The Brownfield Consultancy

Cotefield Farm, Bodicote OX15 4AQ

DESK TOP STUDY AND SITE INVESTIGATION REPORT

Prepared for: **BANNER HOMES**

Report Reference: BC008 RE001 Rev A

17 March 2014

CONTENTS

DESK STUDY AND SITE INVESTIGATION REPORT

COTEFIELD FARM, OXFORD ROAD, BODICOTE OX15 4AQ

1 INTRODUCTION

The Brownfield Consultancy was instructed by Banner Homes to carry out a Desk Study and Site Investigation of a site known as Cotefield Farm, Oxford Road, Bodicote (hereinafter referred to as 'the site'). The offer to carry out the works was contained in an email dated 21st November 2012 to Banner Homes. The instruction to proceed was received from Banner Homes in an email dated 22th November 2012.

The site currently comprises of an open field located to the south of the village of Bodicote. We understand that 83No. residential houses and flats will be constructed with roads, parking areas and driveways. A proposed layout is presented in Appendix A.

The purpose of the desk top study and site investigation is to provide an assessment of the geotechnical engineering properties of the soils and the extent of any soil contamination at the site. The report is subject to Limitations which are set out in Appendix I.

2 SITE DESCRIPTION

The site is located on the south eastern edge of Bodicote, approximately 300m south east of the centre of Bodicote. Bodicote is a village located approximately 2km to the south of Banbury, North Oxfordshire.

The site covers an area of approximately 3.28 hectare and is roughly triangular in shape.

The surface of the site is covered in a stubble of recently cut straw. A tree that is denoted on aerial photographs in the south west of the site is not present. Residential houses are present to the north and west, and the southern boundary is marked by a row of trees, beyond which lie further agricultural fields. To the immediate east, a garden centre is present and to the south east there is an auction house. There is no feature marking the eastern boundary and this boundary was inferred during the site investigation.

The western two thirds of the site is relatively flat whilst the eastern one third drops towards the east by about 5 m.

3 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

3.1 Geology

Reference to the on line BGS Mapping Index indicates that the site is directly underlain by the Marlstone Rock Bed described as a ferruginous limestone and ironstone. The unit is often be fractured and is frequently fossiliferous.

The following table details the risk of geological hazard potential on or underlying the site as identified in the Groundsure Report.

Table 1 Geological Hazards

Hazard	Risk
Compressible ground	Negligible
Landslide ground	Very low
Shallow mining	Negligible
Running sand	Negligible
Swelling clay	Low
Ground dissolution	Negligible

Hence geological hazards do not present a constraint at the site.

3.2 Hydrology

The nearest surface water feature is an extended culvert 193m to the west of the site. The nearest natural surface water course is the Sor Brook located approximately 500m to the south east of the site. There is no water quality information on either of these water courses.

The site is not located in an area considered at risk of flooding by the Environment Agency.

There is one surface water abstraction within 1km of the site at Bodicote Pumping Station located 547m to the south west of the site. The license is held by Thames Water who can abstract a maximum of 4546m^3 / day from the Sor Brook

3.3 Hydrogeology

The Groundwater Vulnerability map contained in the Groundsure Report indicates that the site is underlain by 'Secondary A aquifer' referring to the Marlstone Rock Bed.

The Environment Agency define a Secondary A aquifer as:-

'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'.

Groundwater is therefore considered vulnerable to pollution.

There is one groundwater abstraction within 500m of the site located 91m east of the site at Cotefield Farm. The borehole abstracts up to 109m^3/day from *'Thames Groundwater'* and the water us used for vegetable washing.

The site is not located within a groundwater Source Protection Zone.

4 SITE HISTORY

The history of the site and the surrounding area has been determined from historical map extracts. Copies of these extracts are included in Appendix B. The historical land uses on site and in close proximity to the site are summarised in the following table:-

Table 2 Site History Summary

DATE	ON SITE HISTORICAL LAND USE	OFF SITE HISTORICAL LAND USE
1881	The site is part of a larger field. The far south west of the site crosses a second field boundary. Trees are denoted along the western boundary of the site.	The site is surrounded in all compass directions by open fields. Buildings associated with Cotefield Farm are located approximately 200m to the south east. The Oxford Road is denoted running north south, approximately 200m to the east of the site.

DATE	ON SITE HISTORICAL LAND USE	OFF SITE HISTORICAL LAND USE
1900	The trees are no longer denoted along the western boundary. There are no further changes.	A large building denoted Red house has been built just off the western boundary of the site. Approximately 200m to the North of the site, Bodicote Lodge has been built. This is set in its own grounds with what appears to be an orchard to the immediate south. Two buidings are present approximately 200m to the north east of the site, immediately adjacent to the Oxford Road. A number of north south trending field boundaries to the east of the site have disappeared.
1923	There is a change to the field boundaries.	No significant changes.
1967	The coverage on this map is limited to the northern sector. No changes have taken place.	Significant residential expansion has occurred to the north of the site.
1972	No significant changes.	Residential housing is present to the north and west of the site. There are no further changes.
1984	No significant changes.	No significant changes.
1988	No significant changes.	No significant changes.
1989	No significant changes.	No significant changes.
2012	No significant changes.	No significant changes.
Present day	No significant changes.	No significant changes.

4.1 Site History Summary

The earliest historical map, dated 1881, denotes the site as a field. There have been no changes since that time other than minor variations in field boundaries.

Off site, fields were present in all compass directions until 1967 when residential housing is denoted to the north and west of the site. There are no further changes.

5 INFORMATION HELD BY STATUTORY AUTHORITIES

This section details any relevant information held in the registers maintained by statutory bodies as identified in the Groundsure Envirosight Report in Appendix C.

5.1 Waste Management Facilities

The Groundsure Report does not identify any waste management facilities within 1000m of the site.

5.2 Integrated and Local Authority Pollution Prevention and Control Permits

There are no Local Authority Pollution Prevention and Control Permits within 500m of the site.

5.3 Pollution Incidents to Controlled Waters

Records held by the Environment Agency identified no pollution incidents to controlled waters within 250m of the site.

5.4 Discharge Consents

The Groundsure Report identifies 3No. licensed active discharge consents within 500m of the site. The nearest is located 120m north east of the site and relates to the discharge of sewage effluent to a tributary of the Sor Brook.

5.5 Fuel Sites

The Groundsure Report identifies no fuel station entries within 500m of the site.

5.6 Radon

The BGS Radon Report states that the site is in a radon affected area and that **full radon protection measures** are required. The radon report is presented in Appendix D.

5.7 Environmentally Sensitive Areas

The Groundsure Report indicates that the site is located within a Nitrate Vulnerable Zone (NVZ). NVZs are designated areas where levels of agricultural nitrate in groundwater are above guideline values e.g. Drinking Water Standards. High levels of nitrate in groundwaters has given rise to environmental and health concerns and these have been reflected in the EC

Nitrates Directive (91/676/EEC) which is aimed at reducing the use of nitrate fertilisers and hence nitrate pollution in controlled waters from agriculture.

6 UK CONTAMINATED LAND LEGISLATIVE FRAMEWORK

6.1 Legislation on Contaminated Land

Part IIA of the Environmental Protection Act, 1990, enacted by Section 57 of the Environment Act 1995 and the associated Contaminated Land (England) Regulations 2000 (SI 2000/227) was introduced on 1 April 2000.

Part IIA provides a statutory definition of contaminated land:

"any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is a significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused".

Controlled waters are considered to be all groundwaters, inland surface waters and estuarine and coastal waters.

To determine whether land falls under the Part IIA definition of contaminated land the site should be evaluated in the context of a risk based framework. The assessment of contaminated land is typically a two-phase process which is initially based on a qualitative assessment of the likelihood of complete pollution linkages, with a quantitative element which seeks to determine the degree and the significance of the harm. Land is only defined as 'Contaminated Land' if a "significant pollutant linkage" is present.

A pollutant linkage must comprise of the following:-

Source - a contaminant or substance which is located in, on or under the land and has potential to cause harm to human health, water resources or the wider environment.

Pathway - the means or route by which a source can migrate;

Receptor - something which could come to harm, including human health, water resources, surface water courses or the wider environment.

The responsible authority then needs to consider whether the identified pollution linkage:

- is resulting in significant harm being caused to the receptor in the pollutant linkage;
- presents a significant possibility of significant harm being caused to that receptor;
- is resulting in the pollution of controlled waters, which constitute the receptor; or is likely to result in such pollution.

If a pollutant linkage is demonstrated, then the Part IIA legislation provides powers for remedial action to be enforced by the Local Authority in whose area the contaminated land is situated.

7 CONCEPTUAL MODEL

7.1 General

This section uses information from historical maps to provide a conceptual model and qualitative assessment of the potential risks posed to human health and environmental receptors from potential on-site and off-site sources of contamination. The assessment is presented as a 'source-pathway-receptor' model in accordance with Part IIa of the Environmental Protection Act 1990.

The conceptual model has been developed assuming that the site will be redeveloped for a residential end use with residential gardens.

7.2 Potential Sources of Contamination

Potential On-site Sources of Contamination

- Historically, the site not been developed. It has remained a field since the earliest map dated 1881.

Potential Off-Site Sources of Contamination

- No off site sources of contamination have been identified.

In accordance with CLR 11 – 'Model Procedures for the Management of Land Contamination', no sources of contamination have been identified. Hence pathways and receptors are not considered further. The site walkover confirmed that the fields is under agricultural use (hay stubble was present) and therefore we would recommend that a limited number of near surface soil samples are submitted to a metals testing suite and a pesticide analysis.

8 CONCLUSIONS AND RECOMMENDATIONS OF THE DESK STUDY

- Historically, the site has been a field currently used for agricultural purposes. No potentially contaminative proximal off-site land uses have been identified.
- There are no recorded waste management facilities within 500m of the site.
- Ground gas and landfill gas is not considered a constraint to development.
- The site is immediately underlain by the Marlstone Rock Bed described as a ferruginous limestone and ironstone.
- The Marlstone Rock Bed is designated as a Secondary A aquifer and hence any groundwater stored in this formation is considered vulnerable to pollution.
- The site is not located in an area considered at risk of surface water flooding by the Environment Agency.
- At outcrop the Marlstone Rock is fractured and hence soakaways may be feasible.
- A radon report obtained from the British Geological Survey states that full radon protection measures are necessary for new build. The radon report is presented in Appendix D.
- Should the residential housing proposals proceed then we would recommend that the following works are undertaken:-
    - Three days of trial pitting to determine ground conditions. This should include soakaway testing in accordance with BRE365.
    - Geotechnical testing of the soils to identify volume change potential of cohesive material, concrete classification and predicted CBR values.
    - The risk of contamination is considered to be low. However we would recommend some limited laboratory testing of near surface soils for a suite of metals and pesticides. Waste classification testing is also recommended so site derived soils can be correctly classified should landfill disposal of site arisings be envisaged.

9 FIELDWORK AND MONITORING

The intrusive fieldwork was carried out on the 5th, 6th and 7th December 2012 and comprised of 21No. mechanically excavated trial pits. In three of these pits soakaway tests were undertaken.

The site work was undertaken by Discovery CE under the instruction and supervision of The Brownfield Consultancy, with the ground investigation procedures and sample descriptions based on BS 5930 (1999) 'Code of Practice for Site Investigations' and BS 10175 (2011) "Investigation of potentially contaminated sites - code of practice". The locations of the exploratory holes are shown on the Drawing included in Appendix A. The exploratory hole records are presented in Appendix E. The full details of the fieldwork undertaken are summarised in the following sections.

9.1 Trial Pits

Twenty one trial pits, designated TP101 to TP121 were excavated on 5th, 6th and 7th December 2012 to depths of between 0.70m and 4.00m bgl at various locations across the site. The pits were excavated by a JCB 3CX and backfilled with arisings upon completion. In several pits, the JCB refused on strong limestone and ironstone (the Marlstone Rock Bed).

9.2 Soakaway Test Pits

Three trial pits, TP119, TP120 and TP121 were excavated for the purposes of soakaway testing to depths of between 1.35 and 2.50m. The pits were accurately measured, rapidly filled with water from a mobile bowser and the time taken for the water to drain was recorded. The results of these tests are presented in Appendix H.

10 LABORATORY TESTING

10.1 Geotechnical

A programme of laboratory testing was scheduled to determine the geotechnical properties of selected soil samples obtained from the investigation. The details of the geotechnical testing are summarised below:-

Table 3 Summary of Geotechnical Laboratory Testing Suites

Determinant	No
Water soluble sulphate and pH	5
Atterberg limits including moisture content	10

Tests were carried out in accordance with BS1377 (1990) “Methods of test for Soils for Civil Engineering purposes”. The results of the geotechnical testing are presented in Appendix F.

10.2 Environmental

A programme of chemical laboratory testing was scheduled by The Brownfield Consultancy on 10No. soil samples taken from various depths in the natural soils recovered from the trial pits. The samples were placed into suitable containers for the required chemical analysis.

All samples were transported, on the day of collection to I2 in Watford which is accredited under UKAS and MCerts. The following table summarises the contaminants scheduled:-

Table 4 Summary of Soil Chemical Laboratory Testing Suites

Determinant	No
Metals and semi-metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc)	10
Oragnophosphate and Organochlorine Pesticides	1
Full Waste Acceptance Criteria	1

The results of the laboratory chemical testing are interpreted in Section 13 and presented in full in Appendix G.

11 GROUND AND GROUNDWATER CONDITIONS

11.1 Strata Encountered

The ground conditions encountered during the intrusive investigation were consistent with the published geological map. A variable thickness of topsoil overlies weathered Marlstone Rock Bed which in turn was underlain by bedrock of the Marlstone Rock Bed (hard limestone and ironstone). The base of the weathered Marlstone Rock Bed was not encountered in 6No. trial pits.

A summary of the strata encountered during the investigation is shown in Table 6 and described in the following sections, but for full details and descriptions, reference should be made to the exploratory hole records presented in Appendix E.

Table 5 Strata Encountered

Stratum	Depth to Top (m bgl)	Depth to Base (m bgl)	Thickness (m)
Topsoil	Ground level	0.20 - 0.30	0.20 – 0.30
Marlstone Rock Bed (weathered) All holes	0.20 – 0.30	0.68 - >4.00	0.48 - >3.75
Marlstone Rock Bed (bedrock) All holes except TP101, TP103, TP106, TP109, TP116.	0.68 – 3.10	Not encountered	NA

11.2 Topsoil

Topsoil was encountered in all locations and comprised of a soft to firm brown slightly sandy clay with rare medium gravel of limestone. Occasional roots and rootlets were noted.

11.3 Marlstone Rock Bed (Weathered)

The weathered Marlstone Rock Bed (MRB) was encountered in all locations, directly below the Topsoil. The base of the weathered MRB was not encountered in TP101, TP103, TP106, TP109 and TP116.

The materials were generally cohesive, comprising of grey brown, orange and orange brown slightly sandy silt/clay and a gravelly silt/clay with the gravel fraction comprising of angular fine to coarse of limestone and ironstone. Fissuring of the clay and silt was frequently observed together with rust coloured staining on fissured surfaces.

A distinct horizon of gravel and cobbles of ironstone and limestone was encountered in TP106 (3.20 - >4.00m), TP107 (0.40 – 0.70m), TP109 (0.90 – 1.55m), TP110 (0.90 – 1.55m), TP115 (0.40 – 0.85m), TP117 (0.65 – 0.95m) and TP120 (0.80 – 1.35m).

Forty three 19mm hand vane tests were undertaken in the cohesive weathered MRB. The recorded values of undrained shear strength ranged from 62 (firm) to >120kPa (stiff). The undrained shear strength v depth profile is presented in Figure 3.

Nine Atterberg Limit analyses undertaken on samples of the weathered Marlstone Rock Bed gave plasticity indices ranging from 11% to 32%, with plastic limits ranging from 22% to 30% and liquid limits ranging from 35% to 58%, indicating that the samples were clays of high plasticity (with respect to BS 5930, 1999) and of medium volume change potential (with respect to NHBC Chapter 4.2). A plasticity chart is presented as Figure 2.

11.4 Marlstone Rock Bed

Bedrock was encountered in fourteen locations. The materials comprised of moderately weak limestone and ironstone recovered as angular cobbles. The base of the Marlstone Rock Bed was not proven. The trial pits terminated in this unit as no further penetration was possible with the JCB.

11.5 Groundwater

Groundwater was encountered at the following exploratory hole locations:-

- TP103 slight seepage at 2.70m bgl
- TP105 at 2.50m bgl (rate of inflow not recorded)
- TP106 slight seepage at 3.60m bgl
- TP112 slight seepage at 2.10m

It must be noted that groundwater levels can vary seasonally and in response to high rainfall events.

11.6 Contamination

Evidence of significant contamination was not encountered.

11.7 Trees and Tree Roots

There are no trees at the site and tree roots were not encountered in any of the exploratory hole locations.

12 HUMAN HEALTH QUANTITATIVE RISK ASSESSMENT

Part IIa of the Environmental Protection Act 1990 (which was inserted into that Act by Section 57 of the Environment Act 1995) provides a regulatory regime for the identification and remediation of contaminated land. The main objective of the Part IIa contaminated land regime was to provide an improved system for the identification and remediation of land

A risk based approach is recommended where contamination is causing unacceptable risks to human health or the wider environment, assessed in the context of the current or proposed use and circumstances of the land.

Our proposed risk assessment methodology is based upon UK DEFRA and EA best practice in regard to the assessment of contaminated land. We follow the framework set out in CLR 11 – Model Procedures for the Management of Contaminated Land. This assesses whetehr

contaminated land decisions are rigorous and defensible. The CLR method adopts the characterisation of the Source-Pathway-Receptor pollutant linkage.

12.1 CLEA Soil Guideline Values

The UK technical guidance for assessing risks to human health and controlled waters is split into two parts, both issued by the Environment Agency (EA). The Contaminated Land Exposure Assessment (CLEA) framework produced by the EA can be used to assess potential risks to human health, while a separate tiered methodology has been produced by the UK Environment Agency for assessment of controlled waters (EA, 1999).

The original CLEA Soil Guideline Values (SGVs) were withdrawn in August 2008. The Environment Agency has published a revision of CLEA, and new SGVs for arsenic, cadmium, mercury, nickel and selenium. The new SGVs are not definitive values and the onus is on the contaminated land practitioner to derive Site Specific Assessment Criteria (SSAC) using officially produced toxicity and physico-chemical data.

SGVs for other priority contaminants as well as toxicological profiles were rolled out during 2009. Until a full suite of toxicological profiles are issued, we consider that the existing SGVs for lead and chromium (total) remain a useful tool in assessing the risks to human health from soil contamination.

12.2 CIEH Land Quality Management Generic Assessment Criteria – Version 2 (2009)

Due to the limited range of chemicals for which SGVs were derived by the Environment Agency, The Brownfield Consultancy have adopted the CIEH Land Quality Management Generic Assessment Criteria (LQM GAC) for a variety of other contaminants.

The LQM GACs have been calculated in accordance with the current (2008) CLEA model for a variety of commonly encountered contaminants for which an SGV has not been published by the EA. LQM GACs have been calculated for chromium (iii), chromium (VI), copper, zinc and a variety of organic compounds including PAH species and TPH CWG bands. Values have been published for 'sandy soils' at Soil Organic Matter contents of 1%, 2.5% and 5%. For the purposes of this assessment we have adopted 1% Soil Organic Matter.

