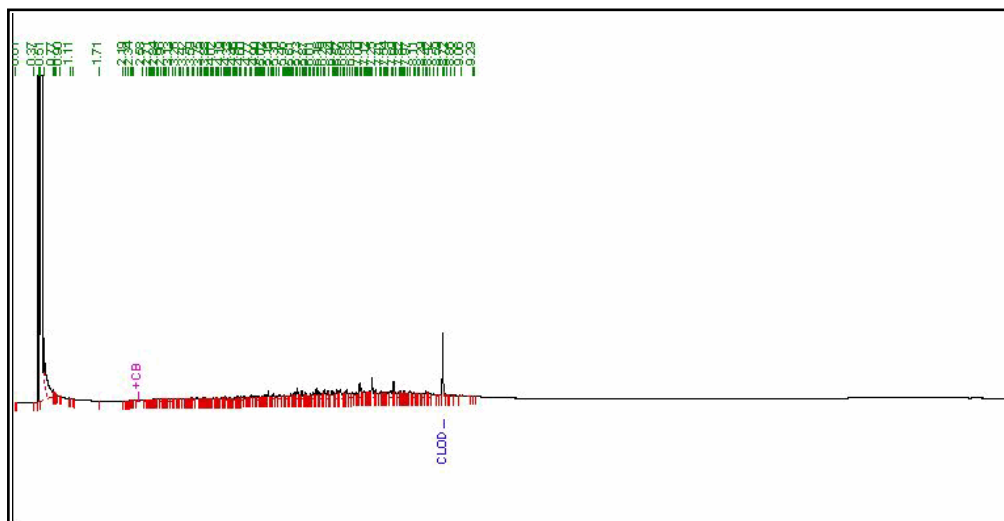
Individual Sample Results

TPH Banded - Soil

Sample Location	BH1/2	Results Reported As	Dry Weight
Sample	sln12963.001002	Reporting Units	mg/kg
Depth(m)	1.10	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES	ES	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)	(ml)	(g)			C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
42.18	38.18	35.37	10	10.02	0.86	0.00	23.9	55.4	239	248	14.9

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

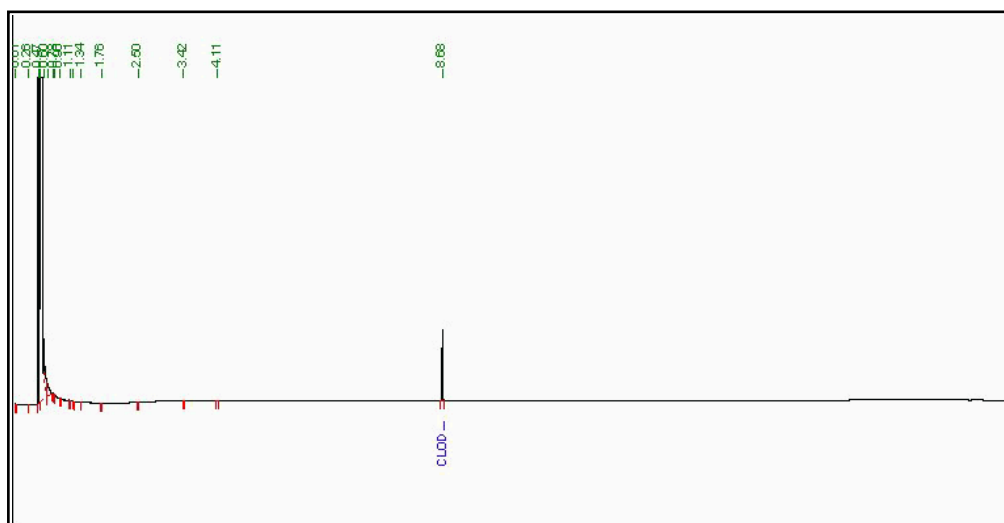
Individual Sample Results

TPH Banded - Soil

Sample Location	BH2/3	Results Reported As	Dry Weight
Sample	sln12963.001003	Reporting Units	mg/kg
Depth(m)	1.80	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.24	30.22	15.48	10	10.2	0.86	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

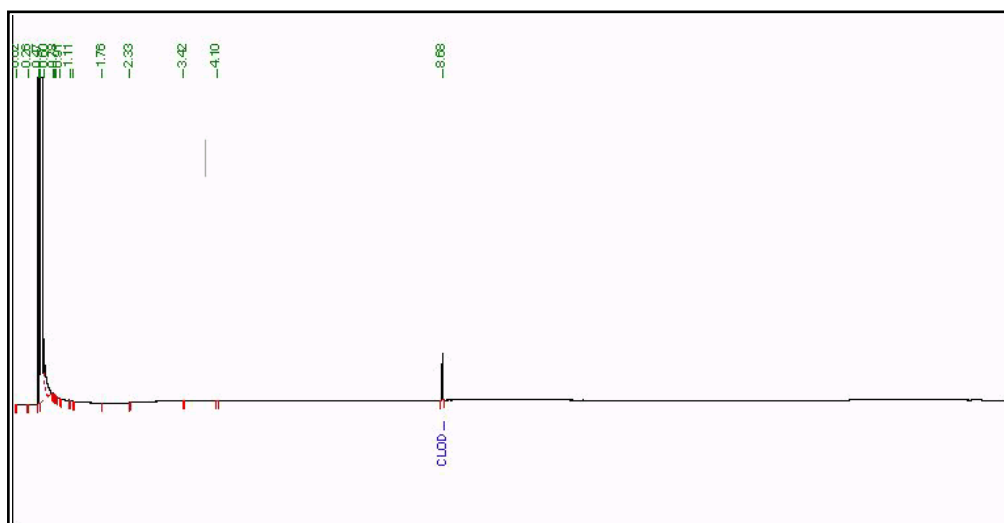
Individual Sample Results

TPH Banded - Soil

Sample Location	BH3/5	Results Reported As	Dry Weight
Sample	sln12963.001004	Reporting Units	mg/kg
Depth(m)	3.60	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.45	29.75	21.41	10	10.27	0.76	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

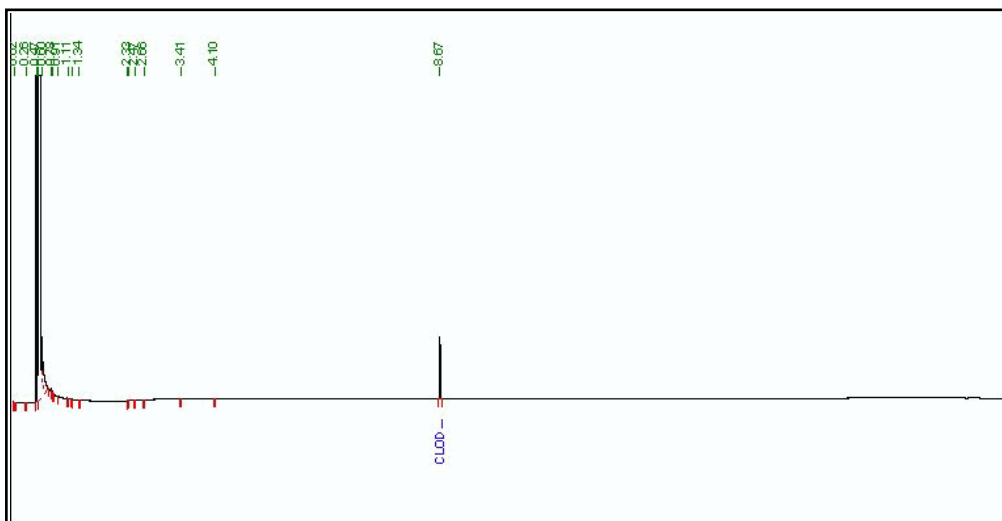
Individual Sample Results

TPH Banded - Soil

Sample Location	BH4/1	Results Reported As	Dry Weight
Sample	sln12963.001005	Reporting Units	mg/kg
Depth(m)	0.70	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.09	25.95	68.60	10	10	0.77	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

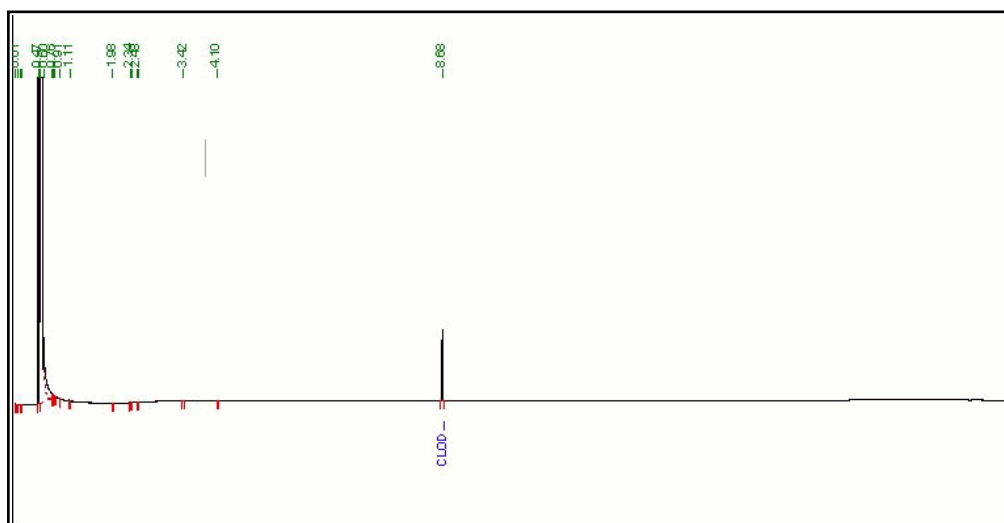
Individual Sample Results

TPH Banded - Soil

Sample Location	BH5/2	Results Reported As	Dry Weight
Sample	sln12963.001006	Reporting Units	mg/kg
Depth(m)	1.20	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES	ES	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)	(ml)	(g)			C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.42	29.59	22.69	10	10.19	0.86	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

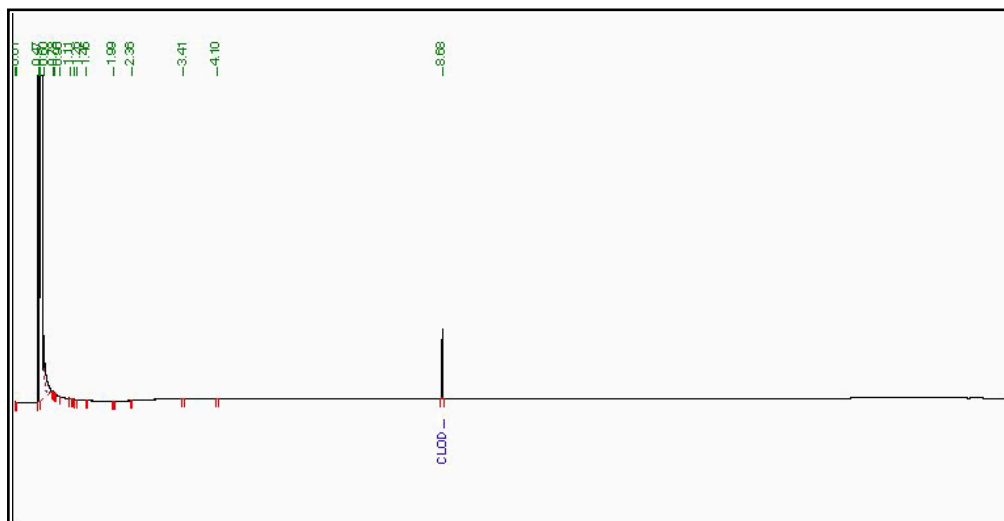
Individual Sample Results

TPH Banded - Soil

Sample Location	BH7/3	Results Reported As	Dry Weight
Sample	sln12963.001007	Reporting Units	mg/kg
Depth(m)	1.50	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES	ES	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)	(ml)	(g)			C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.17	29.41	22.29	10	10.34	0.84	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

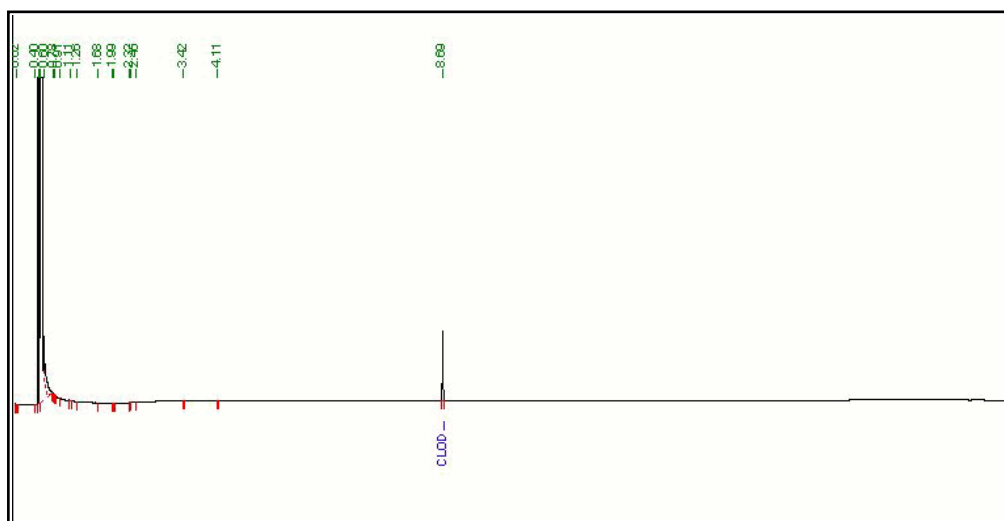
Individual Sample Results

TPH Banded - Soil

Sample Location	BH9/4	Results Reported As	Dry Weight
Sample	sln12963.001008	Reporting Units	mg/kg
Depth(m)	1.80	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES	ES	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)	(ml)	(g)			C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
41.93	39.16	22.61	10	10.25	0.82	0.00	<1.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Retail Trade Park

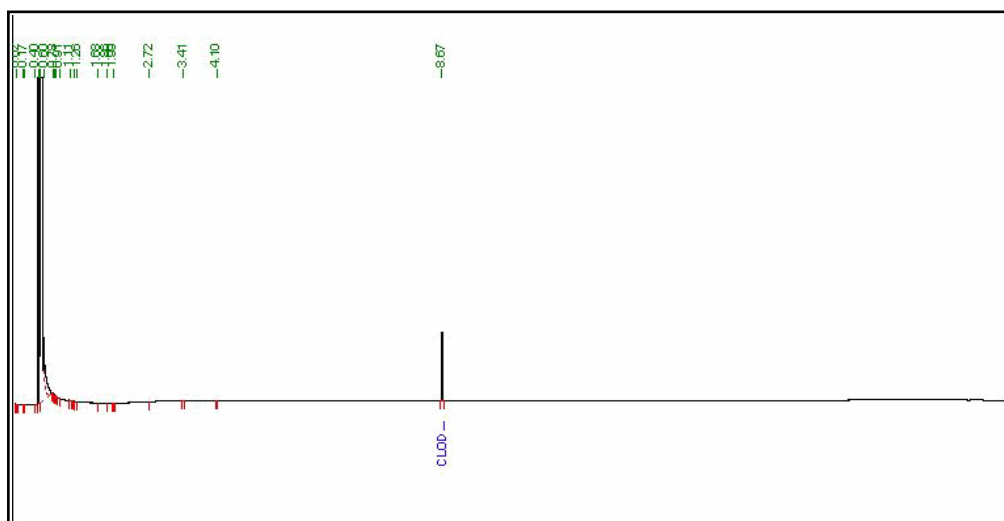
Individual Sample Results

TPH Banded - Soil

Sample Location	BH10/2	Results Reported As	Dry Weight
Sample	sln12963.001009	Reporting Units	mg/kg
Depth(m)	1.70	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES	ES	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)	(ml)	(g)			C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.24	29.95	17.49	10	10.48	0.81	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