13 SOIL CHEMISTRY

13.1 Results

The results of chemical testing of 10No. samples of near surface soils are compared with the SGVs and the LQM GACs for a residential with plant uptake end use. These comparisons are summarised in the following table:-

Table 6 Comparison of Soil Chemical Test Results with Guideline Values

Determinant	Maximum Measured Concentration (mg/kg)	CLEA SGV Residential (mg/kg)	No. of tests carried out	No. of exceedences
Arsenic	**210**	**32**	10	**8**
Cadmium	<0.2	10	10	0
Mercury	<0.3	1	10	0
Lead	39	450	10	0
Nickel	**150**	**130**	10	**1**
Selenium	<1.0	350	10	0
Benzene	<1.0	0.33	10	0
Toluene	<1.0	223	10	0
Ethylbenzene	<1.0	350	10	0
Xylene	<1.0	230	10	0
Determinant	**Maximum Measured Concentration (mg/kg)**	**LQM GAC Residential (mg/kg)**	**No. of tests carried out**	**No. of exceedences**
Beryllium	4.9	51	3	0
Chromium (III)	360	3000	5	0
Chromium (VI)	<4.0	4.3	5	0
Copper	17	2330	3	0
Vanadium	**360**	**75**	3	**3**
Zinc	210	3750	3	0
Acenaphthene	<dl	210	1	0
Acenaphthylene	<dl	170	1	0
Anthracene	<dl	2300	1	0
Benzo(a)anthracene	<dl	3.1	1	0
Benzo(a)pyrene	<dl	0.83	1	0
Benzo(b)fluoranthene	<dl	5.6	1	0
Benzo(k)fluoranthene	<dl	8.5	1	0
Benzo(g,h,i)perylene	<dl	44	1	0
Chrysene	<dl	6	1	0
Dibenzo(a,h)anthracene	<dl	0.76	1	0
Fluoranthene	<dl	260	1	0
Fluorene	<dl	160	1	0
Indeno(1,2,3-c,d)pyrene	<dl	3.2	1	0
Naphthalene	<dl	1.5	1	0
Phenanthrene	<dl	92	1	0
Pyrene	<dl	560	1	0

13.2 Interpretation

One sample of soil (TP102 at 0.50m) was submitted to analysis for organochlorine and organophosphate pesticides (OCPs and OPPs) and these compounds were not recorded above the analytical limit of detection.

The results recorded levels of arsenic, nickel and vanadium at greater concentrations than the soil guideline value for the proposed end use of residential houses with gardens. We consider that these concentrations represent naturally occurring concentrations; the Marlstone Rock Bed is a metalliferous deposit particularly rich in iron and associated metals.

Soil Guideline Values (SGVs) derived using the CLEA model include the assumption that a contaminant might be taken up into the body from soil to the same extent as from the medium of exposure in the study used to derive the oral HCV. Contaminants are often so tightly bound within the soil that only a small percentage of this contamination present is actually mobile and could potentially pose a risk to human health. Physiologically based extraction tests (PBET) measures the percentage of the contaminant present which is not tightly bound to the soil and thus presents a risk to human health. Thus a selection of samples of soil which recorded elevated concentrations of arsenic, nickel and vanadium were rescheduled for PBET testing. This methodology was agreed with the Environmental Health Protection Officer at Cherwell District Council.

The soil samples were submitted to i2 laboratories in Watford for bioaccessibility testing using the Unified Barge Method (UBM). The UBM has been developed by the Bioaccessibility Research Group Europe (BARGE) and has been validated by in vivo bioaccessibility data and by inter laboratory comparison. The test involves simulating the stomach and intestinal digestion tracts.

Bioaccessibility Results and Site Specific Modelling using CLEA software version 1.06

The results from the bioaccessibility testing are given in the following table. The actual laboratory results are given in Appendix G.

Table 1 – Bioaccessibility Results

Trial Pit	Bioaccessibility (%)
TP110 (0.15m)	2.6 As
TP110 (0.15m)	2.8 Ni
TP114 (0.50m)	4.7 V

The results of the bioaccessibility testing indicate that the arsenic, nickel and vanadium present both in the natural soil is not 100% bioaccessible i.e. not all of the metal will be released from the soil following ingestion and digestion and be available for absorption.

Thus the use of the published soil guideline values are considered overly conservative Therefore site specific assessment criteria have been derived by The Brownfield Consultancy using the Contaminated Land Exposure Assessment (CLEA) software version 1.06.

The only site specific data used in the software was a pH of 7 based on the results and the bioaccessibility results. Within the software, in step 4 "Advanced Settings - chemical data" oral bioaccessibility is entered as a bioaccessibility fraction, the default being 1.00 therefore 0.03 was entered to reflect Arsenic bioaccessibility, 0.03 to reflect Nickel bioaccessibility and 0.05 to reflect Vanadium bioaccessibility. The software was then re-run.

The resulting site specific assessment criteria are 220mg/kg for Arsenic, 13,700 for Nickel and 4890mg/kg for Vanadium. Copies of the CLEA reports for the three derived site specific assessment criteria are given in Appendix G. When using the site specific derived assessment criteria, the original concentrations recorded in natural ground are considered acceptable and hence considered unlikely to pose a risk to human health receptors. Thus remediation is not considered necessary.

An addendum to these conclusions is required following on from discussions with Cherwell District Council. This is discussed in Section 16.

13.3 Waste Classification and Site Waste Management

There has been no history of use at the site since the earliest historical maps. The results of WAC testing suggest that soils across the site will be classified as inert waste.

Any excavated material and excess spoil should always be classified prior to removal from site as required by 'Duty of Care' (Environmental Protection Act 1990) legislation. This means

that material has to be given a proper description and waste classification prior to removal consequently; details of the materials required for disposal, together with certificates of chemical analysis should be sent to a suitably licensed waste disposal contractor for classification and to confirm compliance with their license conditions.

It should also be noted that Site Waste Management Plans Regulations 2008 came into force in April 2008. The Regulations require the preparation of a Site Waste Management Plan (SWMP) for all construction projects in England with a value of more than £300,000 and a more detailed plan for projects with a value of more than £500,000. The purpose of the SWMPs is to encourage better resource utilisation and waste management practices in construction, improve environmental performance, minimise the landfilling of wastes, and reduce instances of fly-tipping.

A SWMP is therefore likely to be required for the development and will need to consider all potential construction waste streams, including soils.

14 GEOTECHNICAL ENGINEERING ASSESSMENT

14.1 Proposed Redevelopment

We understand that the existing structures on site will be removed and 82No. detached and semi-detached houses with associated areas of car parking and access roads will be constructed.

14.2 Summary of Ground Conditions

The ground conditions encountered during the intrusive investigation were consistent with the published geological map. A variable thickness of topsoil overlies weathered Marlstone Rock Bed which in turn was underlain by bedrock of the Marlstone Rock Bed (hard limestone and ironstone). A distinct horizon of gravel and cobbles of ironstone and limestone was encountered in TP106 (3.20 - >4.00m), TP107 (0.40 – 0.70m), TP109 (0.90 – 1.55m), TP110 (0.90 – 1.55m), TP115 (0.40 – 0.85m), TP117 (0.65 – 0.95m) and TP120 (0.80 – 1.35m). This horizon is generally encountered across the northern and north eastern half of the site.

14.3 Shallow Foundations

Foundations should be taken through topsoil and any soft compressible soils and placed within the weathered Marlstone Rock Bed at a minimum acceptable founding depth of

0.90m bgl based upon soils of medium volume change potential. An allowable bearing pressure of 100kPa at 0.90m bgl is considered appropriate.

The allowable bearing capacity includes an overall factor of safety of 3 against bearing capacity failure and with total settlements associated with the bearing pressure estimated to be less than 25mm.

Foundations will need to be deepened and heave precautions adopted in accordance with NHBC Chapter 4.2 'Building Near Trees' where the plots are in the influence of existing, felled or proposed trees, based upon soils of medium volume change potential. A hedgerow including small trees is present along the southern boundary of the site. An arboriculturalist should be consulted on the types of species, and foundations should be designed accordingly. We recommend that foundation excavations are inspected by a suitably qualified person to ensure that competent materials are reached and that no soft or loose spots are present.

At founding depths of 0.90m, clay and silt soils will predominate. However a distinct horizon of gravel and cobbles of ironstone and limestone was encountered in TP106 (3.20 - >4.00m), TP107 (0.40 – 0.70m), TP109 (0.90 – 1.55m), TP110 (0.90 – 1.55m), TP115 (0.40 – 0.85m), TP117 (0.65 – 0.95m) and TP120 (0.80 – 1.35m). To avoid potential differential settlement where foundations span from clay to gravel, foundations should be locally reinforced.

Groundwater was encountered at the following exploratory hole locations:-

- TP103 slight seepage at 2.70m bgl
- TP105 at 2.50m bgl (rate of inflow not recorded)
- TP106 slight seepage at 3.60m bgl
- TP112 slight seepage at 2.10m

Hence groundwater should not present a constraint to foundation excavations. It must be noted that groundwater levels can vary seasonally and in response to high rainfall events. All trial pits remained stable during the investigations.

14.4 Ground Slabs

The underlying soils are shrinkable and consequently have the potential for heave. Therefore a suspended floor should be used incorporating a suitable underfloor void, based

on the recommendations in NHBC Chapter 4.2, assuming soils of medium volume change potential.

14.5 Road Pavement Design

The site is underlain by cohesive soils of medium volume change potential. A CBR value of 3% would be appropriate, in accordance with Highways Agency Design Manual for Roads and Bridges HD25/94.

14.6 Chemical Considerations for Buried Concrete

Chemical analysis of five samples of the Marlstone Rock Bed gave water-soluble sulphate concentrations (SO_4 in 2:1 soil aqueous extract) of between 7.9mg/l and 52mg/l with pH values of between 6.5 and 7.1. Groundwater was encountered during the investigation, consequently a mobile groundwater regime is assumed. On this basis and in accordance with BRE SD1 (2005) "Concrete in aggressive ground" a Design Sulphate Class of DS1 with an ACEC of AC-1 would apply for all buried concrete.

15 SOAKAWAY DRAINAGE

Three trial pits, denoted TP119, TP120 and TP121 were excavated in order to undertake soakaway tests. The soakaway test in TP119 undertaken in clay, failed to achieve a 75% reduction in head, a requirement under BRE 365.

The test in TP120 was undertaken in ironstone described as *'brown very clayey angular GRAVEL and COBBLE of Limestone and Ironstone'* from 0.80m – 1.35m bgl. This test achieved an infiltration rate of 1.54×10^{-4} m/s. This layer is limited in its lateral extent, noted only in TP107, TP109, TP110 and TP120. It was not noted in the proximal trial pits TP108 and TP118.

The test in TP121 was located in *'Moderately weak limestone and ironstone recovered as angular cobbles'* at a depth of 2.15-2.20m. Above this depth sandy fissured Clay was recorded. The test in TP121 achieved an infiltration rate of 1.2×10^{-5} m/s.

Soakaway drainage is therefore feasible but soakaways must be located in layers of ironstone and limestone.

Any design should also take into account groundwater occurrence as described in Section 11.5.

16 CONCLUSIONS AND RECOMMENDATIONS

16.1 Land Quality

Elevated concentrations of naturally occurring arsenic, nickel and vanadium are recorded in soils which exceed the soil guideline values for a residential end use. However, The Brownfield Consultancy have determined through physiologically based extraction tests (PBET) analysis that a risk to future residential end users is not present.

ADDENDUM

Following on from discussions with the Environmental Health Department at Cherwell District Council, a revised site specific assessment criteria (SSAC) of 157mg/kg is proposed. When the results of testing are compared to this revised SSAC there is one exceedance in TP110 where a concentration of 210mg/kg was recorded. We therefore recommend that remediation is undertaken in the rear gardens of Plots 2 –13. Each garden should benefit from a 600mm thick capping layer. Surplus soils from the south of the site can be used to provide this capping layer as concentrations of arsenic are below the revised SSAC. The gardens should be subject to validation of correct depths during the placement of the capping.

Should contamination be observed during groundworks then the principal contractor should contact The Brownfield Consultancy who will attend site and advise on the best course of action.

16.2 Gas Protection Measures

The site is not located within 250m of a landfill site. In addition, extensive thicknesses of Made Ground were not encountered. Hence ground gas protection measures are not required.

A radon report obtained from the British Geological Survey states that full radon protection measures are necessary for new build. The radon report is presented in Appendix D.

16.3 Buried Services

The site is a green field and does not have a contaminative history. The ground investigation and results of laboratory testing have confirmed that the site is free from contamination. Hence there is no requirement for protective water supply pipework.

16.4 Soil Disposal and Reuse

The results of WAC and air dried chemical testing suggest that the soils are inert and thus any surplus soil can be reused on site. The reader is referred to Section 13.3

16.5 Soakaways

Soakaway drainage is considered feasible in the Marlstone Rock Bed strata which outcrop discontinuously across the northern and north eastern half of the site. Infiltration rates of 1.54×10^{-4} m/s and 1.2×10^{-5} m/s are derived and the reader is referred to Section 15.

16.6 Geotechnical

Traditional shallow foundations at a depth of 0.90m bgl with an allowable bearing capacity of 100kPa are recommended. The reader is referred to Section 14 where the geotechnical conclusions are presented in full.

Prepared and approved by

JIM TWADDLE BSc (Hons) CGeol FGS
Director

REFERENCES

ASTM : 1992 : Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils. Designation D1586-84 (reapproved 1992). American Society for Testing and Materials, West Conshohocken, USA.

BRE : 2005 : Special Digest 1 : Concrete in Aggressive Ground. Building Research Establishment.

BS 1377 : 1990 : Methods of Test for soils for civil engineering purposes. British Standards Institution, London.

BS 5930 : 1999 : Code of practice for site investigations. British Standards Institution, London.

BS 10175 : 2001 : Investigation of potentially contaminated sites - code of practice. British Standards Institution, London.

Clayton C R I : 1990 : SPT energy transmission : theory, measurement and significance. Ground Engineering, December.

Chengini A and N A Trenter : 1995 : The shear strength and deformation behaviour of a glacial till. Proceedings of International Conference on Advances in site investigation practice. ICE, London.

Clayton C R I : 1995 : The Standard Penetration Test (SPT) : Methods and use. CIRIA Report 143. Construction Industry Research Information Association, London.

Croney D and J C Jacobs : 1967 : The frost susceptibility of soils and road materials. RRL Report LR90. Transport Research Laboratory (formerly Road Research Laboratory), Crowthorne

CIRIA C665 : 2007 Assessing Risks Posed by Hazardous Ground Gases to Buildings. CIRIA, London

DEFRA and EA (2002). SGV 4. Soil Guideline Values for Chromium Contamination. Environment Agency, Bristol.

DEFRA and EA (2002). SGV 10. Soil Guideline Values for Lead Contamination. Environment Agency, Bristol.

DEFRA and EA (2002). Assessment of risks to human health from contaminated land, An overview of the development of the soil guideline values and related research. R & D Publication CLR 7. Environment Agency, Bristol.

Driscoll R : (1983) The influence of vegetation on swelling and shrinking of clay soils in Britain. Geotechnique 23 (2): 93-105

Environment Agency : 2009 : Soil Guideline Values for Arsenic In Soil - Science Report SC050021/arsenic SGV.

Environment Agency : 2009 : Soil Guideline Values for Cadmium In Soil - Science Report SC050021/cadmium SGV.

Environment Agency : 2009 : Soil Guideline Values for Mercury In Soil - Science Report SC050021/mercury SGV.

Environment Agency : 2009 : Soil Guideline Values for Nickel In Soil - Science Report SC050021/nickel SGV.

Environment Agency : 2009 : Soil Guideline Values for Selenium In Soil - Science Report SC050021/selenium SGV.

Environment Agency : 2009 : Soil Guideline Values for Benzene In Soil - Science Report SC050021/benzene SGV.

Environment Agency : 2009 : Soil Guideline Values for Toluene In Soil - Science Report SC050021/toluene SGV.

Environment Agency : 2009 : Soil Guideline Values for Ethylbenzene In Soil - Science Report SC050021/ethylbenzene SGV.

Environment Agency : 2009 : Soil Guideline Values for Xylene In Soil - Science Report SC050021/xylene SGV

Environment Agency : 2009 : CLEA Software (Version 1.04) - Science Report SC050021/SR4.

HD25/94 : 1994 : Design Manual for Roads and Bridges Volume 7. The Department of Transport.

Land Quality Management & Chartered Institute of Environmental Health (2009) Generic Assessment Criteria for Human Health Risk Assessment - LQM CIEH. 2nd Edition. Land Quality Press, Nottingham.

Nixon I K : 1982 : Standard penetration test. State of the art report. Proceedings of the Second European Symposium on Penetration Testing, Amsterdam.

Peck R B, W E Hanson and T H Thornburn : 1953 : Foundation Engineering, 1st Edition. Wiley, New York.

Peck R B, W E Hanson and T H Thornburn : 1974 : Foundation Engineering, 2nd Edition. Wiley, New York.