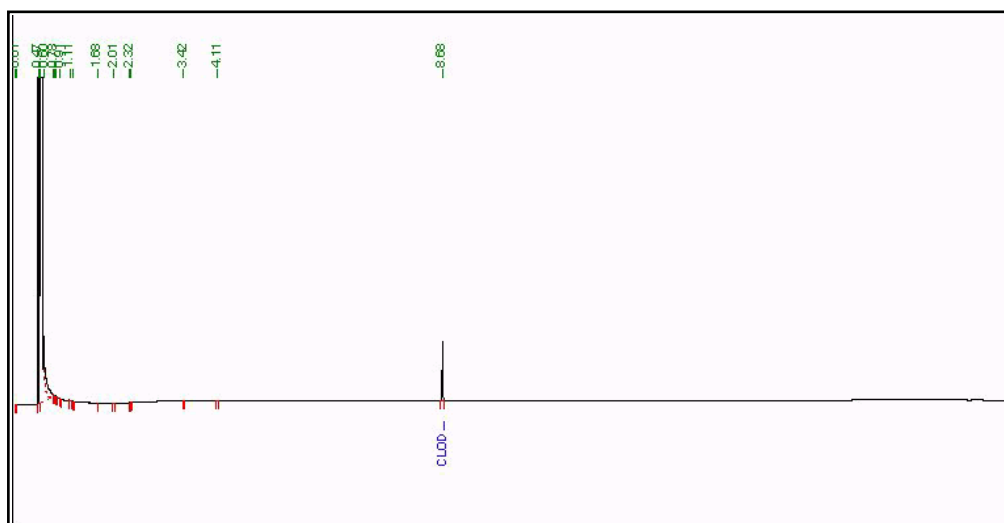
Individual Sample Results

TPH Banded - Soil

Sample Location	BH11/2	Results Reported As	Dry Weight
Sample	sln12963.001010	Reporting Units	mg/kg
Depth(m)	1.90	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES	ES	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)	(ml)	(g)			C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.29	29.83	19.49	10	10.48	0.70	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

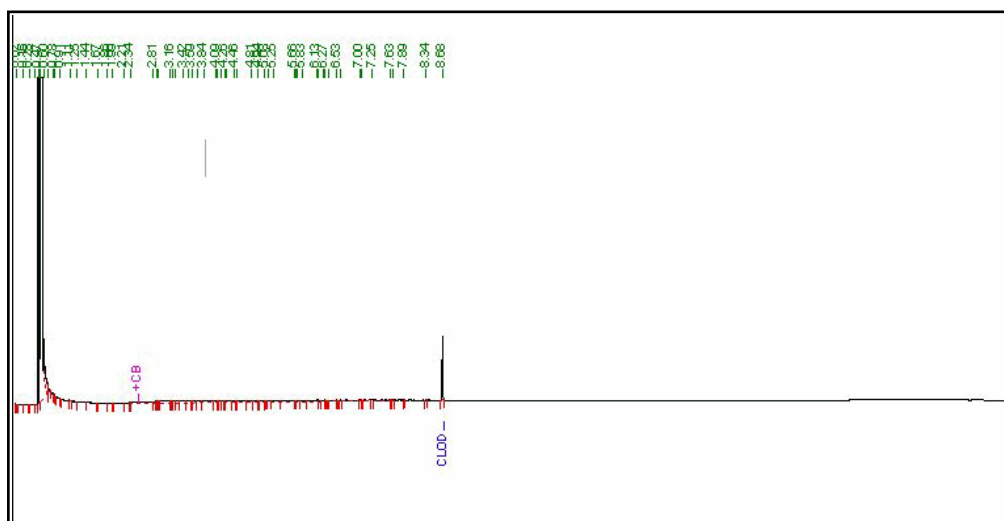
Individual Sample Results

TPH Banded - Soil

Sample Location	BH12/3	Results Reported As	Dry Weight
Sample	sln12963.001011	Reporting Units	mg/kg
Depth(m)	2.30	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES	ES	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)	(ml)	(g)			C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
42.06	39.82	17.22	10	10.32	0.78	0.00	14.3	28.7	20.9	3.31	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

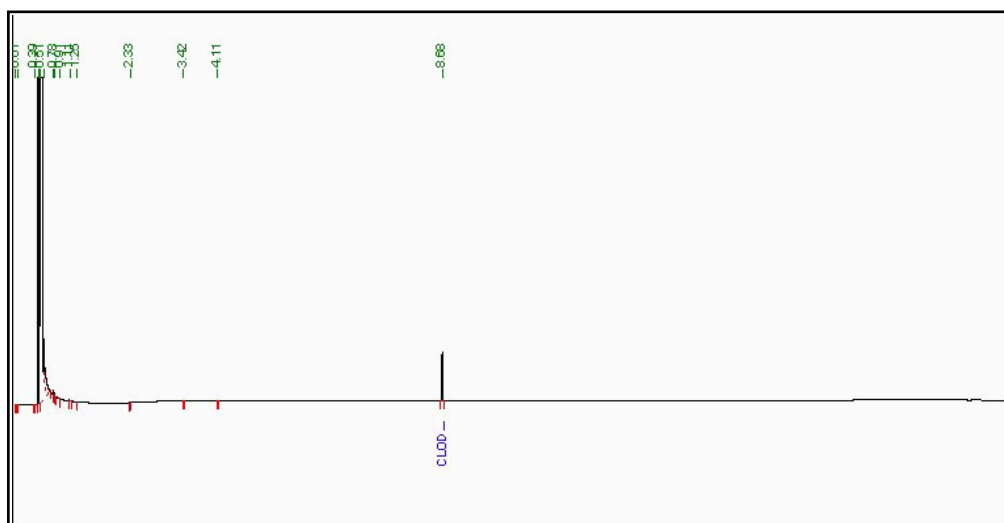
Individual Sample Results

TPH Banded - Soil

Sample Location	BH13/2	Results Reported As	Dry Weight
Sample	sln12963.001012	Reporting Units	mg/kg
Depth(m)	1.40	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
41.89	35.58	72.45	10	10.14	0.78	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

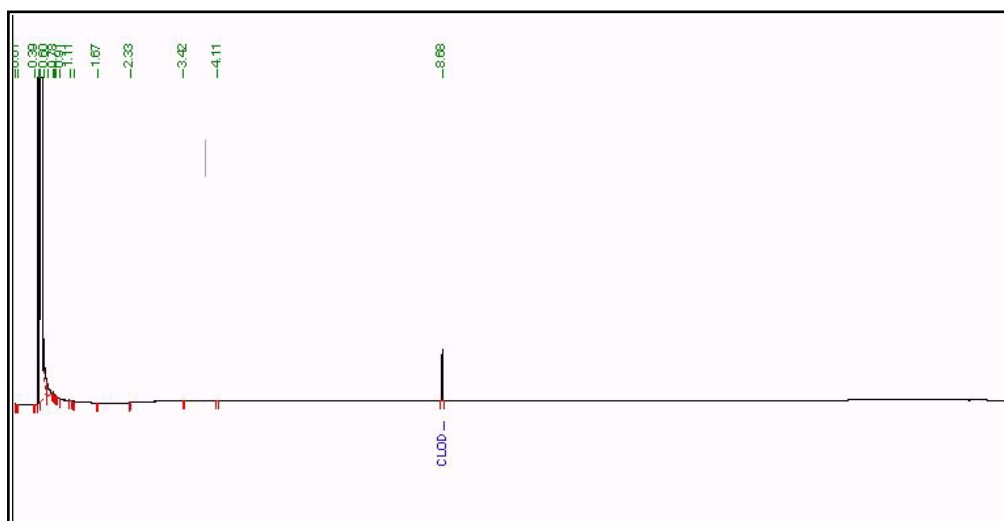
Individual Sample Results

TPH Banded - Soil

Sample Location	BH13/4	Results Reported As	Dry Weight
Sample	sln12963.001013	Reporting Units	mg/kg
Depth(m)	2.80	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.34	30.15	16.76	10	10.37	0.62	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

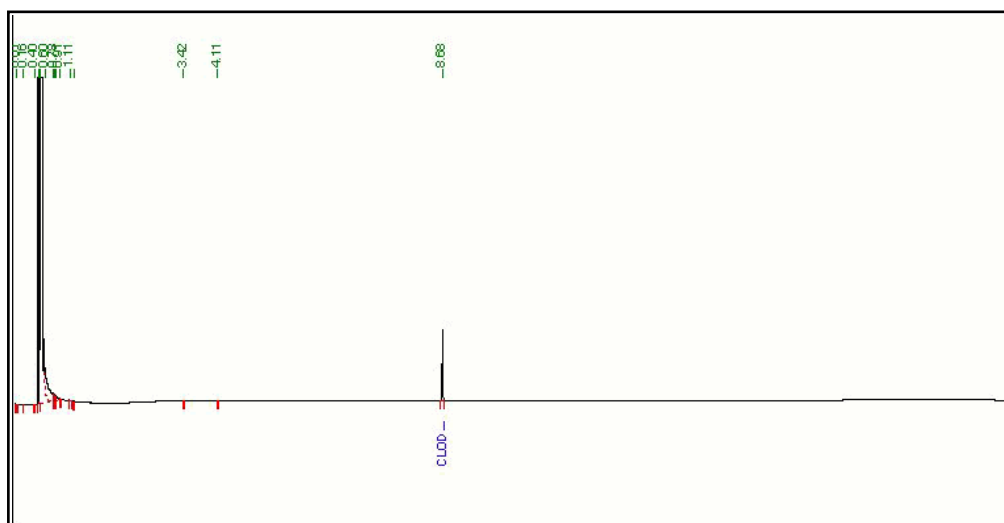
Individual Sample Results

TPH Banded - Soil

Sample Location	BH15/3	Results Reported As	Dry Weight
Sample	sln12963.001014	Reporting Units	mg/kg
Depth(m)	1.90	Date Received	15/01/2013
Chain of Custody No.	6,365	Date of Sampling	14/01/2013
Accreditation	UKAS	Date of Analysis	16/01/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.43	28.15	39.45	10	10.25	0.83	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

End of Report



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russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 13-12472

Site Reference: Retail Trade Park

Project / Job Ref: In12963

Order No: 11599

Sample Receipt Date: 15/01/2013

Sample Scheduled Date: 15/01/2013

Report Issue Number: 1

Reporting Date: 21/01/2013

Authorised by:

Russell Jarvis
Director

On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director

On behalf of QTS Environmental Ltd



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Unit 1, Rose Lane Industrial Estate
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Soil Analysis Certificate					
QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13	10/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH1	BH1	BH2	BH2
Project / Job Ref: In12963	Additional Refs	S1	S5	S1	S6
Order No: 11599	Depth (m)	0.50 - 0.70	3.90	0.50	3.10
Reporting Date: 21/01/2013	QTSE Sample No	59289	59291	59292	59293

Determinand	Unit	MDL	Accreditation				
pH	pH Units	N / a	MCERTS				7.8
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	NONE				< 0.01
Total Organic Carbon (TOC)	%	< 0.1	NONE		< 0.1		0.7
Arsenic (As)	mg/kg	< 2	MCERTS	5		5	
Barium (Ba)	mg/kg	< 5	NONE	52		84	
Beryllium (Be)	mg/kg	< 0.5	NONE	< 0.5		< 0.5	
W/S Boron	mg/kg	< 1	NONE	1.4		< 1	
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5		< 0.5	
Chromium (Cr)	mg/kg	< 2	MCERTS	12		26	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	11		16	
Lead (Pb)	mg/kg	< 3	MCERTS	35		28	
Mercury (Hg)	mg/kg	< 1	NONE	< 1		< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	8		18	
Selenium (Se)	mg/kg	< 3	NONE	< 3		< 3	
Vanadium (V)	mg/kg	< 2	NONE	19		37	
Zinc (Zn)	mg/kg	< 3	MCERTS	89		58	

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

Analysis carried out on the dried sample is corrected for the stone content

Stone content is classified as material greater than 10mm in diameter

Subcontracted analysis ⁽⁵⁾



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Soil Analysis Certificate					
QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13	10/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH3	BH3	BH4	BH5
Project / Job Ref: In12963	Additional Refs	S1	S3	S3	S1
Order No: 11599	Depth (m)	0.20 - 0.30	1.80	2.60	0.50
Reporting Date: 21/01/2013	QTSE Sample No	59295	59296	59300	59301

Determinand	Unit	MDL	Accreditation				
pH	pH Units	N / a	MCERTS		7.7		
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	NONE		0.05		
Total Organic Carbon (TOC)	%	< 0.1	NONE			0.2	0.3
Arsenic (As)	mg/kg	< 2	MCERTS	5			5
Barium (Ba)	mg/kg	< 5	NONE	85			70
Beryllium (Be)	mg/kg	< 0.5	NONE	< 0.5			< 0.5
W/S Boron	mg/kg	< 1	NONE	10.3			1.1
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	0.6			< 0.5
Chromium (Cr)	mg/kg	< 2	MCERTS	21			23
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2			< 2
Copper (Cu)	mg/kg	< 4	MCERTS	17			15
Lead (Pb)	mg/kg	< 3	MCERTS	10			31
Mercury (Hg)	mg/kg	< 1	NONE	< 1			< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	15			19
Selenium (Se)	mg/kg	< 3	NONE	< 3			< 3
Vanadium (V)	mg/kg	< 2	NONE	28			36
Zinc (Zn)	mg/kg	< 3	MCERTS	82			46

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Subcontracted analysis ⁽⁵⁾



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Soil Analysis Certificate					
QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13	10/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH7	BH7	BH7	BH9
Project / Job Ref: In12963	Additional Refs	S1	S2	S4	S5
Order No: 11599	Depth (m)	0.20 - 0.50	0.60	2.30 - 2.60	0.20 - 0.40
Reporting Date: 21/01/2013	QTSE Sample No	59307	59308	59309	59310

Determinand	Unit	MDL	Accreditation				
pH	pH Units	N / a	MCERTS		7.6		7.9
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	NONE		0.03		< 0.01
Total Organic Carbon (TOC)	%	< 0.1	NONE				
Arsenic (As)	mg/kg	< 2	MCERTS	5		5	7
Barium (Ba)	mg/kg	< 5	NONE	40		21	131
Beryllium (Be)	mg/kg	< 0.5	NONE	< 0.5		< 0.5	< 0.5
W/S Boron	mg/kg	< 1	NONE	< 1		< 1	< 1
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5		< 0.5	0.6
Chromium (Cr)	mg/kg	< 2	MCERTS	20		4	12
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	12		< 4	5
Lead (Pb)	mg/kg	< 3	MCERTS	106		3	18
Mercury (Hg)	mg/kg	< 1	NONE	< 1		< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	13		10	7
Selenium (Se)	mg/kg	< 3	NONE	< 3		< 3	< 3
Vanadium (V)	mg/kg	< 2	NONE	28		6	15
Zinc (Zn)	mg/kg	< 3	MCERTS	32		14	36

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

Analysis carried out on the dried sample is corrected for the stone content

Stone content is classified as material greater than 10mm in diameter

Subcontracted analysis ⁽⁵⁾



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Soil Analysis Certificate					
QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13	10/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH11	BH12	BH14	BH15
Project / Job Ref: In12963	Additional Refs	S1	S1	S2	S4
Order No: 11599	Depth (m)	0.60	0.70	0.60 - 0.90	0.40 - 0.90
Reporting Date: 21/01/2013	QTSE Sample No	59314	59315	59320	59322

Determinand	Unit	MDL	Accreditation					
pH	pH Units	N / a	MCERTS					7.8
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	NONE					< 0.01
Total Organic Carbon (TOC)	%	< 0.1	NONE					
Arsenic (As)	mg/kg	< 2	MCERTS	8	10	6	3	
Barium (Ba)	mg/kg	< 5	NONE	91	220	99	68	
Beryllium (Be)	mg/kg	< 0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	
W/S Boron	mg/kg	< 1	NONE	< 1	1.5	< 1	< 1	
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	
Chromium (Cr)	mg/kg	< 2	MCERTS	32	24	36	22	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	16	35	15	12	
Lead (Pb)	mg/kg	< 3	MCERTS	33	135	22	25	
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	33	23	28	15	
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	
Vanadium (V)	mg/kg	< 2	NONE	50	38	49	33	
Zinc (Zn)	mg/kg	< 3	MCERTS	50	228	74	58	

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

Analysis carried out on the dried sample is corrected for the stone content

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Subcontracted analysis ⁽⁵⁾



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Soil Analysis Certificate						
QTS Environmental Report No: 13-12472	Date Sampled	10/01/13				
Subadra Consulting Ltd	Time Sampled	None Supplied				
Site Reference: Retail Trade Park	TP / BH No	BH16				
Project / Job Ref: In12963	Additional Refs	S3				
Order No: 11599	Depth (m)	1.20 - 2.00				
Reporting Date: 21/01/2013	QTSE Sample No	59326				

Determinand	Unit	MDL	Accreditation				
pH	pH Units	N / a	MCERTS				
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	NONE				
Total Organic Carbon (TOC)	%	< 0.1	NONE				
Arsenic (As)	mg/kg	< 2	MCERTS	3			
Barium (Ba)	mg/kg	< 5	NONE	50			
Beryllium (Be)	mg/kg	< 0.5	NONE	0.6			
W/S Boron	mg/kg	< 1	NONE	< 1			
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5			
Chromium (Cr)	mg/kg	< 2	MCERTS	30			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	9			
Lead (Pb)	mg/kg	< 3	MCERTS	12			
Mercury (Hg)	mg/kg	< 1	NONE	< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	21			
Selenium (Se)	mg/kg	< 3	NONE	< 3			
Vanadium (V)	mg/kg	< 2	NONE	33			
Zinc (Zn)	mg/kg	< 3	MCERTS	44			

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Analysis carried out on the dried sample is corrected for the stone content

Stone content is classified as material greater than 10mm in diameter

Subcontracted analysis ⁽⁵⁾



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Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13	10/01/13	10/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH1	BH3	BH4	BH5	BH6
Project / Job Ref: In12963	Additional Refs	S3	S5	S2	S3	S4
Order No: 11599	Depth (m)	1.80	2.60	1.80	2.20	3.40
Reporting Date: 21/01/2013	QTSE Sample No	59290	59297	59299	59302	59305

Determinand	Unit	MDL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C



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Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13	10/01/13	10/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH8	BH10	BH13	BH14	BH16
Project / Job Ref: In12963	Additional Refs	S2	S1	S3	S4	S2
Order No: 11599	Depth (m)	1.00	0.70	1.80 - 2.00	3.00	0.90
Reporting Date: 21/01/2013	QTSE Sample No	59311	59313	59317	59321	59325

Determinand	Unit	MDL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C



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Soil Analysis Certificate - TPH CWG Banded

QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13		
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Retail Trade Park	TP / BH No	BH3	BH12	BH13		
Project / Job Ref: In12963	Additional Refs	S5	S2	S3		
Order No: 11599	Depth (m)	2.60	1.80	1.80 - 2.00		
Reporting Date: 21/01/2013	QTSE Sample No	59297	59316	59317		

Determinand	Unit	MDL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aliphatic >C8 - C10	mg/kg	< 1	NONE	< 1	24	< 1		
Aliphatic >C10 - C12	mg/kg	< 1	NONE	< 1	79	2		
Aliphatic >C12 - C16	mg/kg	< 1	NONE	1	271	9		
Aliphatic >C16 - C21	mg/kg	< 1	NONE	205	449	73		
Aliphatic >C21 - C34	mg/kg	< 6	NONE	1305	163	442		
Aliphatic (C5 - C34)	mg/kg	< 12	NONE	1512	986	527		
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aromatic >C8 - C10	mg/kg	< 1	NONE	< 1	5	< 1		
Aromatic >C10 - C12	mg/kg	< 1	NONE	< 1	15	< 1		
Aromatic >C12 - C16	mg/kg	< 1	NONE	< 1	71	< 1		
Aromatic >C16 - C21	mg/kg	< 1	NONE	62	127	22		
Aromatic >C21 - C35	mg/kg	< 6	NONE	383	41	127		
Aromatic (C5 - C35)	mg/kg	< 12	NONE	445	259	149		
Total >C5 - C35	mg/kg	< 24	NONE	1957	1244	676		

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Soil Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13		
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Retail Trade Park	TP / BH No	BH3	BH12	BH13		
Project / Job Ref: In12963	Additional Refs	S5	S2	S3		
Order No: 11599	Depth (m)	2.60	1.80	1.80 - 2.00		
Reporting Date: 21/01/2013	QTSE Sample No	59297	59316	59317		

Determinand	Unit	MDL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Ethylbenzene	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
p & m-xylene	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
o-xylene	ug/kg	< 10	MCERTS	< 10	< 10	< 10		

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C



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Soil Analysis Certificate - Volatile Organic Compounds (VOC)

QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13	10/01/13	10/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH3	BH5	BH6	BH13	BH13
Project / Job Ref: In12963	Additional Refs	S7	S5	S5	S3	S6
Order No: 11599	Depth (m)	6.00	6.00	5.00	1.80 - 2.00	4.10
Reporting Date: 21/01/2013	QTSE Sample No	59298	59303	59306	59317	59318

Determinand	Unit	MDL	Accreditation					
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloromethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Chloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromomethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	ug/kg	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloroform	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Trichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Dibromomethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
TAME	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethyl Benzene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
m,p-Xylene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
o-Xylene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Styrene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromoform	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	15	< 5
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	38	< 5
Bromobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	23	< 5
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	69	< 5
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

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Soil Analysis Certificate - Volatile Organic Compounds (VOC)

QTS Environmental Report No: 13-12472	Date Sampled	10/01/13				
Subadra Consulting Ltd	Time Sampled	None Supplied				
Site Reference: Retail Trade Park	TP / BH No	BH16				
Project / Job Ref: In12963	Additional Refs	S6				
Order No: 11599	Depth (m)	4.40				
Reporting Date: 21/01/2013	QTSE Sample No	59327				

Determinand	Unit	MDL	Accreditation				
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5			
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5			
Chloromethane	ug/kg	< 10	MCERTS	< 10			
Chloroethane	ug/kg	< 5	MCERTS	< 5			
Bromomethane	ug/kg	< 10	MCERTS	< 10			
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5			
1,1-Dichloroethene	ug/kg	< 5	ISO17025	< 5			
MTBE	ug/kg	< 5	MCERTS	< 5			
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5			
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5			
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5			
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5			
Chloroform	ug/kg	< 5	MCERTS	< 5			
Bromochloromethane	ug/kg	< 5	MCERTS	< 5			
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5			
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10			
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5			
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5			
Benzene	ug/kg	< 2	MCERTS	< 2			
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5			
Trichloroethene	ug/kg	< 5	MCERTS	< 5			
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5			
Dibromomethane	ug/kg	< 5	MCERTS	< 5			
TAME	ug/kg	< 5	MCERTS	< 5			
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5			
Toluene	ug/kg	< 5	MCERTS	< 5			
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5			
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10			
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5			
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5			
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5			
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5			
Chlorobenzene	ug/kg	< 5	MCERTS	< 5			
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5			
Ethyl Benzene	ug/kg	< 10	MCERTS	< 10			
m,p-Xylene	ug/kg	< 10	MCERTS	< 10			
o-Xylene	ug/kg	< 10	MCERTS	< 10			
Styrene	ug/kg	< 5	MCERTS	< 5			
Bromoform	ug/kg	< 10	MCERTS	< 10			
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5			
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5			
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5			
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5			
Bromobenzene	ug/kg	< 5	MCERTS	< 5			
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5			
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5			
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5			
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5			
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5			
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5			
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5			
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5			
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5			
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5			
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5			
1,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10			
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5			

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Soil Analysis Certificate - PCB (7 Congeners)						
QTS Environmental Report No: 13-12472	Date Sampled	10/01/13	10/01/13	10/01/13		
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Retail Trade Park	TP / BH No	BH10	BH14	BH15		
Project / Job Ref: In12963	Additional Refs	S1	S1	S2		
Order No: 11599	Depth (m)	0.70	0.40	1.00		
Reporting Date: 21/01/2013	QTSE Sample No	59313	59319	59323		

Determinand	Unit	MDL	Accreditation					
PCB Congener 28	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008		
PCB Congener 52	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008		
PCB Congener 101	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008		
PCB Congener 118	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008		
PCB Congener 138	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008		
PCB Congener 153	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008		
PCB Congener 180	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008		
Total PCB (7 Congeners)	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1		

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Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 13-12472	
Subadra Consulting Ltd	
Site Reference: Retail Trade Park	
Project / Job Ref: In12963	
Order No: 11599	
Reporting Date: 21/01/2013	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
59289	BH1	S1	0.50 - 0.70	15.6	Brown clay with stones
59290	BH1	S3	1.80	14.7	Light grey clay with chalk
59291	BH1	S5	3.90	11.5	Light brown clayey gravel with stones
59292	BH2	S1	0.50	17.7	Brown clay with vegetation
59293	BH2	S5	3.10	9.7	Beige clayey gravel with stones
59294	BH2	S6	4.00	7.3	Beige clayey gravel with stones
59295	BH3	S1	0.20 - 0.30	9.7	Brown clayey gravel with stones
59296	BH3	S3	1.80	16	Light grey clay with stones
59297	BH3	S5	2.60	30	Light grey clay with stones
59298	BH3	S7	6.00	17.5	Light grey clay with stones and vegetation
59299	BH4	S2	1.80	17.8	Light brown clayey gravel
59300	BH4	S3	2.60	14.6	Light brown clayey sand with stones
59301	BH5	S1	0.50	16.8	Brown clay
59302	BH5	S3	2.20	21.1	Light grey clay
59303	BH5	S5	6.00	16.7	Beige clayey gravel with stones
59304	BH6	S3	1.70	17.5	Brown clay
59305	BH6	S4	3.40	19.3	Grey clay
59306	BH6	S5	5.00	17	Grey clay
59307	BH7	S1	0.20 - 0.50	11.9	Orange clayey gravel with stones and concrete
59308	BH7	S2	0.60	17.7	Brown clayey sand
59309	BH7	S4	2.30 - 2.60	13.2	Orange gravelly clay with stones
59310	BH8	S1	0.20 - 0.40	6.4	Brown clayey gravel with stones
59311	BH8	S2	1.00	16.3	Light brown clayey sand
59312	BH9	S5	2.80	13.4	Orange gravelly clay with stones
59313	BH10	S1	0.70	14.9	Brown clay
59314	BH11	S1	0.60	14.6	Brown clay with vegetation
59315	BH12	S1	0.70	22.5	Brown clay with vegetation
59316	BH12	S2	1.80	16	Light brown gravelly clay with stones
59317	BH13	S3	1.80 - 2.00	20.9	Grey chalk with stones
59318	BH13	S6	4.10	15.1	Brown clay
59319	BH14	S1	0.40	15.5	Grey gravelly clay with stones
59320	BH14	S2	0.60 - 0.90	16.8	Brown clay with stones
59321	BH14	S4	3.00	11.3	Grey gravelly clay with stones
59322	BH15	S1	0.40 - 0.90	19.4	Brown clay with stones
59323	BH15	S2	1.00	19.5	Brown clay
59324	BH15	S4	3.60	9.8	Light brown gravelly clay
59325	BH16	S2	0.90	18.9	Brown clay
59326	BH16	S3	1.20 - 2.00	12.6	Brown clayey gravel
59327	BH16	S6	4.40	20.4	White clay

Insufficient sample ^{1/5}
 Unsuitable Sample ^{U/5}



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Soil Analysis Certificate - Methodology & Miscellaneous Information	
QTS Environmental Report No: 13-12472	
Subadra Consulting Ltd	
Site Reference: Retail Trade Park	
Project / Job Ref: In12963	
Order No: 11599	
Reporting Date: 21/01/2013	

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry	E016
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	AR	Asbestos Screening	Visual screening of samples for fibrous material	E024
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E021
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by turbidimeter	E020
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E023
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	D	Phosphorus	Determination of phosphorus by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Sulphate (as SO ₄) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	D	Sulphate (as SO ₄) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	AR	Sulphide	Determination of sulphide by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia, potassium iodide/iodate followed by ICP-OES	E002
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E009
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E009
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E010
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E009
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VPH (C6 - C10)	Determination of hydrocarbons C6-C10 by headspace GC-MS	E001
Soil	AR	EPH TEXAS	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	TPH CWG	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	TPH LQM	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	EPH (with florilil cleanup)	Determination of acetone/hexane extractable hydrocarbons with florilil cleanup step by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001

Key

D Dried
AR As Received

Laboratory Analysis Report

Report Number 003785

Sampling Date 31st January 2013
Report Date 05th February 2013

Client	Site Name/Address
Hargreaves Properties Ltd Rustington House Worthing Road Rustington West Sussex BN16 3PS	Retail Trade Park

Number of Samples	Sample Type	Analysis Completed	Blind Testing	UKAS	MCERTS
9	Water	IH QM:E9.5 based on TNRCC 1005 by GC-FID	RTCorp	Yes	No

QM E9.5: IH TPH Banded method C8 - C35 - Solvent (pentane) extraction then Liquid injection into GC-FID.
Samples were received 31-1-13
Samples were prepared and analysed 4-1-13

Analysis Report Approved By



Katherine Clark
Duty Reporting Manager



Glossary of Terms Used in This Report

Blank - A sample known to contain none of the compounds being analysed, and used to confirm that the analytical instrument is not giving false positives during analysis.

Blind Testing: Name of any blind testing scheme participated in. The laboratory's accuracy is reported as a Z score; the lower the Z score the more accurate the analysis, with a score of less than 2 considered excellent.

CRM - Certified Reference Material. A sample prepared by an accredited source and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Duplicate - A duplicate sample, used to give a measure of the repeatability of a given analysis.

External Calibration - External calibration samples are samples containing a known concentration of the compounds being analysed. They are added to the analysis sequence after every nth sample being analysed and provide confirmation that the instrument remains within its calibration range.

Field Blank - Similar to a blank sample, except a field blank accompanies the samples throughout their existence (i.e. from the site being sampled to the laboratory) and used to provide a check that the samples aren't being cross-contaminated during the transportation/storage process.

IRM - In house reference material. A sample prepared by our laboratory and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Linearity - The linearity of a given analytical method is the range of concentrations between which the analytical instrument's response is directly proportional to the concentration being analysed, and hence the range of concentrations that the instrument can be said to give quantitative results.

LOD - Limit of detection. This is the lowest response for any given compound generated at the instrument's detector, that can be differentiated from the instrument's baseline noise.

LOQ - Limit of quantification. This is the lowest concentration that a given compound can be both detected and its concentration accurately measured in a sample.

MCERTS - An accreditation scheme created by the Environment Agency for the analysis of soil samples used to determine land quality. The scheme does not apply to analysis of soil samples used for waste classification purposes or to the analysis of water samples.

Method Calibration - The means by which an analytical method is calibrated. Usually this involves analysing a number of external calibration samples, containing different concentrations of the compounds to be analysed.

Precision - A measure of the repeatability of the analysis.

Sample - The material provided by the client to the laboratory for analysis.

Sensitivity - The smallest increment in analytical result that can be reliably quantified.

Spike - Also known as an internal calibration, a spike sample is a sample to be analysed which has a known concentration of another compound added. This provides a check on that the compounds being analysed are being correctly extracted from the sample matrix.

UKAS - The UK's implementation of ISO17025, the international standard accreditation for laboratory analysis

Quality Control/Quality Assurance Information

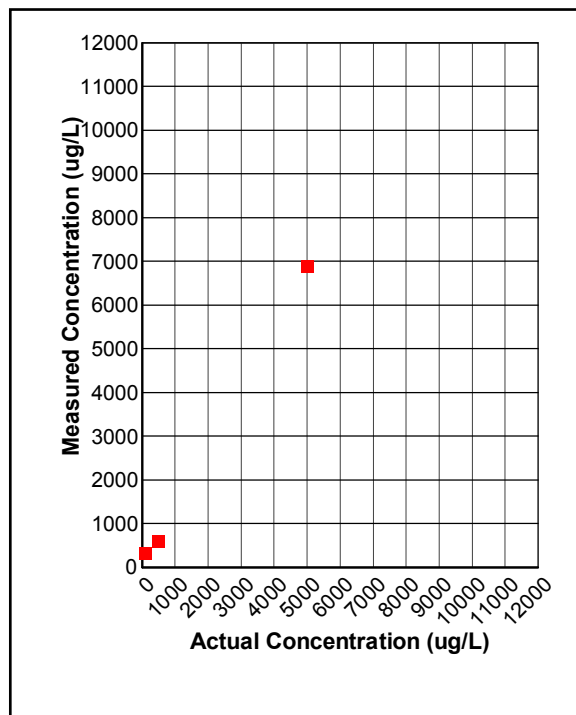
TPH Banded - Water

Our laboratory carries out a wide variety of verification analyses in order to ensure the validity of the analysis results we produce.