FIGURES

Figure 1

The Brownfield Consultancy

Project:

Cotefield Farm, Bodicote

Project No:

BC008

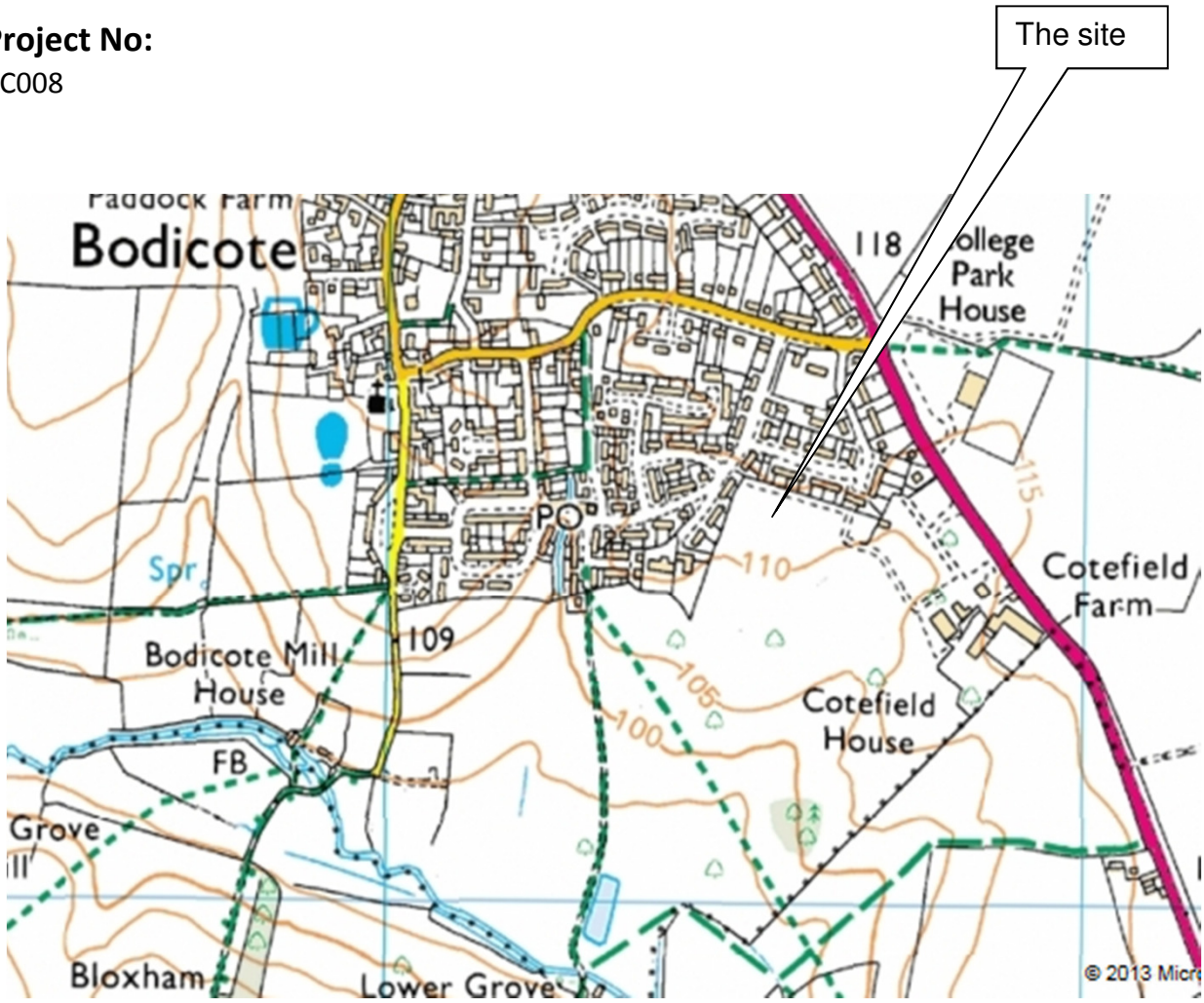


Figure 2

The Brownfield Consultancy

Project:

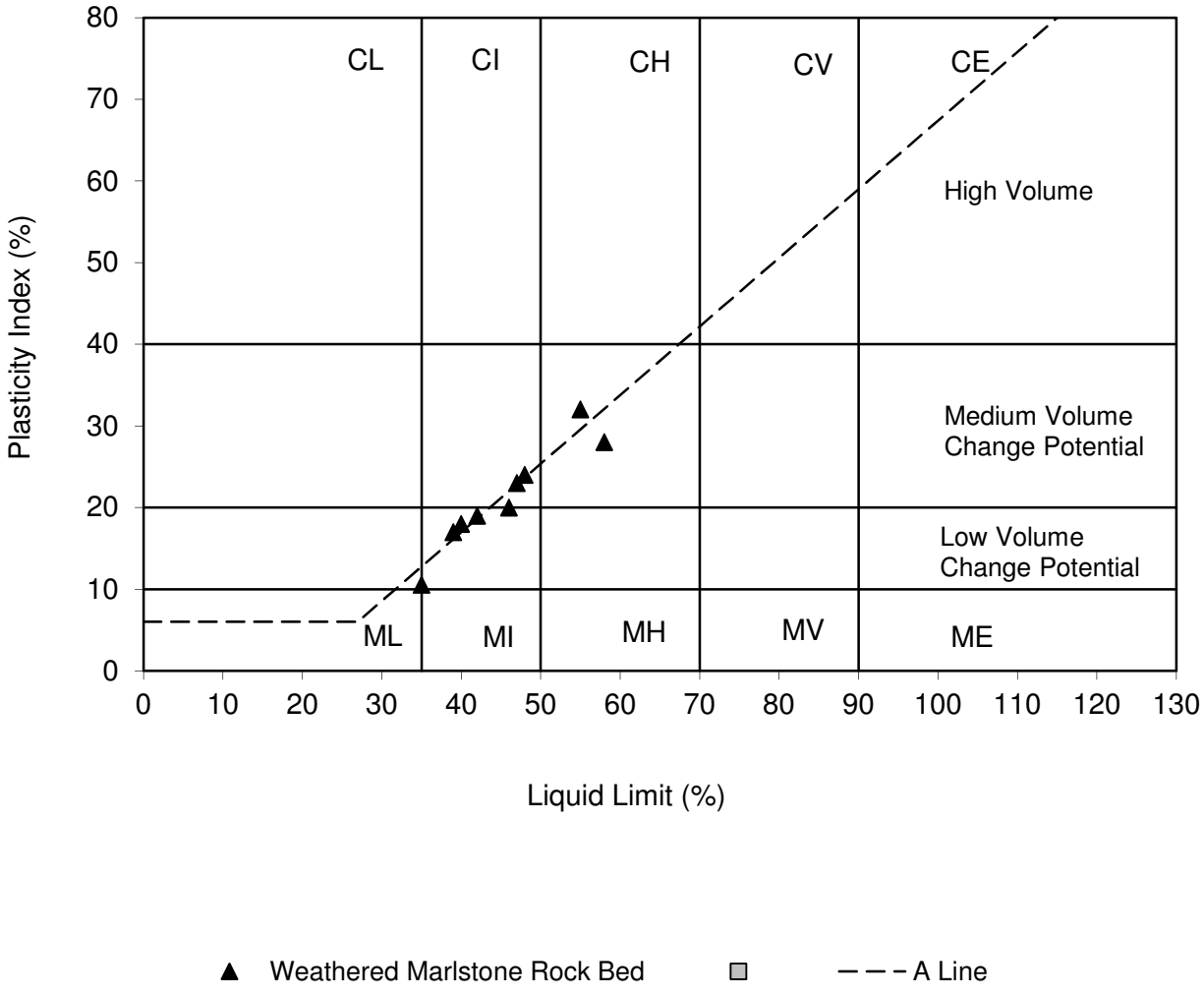
Cotefield Farm, Bodicote

Project No:

BC008

Key:
C Clay M Silt

L Low plasticity
I Intermediate plasticity
H High plasticity
V Very high plasticity
E Extremely high plasticity



▲ Weathered Marlstone Rock Bed ▢ – – – A Line

Figure 3

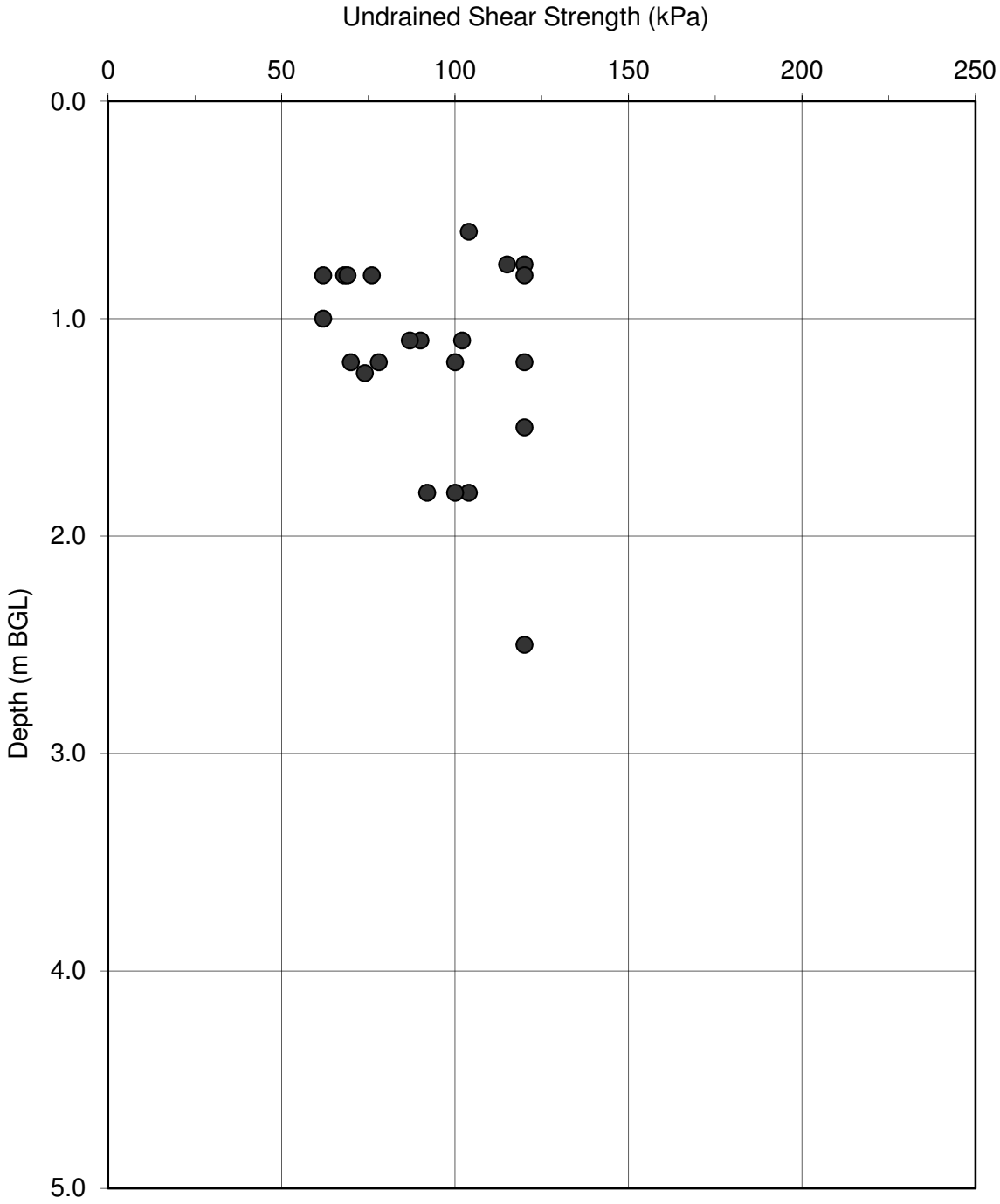
The Brownfield Consultancy

Project:

Cotefield Farm, Bodicote

Project No:

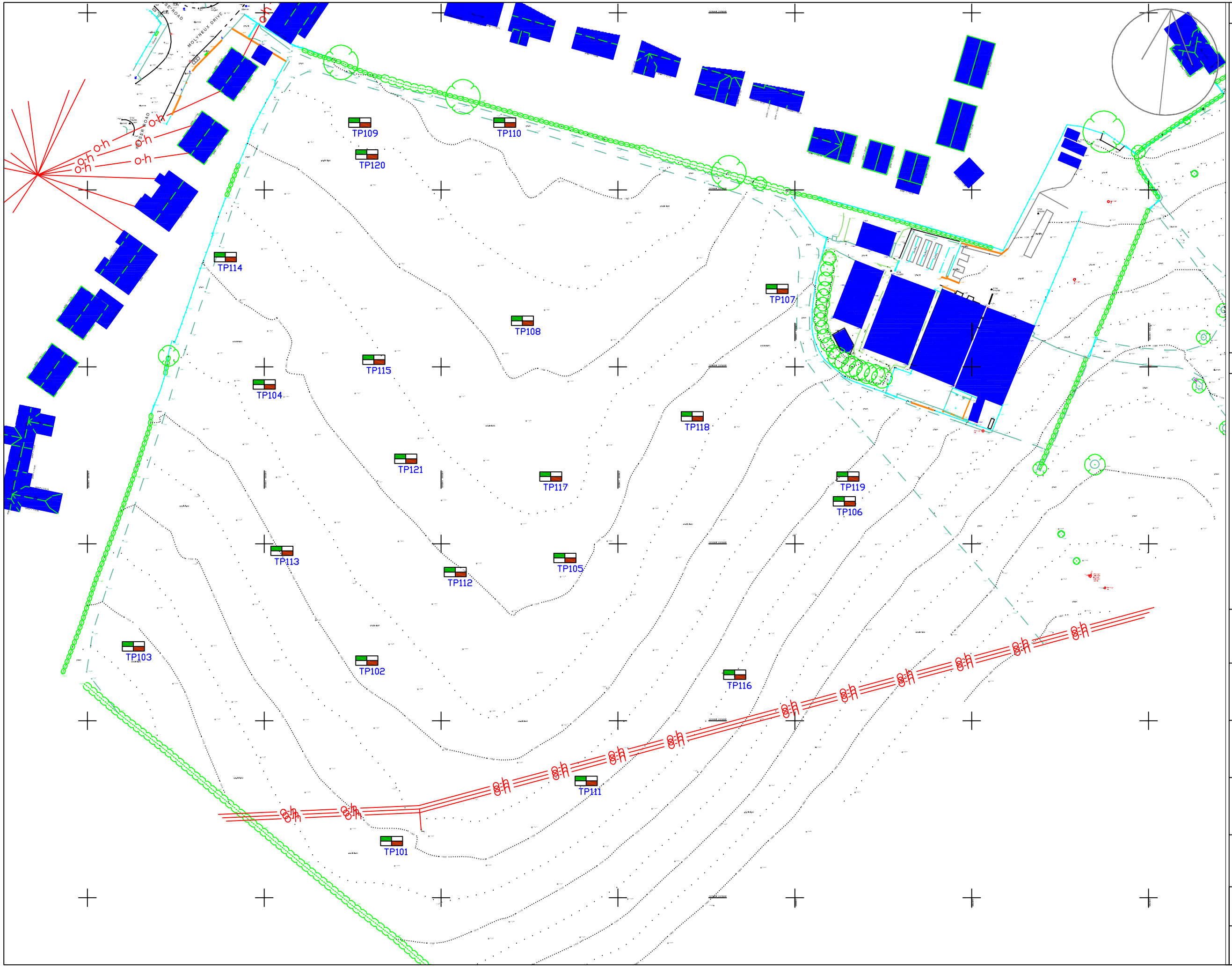
BC008



APPENDIX A

Exploratory Hole Location Plan

Proposed Layout



General notes

1. Base Drawing Taken From Interlock Survey Drawing 120278

Legend to symbols

TP118 Machine Excavated Trial Pit Location

Revision	Description

Title: EXPLORATORY HOLE LOCATIONS

Project: BODICOTE

Client: BANNER HOMES

The Brownfield Consultancy

Date	Drawing No.	Scale
29/01/2013	12160J-001	1:500
Drawn By	**Checked by**	**Sheet Size**
TH	JT	A3

4.5m x 120m
Visibility Splay

BLACKWOOD PLACE

Cotefield
Cottages

KEISER ROAD

Orchard
View

Hunters End

Garden Centre

Existing Garden Centre

Existing garden centre
delivery access to be
retained

Existing customer
access to garden
centre to be retained

LEAP

LAP

16 C
15 D
14 D
13 I1
12 E
11 C
10 C
9 C
8 C
7 C
6 F
5 F
4 C
3 C
2 C
1 C
17 C
18 D
19 D
20 I2
21 I1
22 I1
23 I2
24 I2
25 J1
26 J1
27 L
28 L
29 L
30 L
31 L
32 K1
33 K1
34 K2
35 K2
36 L
37 K1
38 K1
39 J1
40 H
41 H
42-49
4 x A
4 x B
50 E
51 E
52 D
53 D
54 K1
55 G2
56 G2
57 G2
58 G2
59 G2
60 G2
61 K1
62 J2
63 J2
64 I
65 C
66 C
67 C
68 C
69 J2
70 H
71 H
72 H
73 H
74 J2
75 F
76 F
77 G1
78 G1
79 F
80 F
81 J2
82 J2

0 5 10 15 20 25 50

accommodation schedule:

affordable:

A	1 bed flats @ 495 sq ft	4
B	2 bed flats @ 646 sq ft	4
C	2 bed houses @ 785 sq ft	15
D	3 bed houses @ 946 sq ft	6
E	4 bed houses @ 1098 sq ft	3

open market:

F	3 bed houses @ 915 sq ft	6
G1	3 bed houses @ 950 sq ft	2
G2	3 bed houses @ 950 sq ft	6
H	3 bed houses @ 1100 sq ft	6
I1	4 bed houses @ 1250 sq ft	5
I2	4 bed houses @ 1250 sq ft	3
J1	4 bed houses @ 1400 sq ft	2
J2	4 bed houses @ 1400 sq ft	6
K1	4 bed houses @ 1750 sq ft	6
K2	4 bed houses @ 1750 sq ft	2
L	5 bed houses @ 1950 sq ft	6
		82

T·S·H
Rochester House,
Eynsham Road,
Farmoor,
Oxford OX2 9NH
Telephone: 01865 861281

Land South of Blackwood Place,
Bodicote

Oct 2012

1:500@A1

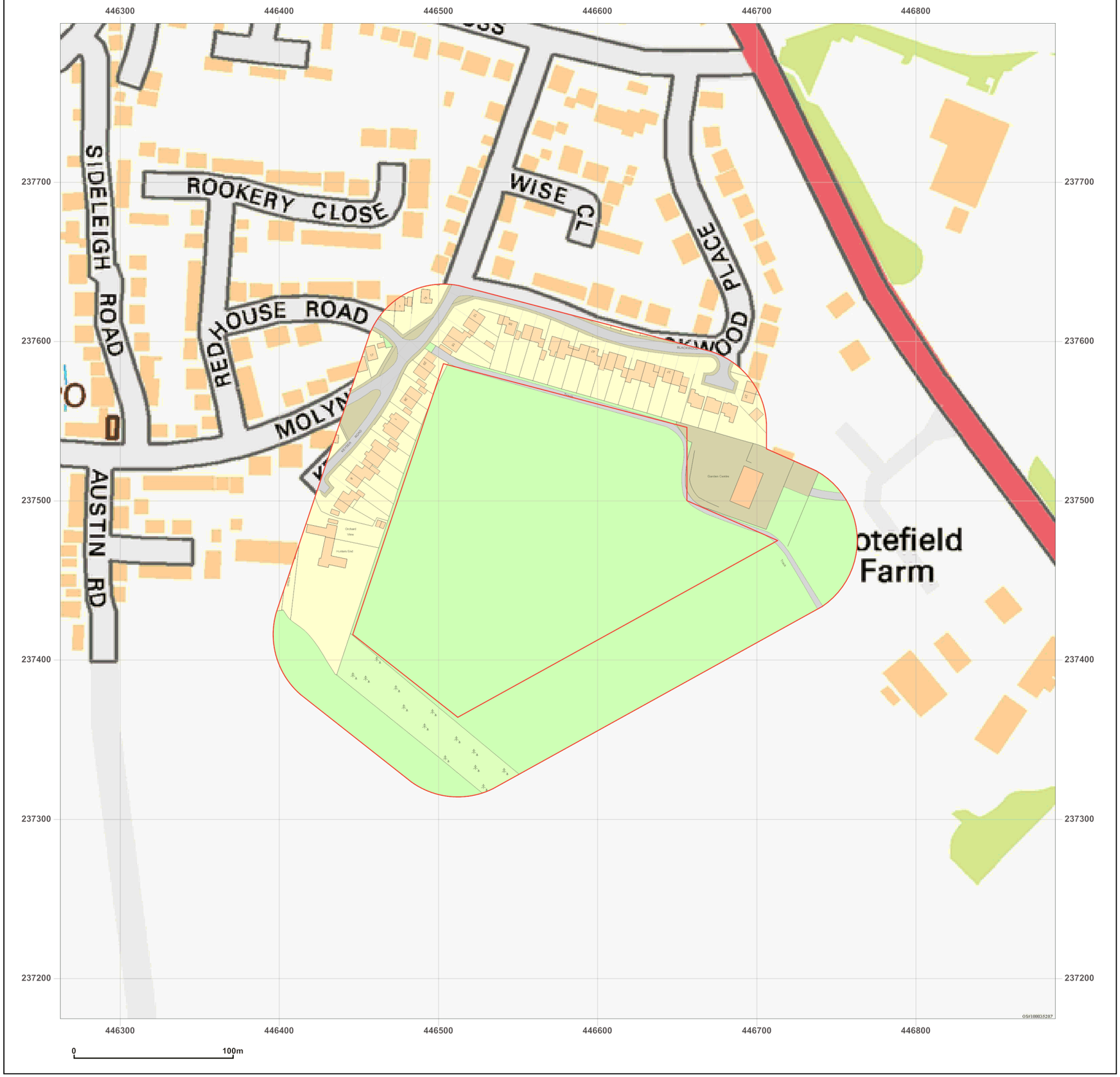
2012049

Site plan

P01

APPENDIX B

Historical Map Extracts



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: MasterMap

Map date: **2012**

Scale: 1:1,250

Printed at: 1:2,500

N
W E
S

2012

Ordnance Survey Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: National Grid

Map date: **1994**

Scale: 1:1,250

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1994
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1994
Levelled N/A