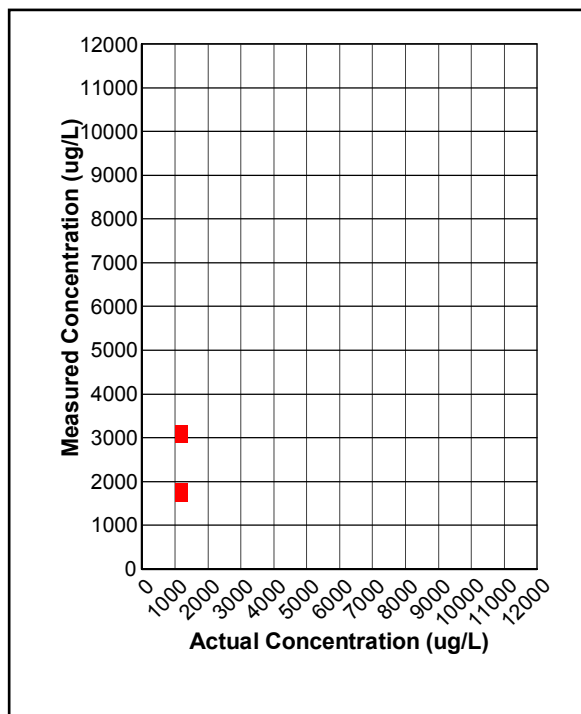
Samples are analysed in batches, usually according to the sample chain of custody form we receive. However, we also add additional samples into the sample sequence. These additional samples may include blanks, calibration samples, in-house reference material samples and duplicate samples. In addition to

this, each sample is 'spiked' with a known concentration of a compound. In the case of this analysis, we use a combination of

2-fluorobiphenyl and 1-chlorooctadecane. The results of the analyses we have carried out on the additional quality assurance samples during the ten days prior to the samples reported here are shown in the accompanying graphs. Results are reported in ug/litre for the C8-C10 band. These provide a visual indication of the stability of our laboratory analysis.



Calibration Samples - Previous 10 days



Spike Samples - Previous 10 days

Retail Trade Park

Summary of Results

TPH Banded - Water

Accreditation	UKAS	Blind Testing	RTCorp		
Results Reported As	Not Applicable	Last Three Z Scores	-0.08	-1.06	-0.09

Analysis Method Parameters			
Reporting Units	µg/litre	Limit of Detection	5ug/litre
Linearity	10-10,000 ug/litre	Limit of Quantification	10 ug/litre
Sensitivity	100 ug/litre	Precision	+/-1.0ug/litre

Sample Location	Sample	Depth	Total Petroleum Hydrocarbons				
			C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
BH4	wln12963.001001	0.84	<10	<10	<10	<10	<10
BH8	wln12963.001002	0.87	<10	<10	<10	<10	<10
BH11	wln12963.001003	1.10	<10	<10	<10	<10	<10
BH12	wln12963.001004	0.69	602	1470	3360	3720	1150
BH13	wln12963.001005	0.74	703	3380	8830	25900	130000
BH14	wln12963.001006	0.68	<10	<10	<10	<10	<10
BH5	wln12963.001007	0.79	<10	<10	<10	<10	100
BH15	wln12963.001008	0.80	<10	<10	<10	<10	<10
BH16	wln12963.001009	1.10	<10	<10	<10	<10	<10

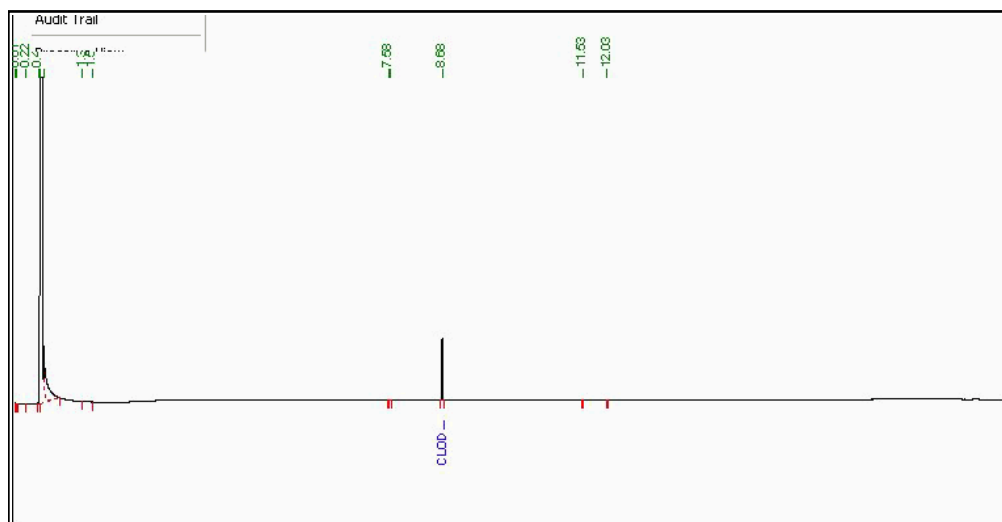
Individual Sample Results

TPH Banded - Water

Sample Location	BH4	Results Reported As	Not Applicable
Sample	wln12963.001001	Reporting Units	ug/litre
Depth(m)	0.84	Date Received	04/02/2013
Chain of Custody No.	6504	Date of Sampling	31/01/2013
Accreditation	UKAS	Date of Analysis	04/02/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.3	0.80	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

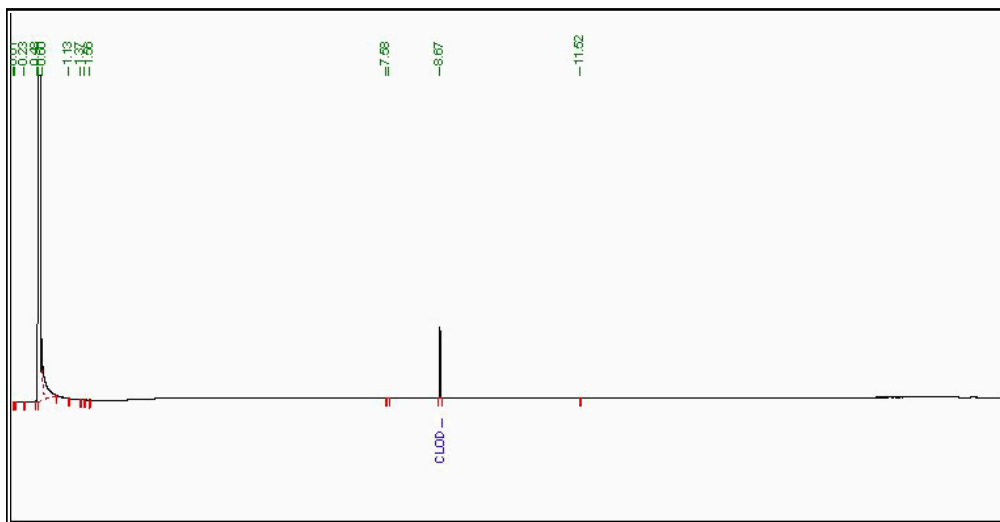
Individual Sample Results

TPH Banded - Water

Sample Location	BH8	Results Reported As	Not Applicable
Sample	wln12963.001002	Reporting Units	ug/litre
Depth(m)	0.87	Date Received	04/02/2013
Chain of Custody No.	6504	Date of Sampling	31/01/2013
Accreditation	UKAS	Date of Analysis	04/02/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.67	0.85	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

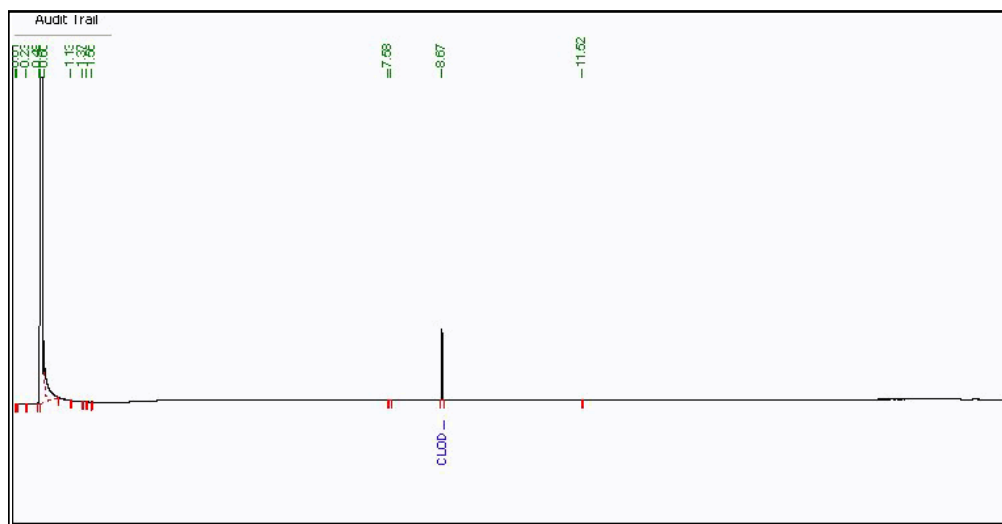
Individual Sample Results

TPH Banded - Water

Sample Location	BH11	Results Reported As	Not Applicable
Sample	wln12963.001003	Reporting Units	ug/litre
Depth(m)	1.10	Date Received	04/02/2013
Chain of Custody No.	6504	Date of Sampling	31/01/2013
Accreditation	UKAS	Date of Analysis	04/02/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.1	0.98	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Trade Park

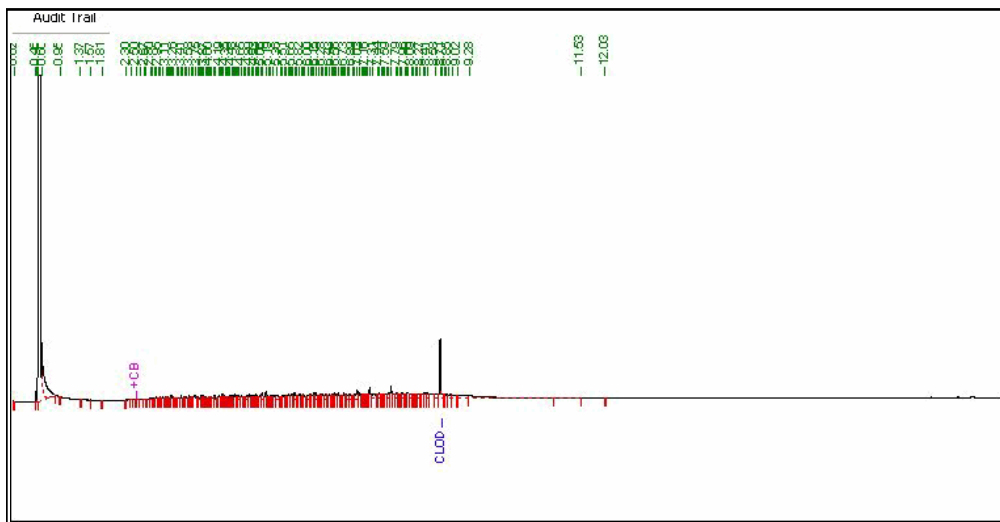
Individual Sample Results

TPH Banded - Water

Sample Location	BH12	Results Reported As	Not Applicable
Sample	wln12963.001004	Reporting Units	ug/litre
Depth(m)	0.69	Date Received	04/02/2013
Chain of Custody No.	6504	Date of Sampling	31/01/2013
Accreditation	UKAS	Date of Analysis	04/02/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	125.15	1.02	0.00	602	1470	3360	3720	1150

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

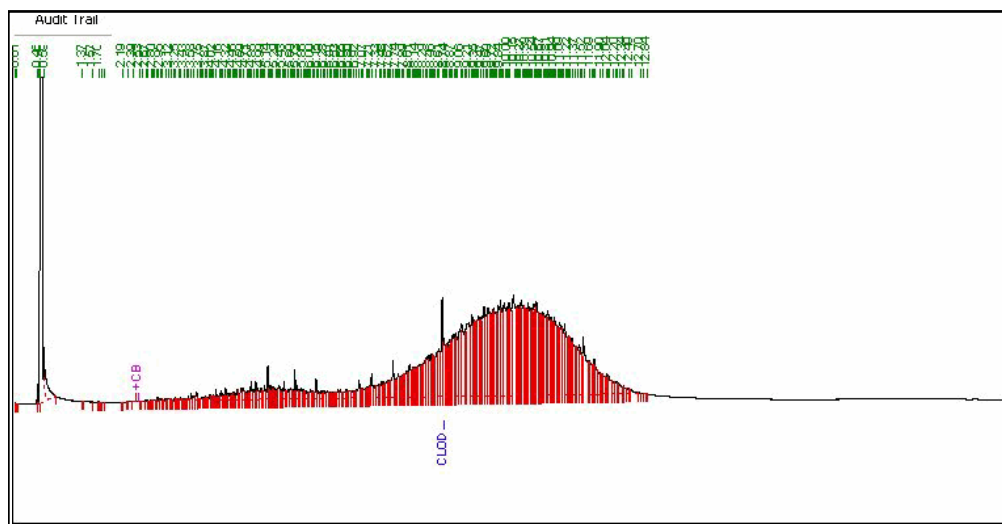
Individual Sample Results

TPH Banded - Water

Sample Location	BH13	Results Reported As	Not Applicable
Sample	wln12963.001005	Reporting Units	ug/litre
Depth(m)	0.74	Date Received	04/02/2013
Chain of Custody No.	6504	Date of Sampling	31/01/2013
Accreditation	UKAS	Date of Analysis	04/02/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.25	0.90	0.00	703	3380	8830	25900	130000

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

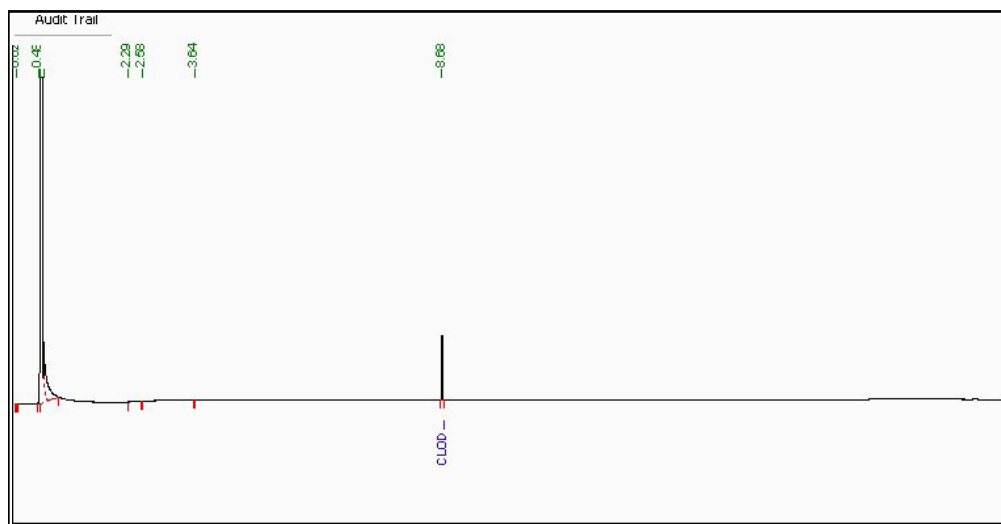
Individual Sample Results

TPH Banded - Water

Sample Location	BH14	Results Reported As	Not Applicable
Sample	wln12963.001006	Reporting Units	ug/litre
Depth(m)	0.68	Date Received	04/02/2013
Chain of Custody No.	6504	Date of Sampling	31/01/2013
Accreditation	UKAS	Date of Analysis	04/02/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	125.35	0.89	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

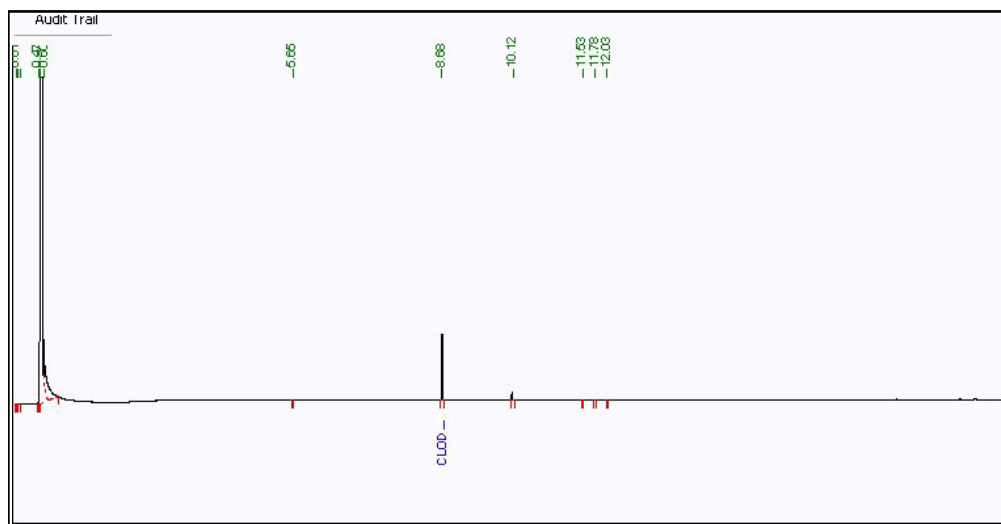
Individual Sample Results

TPH Banded - Water

Sample Location	BH5	Results Reported As	Not Applicable
Sample	wln12963.001007	Reporting Units	ug/litre
Depth(m)	0.79	Date Received	04/02/2013
Chain of Custody No.	6504	Date of Sampling	31/01/2013
Accreditation	UKAS	Date of Analysis	04/02/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	116.38	0.97	0.00	<10	<10	<10	<10	100

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

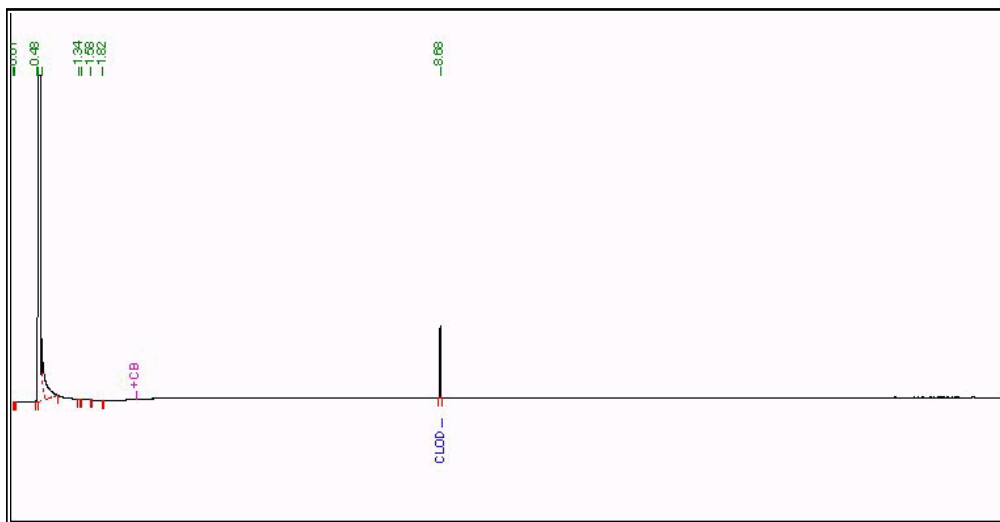
Individual Sample Results

TPH Banded - Water

Sample Location	BH15	Results Reported As	Not Applicable
Sample	wln12963.001008	Reporting Units	ug/litre
Depth(m)	0.80	Date Received	04/02/2013
Chain of Custody No.	6504	Date of Sampling	31/01/2013
Accreditation	UKAS	Date of Analysis	04/02/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.64	0.90	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



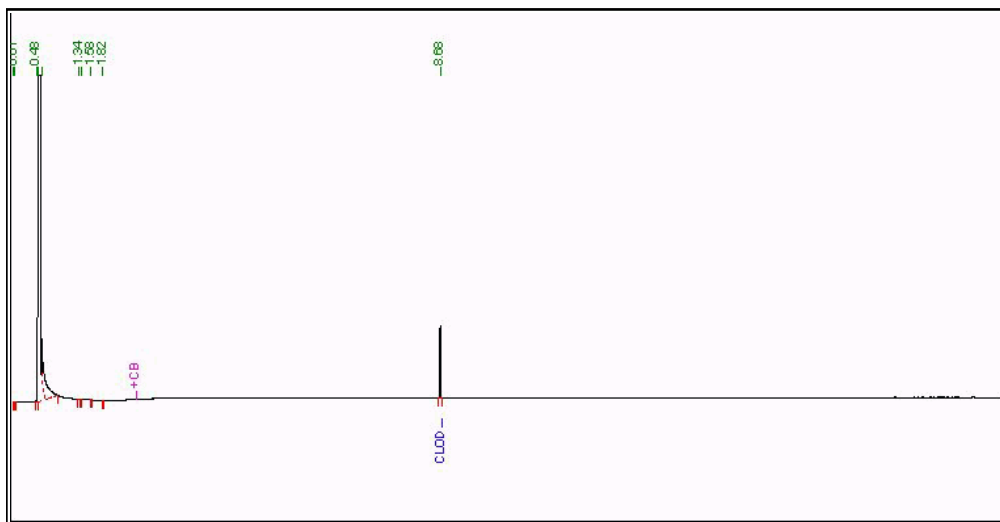
Individual Sample Results

TPH Banded - Water

Sample Location	BH16	Results Reported As	Not Applicable
Sample	wln12963.001009	Reporting Units	ug/litre
Depth(m)	1.10	Date Received	04/02/2013
Chain of Custody No.	6504	Date of Sampling	31/01/2013
Accreditation	UKAS	Date of Analysis	04/02/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	125.25	0.99	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Retail Trade Park

End of Report



James Skinner
Subadra Consulting Ltd
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HP22 5BL

QTS Environmental Ltd
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Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 851105
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 13-12778

Site Reference: Retail Trade Park

Project / Job Ref: In12963

Order No: 11669

Sample Receipt Date: 01/02/2013

Sample Scheduled Date: 01/02/2013

Report Issue Number: 1

Reporting Date: 11/02/2013

Authorised by:

Russell Jarvis
Director

On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director

On behalf of QTS Environmental Ltd



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 851105

Water Analysis Certificate					
QTS Environmental Report No: 13-12778	Date Sampled	30/01/13	30/01/13	30/01/13	30/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH8	BH11	BH13	BH15
Project / Job Ref: In12963	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 11669	Depth (m)	0.87	1.10	0.74	0.80
Reporting Date: 11/02/2013	QTSE Sample No	60661	60662	60664	60666

Determinand	Unit	MDL	Accreditation					
Arsenic (dissolved)	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Barium (dissolved)	ug/l	< 20	NONE	195	218	181	< 20	
Beryllium (dissolved)	ug/l	< 1	NONE	< 1	< 1	< 1	< 1	
Boron (dissolved)	ug/l	< 50	NONE	< 50	< 50	< 50	< 50	
Cadmium (dissolved)	ug/l	< 0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	
Chromium (dissolved)	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	
Chromium (hexavalent)	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	
Copper (dissolved)	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Lead (dissolved)	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	
Mercury (dissolved)	ug/l	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Nickel (dissolved)	ug/l	< 7	NONE	< 7	< 7	< 7	< 7	
Selenium (dissolved)	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	
Vanadium (dissolved)	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	
Zinc (dissolved)	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	

Subcontracted analysis ^(S)



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 851105

Water Analysis Certificate - Speciated PAH						
QTS Environmental Report No: 13-1	Date Sampled	30/01/13	30/01/13	30/01/13	30/01/13	30/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH4	BH12	BH13	BH14	BH15
Project / Job Ref: In12963	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 11669	Depth (m)	0.84	0.69	0.74	0.68	0.80
Reporting Date: 11/02/2013	QTSE Sample No	60659	60663	60664	60665	60666

Determinand	Unit	MDL	Accreditation					
Naphthalene	ug/l	< 0.01	NONE	< 0.01	7.52	< 0.01	< 0.01	< 0.01
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01	0.64	< 0.01	< 0.01	< 0.01
Acenaphthene	ug/l	< 0.01	NONE	< 0.01	3.02	0.10	< 0.01	< 0.01
Fluorene	ug/l	< 0.01	NONE	< 0.01	3.65	0.12	< 0.01	< 0.01
Phenanthrene	ug/l	< 0.01	NONE	< 0.01	4.37	0.11	< 0.01	< 0.01
Anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	ug/l	< 0.01	NONE	< 0.01	0.21	< 0.01	< 0.01	< 0.01
Pyrene	ug/l	< 0.01	NONE	< 0.01	0.76	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total EPA-16 PAHs	ug/l	< 0.01	NONE	< 0.01	20.17	0.33	< 0.01	< 0.01



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 851105

Water Analysis Certificate - Speciated PAH						
QTS Environmental Report No: 13-1	Date Sampled	30/01/13				
Subadra Consulting Ltd	Time Sampled	None Supplied				
Site Reference: Retail Trade Park	TP / BH No	BH16				
Project / Job Ref: In12963	Additional Refs	None Supplied				
Order No: 11669	Depth (m)	1.10				
Reporting Date: 11/02/2013	QTSE Sample No	60667				

Determinand	Unit	MDL	Accreditation				
Naphthalene	ug/l	< 0.01	NONE	< 0.01			
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01			
Acenaphthene	ug/l	< 0.01	NONE	< 0.01			
Fluorene	ug/l	< 0.01	NONE	< 0.01			
Phenanthrene	ug/l	< 0.01	NONE	< 0.01			
Anthracene	ug/l	< 0.01	NONE	< 0.01			
Fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Pyrene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01			
Chrysene	ug/l	< 0.01	NONE	< 0.01			
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01			
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01			
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01			
Benzo(ghi)perylene	ug/l	< 0.01	NONE	< 0.01			
Total EPA-16 PAHs	ug/l	< 0.01	NONE	< 0.01			



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 851105

Water Analysis Certificate - TPH CWG Banded						
QTS Environmental Report No: 13-12778	Date Sampled	30/01/13	30/01/13			
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Retail Trade Park	TP / BH No	BH4	BH12			
Project / Job Ref: In12963	Additional Refs	None Supplied	None Supplied			
Order No: 11669	Depth (m)	0.84	0.69			
Reporting Date: 11/02/2013	QTSE Sample No	60659	60663			

Determinand	Unit	MDL	Accreditation					
Aliphatic >C5 - C6	ug/l	< 10	NONE	< 10	< 10			
Aliphatic >C6 - C8	ug/l	< 10	NONE	< 10	184			
Aliphatic >C8 - C10	ug/l	< 10	NONE	< 10	27			
Aliphatic >C10 - C12	ug/l	< 10	NONE	< 10	42			
Aliphatic >C12 - C16	ug/l	< 10	NONE	< 10	229			
Aliphatic >C16 - C21	ug/l	< 10	NONE	< 10	485			
Aliphatic >C21 - C34	ug/l	< 10	NONE	< 10	163			
Aliphatic (C5 - C34)	ug/l	< 70	NONE	< 70	1130			
Aromatic >C5 - C7	ug/l	< 10	NONE	< 10	< 10			
Aromatic >C7 - C8	ug/l	< 10	NONE	< 10	< 10			
Aromatic >C8 - C10	ug/l	< 10	NONE	< 10	17			
Aromatic >C10 - C12	ug/l	< 10	NONE	< 10	2772			
Aromatic >C12 - C16	ug/l	< 10	NONE	< 10	1456			
Aromatic >C16 - C21	ug/l	< 10	NONE	< 10	359			
Aromatic >C21 - C35	ug/l	< 10	NONE	< 10	120			
Aromatic (C5 - C35)	ug/l	< 70	NONE	< 70	4724			
Total >C5 - C35	ug/l	< 140	NONE	< 140	5854			



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 851105



Water Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 13-12778	Date Sampled	30/01/13	30/01/13			
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Retail Trade Park	TP / BH No	BH4	BH12			
Project / Job Ref: In12963	Additional Refs	None Supplied	None Supplied			
Order No: 11669	Depth (m)	0.84	0.69			
Reporting Date: 11/02/2013	QTSE Sample No	60659	60663			

Determinand	Unit	MDL	Accreditation					
Benzene	ug/l	< 5	ISO17025	< 5	< 5			
Toluene	ug/l	< 5	ISO17025	< 5	< 5			
Ethylbenzene	ug/l	< 5	ISO17025	< 5	< 5			
p & m-xylene	ug/l	< 10	ISO17025	< 10	< 10			
o-xylene	ug/l	< 5	ISO17025	< 5	< 5			



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Rose Lane
Lenham Heath
Maidstone
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Tel : 01622 851105



Water Analysis Certificate - Volatile Organic Compounds (VOC)

QTS Environmental Report No: 13-12778	Date Sampled	30/01/13	30/01/13	30/01/13	30/01/13	30/01/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Trade Park	TP / BH No	BH4	BH5	BH13	BH14	BH15
Project / Job Ref: In12963	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 11669	Depth (m)	0.84	0.79	0.74	0.68	0.80
Reporting Date: 11/02/2013	QTSE Sample No	60659	60660	60664	60665	60666

Determinand	Unit	MDL	Accreditation					
Dichlorodifluoromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chloromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromomethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Trichlorofluoromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
MTBE	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
trans-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
2,2-Dichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chloroform	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromochloromethane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1-Dichloropropene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
Benzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Trichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromodichloromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Dibromomethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
TAME	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Toluene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
1,3-Dichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2-Dibromoethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1,1,2-Tetrachloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Ethyl Benzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
m,p-Xylene	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
o-Xylene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Styrene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromoform	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
Isopropylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
1,2,3-Trichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
n-Propylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
2-Chlorotoluene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,3,5-Trimethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
4-Chlorotoluene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
tert-Butylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2,4-Trimethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
sec-Butylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
p-Isopropyltoluene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,3-Dichlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,4-Dichlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
n-Butylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2-Dichlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2-Dibromo-3-chloropropane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5



QTS Environmental Ltd
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Water Analysis Certificate - Volatile Organic Compounds (VOC)

QTS Environmental Report No: 13-12778	Date Sampled	30/01/13				
Subadra Consulting Ltd	Time Sampled	None Supplied				
Site Reference: Retail Trade Park	TP / BH No	BH16				
Project / Job Ref: In12963	Additional Refs	None Supplied				
Order No: 11669	Depth (m)	1.10				
Reporting Date: 11/02/2013	QTSE Sample No	60667				