Ordnance Survey Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: National Grid

Map date: **1984-1989**

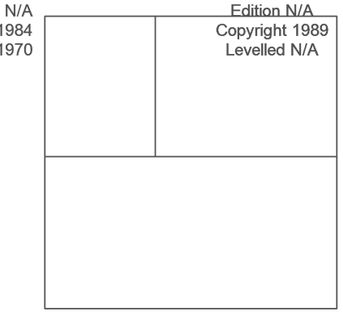
Scale: 1:1,250

Printed at: 1:2,500

N
W E
S

Surveyed 1966
Revised 1983
Edition N/A
Copyright 1984
Levelled 1970

Surveyed 1989
Revised 1989
Edition N/A
Copyright 1989
Levelled N/A



Ordnance Survey Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: National Grid

Map date: **1988**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

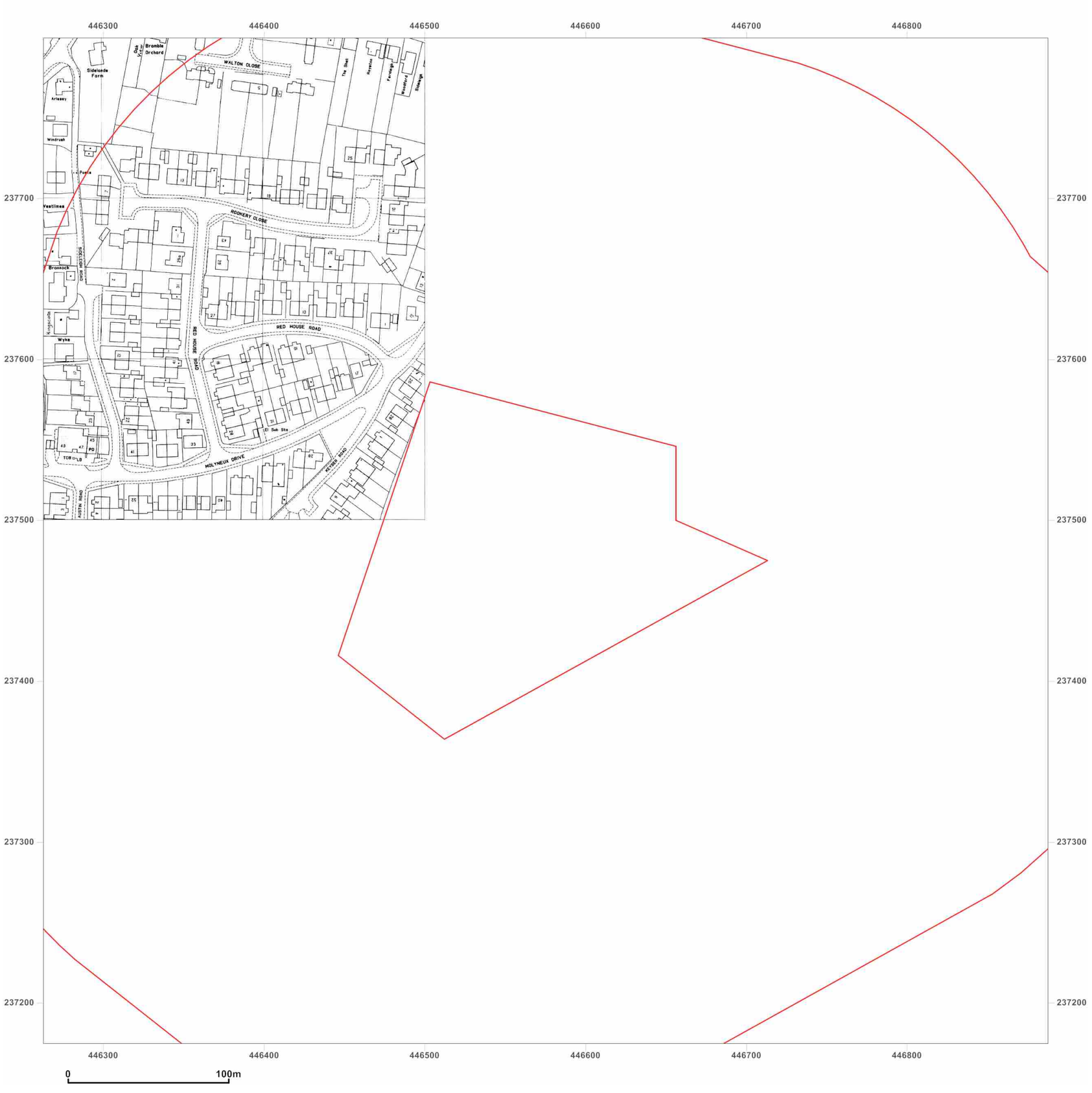
Surveyed 1988
Revised 1988
Edition N/A
Copyright 1988
Levelled N/A

Ordnance Survey® Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: National Grid

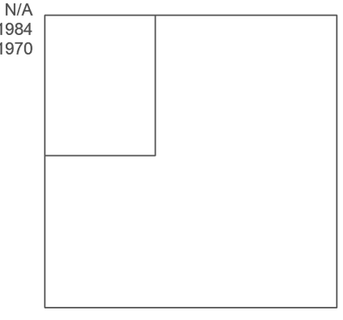
Map date: **1984**

Scale: 1:1,250

Printed at: 1:2,500

N
W E
S

Surveyed 1966
Revised 1983
Edition N/A
Copyright 1984
Levelled 1970



Ordnance Survey Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: National Grid

Map date: **1972**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1966
Revised 1972
Edition N/A
Copyright 1973
Levelled 1970

Ordnance Survey
Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: National Grid

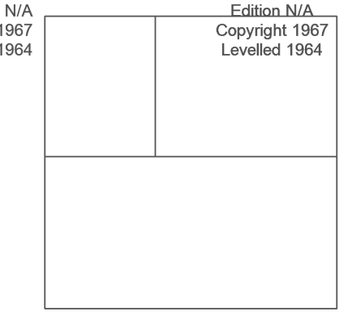
Map date: **1967**

Scale: 1:1,250

Printed at: 1:2,500

N
W E
S

Surveyed 1966
Revised 1966
Edition N/A
Copyright 1967
Levelled 1964



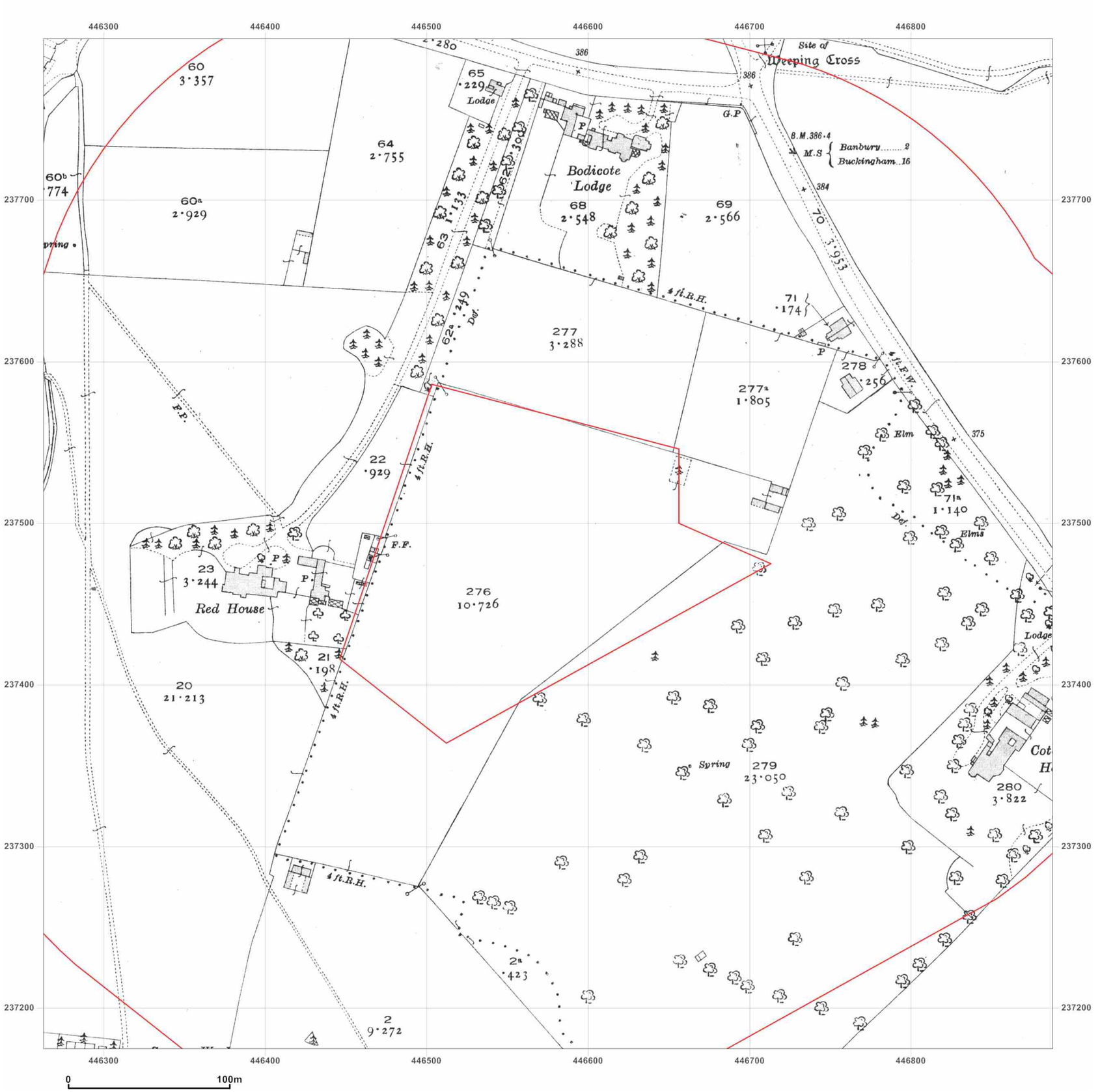
Surveyed 1966
Revised 1966
Edition N/A
Copyright 1967
Levelled 1964

Ordnance Survey Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: County Series

Map date: **1923**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

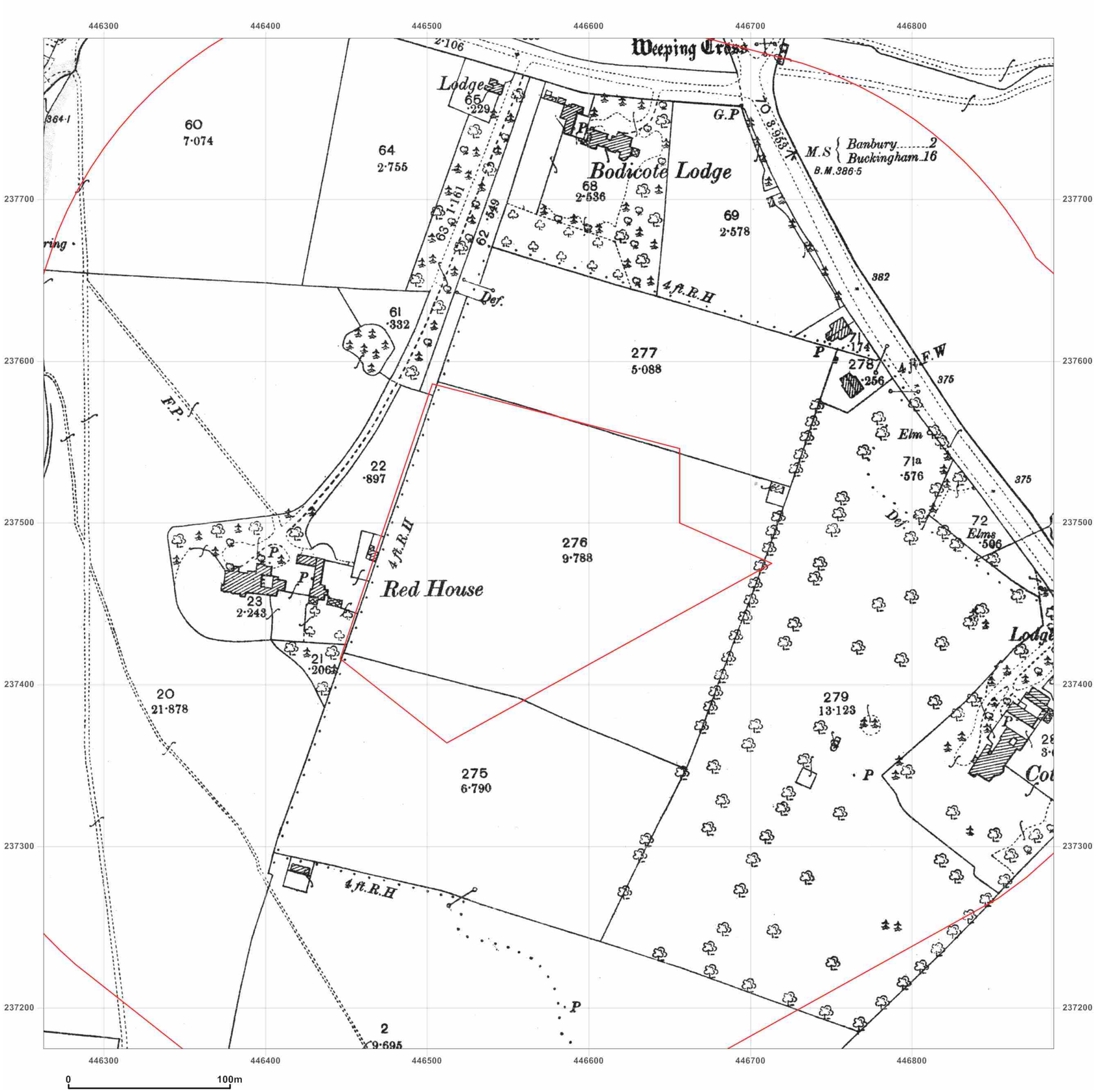
Surveyed 1923
Revised 1923
Edition N/A
Copyright N/A
Levelled N/A

Ordnance Survey Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: County Series

Map date: **1898**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

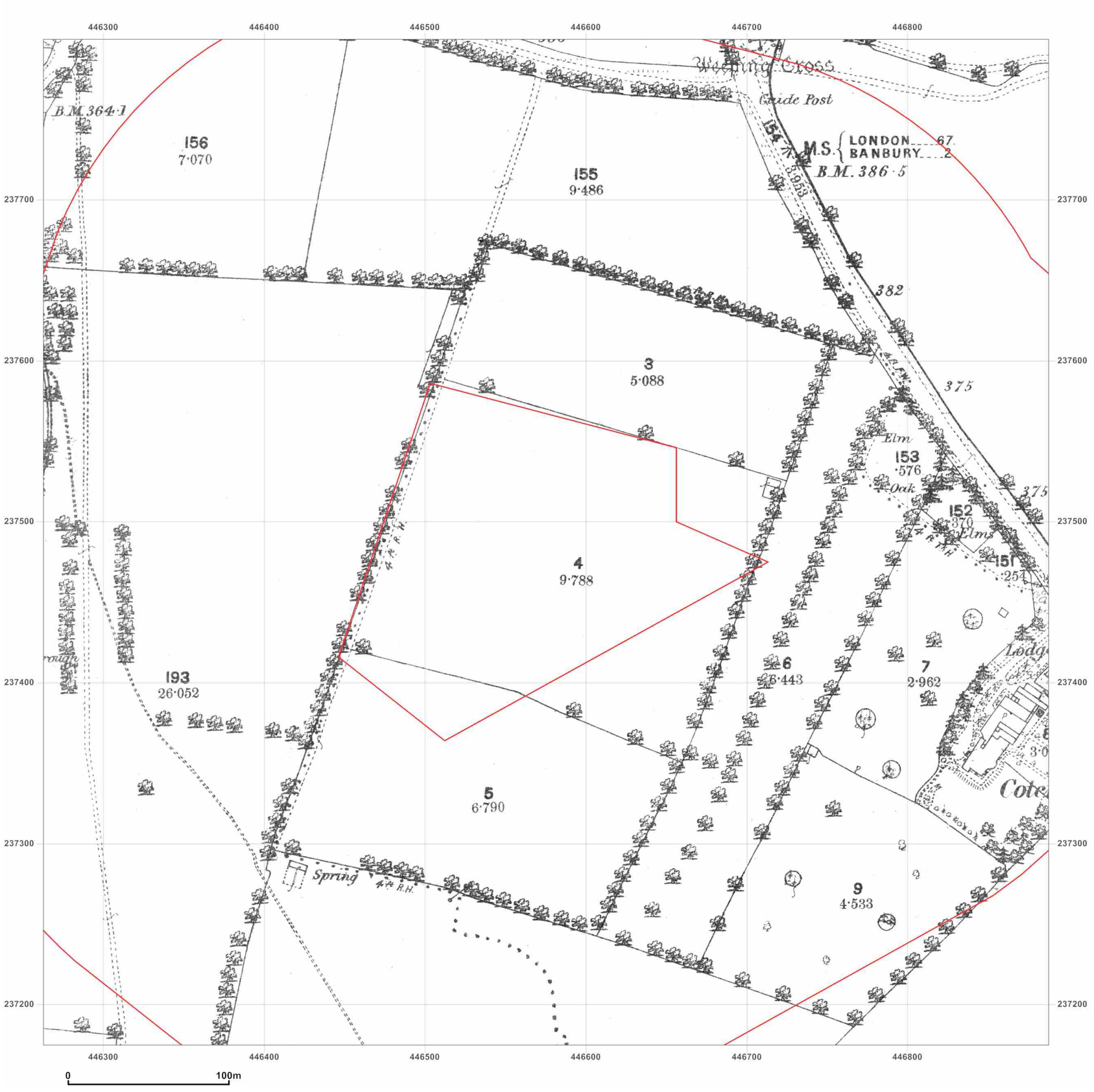
Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

Ordnance Survey Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Client Ref: Cotefield Farm, Bodicote
Report Ref: GS-558784
Grid Ref: 446575, 237487

Map Name: County Series
Map date: **1881**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1881
Revised 1881
Edition N/A
Copyright N/A
Levelled N/A

Ordnance Survey Licensed Partner

Produced by
GroundSure Environmental Insight
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 05 December 2012

To view map legend click here *Legend*

APPENDIX C

Environmental Insight Report

The Brownfield Consultancy
The Cottage, Mill Lane,
Warwickshire,
Southam, CV47 2YF

GroundSure Reference:	GS-558783
Your Reference:	Cotefield Farm, Bodicote
Report Date:	Dec 5, 2012
Report Delivery Method:	**xml**
Client Email:	jim.twaddle@brownfieldconsultancy.co.uk

GroundSure EnviroInsight

Address: COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Dear Sir/Madam,

Thank you for placing your order with GroundSure. Please find enclosed the GroundSure EnviroInsight as requested

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above GroundSure reference number.