Determinand	Unit	MDL	Accreditation				
Dichlorodifluoromethane	ug/l	< 5	ISO17025	< 5			
Vinyl Chloride	ug/l	< 5	ISO17025	< 5			
Chloromethane	ug/l	< 5	ISO17025	< 5			
Chloroethane	ug/l	< 5	ISO17025	< 5			
Bromomethane	ug/l	< 5	ISO17025	< 5			
Trichlorofluoromethane	ug/l	< 5	ISO17025	< 5			
1,1-Dichloroethene	ug/l	< 5	ISO17025	< 5			
MTBE	ug/l	< 10	ISO17025	< 10			
trans-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5			
1,1-Dichloroethane	ug/l	< 5	ISO17025	< 5			
cis-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5			
2,2-Dichloropropane	ug/l	< 5	ISO17025	< 5			
Chloroform	ug/l	< 5	ISO17025	< 5			
Bromochloromethane	ug/l	< 10	ISO17025	< 10			
1,1,1-Trichloroethane	ug/l	< 5	ISO17025	< 5			
1,1-Dichloropropene	ug/l	< 5	ISO17025	< 5			
Carbon Tetrachloride	ug/l	< 5	ISO17025	< 5			
1,2-Dichloroethane	ug/l	< 10	ISO17025	< 10			
Benzene	ug/l	< 5	ISO17025	< 5			
1,2-Dichloropropane	ug/l	< 5	ISO17025	< 5			
Trichloroethene	ug/l	< 5	ISO17025	< 5			
Bromodichloromethane	ug/l	< 5	ISO17025	< 5			
Dibromomethane	ug/l	< 5	ISO17025	< 5			
TAME	ug/l	< 5	ISO17025	< 5			
cis-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5			
Toluene	ug/l	< 5	ISO17025	< 5			
trans-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5			
1,1,2-Trichloroethane	ug/l	< 10	ISO17025	< 10			
1,3-Dichloropropane	ug/l	< 5	ISO17025	< 5			
Tetrachloroethene	ug/l	< 5	ISO17025	< 5			
Dibromochloromethane	ug/l	< 5	ISO17025	< 5			
1,2-Dibromoethane	ug/l	< 5	ISO17025	< 5			
Chlorobenzene	ug/l	< 5	ISO17025	< 5			
1,1,1,2-Tetrachloroethane	ug/l	< 5	ISO17025	< 5			
Ethyl Benzene	ug/l	< 5	ISO17025	< 5			
m,p-Xylene	ug/l	< 10	ISO17025	< 10			
o-Xylene	ug/l	< 5	ISO17025	< 5			
Styrene	ug/l	< 5	ISO17025	< 5			
Bromoform	ug/l	< 10	ISO17025	< 10			
Isopropylbenzene	ug/l	< 5	ISO17025	< 5			
1,1,2,2-Tetrachloroethane	ug/l	< 10	ISO17025	< 10			
1,2,3-Trichloropropane	ug/l	< 5	ISO17025	< 5			
n-Propylbenzene	ug/l	< 5	ISO17025	< 5			
Bromobenzene	ug/l	< 5	ISO17025	< 5			
2-Chlorotoluene	ug/l	< 5	ISO17025	< 5			
1,3,5-Trimethylbenzene	ug/l	< 5	ISO17025	< 5			
4-Chlorotoluene	ug/l	< 5	ISO17025	< 5			
tert-Butylbenzene	ug/l	< 5	ISO17025	< 5			
1,2,4-Trimethylbenzene	ug/l	< 5	ISO17025	< 5			
sec-Butylbenzene	ug/l	< 5	ISO17025	< 5			
p-Isopropyltoluene	ug/l	< 5	ISO17025	< 5			
1,3-Dichlorobenzene	ug/l	< 5	ISO17025	< 5			
1,4-Dichlorobenzene	ug/l	< 5	ISO17025	< 5			
n-Butylbenzene	ug/l	< 5	ISO17025	< 5			
1,2-Dichlorobenzene	ug/l	< 5	ISO17025	< 5			
1,2-Dibromo-3-chloropropane	ug/l	< 10	ISO17025	< 10			
Hexachlorobutadiene	ug/l	< 5	ISO17025	< 5			

ATTACHMENT FIVE: GEOTECHNICAL ANALYSIS DATA

Dynamic Probe No. DP1/Borehole BH1

SUBADRA

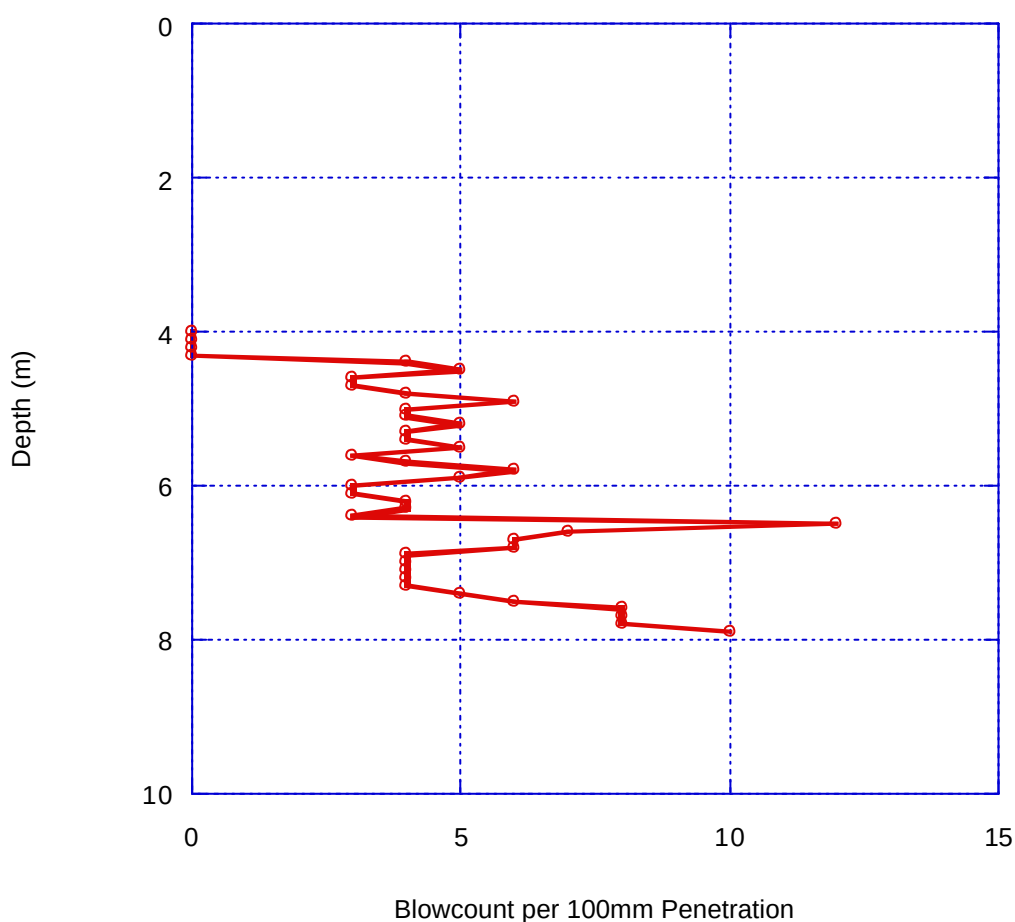
Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL

Tel. 01296 739400 Fax. 01296 739401

Email: consultants@subadra.com Web: www.subadra.com

Drive Weight:	63.5kg	Cone Area	20cm ²	Rod Diameter	35mm
Drop Height:	750mm	Cone Diameter	50.5mm	Rod Mass	8kg/m
Probe Type:	DPSH	Cone Length	55.3mm	Equipment	Terrier



Comments:

Dynamic probing started at base of borehole at 4.0m

Rods dropped from 4.0m to 4.4m depth under their own weight.

Dynamic Probe No. DP2/Borehole BH2

SUBADRA

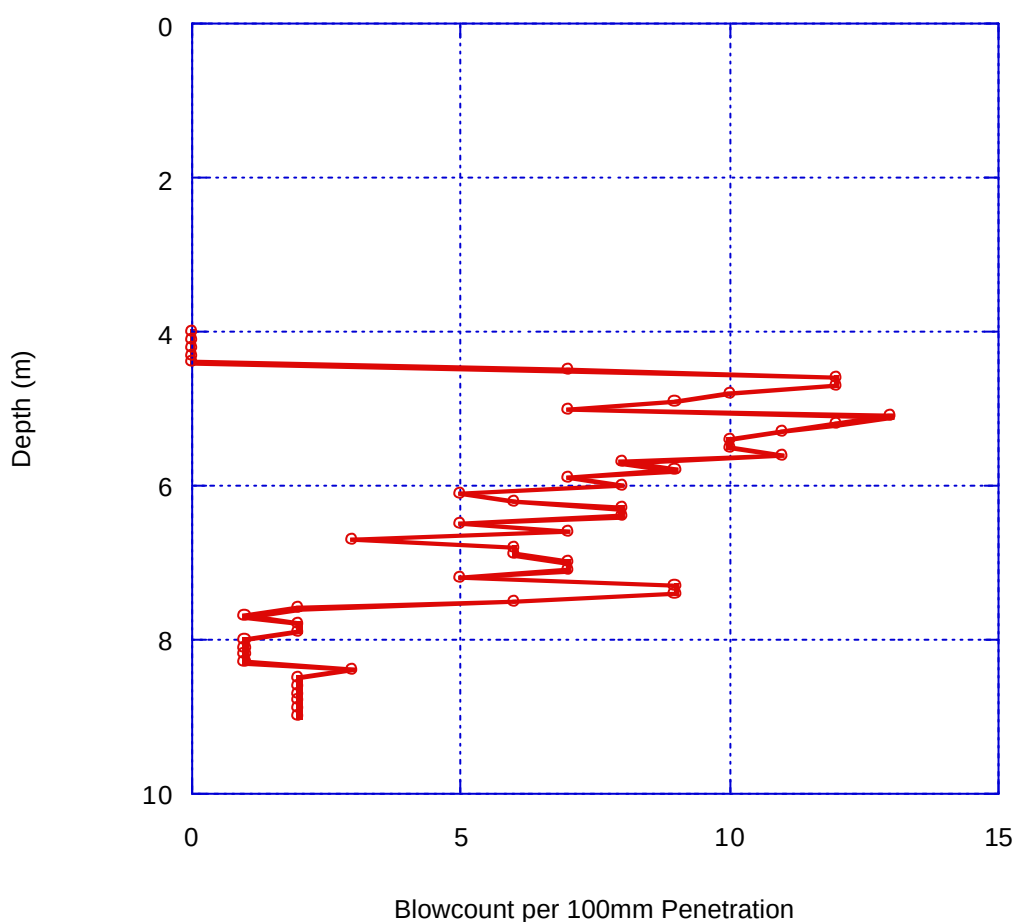
Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL

Tel. 01296 739400 Fax. 01296 739401

Email: consultants@subadra.com Web: www.subadra.com

Drive Weight:	63.5kg	Cone Area	20cm ²	Rod Diameter	35mm
Drop Height:	750mm	Cone Diameter	50.5mm	Rod Mass	8kg/m
Probe Type:	DPSH	Cone Length	55.3mm	Equipment	Comacchio 205



Comments:

Dynamic probing started at base of borehole at 4.0m

Rods dropped from 4.0m to 4.5m depth under their own weight

Dynamic Probe No. DP7/Borehole BH7

SUBADRA

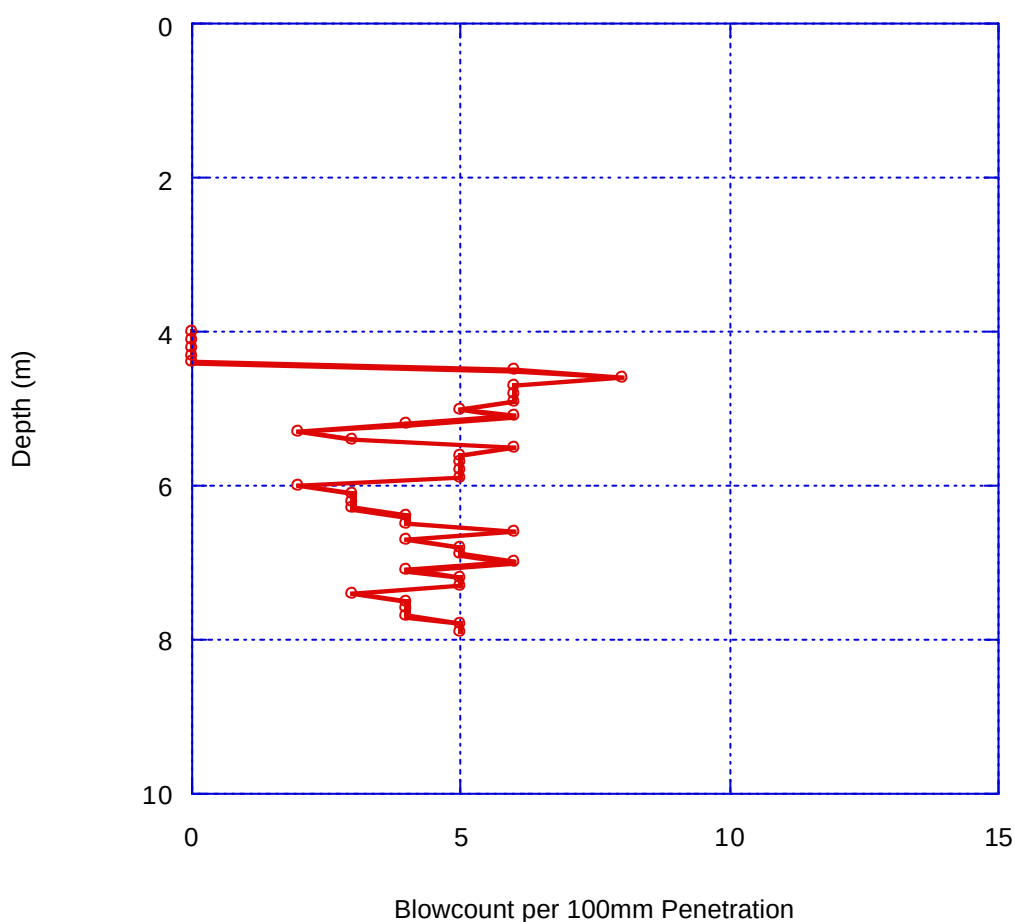
Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL

Tel. 01296 739400 Fax. 01296 739401

Email: consultants@subadra.com Web: www.subadra.com

Drive Weight:	63.5kg	Cone Area	20cm ²	Rod Diameter	35mm
Drop Height:	750mm	Cone Diameter	50.5mm	Rod Mass	8kg/m
Probe Type:	DPSH	Cone Length	55.3mm	Equipment	Comacchio 205



Comments:

Dynamic probing started at base of borehole at 4.0m

Rods dropped from 4.0m to 4.6m depth under their own weight.

**Dynamic Probe No. DP11/ Borehole
BH11**

SUBADRA

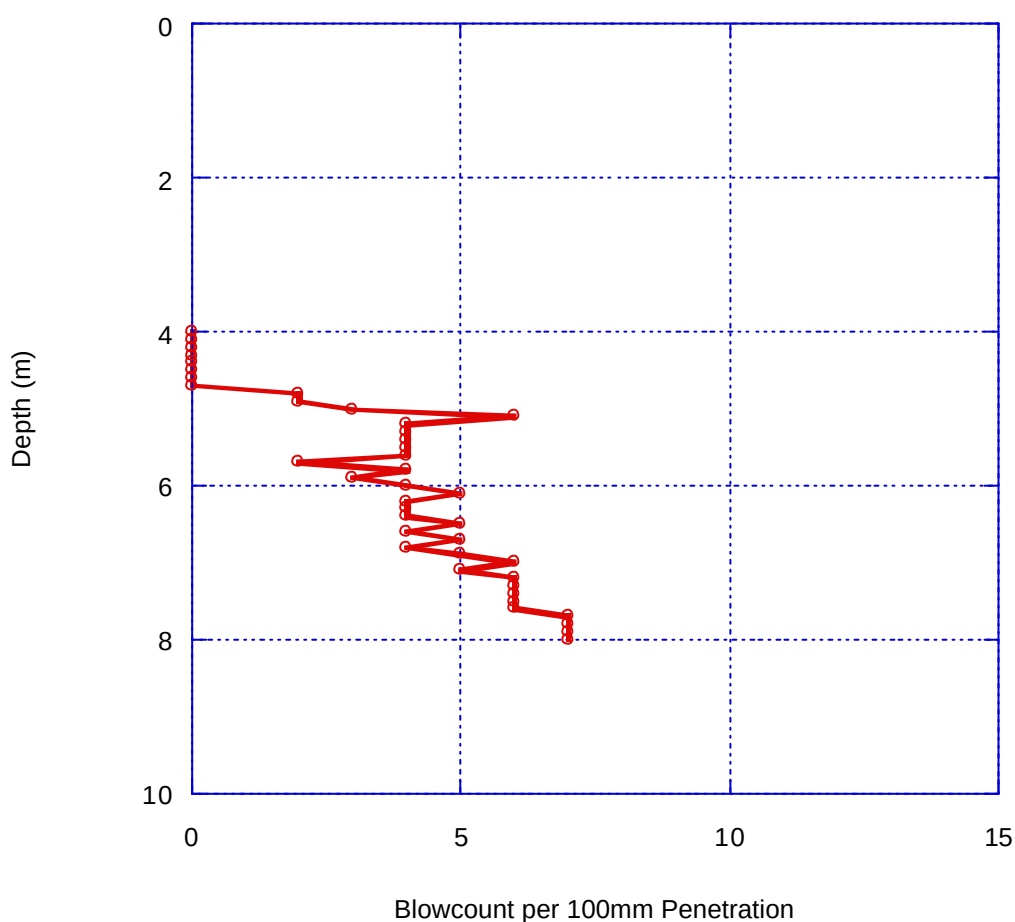
Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL

Tel. 01296 739400 Fax. 01296 739401

Email: consultants@subadra.com Web: www.subadra.com

Drive Weight:	63.5kg	Cone Area	20cm ²	Rod Diameter	35mm
Drop Height:	750mm	Cone Diameter	50.5mm	Rod Mass	8kg/m
Probe Type:	DPSH	Cone Length	55.3mm	Equipment	Comacchio 205



Comments:

Dynamic probing started at base of borehole at 4.0m

Rods dropped from 4.0m to 4.7m depth under their own weight.

Dynamic Probe No. DP15

SUBADRA

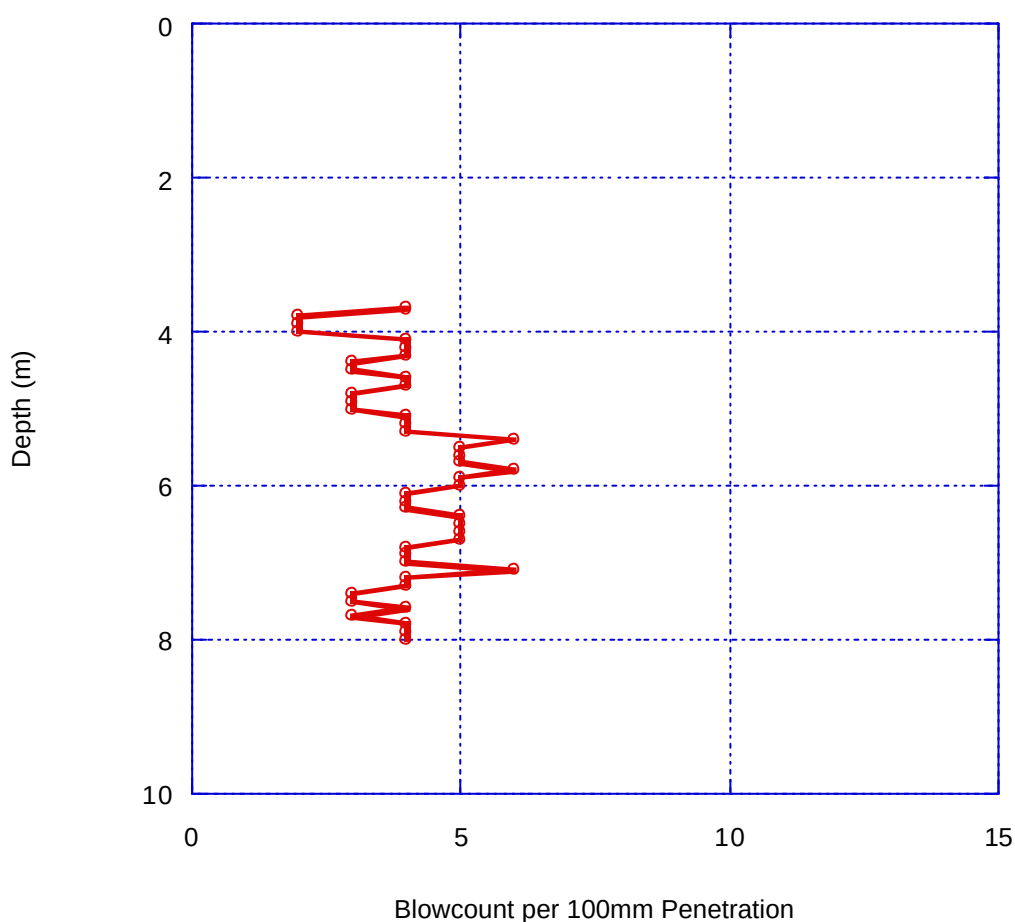
Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL

Tel. 01296 739400 Fax. 01296 739401

Email: consultants@subadra.com Web: www.subadra.com

Drive Weight:	63.5kg	Cone Area	20cm ²	Rod Diameter	35mm
Drop Height:	750mm	Cone Diameter	50.5mm	Rod Mass	8kg/m
Probe Type:	DPSH	Cone Length	55.3mm	Equipment	Comacchio 205



Comments:

Dynamic probing started at base of borehole at 3.6



Laboratory Report



Contract Number: 18346

Client's Reference: IN12963 PO11600

Report Date: 25-01-2013

Client Name: Subadra Consulting Ltd
Unit 13
Triangle Business Park,
Wendover Road
Stoke Mandeville
Bucks
HP22 5BL

Contract Title: Retail Trade Park
For the attention of: James Skinner

Date Received: 16-01-2013
Date Commenced: 16-01-2013
Date Completed: 25-01-2013

Test Description	Quantity	Checked	Approved
Moisture Content 1377 : 1990 Part 2 : 3.2 *	3		
4 Point Liquid & Plastic Limit (LL/PL) Part 2 : 4.3 & 5.3 *	3		
PSD Wet Sieve method 1377 : 1990 Part 2 : 9.2 *	3		

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
* - Denotes test included in laboratory scope of accreditation
- Denotes test carried out by approved contractor

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Approved Signatories:

Paul Evans (Quality Manager), Emma Williams (Office Manager),
Benjamin Sharp (Laboratory Coordinator), Alex Wynn (Business Development Manager).

Client ref: IN12963
Location: Retail Trade Park
Contract Number: 18346-160113

[illegible]

Note: Results on this table are in summary format and may not meet the requirements of the relevant standards, additional information is held by the laboratory



Checked By

DP Gang

Date Approved: **25.1.13**

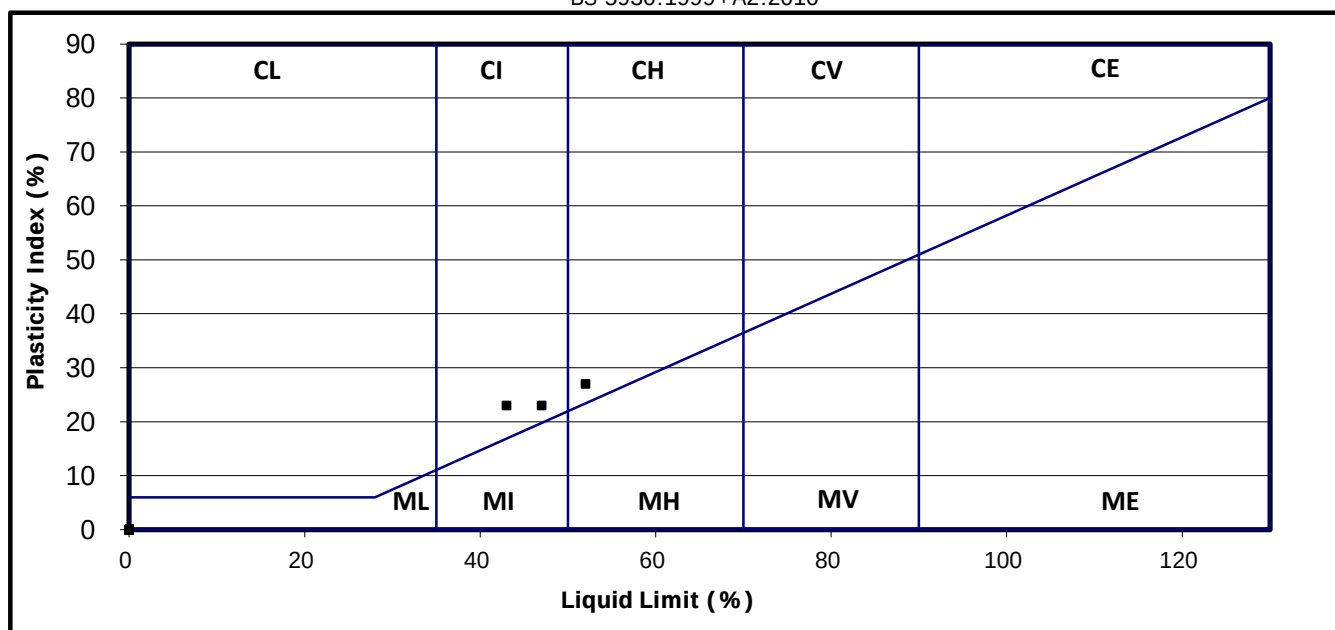
**Test Report: Method of the Determination of the plastic limit and plasticity index
BS 1377 : Part 2 : 1990 Method 5**

Client ref: IN12963
Location: Retail Trade Park
Contract Number: 18346-160113

Hole/ Sample Number	Sample Type	Depth m	Moisture Content % Cl. 3.2	Liquid Limit % Cl. 4.3/4.4	Plastic Limit % Cl. 5.	Plasticity Index % Cl. 6.	% Passing .425mm	Remarks
BH6/2		1.00 - 1.60	21	47	24	23	100	CI Intermediate Plasticity
BH8/3		1.20 - 1.90	24	52	25	27	90	CH High Plasticity
BH9/3		1.20 - 1.70	22	43	20	23	90	CI Intermediate Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

BS 5930:1999+A2:2010



[Signature]
Checked By

Date Approved: 21.1.13

[Signature]
Approved By:

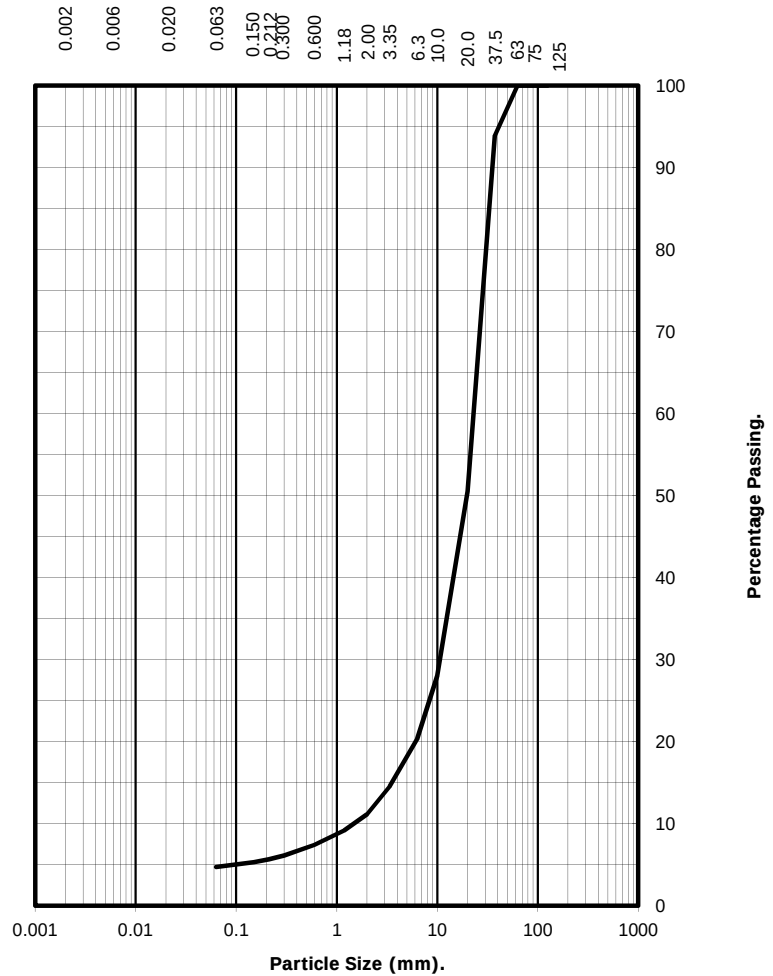


Test Report: Particle Size Distribution Test
BS 1377 Part 2:1990.
Wet Sieve, Clause 9.2

Client ref: IN12963 PO11600
Location: Retail Trade Park
Contract Number: 18346-160113
Hole Number: BH2
Sample Number:
Depth (m) : 2.30-3.00
Sample Type: B

BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	94
20	50
10	28
6.3	20
3.35	15
2.00	11
1.18	9
0.60	7
0.300	6
0.212	6
0.150	5
0.063	5

Particle Diameter	Percentage Passing
0.02	#
0.006	#
0.002	#



	Silt and Clay	Sand	Gravel	Cobbles	Soil Fraction
	5	6	89	0	Total Percentage

Remarks:

#- not determined



Checked By

Date Approved:

Approved By:

25.1.13

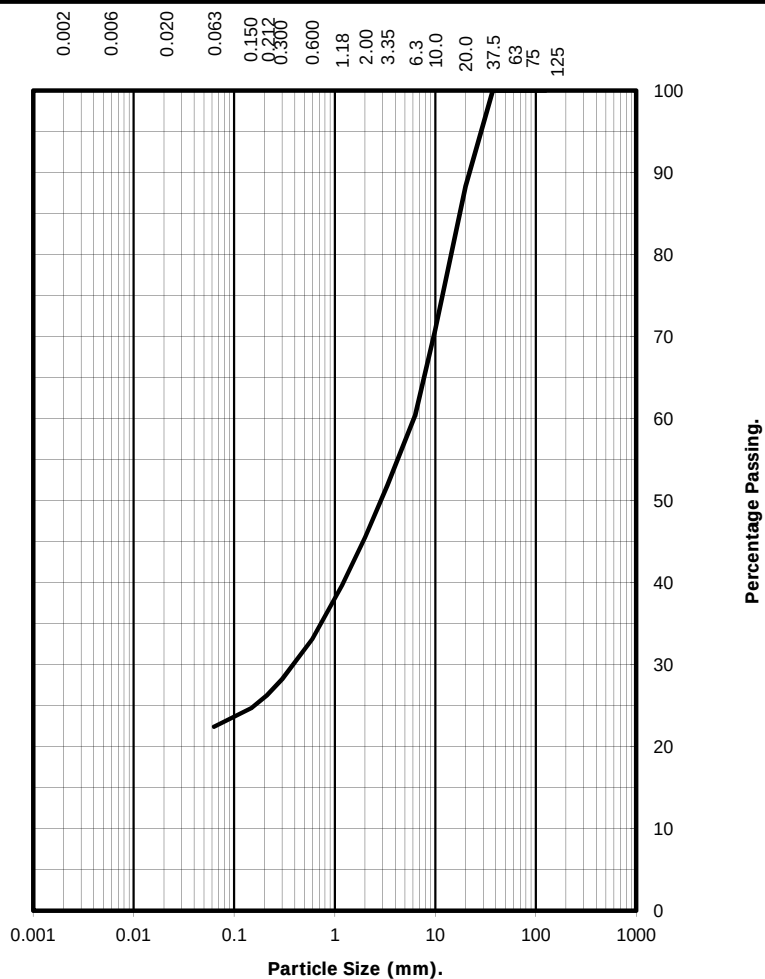


Test Report: Particle Size Distribution Test
BS 1377 Part 2:1990.
Wet Sieve, Clause 9.2

Client ref: IN12963 PO11600
Location: Retail Trade Park
Contract Number: 18346-160113
Hole Number: BH10
Sample Number:
Depth (m) : 4.40-4.70
Sample Type: B

BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	88
10	71
6.3	60
3.35	52
2.00	46
1.18	40
0.60	33
0.300	28
0.212	26
0.150	25
0.063	22

Particle Diameter	Percentage Passing
0.02	#
0.006	#
0.002	#



	Silt and Clay	Sand	Gravel	Cobbles	Soil Fraction
	22	24	54	0	Total Percentage

Remarks:

#- not determined



Checked By

Date Approved:

Approved By:

25.1.13

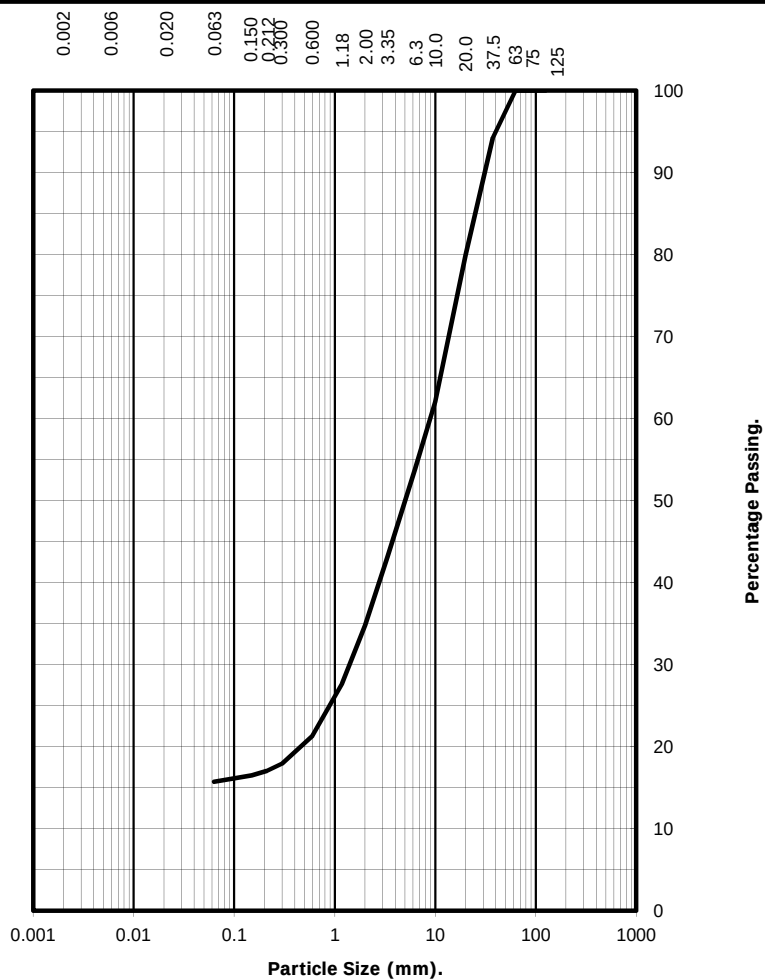


Test Report: Particle Size Distribution Test
BS 1377 Part 2:1990.
Wet Sieve, Clause 9.2