[redacted]
Groundsure Limited

Enc.
GroundSure EnviroInsight

GroundSure EnviroInsight

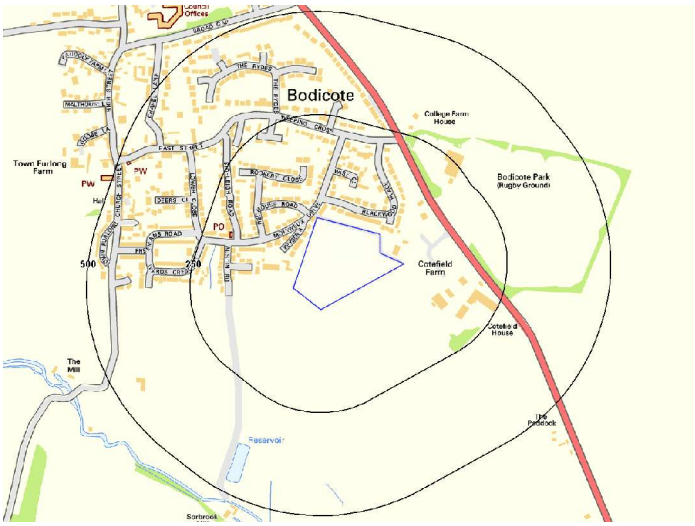
Address: COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ

Date: Dec 5, 2012

GroundSure Reference: GS-558783

Your Reference: Cotefield Farm, Bodicote

Client: The Brownfield Consultancy

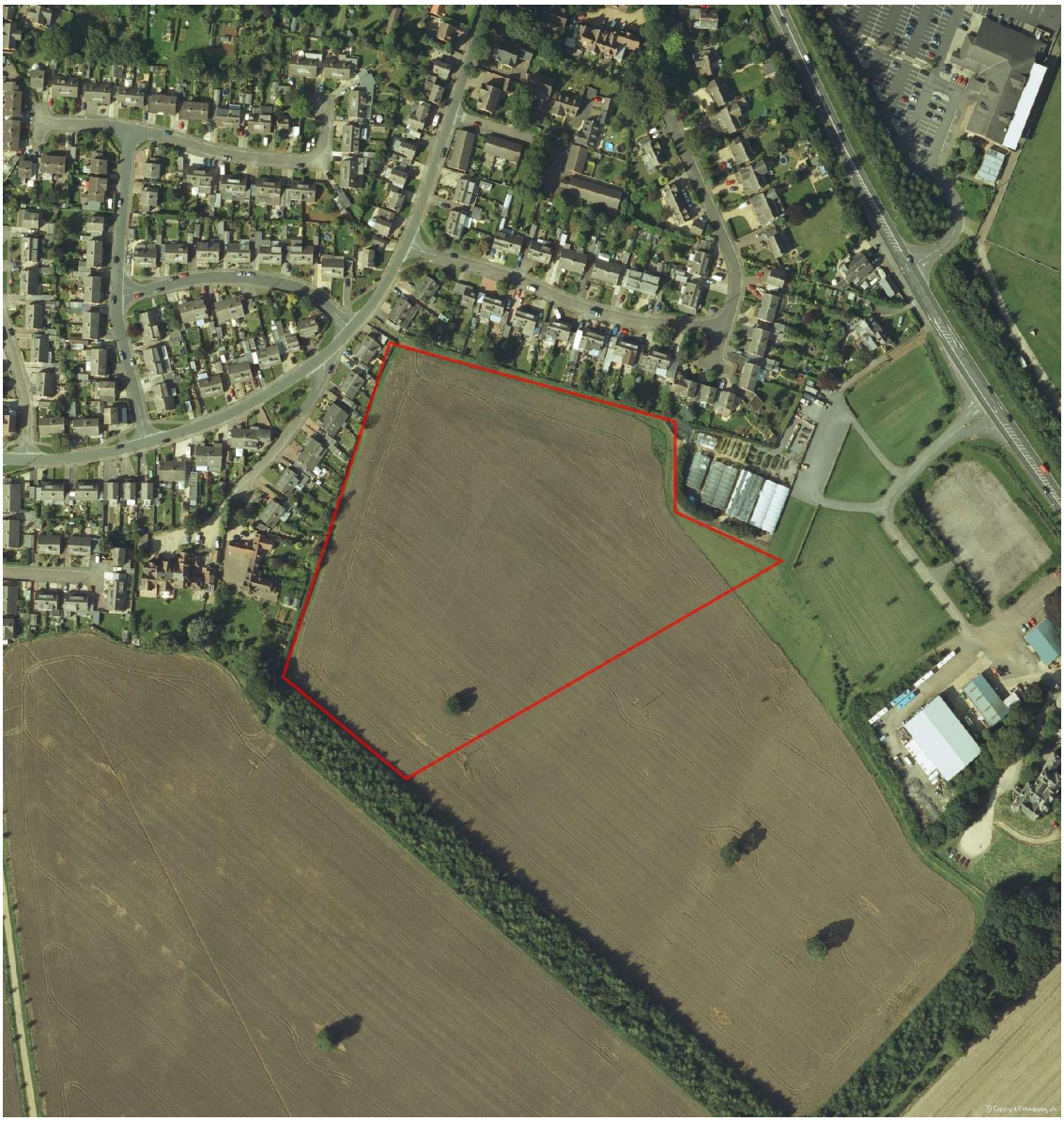


Brought to you by GroundSure

Aerial Photograph of Study Site

NW ▲ N NE

◄W E►



SW ▼ S SE

Site Name: COTEFIELD FARM, OXFORD ROAD, BODICOTE, BANBURY, OX15 4AQ
Grid Reference: 446575,237487
Size of Site: 3.28 ha

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	0	-	-
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	0	0	0	-	-
Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0	-	-
Records of Licensed Discharge Consents	0	0	3	0	-	-
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	0	-	-	-
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	0	0	-
Landfill Data – Operational Landfill Sites	0	0	0	0	0	-
Environment Agency Historic Landfill Sites	0	0	0	0	0	0
Landfill Data – Non-Operational Landfill Sites	0	0	0	0	0	-
BGS/DoE Landfill Site Survey	0	0	0	0	0	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	0	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	-	-
Environment Agency Licensed Waste Sites	0	0	0	0	0	0

3. Current Land Uses	on-site	0-50	51-250	251-500	501-1000	1000-1500
3.1 Current Industrial Sites Data	0	0	4	-	-	-
3.2 Records of Petrol and Fuel Sites	0	0	0	0	-	-
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? *	No
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 218	

* 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	1	0	1	2
5.4 Surface Water Abstraction Licences (within 2000m of the study site).	0	0	0	0	3	2
5.5 Potable Water Abstraction Licences (within 2000m of the study site).	0	0	0	0	3	0
5.6 Are there any Source Protection Zones within 500m of the study site?					No	

5.7 River Quality	on-site	0-50	51-250	251-500	501-1000	1001-1500
Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	No	No
5.8 Detailed River Network entries within 500m of the site	0	0	2	1	-	-
5.9 Surface water features within 250m of the study site	No	No	Yes	-	-	-

6. Flooding	
6.1 Are there any Environment Agency indicative Zone 2 floodplains within 250m of the study site?	No
6.2 Are there any Environment Agency indicative Zone 3 floodplains within 250m of the study site?	No
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?	High
6.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Low

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	0	0
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	0	0
7.3 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
7.4 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
7.5 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
7.6 Records of Ramsar sites	0	0	0	0	0	0
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	1
7.9 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	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	0
7.13 Records of Ancient Woodlands	0	0	0	0	0	0

8. Natural Hazards

8.1 What is the maximum risk of natural ground subsidence?	Low

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

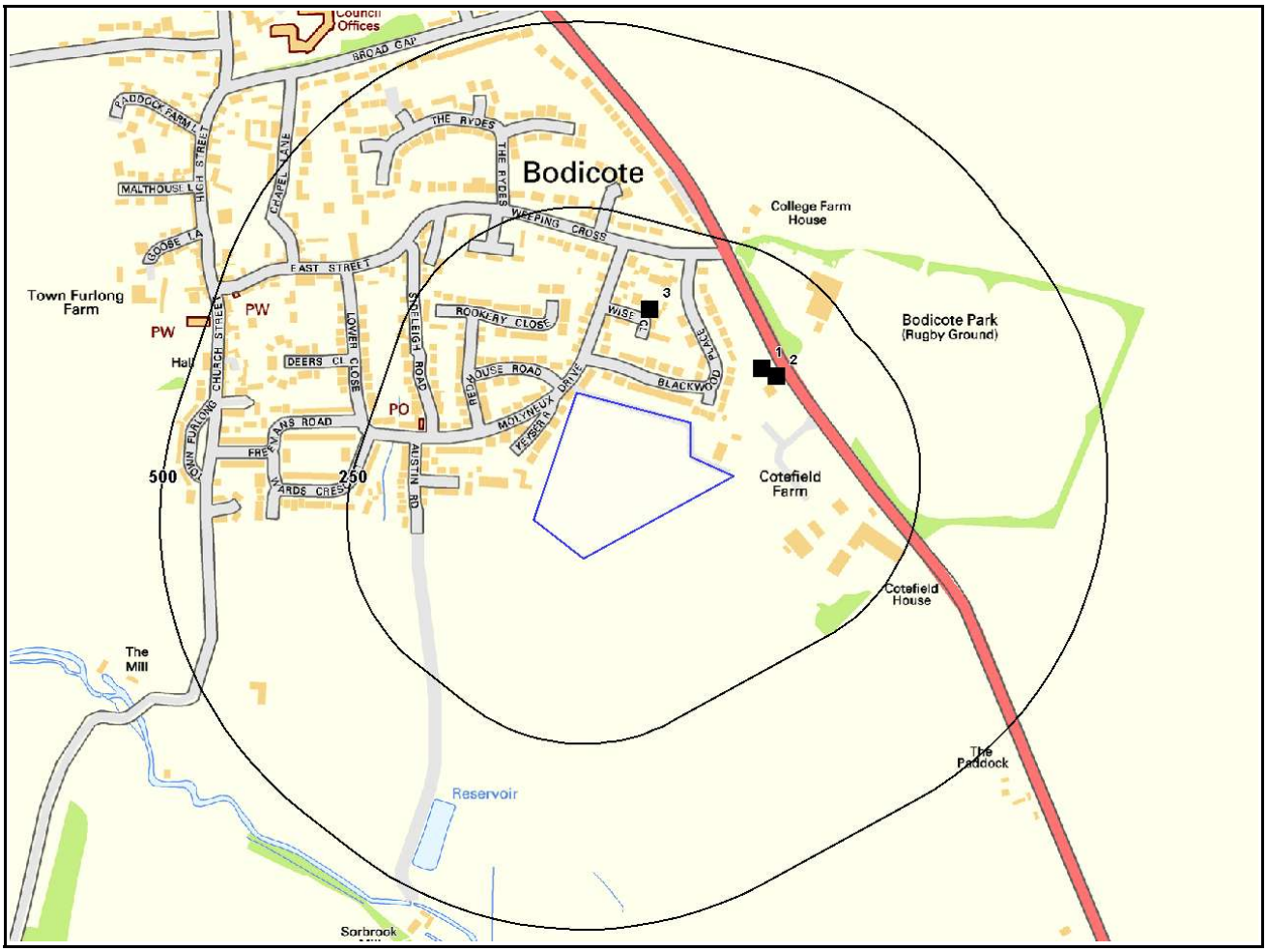
Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes 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

NW N NE



W E

SW S SE

Authorisations,Incidents and Registers Legend

Enabled by Ordnance Survey

- Site Outline
- Search Buffers (m) — 250 / 500
- Recorded Pollution Incident
- Dangerous Substances (List 1)
- Dangerous Substances (List 2)
- Water Industry Referrals
- Licenced Discharge Consents
- Red List Discharge Consents
- RAS 3 & 4 Authorisations
- Part A(1) Authorised Processes and Historic IPC Authorisations
- Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

1.Environmental Permits, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

Records of historic IPC Authorisations within 500m of the study site: **0**

Database searched and no data found.

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: **0**

Database searched and no data found.

Records of Category 3 or 4 Radioactive Substance Licences within 500m of the study site: **0**

Database searched and no data found.

Records of Licensed Discharge Consents within 500m of the study site: **3**

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

ID	Distance	Direction	NGR	Details	
1	120.0	NE	446750, 237620	Address: 2 Victoria Cottages,oxford Road,bod, 2 Victoria Cottages,oxford Road, Bodicote,banbury,oxfordshire,ox1, 5 4ah Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: CATM.3317 Permit Version: 1	Receiving Water: A Tributaryof The Sor Brook Status: New Consent, By Application (wra 91, Section 88) Issue date: 10/7/1998 Effective Date: 10/7/1998 Revocation Date: -
2	131.0	NE	446770, 237610	Address: No 1 Victoria Cottages, Oxford Road, Bodicote, Banbury, Oxfordshire, OX15 4AH Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: CATM.3529 Permit Version: 1	Receiving Water: Tributary Of The Sor Brook Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 4/5/1999 Effective Date: - Revocation Date: -
3	135.0	N	446600, 237700	Address: Blackwood Place, Blackwood Place Effluent Type: Sewage Discharges - Pumping Station - Water Company Permit Number: TEMP.0473 Permit Version: 1	Receiving Water: Oxford Canal Status: Revoked - Unspecified Issue date: 2/11/1989 Effective Date: 2/11/1989 Revocation Date: -

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: **0**

Database searched and no data found.

Records of National Incidents Recording System, List 1 within 250m of the study site: **0**

Database searched and no data found.

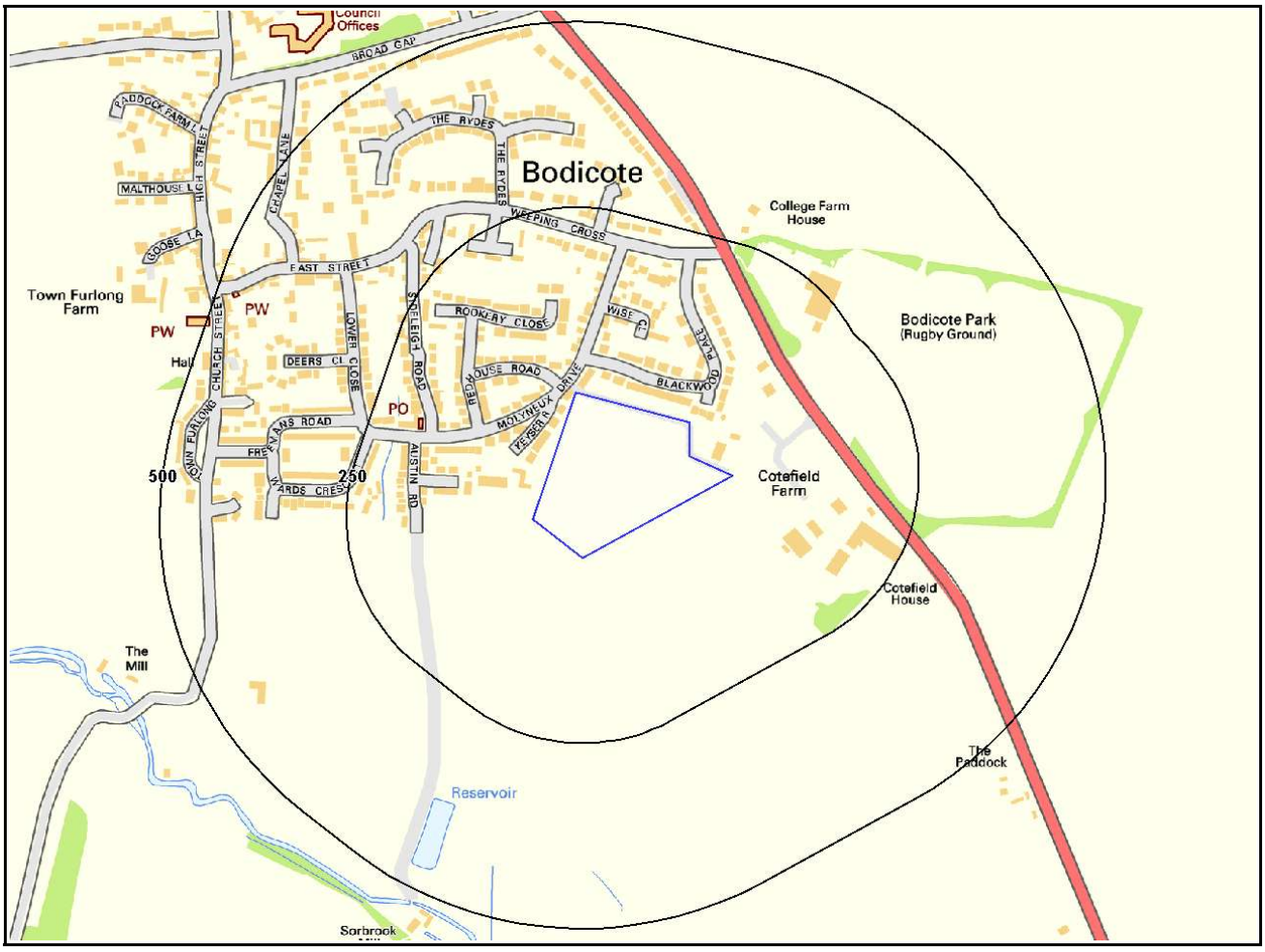
1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? **0**

Database searched and no data found.

2. Landfill and Other Waste Sites Map

NW N NE



W E

SW S SE

Landfill & Other Waste Sites Legend

- Site Outline
- Search Buffers (m): 250, 500
- E.A. Active Landfill
- E.A. Historic Landfill (Area Data)
- E.A. Historic Landfill (Point Data)
- BGS / DoE Survey Landfill
- Local Authority Landfill (Area Data)
- Local Authority Landfill (Point Data)
- Operational Waste Treatment Licence
- Closed Waste Treatment Licence
- REGIS Waste Licence
- Operational Landfill
- Closed Landfill

2. Landfill and Other Waste Sites

2.1 Landfill Sites

Records from Environment Agency landfill data within 1000m of the study site: **0**

Database searched and no data found.

Records of operational landfill sites sourced from Landmark within 1000m of the study site: **0**

Database searched and no data found.

Records of Environment Agency historic landfill sites within 1500m of the study site: **0**

Database searched and no data found.

Records of non-operational landfill sites sourced from Landmark within 1000m of the study site: **0**

Database searched and no data found.

Records of BGS/DoE non-operational landfill sites within 1500m of the study site: **0**

Database searched and no data found.

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: **0**

Database searched and no data found.

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site: **0**

Database searched and no data found.