Client ref: IN12963 PO11600
Location: Retail Trade Park
Contract Number: 18346-160113
Hole Number: BH11
Sample Number:
Depth (m) : 2.50-3.00
Sample Type: B

BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	94
20	80
10	62
6.3	54
3.35	43
2.00	35
1.18	28
0.60	21
0.300	18
0.212	17
0.150	16
0.063	16

Particle Diameter	Percentage Passing
0.02	#
0.006	#
0.002	#



	Silt and Clay	Sand	Gravel	Cobbles	Soil Fraction
	16	19	65	0	Total Percentage

Remarks:

#- not determined



[Signature]
 Checked By

[Signature]
 Approved By:

Date Approved: 25.1.13



ATTACHMENT FIVE: GEOTECHNICAL ANALYSIS DATA



Laboratory Report



Contract Number: 18346

Client's Reference: IN12963 PO11600

Report Date: 25-01-2013

Client Name: Subadra Consulting Ltd
Unit 13
Triangle Business Park,
Wendover Road
Stoke Mandeville
Bucks
HP22 5BL

Contract Title: Retail Trade Park
For the attention of: James Skinner

Date Received: 16-01-2013
Date Commenced: 16-01-2013
Date Completed: 25-01-2013

Test Description	Quantity	Checked	Approved
Moisture Content 1377 : 1990 Part 2 : 3.2 *	3		
4 Point Liquid & Plastic Limit (LL/PL) Part 2 : 4.3 & 5.3 *	3		
PSD Wet Sieve method 1377 : 1990 Part 2 : 9.2 *	3		

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
* - Denotes test included in laboratory scope of accreditation
- Denotes test carried out by approved contractor

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Approved Signatories:

Paul Evans (Quality Manager), Emma Williams (Office Manager),
Benjamin Sharp (Laboratory Coordinator), Alex Wynn (Business Development Manager).

Client ref: IN12963
Location: Retail Trade Park
Contract Number: 18346-160113

[illegible]

Note: Results on this table are in summary format and may not meet the requirements of the relevant standards, additional information is held by the laboratory



Checked By

DP Gang

Date Approved: **25.1.13**

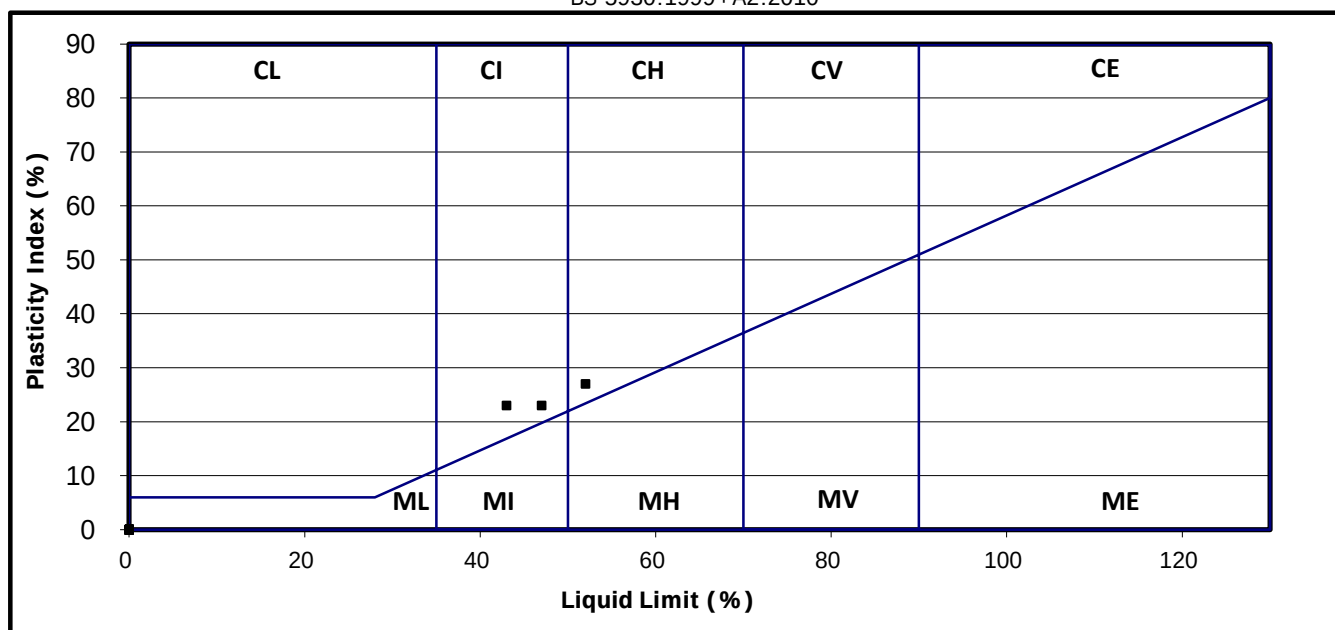
**Test Report: Method of the Determination of the plastic limit and plasticity index
BS 1377 : Part 2 : 1990 Method 5**

Client ref: IN12963
Location: Retail Trade Park
Contract Number: 18346-160113

Hole/ Sample Number	Sample Type	Depth m	Moisture Content % Cl. 3.2	Liquid Limit % Cl. 4.3/4.4	Plastic Limit % Cl. 5.	Plasticity Index % Cl. 6.	% Passing .425mm	Remarks
BH6/2		1.00 - 1.60	21	47	24	23	100	CI Intermediate Plasticity
BH8/3		1.20 - 1.90	24	52	25	27	90	CH High Plasticity
BH9/3		1.20 - 1.70	22	43	20	23	90	CI Intermediate Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

BS 5930:1999+A2:2010



lud
Checked By

Date Approved: 21.1.13

B. Shep
Approved By:

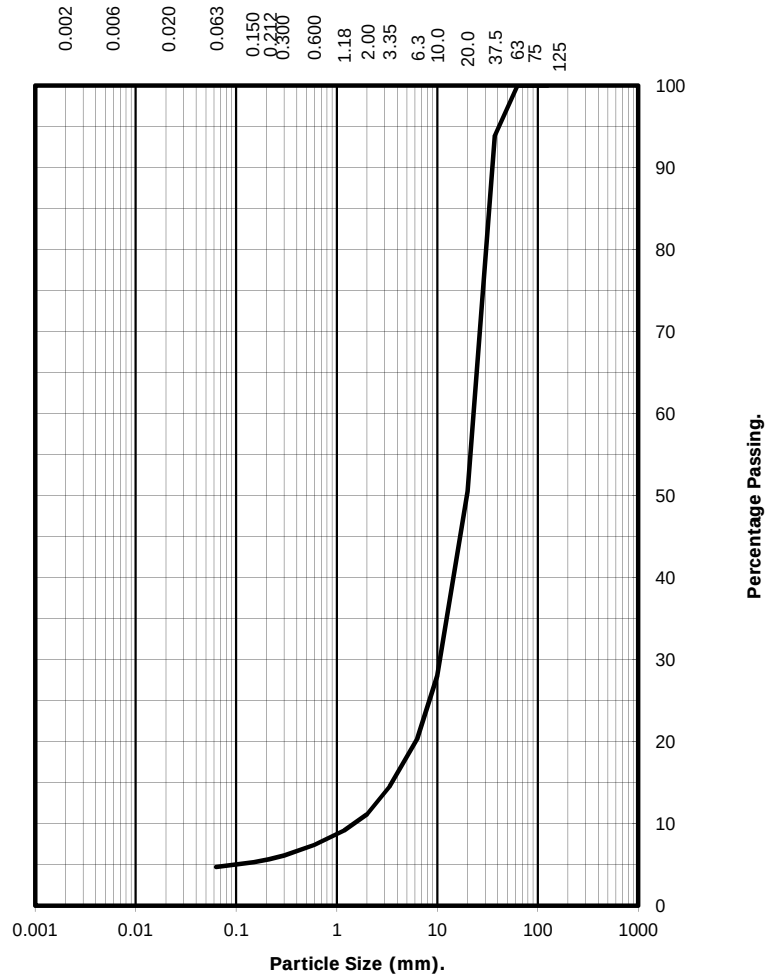


Test Report: Particle Size Distribution Test
BS 1377 Part 2:1990.
Wet Sieve, Clause 9.2

Client ref: IN12963 PO11600
Location: Retail Trade Park
Contract Number: 18346-160113
Hole Number: BH2
Sample Number:
Depth (m) : 2.30-3.00
Sample Type: B

BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	94
20	50
10	28
6.3	20
3.35	15
2.00	11
1.18	9
0.60	7
0.300	6
0.212	6
0.150	5
0.063	5

Particle Diameter	Percentage Passing
0.02	#
0.006	#
0.002	#



	Silt and Clay	Sand	Gravel	Cobbles	Soil Fraction
	5	6	89	0	Total Percentage

Remarks:

#- not determined



[Signature]
 Checked By

[Signature]
 Approved By:

Date Approved: 25.1.13

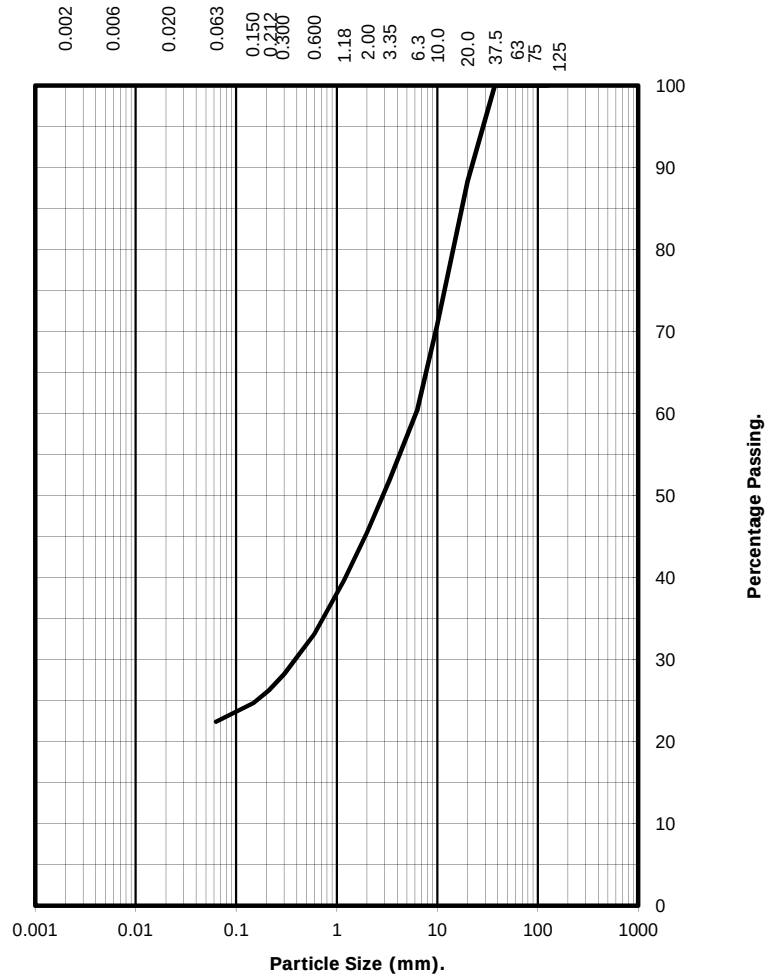


Test Report: Particle Size Distribution Test
BS 1377 Part 2:1990.
Wet Sieve, Clause 9.2

Client ref: IN12963 PO11600
Location: Retail Trade Park
Contract Number: 18346-160113
Hole Number: BH10
Sample Number:
Depth (m) : 4.40-4.70
Sample Type: B

BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	88
10	71
6.3	60
3.35	52
2.00	46
1.18	40
0.60	33
0.300	28
0.212	26
0.150	25
0.063	22

Particle Diameter	Percentage Passing
0.02	#
0.006	#
0.002	#



	Silt and Clay	Sand	Gravel	Cobbles	Soil Fraction
	22	24	54	0	Total Percentage

Remarks:

#- not determined



Checked By

Date Approved:

Approved By:

25.1.13

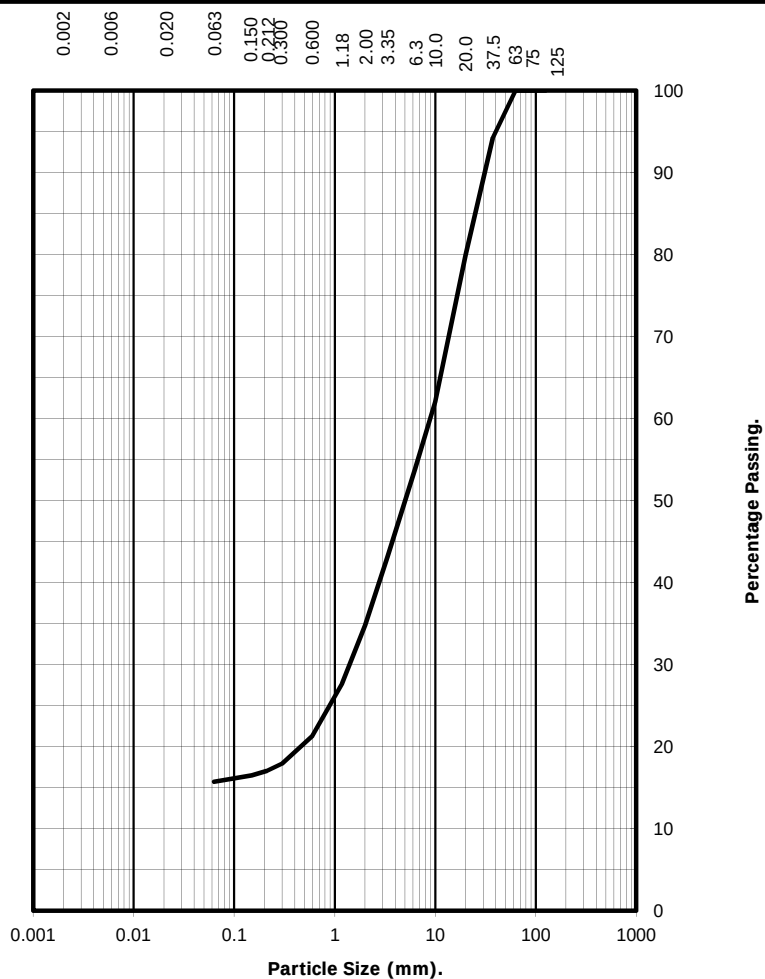


Test Report: Particle Size Distribution Test
BS 1377 Part 2:1990.
Wet Sieve, Clause 9.2

Client ref: IN12963 PO11600
Location: Retail Trade Park
Contract Number: 18346-160113
Hole Number: BH11
Sample Number:
Depth (m) : 2.50-3.00
Sample Type: B

BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	94
20	80
10	62
6.3	54
3.35	43
2.00	35
1.18	28
0.60	21
0.300	18
0.212	17
0.150	16
0.063	16

Particle Diameter	Percentage Passing
0.02	#
0.006	#
0.002	#



	Silt and Clay	Sand	Gravel	Cobbles	Soil Fraction
	16	19	65	0	Total Percentage

Remarks:

#- not determined



Checked By

Date Approved:

Approved By:

25.1.13