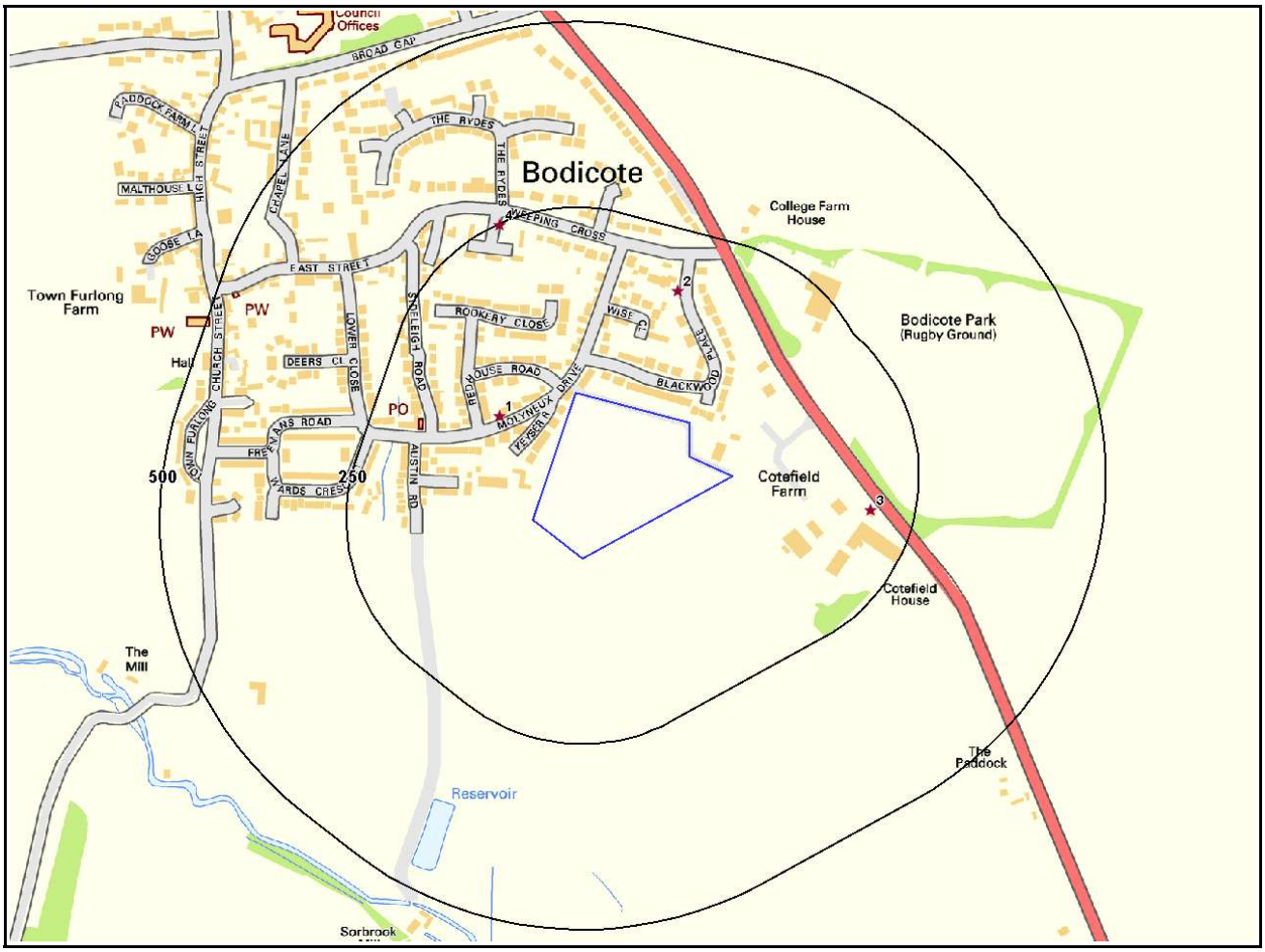
Records of Environment Agency licensed waste sites within 1500m of the study site: **0**

Database searched and no data found.

---

3. Current Land Use Map

NW N NE



W E

SW S SE

Current Land Use Legend

Enabled by Ordnance Survey

Site Outline

250
500
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: **4**

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

ID	Distance	Direction	Company	Address	Activity	Category
1	87.0	W	Electricity Sub Station	OX15	Electrical Features	Infrastructure and Facilities
2	167.0	N	Electricity Sub Station	OX15	Electrical Features	Infrastructure and Facilities
3	190.0	E	Tex Cars	Cotefield Farm, Oxford Road, Bodicote, Banbury, OX15 4AQ	Vehicle Hire and Rental	Hire Services
4	248.0	NW	Electricity Sub Station	OX15	Electrical Features	Infrastructure and Facilities

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: **0**

Database searched and no data found.

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

Database searched and no data found.
The database has been searched on site, including a 50m buffer.

4.3 Bedrock and Solid Geology

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

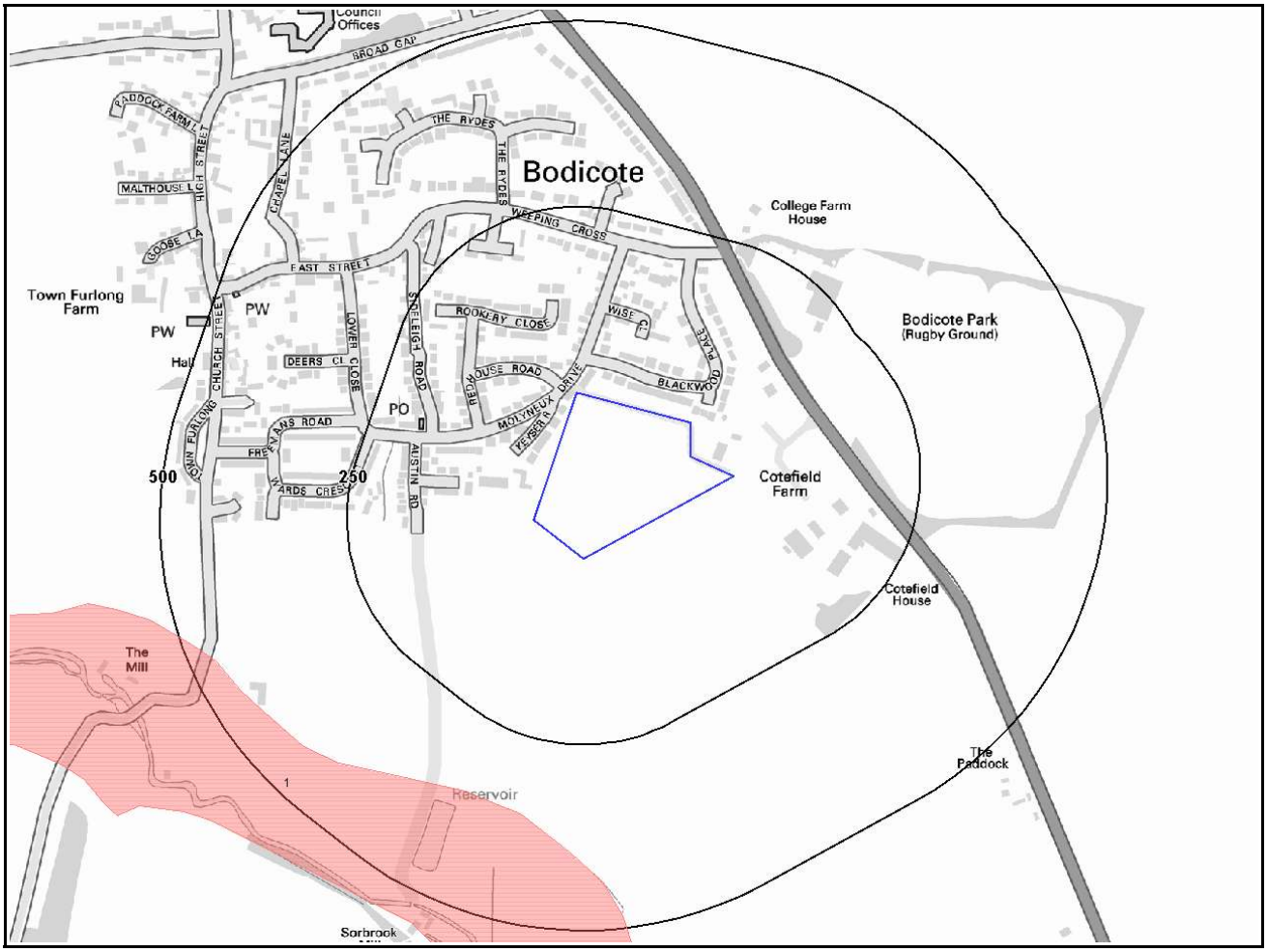
LEX Code	Description	Rock Type
MRB-FLIR	MARLSTONE ROCK FORMATION	FERRUGINOUS LIMESTONE AND IRONSTONE
DYS-SIMD	DYRHAM FORMATION	SILTSTONE AND MUDSTONE, INTERBEDDED

(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

NW N NE



W E

SW S SE

Aquifer Within Superficial Geology Legend

Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

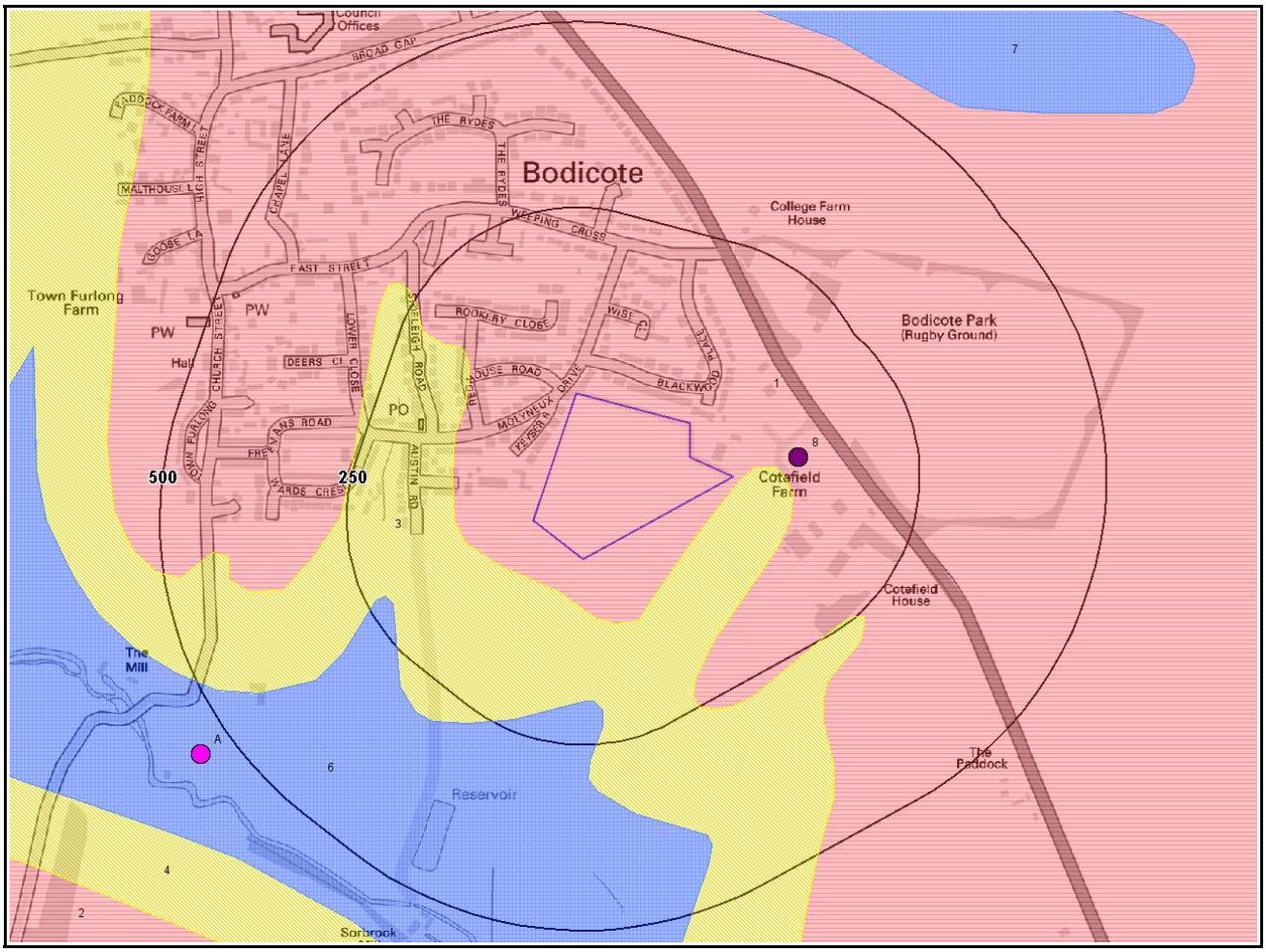
Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

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

NW N NE



W E

SW S SE

Aquifer Within Bedrock Geology Legend

Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

Secondary Aquifer - Undifferentiated Layers

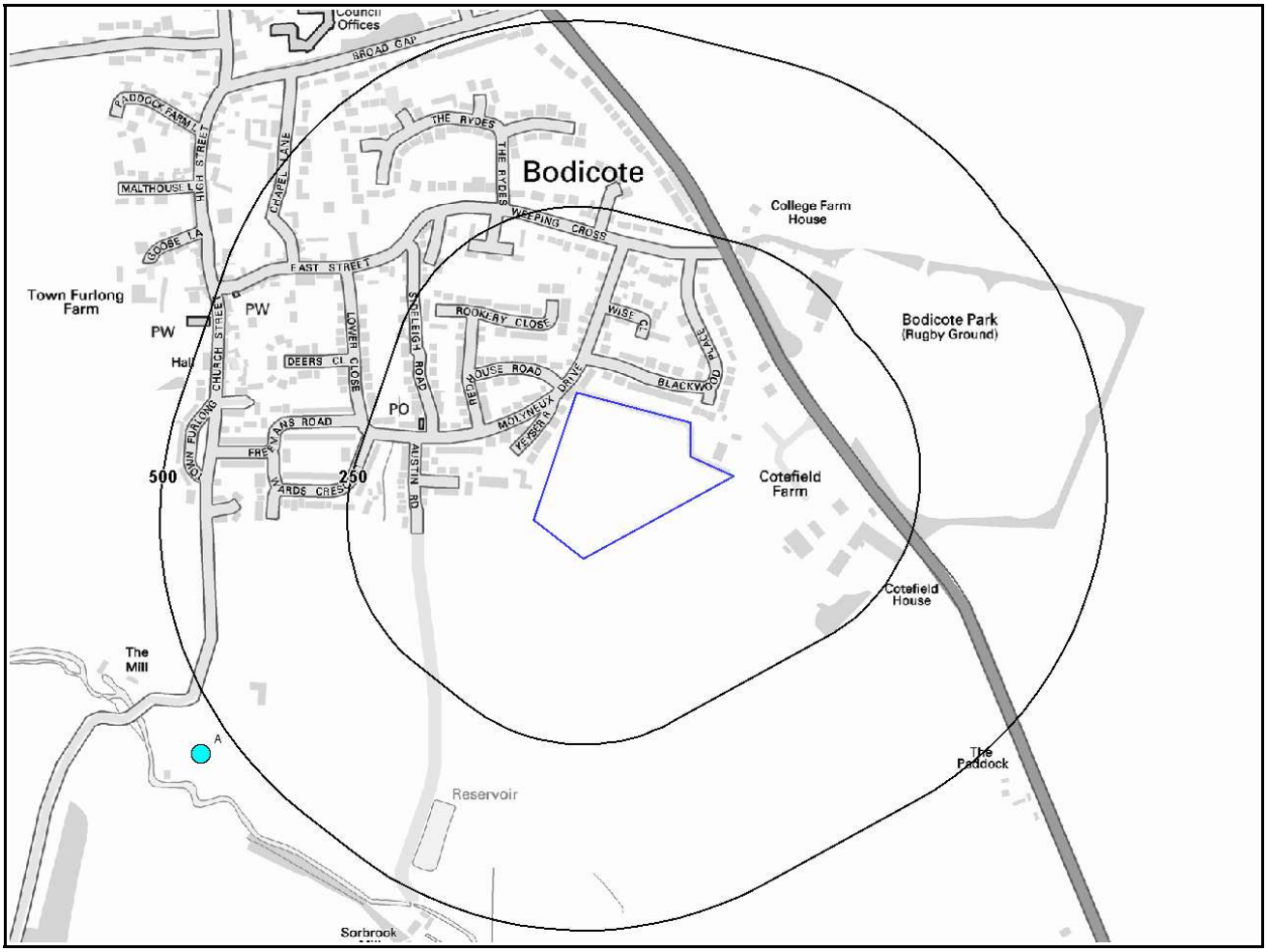
Unproductive

Unknown (lakes and landslip)

Surface Water Abstraction Licence

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

NW N NE



W E

SW S SE

SPZ and Potable Water Abstraction Licenses
Legend

Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2 - Outer Catchment

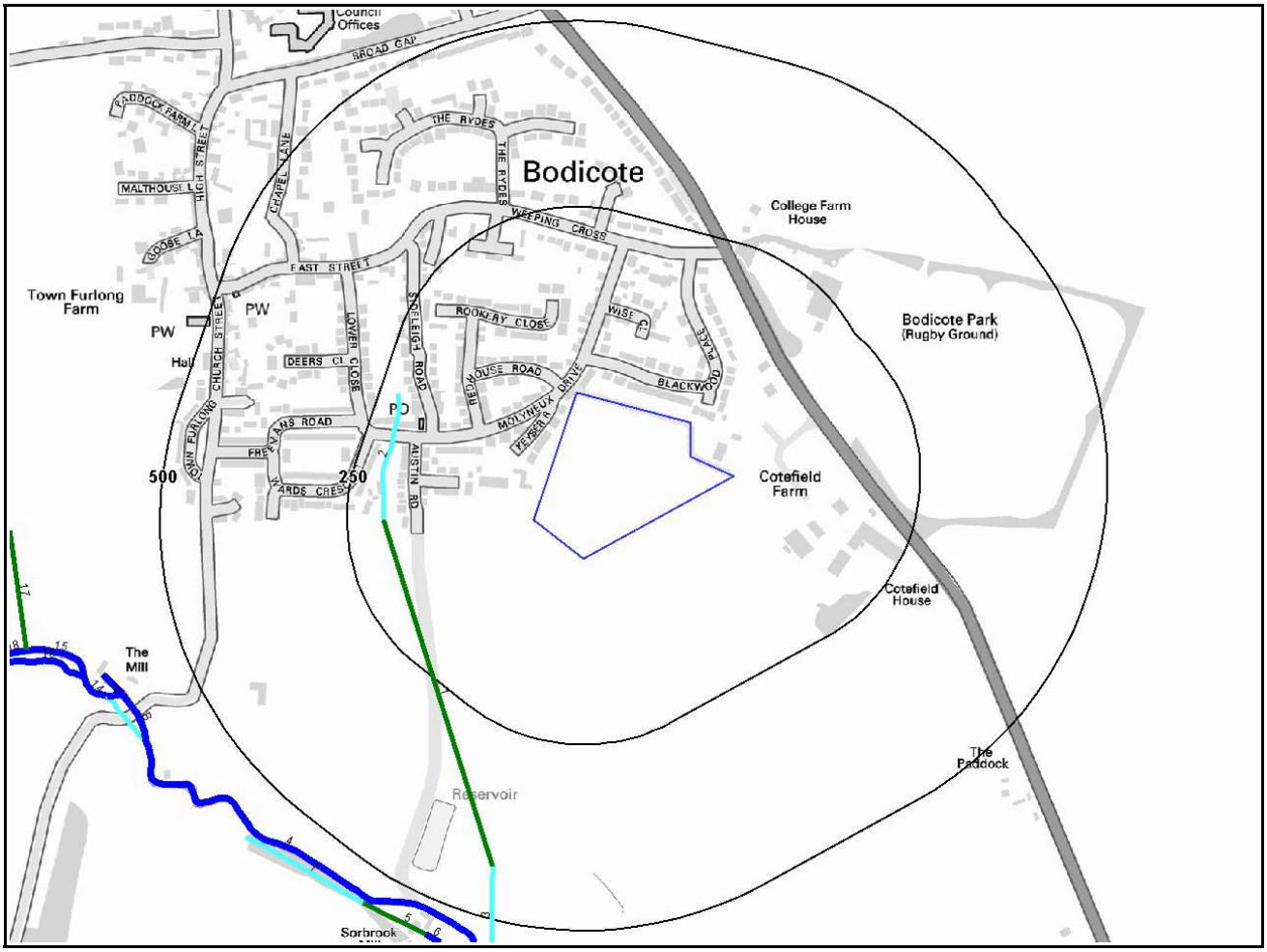
Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

5d. Hydrology – Detailed River Network and River Quality

NW N NE



W E

SW S SE

Hydrology Legend

Site Outline

250
500
Search Buffers (m)

Primary River
Secondary River
Tertiary River
Lake/Reservoir
Underground River (inferred)
General Quality Assessment: Chemistry

Canal
Canal Tunnel
Extended Culvert (greater than 50m)
D/S of High Water Mark
D/S seaward extension
General Quality Assessment: Biology

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	349.0	SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

5.2 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	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	11.0	SE	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
6	191.0	S	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

8	91.0	E	446800, 237500	Licence No: 28/39/14/0314 Details: Vegetable Washing Direct Source: Thames Groundwater Point: Cotefield Farm, Bodicate, Banbury, Oxon Data Type: Point	Annual Volume (m³): 20000 Max Daily Volume (m³): 109 Original Application No: WRA./5964 Original Start Date: 9/7/1992 Expiry Date: - Issue No: 100 Version Start Date: 9/7/1992 Version End Date:
Not shown	967.0	SW	445700, 236800	Licence No: 28/39/14/0008 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Bloxham Grove, Bodicote (a) Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: WR.A/959 Original Start Date: 14/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 9/5/1979 Version End Date:
Not shown	1887.0	E		Licence No: 28/39/14/0206 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Sutton Lodge, Twyford (l) Data Type: Point	Annual Volume (m³): 4546 Max Daily Volume (m³): 27.28 Original Application No: WR.A/682 Original Start Date: 10/4/1967 Expiry Date: - Issue No: 100 Version Start Date: 10/4/1967 Version End Date:
Not shown	1930.0	NE		Licence No: 28/39/14/0206 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Sutton Lodge, Twyford (a) Data Type: Point	Annual Volume (m³): 4546 Max Daily Volume (m³): 27.28 Original Application No: WR.A/682 Original Start Date: 10/4/1967 Expiry Date: - Issue No: 100 Version Start Date: 10/4/1967 Version End Date:

5.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? **Yes**

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance	Direction	NGR	Details	
12A	547.0	SW	446000, 237100	Licence No: 28/39/14/0234 Details: Potable Water Supply - Direct Direct Source: Thames Surface Water - Non Tidal Point: Bodicote Pumping Station Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: RG480 Original Start Date: 9/10/1967 Expiry Date: - Issue No: 100 Version Start Date: 18/2/1994 Version End Date:
13A	547.0	SW	446000, 237100	Licence No: 28/39/14/0234 Details: Potable Water Supply - Direct Direct Source: Thames Surface Water - Non Tidal Point: Bodicote Pumping Stationsor Brook Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: RG480 Original Start Date: 9/10/1967 Expiry Date: - Issue No: 100 Version Start Date: 18/2/1994 Version End Date:
14A	547.0	SW	446000, 237100	Licence No: 28/39/14/0234 Details: Potable Water Supply - Direct Direct Source: Thames Surface Water - Non Tidal Point: Bodicote Pumping Station - Sor Brook Data Type: Point	Annual Volume (m³): 1663836 Max Daily Volume (m³): 4546 Application No: RG480 Original Start Date: 9/10/1967 Expiry Date: - Issue No: 100 Version Start Date: 18/2/1994 Version End Date:
Not shown	1304.0	W	445200, 237800	Licence No: 28/39/14/0296 Details: Spray Irrigation - Storage Direct Source: Thames Surface Water - Non Tidal Point: Wykham Park Farm, Banbury, Oxon (point A) Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: WRA./4804 Original Start Date: 18/7/1984 Expiry Date: - Issue No: 100 Version Start Date: 18/7/1984 Version End Date:

Not shown	1304.0	W	445200, 237800	Licence No: 28/39/14/0296 Details: Spray Irrigation - Storage Direct Source: Thames Surface Water - Non Tidal Point: Wykham Park Farm, Banbury, Oxon (point A) - Trib.of.sor Broo Data Type: Point	Annual Volume (m³): 27276 Max Daily Volume (m³): 828 Application No: WRA./4804 Original Start Date: 18/7/1984 Expiry Date: - Issue No: 100 Version Start Date: 18/7/1984 Version End Date:

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	
1A	547.0	SW	446000, 237100	Licence No: 28/39/14/0234 Details: Potable Water Supply - Direct Direct Source: Thames Surface Water - Non Tidal Point: Bodicote Pumping Station Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: RG480 Original Start Date: 9/10/1967 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:
2A	547.0	SW	446000, 237100	Licence No: 28/39/14/0234 Details: Potable Water Supply - Direct Direct Source: Thames Surface Water - Non Tidal Point: Bodicote Pumping Stationsor Brook Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: RG480 Original Start Date: 9/10/1967 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:
3A	547.0	SW	446000, 237100	Licence No: 28/39/14/0234 Details: Potable Water Supply - Direct Direct Source: Thames Surface Water - Non Tidal Point: Bodicote Pumping Station - Sor Brook Data Type: Point	Annual Volume (m³): 1663836 Max Daily Volume (m³): 4546 Original Application No: RG480 Original Start Date: 9/10/1967 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:

5.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? **No**

Database searched and no data found.

5.7 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? **No**

Biological Quality:

Database searched and no data found.

Chemical Quality:

Database searched and no data found.

5.8 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? **Yes**

The following Detailed River Network records are represented on the Hydrology Map (5d):

ID	Distance	Direction		Details
1	193.0	W	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
2	201.0	W	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
3	432.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary 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**

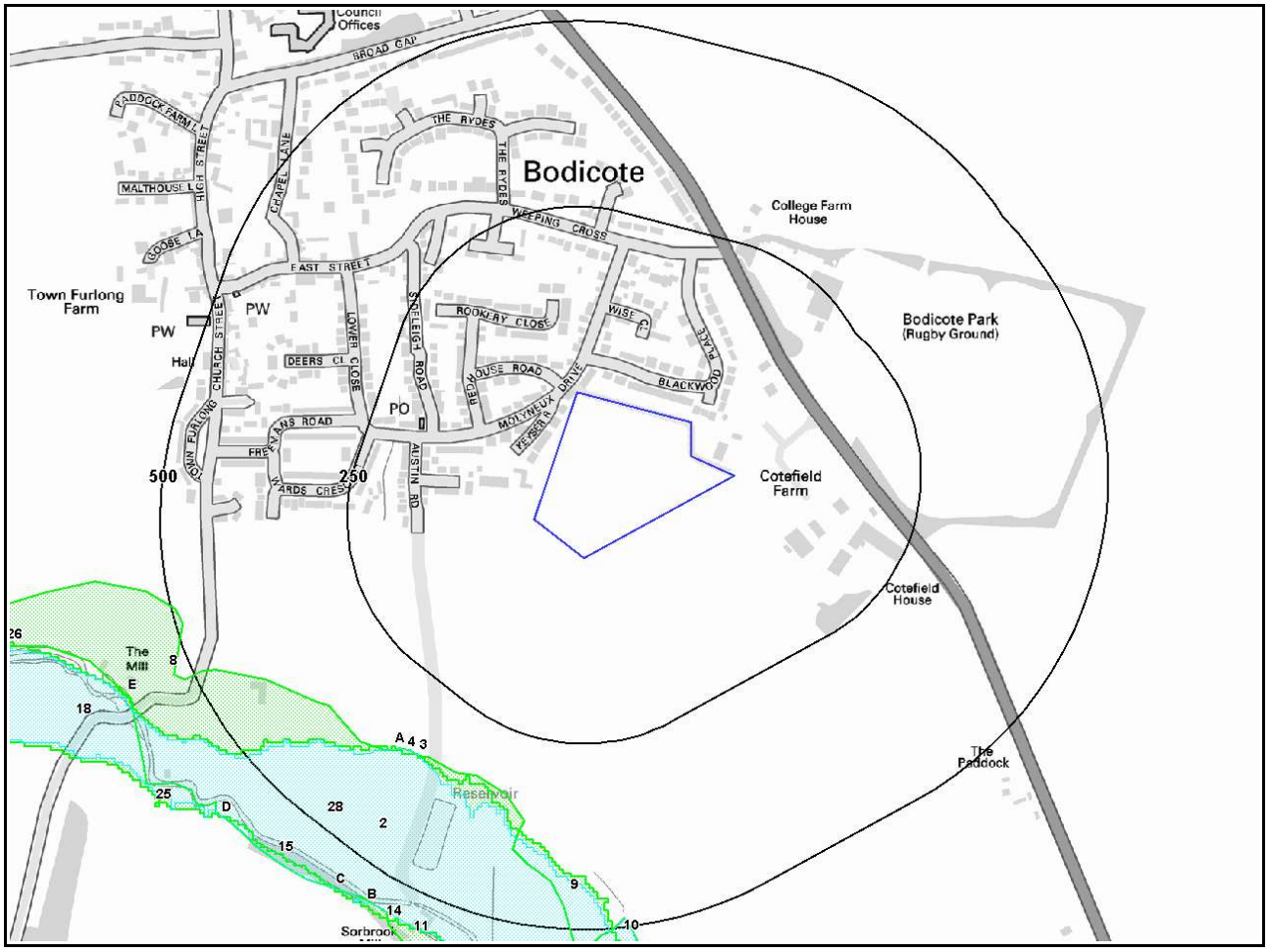
The following surface water records are not represented on mapping:

Distance to Surface Water (m)	on-site	0-50	51-250
Surface water features within 250m of the study site	No	No	Yes

6. Environment Agency Flood Map

NW ▲ N NE

◄W



E► SW ▼ S SE

Environment Agency Flood Legend

Site Outline

250
500
Search Buffers (m)

Zone 2 Floodplain

Zone 3 Floodplain

Flood Storage Area

Area Benefiting from Flood Defences

Flood Defences

6. Flooding

6.1 Zone 2 Flooding

Zone 2 floodplain estimates the annual probability of flooding as one in one thousand (0.1%) or greater from rivers and the sea but less than 1% from rivers or 0.5% from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 2 floodplain? **No**

Database searched and no data found.

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? **No**

Database searched and no data found.

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? **High**

6.7 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? **Low**

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.

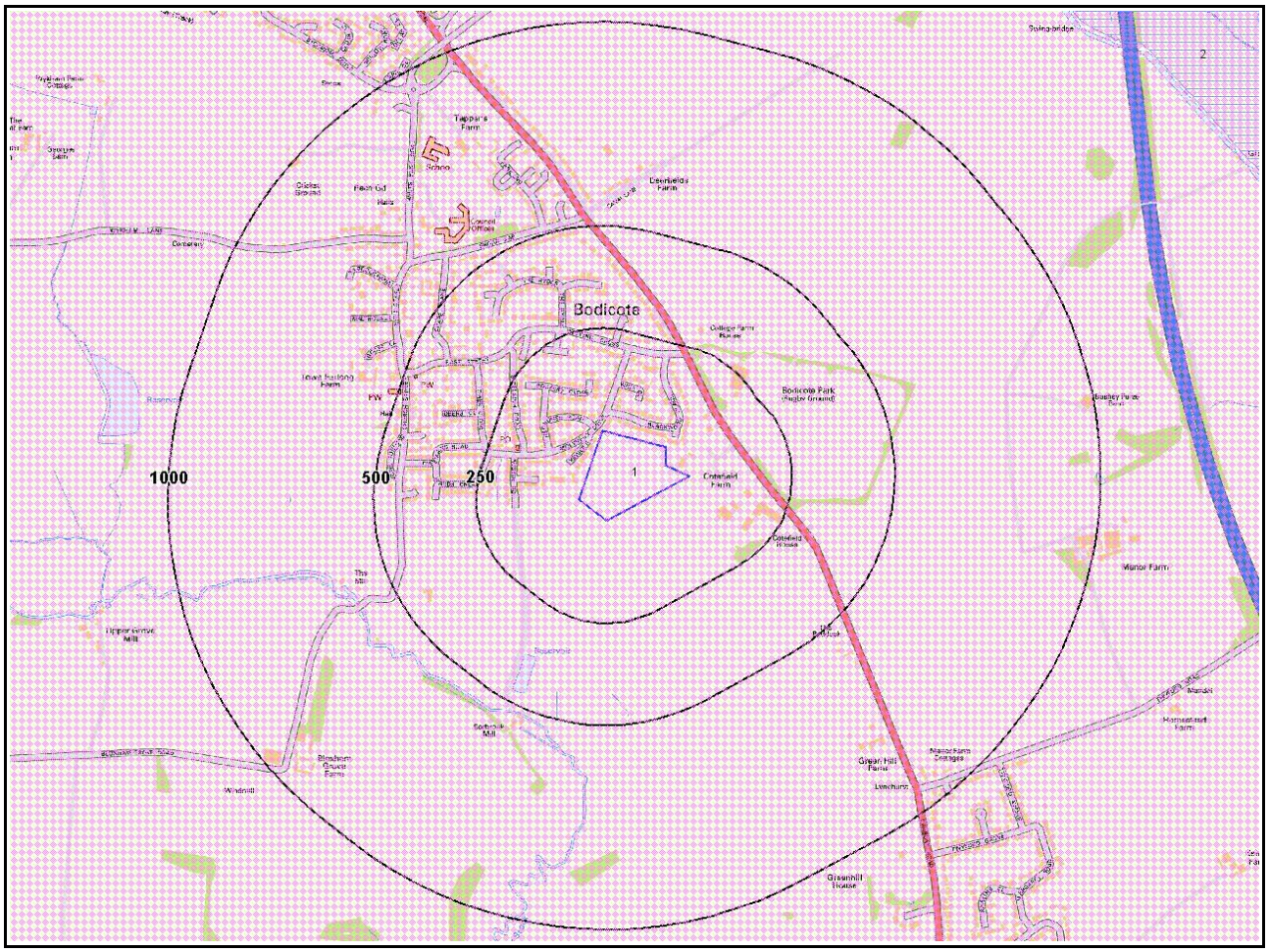
The **confidence rating** is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with 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

- Site Outline
- Areas of Outstanding Natural Beauty
- SAC
- SPA
- Nitrate Vulnerable Zones
- SSSI
- Ramsar
- Nitrate Sensitive Areas
- NNR
- LNR
- National Parks
- World Heritage Sites
- Environmentally Sensitive Areas
- Ancient Woodlands

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: **0**

Database searched and no data found.

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: **0**

Database searched and no data found.

Records of Special Protection Areas (SPA) within 2000m of the study site: **0**

Database searched and no data found.

Records of Ramsar sites within 2000m of the study site: **0**

Database searched and no data found.

Records of Local Nature Reserves (LNR) within 2000m of the study site: **0**

Database searched and no data found.

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: **1**

The following Environmentally Sensitive Area records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	ESA Name	Data Source
2	1410.0	NE	Upper Thames Tributaries	Natural England

Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site: **0**

Database searched and no data found.

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: **1**

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
1	0.0	On Site	NVZ Area	DEFRA

Records of Ancient Woodland within 2000m of the study site: **0**

Database searched and no data found.

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? **Null - Negligible**

Soluble rocks are not present in the search area. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

8.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? **Negligible**

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

Hazard
No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

8.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? **Very Low**

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

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

8.1.6Running Sand

What is the maximum Running Sand* hazard rating identified on the study site? **Negligible**

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

Hazard
No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

* 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.

10.Contacts

GroundSure Helpline
Telephone: 08444 159 000
info@4c.groundsure.com

British Geological Survey (England & Wales)
Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143. Fax: 0115 936 3276. Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk
BGS Geological Hazards Reports and general geological enquiries

Environment Agency
National Customer Contact Centre
PO Box 544
Rotherham
S60 1BY
Tel: 08708 506 506
Web: www.environment-agency.gov.uk
Email: enquiries@environment-agency.gov.uk

Health Protection Agency
Chilton, Didcot, Oxon, OX11 0RQ
Tel: 01235 822622 www.hpa.org.uk/radiation
Radon measures and general radon information and guidance

The Coal Authority
200 Lichfield Lane, Mansfield, Notts NG18 4RG
Tel: 0845 762 6848
DX 716176 Mansfield 5
Web: www.groundstability.com

Ordnance Survey
Romsey Road
Southampton SO16 4GU
Tel: 08456 050505

Local Authority
Authority: Cherwell District Council
Phone: 01295 252535
Web: www.cherwell-dc.gov.uk
Address: Bodicote House, Bodicote, Banbury, OX15 4AA

Get Mapping PLC
Virginia Villas, High Street, Hartley Witney, Hampshire RG27 8NW
Tel: 01252 845444

Standard Terms and Conditions

1 Definitions

In these conditions unless the context otherwise requires:

"Beneficiary" means the Client or the customer of the Client for whom the Client has procured the Services.

"Commercial" means any building which is not Residential.

"Commission" means an order for Consultancy Services submitted by a Client.

"Consultancy Services" mean consultancy services provided by GroundSure including, without limitation, carrying out interpretation of third party and in-house environmental data, provision of environmental consultancy advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Contract" means the contract between GroundSure and the Client for the performance of the Services which arises upon GroundSure's acceptance of an Order or Commission and which shall incorporate these conditions, the relevant GroundSure User Guide, proposal by GroundSure and the content of any subsequent report, and any agreed amendments in accordance with clause 11.

"Client" means the party that submits an Order or Commission.

"Data Provider" means any third party providing Third Party Content to GroundSure.

"Data Report" means reports comprising factual data with no professional interpretation in respect of the level of likely risk and/or liability available from GroundSure.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028 and whose registered office is at Greater London House, Hampstead Road, London NW1 7EJ.

"GroundSure Materials" means all materials prepared by GroundSure as a result of the provision of the Services, including but not limited to Data Reports, Mapping and Risk Screening Reports.

"Intellectual Property" means any patent, copyright, design rights, service marks, moral rights, data protection rights, know-how, trade mark or any other intellectual property rights.

"Mapping" an historical map or a combination of historical maps of various ages, time periods and scales available from GroundSure.

"Order" means an order form submitted by the Client requiring Services from GroundSure in respect of a specified Site.

"Order Website" means online platform via which Orders may be placed.

"Report" means a Risk Screening Report or Data Report for commercial or residential property available from GroundSure relating to the Site prepared in accordance with the specifications set out in the relevant User Guide.

"Residential" means any building used as or suitable for use as an individual dwelling.

"Risk Screening Report" means one of GroundSure's risk screening reports, comprising factual data with interpretation in respect of the level of likely risk and/or liability, excluding **"Consultancy Services"**.

"Services" means the provision of any Report, Mapping or Consultancy Services which GroundSure has agreed to carry out for the Client/Beneficiary on these terms and conditions in respect of the Site.

"Site" means the landsite in respect of which GroundSure provides the Services.

"Third Party Content" means any data, database or other information contained in a Report or Mapping which is provided to GroundSure by a Data Provider.

"User Guide" means the relevant current version of the user guide, available upon request from GroundSure.

2 Scope of Services

2.1 GroundSure agrees to carry out the Services in accordance with the Contract and to the extent set out therein.

2.2 GroundSure shall exercise all the reasonable skill, care and diligence to be expected of experienced environmental consultants in the performance of the Services.

2.3 The Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in the Contract.

2.4 Terms and conditions appearing on a Client's order form, printed stationery or other communication, including invoices, to GroundSure, its employees, servants, agents or other representatives or any terms implied by custom, practice or course of dealing shall be of no effect and these terms and conditions shall prevail over all others.

2.5 If a Client/Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to procure such insurance, but makes no warranty that such insurance shall be available from insurers or offered on reasonable terms. GroundSure does not endorse or recommend any particular insurance product, policy or insurer. Any insurance purchased shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. The Client/Beneficiary should take independent advice to ensure that the insurance policy requested and/or offered is suitable for its requirements.

2.6 GroundSure's quotations/proposals are valid for a period of 30 days only. GroundSure reserves the right to withdraw any quotation at any time before GroundSure accepts an Order or Commission. GroundSure's acceptance of an Order or Commission shall be effective only where such acceptance is in writing and signed by GroundSure's authorised representative or where accepted via GroundSure's Order Website.

3 The Client's obligations

3.1 The Client shall ensure the Beneficiary complies with and is bound by the terms and conditions set out in the Contract and shall provide that Groundsure may in its own right enforce such terms and conditions against the Beneficiary pursuant to the Contracts (Rights of Third parties) Act 1999. The Client shall be liable for all breaches of the Contract by the Beneficiary as if they were breaches by the Client. The Client shall be solely responsible for ensuring that the Report/Mapping ordered is appropriate and suitable for the Beneficiary's needs.

3.2 The Client shall (or shall procure that the Beneficiary shall) supply to GroundSure as soon as practicable and without charge all information necessary and accurate relevant data including any specific and/or unusual environmental information relating to the Site known to the Client/Beneficiary which may pertain to the Services and shall give such assistance as GroundSure shall reasonably require in the performance of the Services (including, without limitation, access to a Site, facilities and equipment as agreed in the Contract).

3.3 Where Client/Beneficiary approval or decision is required, such approval or decision shall be given or procured in reasonable time as not to delay or disrupt the performance of any other part of the Services.

3.4 The Client shall not and shall not knowingly permit the Beneficiary to, save as expressly permitted by these terms and conditions, re-sell, alter, add to, amend or use out of context the content of any Report, Mapping or, in respect of any Services, information given by GroundSure. For the avoidance of doubt, the Client and Beneficiary may make the Report, Mapping or GroundSure's findings available to a third party who is considering acquiring the whole or part of the Site, or providing funding in relation to the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.5 The Client is responsible for maintaining the confidentiality of its user name and password if using GroundSure's internet ordering service and accepts responsibility for all activity that occurs under such account and password.

4 Reliance

4.1 Upon full payment of all relevant fees and subject to the provisions of these terms and conditions, the Client and Beneficiary are granted an irrevocable royalty-free licence to access the information contained in a Report, Mapping or in a report prepared by GroundSure in respect of or arising out of Consultancy Services. The Services may only be used for the benefit of the Client and those persons listed in clauses 4.2 and 4.3.

4.2 In relation to Data Reports, Mapping and Risk Screening Reports, the Client shall be entitled to make Reports available to (i) the Beneficiary, (ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate), (iv) the first purchaser or first tenant of the Site (v) the professional advisers and lenders of the first purchaser or tenant of the Site. Accordingly GroundSure shall have the same duties and obligations to those persons in respect of the Services as it has to the Client and those persons shall have the benefit of any of the Client's rights under the Contract as if those persons were parties to the Contract. For the avoidance of doubt, the limitations of GroundSure's liability as set out in clauses 7 and 11.6 shall apply.

4.3 In relation to Consultancy Services, reliance shall be limited to the Client, Beneficiary and named parties on the Report.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise agreed in writing with GroundSure, any other party considering the information supplied by GroundSure as part of the Services, including (but not limited to) insurance underwriters, does so at their own risk and GroundSure has no legal obligations to such party unless otherwise agreed in writing.

4.5 The Client shall not and shall not knowingly permit any person (including the Beneficiary) who is provided with a copy of any Report, (except as permitted herein or by separate agreement with GroundSure) to,: (a) remove, suppress or modify any trade mark, copyright or other proprietary marking from the Report or Mapping; (b) create any product which is derived directly or indirectly from the data contained in the Report or Mapping; (c) combine the Report or Mapping with, or incorporate the Report or Mapping into any other information data or service; or (d) re-format or otherwise change (whether by modification, addition or enhancement) data or images contained in the Report or Mapping.

4.6 Notwithstanding clause 4.5, if the Client acts in a professional capacity, it may make reasonable use of a Report and/or findings made as a result of Consultancy Services to advise Beneficiaries. However, GroundSure shall have no liability in respect of any opinion or report given to such Beneficiaries by the Client or a third party.

5 Fees and Disbursements

5.1 GroundSure shall charge the Client fees at the rate and frequency specified in the Contract together, in the case of Consultancy Services, with all proper disbursements incurred by GroundSure in performing the Services. For the avoidance of doubt, the fees payable for the Services are as set out in GroundSure's written proposal, Order Website or Order acknowledgement form. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services.

5.2 Unless GroundSure requires prepayment, the Client shall promptly pay all fees disbursements and other monies due to GroundSure in full without deduction, counterclaim or set off together with such value added tax or other tax as may be required within 30 days from the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client (**"Payment Date"**). GroundSure reserves the right to charge interest which shall accrue on a daily basis from 30 days after the date of Payment Date until the date of payment (whether before or after judgment) at the rate of five per cent per annum above the Bank of England base rate from time to time.

5.3 In the event that the Client disputes the amount payable in respect of GroundSure's invoice it shall notify GroundSure no later than 28 days after the date thereof that it is in dispute. In default of such notification the Client shall be deemed to have agreed the amount thereof. As soon as reasonably practicable following receipt of a notification in respect of any disputed invoice, a member of the management team at GroundSure shall contact the Client and the parties shall use all reasonable endeavours to resolve the dispute.

6 Intellectual Property and Confidentiality

6.1 Subject to the provisions of clause 4.1, the Client and the Beneficiary hereby acknowledge that all Intellectual Property in the Services and Content are and shall remain owned by either GroundSure or the Data Providers and nothing in these terms purports to transfer or assign any rights to the Client or the Beneficiary in respect of the Intellectual Property.

6.2 The Client shall acknowledge the ownership of the **Third Party** Content where such **Third Party** Content is incorporated or used in the Client's own documents, reports, systems or services whether or not these are supplied to a third party.

6.3 Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client acknowledges that the proprietary rights subsisting in copyright, database rights and any other intellectual property rights in respect of any data and information contained in any Report are and shall remain (subject to clause 11.1) the property of GroundSure and/or any third party that has supplied data or information used to create a Report, and that these conditions do not purport to grant, assign or transfer any such rights in respect thereof to a Client and/or a Beneficiary.

6.5 The Client shall (and shall procure that any recipients of the Report as permitted under clause 4.2 shall):

(i) not remove, suppress or modify any trademark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the data contained in the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);
(iv) not combine the Services with or incorporate such Services into any other information data or service; and
(v) not reformat or otherwise change (whether by modification, addition or enhancement), data contained in the Services (save that those acting in a professional capacity to the Beneficiary shall not be in breach of this clause 6.5(v) where such reformatting is in the normal course of providing advice based upon the Services),
in each case of parts (iii) to (v) inclusive, whether or not such product or report is produced for commercial profit or not.

6.6 The Client and/or Beneficiary shall and shall procure that any party to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

6.8 Save as otherwise set out in these terms and conditions, any information provided by one party ("**Disclosing Party**") to the other party ("**Receiving Party**") shall be treated as confidential and only used for the purposes of these terms and conditions, except in so far as the Receiving Party is authorised by the Disclosing Party to provide such information in whole or in part to a third party.

7 Liability

THE CLIENT'S ATTENTION IS DRAWN TO THIS PROVISION

7.1Subject to the provisions of this clause 7, GroundSure shall be liable to the Beneficiary only in relation to any direct losses or damages caused by any negligent act or omission of GroundSure in preparing the GroundSure Materials and provided that the Beneficiary has used all reasonable endeavours to mitigate any such losses.

7.2GroundSure shall not be liable for any other losses or damages incurred by the Beneficiary, including but not limited to:
(i) loss of profit, revenue, business or goodwill, losses relating to business interruption, loss of anticipated savings, loss of or corruption to data or for any special, indirect or consequential loss or damage which arise out of or in connection with the GroundSure Materials or otherwise in relation to a Contract;
(ii) any losses or damages that arise as a result of the use of all or part of the GroundSure Materials in breach of these terms and conditions or contrary to the terms of the relevant User Guide;
(iii) any losses or damages that arise as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such part is based on any Third Party Content or any reasonable interpretation of Third Party Content. The Client accepts, and shall procure that any other Beneficiary shall accept, that it has no claim or recourse to any Data Provider in relation to Third Party Content; and/or
(iv) any loss or damage to a Client's computer, software, modem, telephone or other property caused by a delay or loss of use of GroundSure's internet ordering service.

7.3 GroudSure's total liability in contract, tort (including negligence or breach of statutory duty), misrepresentation, restitution or otherwise, arising in connection with the GroundSure Materials or otherwise in relation to the Contract shall be limited to £10 million in total (i) for any one claim or (ii) for a series of connected claims brought by one or more parties.

7.4 For the duration of the liability periods set out in clauses 7.5 and 7.6 below, GroundSure shall maintain professional indemnity insurance in respect of its liability under these terms and conditions provided such insurance is readily available at commercially viable rates. GroundSure shall produce evidence of such insurance if reasonably requested by the Client. A level of cover greater than GroundSure's current level of cover may be available upon request and agreement with the Client.

7.5 Any claim under the Contract in relation to Data Reports, Mapping and Risk Screening Reports, must be brought within six years from the date when the Beneficiary became aware that it may have a claim and in no event may a claim be brought twelve years or more after completion of such a Contract. For the avoidance of doubt, any claim in respect of which proceedings are notified to GroundSure in writing prior to the expiry of the time periods referred to in this clause 7.5 shall survive the expiry of those time periods provided the claim is actually commenced within six months of notification.

7.6 Any claim under the Contract in relation to Consultancy Services, must be brought within six years from the date the Consultancy Services were completed.

7.7 he Client accepts and shall procure that any other Beneficiary shall accept that it has no claim or recourse to any Data Provider or to GroundSure in respect of the acts or omissions of any Data Provider and/or any Third Party Content provided by a Data Provider.

7.8 Nothing in these terms and conditions:
(i) excludes or limits the liability of GroundSure for death or personal injury caused by GroundSure's negligence, or for fraudulent misrepresentation; or
(ii) shall affect the statutory rights of a consumer under the applicable legislation.

8 GroundSure right to suspend or terminate

8.1 In the event that GroundSure reasonably believes that the Client or Beneficiary as applicable has not provided the information or assistance required to enable the proper performance of the Services, GroundSure shall be entitled on fourteen days written notice to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 GroundSure may additionally terminate the Contract immediately on written notice in the event that:
(i)the Client shall fail to pay any sum due to GroundSure within 28 days of the Payment Date; or
(ii)the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an Administration Order made against it or if a Receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or
(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or
(iv)the Client or the Beneficiary breaches any material term of the Contract (including, but not limited to, the obligations in clause 4) incapable of remedy or if remediable, is not remedied within 14 days of notice of the breach.

9 Client's Right to Terminate and Suspend

9.1 Subject to clause 10.2, the Client may at any time after commencement of the Services by notice in writing to GroundSure require GroundSure to terminate or suspend immediately performance of all or any of the Services.

9.2 The Client waives all and any right of cancellation it may have under the Consumer Protection (Distance Selling) Regulations 2000 (as amended) in respect of the Order of a Report/Mapping. This does not affect the Beneficiary's statutory rights.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination or any suspension of the Services, GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client/Beneficiary any property of the Client/ Beneficiary in GroundSure's possession or control.

10.2 In the event of termination/suspension of the Contract under clauses 8 or 9, the Client shall pay to GroundSure all and any fees payable in respect of the performance of the Services up to the date of termination/suspension. In respect of any Consultancy Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination/suspension of the Contract.

11 General

11.1 The mapping contained in the Services is protected by Crown copyright and must not be used for any purpose outside the context of the Services or as specifically provided in these terms.

11.2 GroundSure reserves the right to amend these terms and conditions. No variation to these terms shall be valid unless signed by an authorised representative of GroundSure.

11.3 No failure on the part of GroundSure to exercise and no delay in exercising, any right, power or provision under these terms and conditions shall operate as a waiver thereof.

11.4 Save as expressly provided in clauses 4.2, 4.3, 6.3 and 11.5, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

11.5 The Secretary of State for Communities and Local Government acting through Ordnance Survey may enforce breach of clause 6.1 of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

11.6 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:
(i) the Client or Beneficiary's failure to provide facilities, access or information;
(ii) fire, storm, flood, tempest or epidemic;
(iii) Acts of God or the public enemy;
(iv) riot, civil commotion or war;
(v) strikes, labour disputes or industrial action;
(vi) acts or regulations of any governmental or other agency;
(vii) suspension or delay of services at public registries by Data Providers; or
(viii) changes in law.

11.7 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

11.8 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email and on the second working day after the day of posting if sent by first class post.

11.9 The Contract constitutes the entire contract between the parties and shall supersede all previous arrangements between the parties.

11.10 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

11.11 These terms and conditions shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with these terms and conditions shall be subject to the exclusive jurisdiction of the English courts.

11.12 If the Client or Beneficiary has a complaint about the Services, notice can be given in any format eg writing, phone, email to the Compliance Officer at GroundSure who will respond in a timely manner.

APPENDIX D

BGS Radon Report

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

GeoReports

Jim Twaddle
The Cottage
Mill Lane
Fenny Compton
CV47 2YF

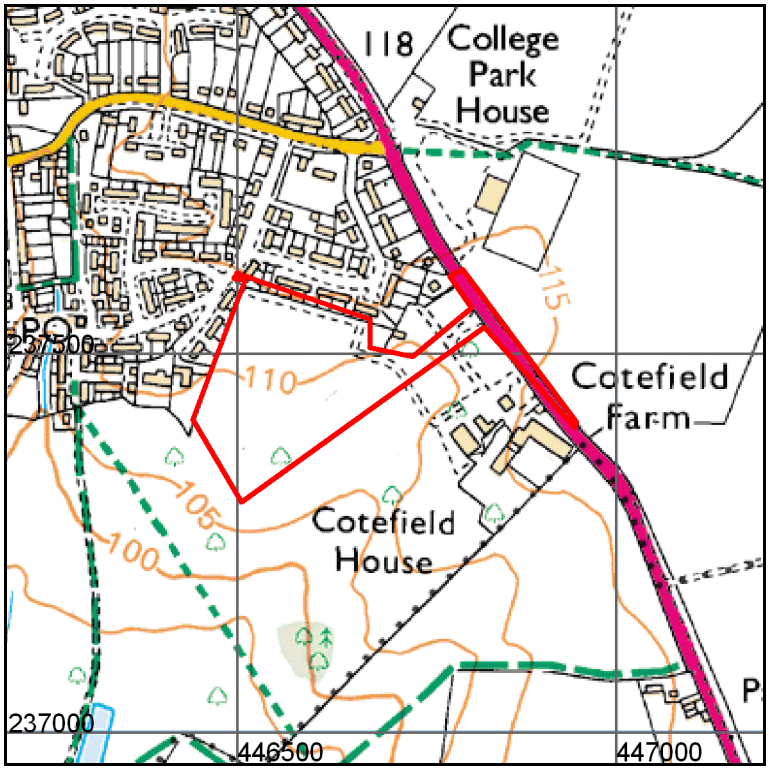
Radon Report: England and Wales

Advisory report on the requirement for radon protective measures in new buildings, conversions and extensions to existing buildings. The report also indicates whether a site is located within a radon Affected Area

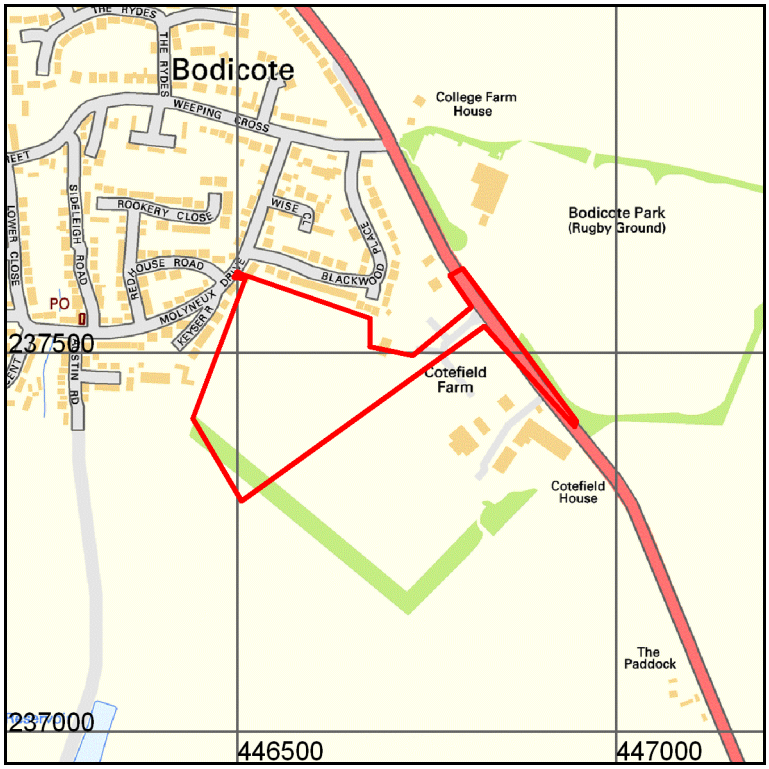
Report Id: ***GR_205904/1***

Client reference: Cotefield Farm

Search location



This product includes mapping data licensed from Ordnance Survey.
© Crown Copyright and/or database right 2013. Licence number 100037272
Scale: 1:10 000 (1cm = 100 m)



Contains Ordnance Survey data © Crown Copyright and database right 2013
OS Street View: Scale: 1:10 000 (1cm = 100 m)

This report describes a site located at National Grid Reference 446694, 237458. Note that for sites of irregular shape, this point may lie outside the site boundary. Where the client has submitted a site plan the assessment will be based on the area given.

Search location indicated in red

Radon Report: England and Wales

This is an advisory report on the requirement for radon protective measures in new buildings, conversions and extensions. The report also indicates whether a site is located within a radon Affected Area

Requirement for radon protective measures
The determination below follows advice in *BR211 Radon: Guidance on protective measures for new buildings (2007 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

FULL RADON PROTECTIVE MEASURES ARE REQUIRED FOR THE REPORT AREA.

The BGS is not able to provide advice on the technical specifications of 'basic' and 'full' radon protective measures. This information is detailed in **BRE Report BR211 Radon: guidance on protective measures for new buildings** which may be purchased from **brebookshop.com.** This report offers guidance on the technical solutions that are required to satisfy Building Regulations requirements.

Technical solutions to radon protection in new build and existing dwellings in radon affected areas are available on the BRE web site at:
http://www.bre.co.uk/page.jsp?id=1626 and http://www.bre.co.uk/radon/ and in a range of technical reports available from **brebookshop.com;** Tel: 01923 664262, email: bookshop@bre.co.uk.
Summary guidance is available on the web at:
http://www.bre.co.uk/radon/protect.html.

If you require further information or guidance, you should contact your local authority building control officer or approved inspector.

Radon in existing buildings

Is this property in a radon affected area – YES

The answer to the standard enquiry on house purchase known as **CON29 Standard Enquiry of Local Authority 3.13 Radon Gas: Location of the Property in a radon Affected Area is YES** this property is in a Radon Affected Area as defined by the Health Protection Agency (HPA).

The estimated probability of the property being above the Action Level for radon is: 30%+ (HIGHER PROBABILITY).

The result informs you of the estimated probability that this particular property is above the Action Level for radon. This does not necessarily mean there is a radon problem in the property. The only way to determine whether it is above or below the Action Level is to carry out a radon measurement within the existing property.

Radon Affected Areas are designated by the HPA. They advise that radon gas should be measured in all properties within Radon Affected Areas.

If you are buying a new build property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

If you are buying a currently occupied property in a Radon Affected Area you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were above the Radon Action Level and if so whether remedial measures were installed, radon levels were retested, and the that the results of re-testing confirmed the effectiveness of the measures.

In radon affected homes, the problem of radon can usually be tackled with simple, effective and relatively inexpensive measures. These measures are comparable in cost to work such as damp-proofing and timber treatment. You can get practical advice about construction work to reduce radon levels from the Building Control Officer at your local council.

For further information, advice about radon, its health risks and details of how to order the radon test, please contact the HPA Radon Helpline on 01235 822622 or go online at www.ukradon.org or write to Radon Survey, Health Protection Agency, Centre for Radiation, Chemical and Environmental Hazards, Chilton, Didcot, Oxon, OX11 0RQ, email: radon@hpa.org.uk. You can obtain an information pack from the HPA free Radon answerphone on 0800 614529

What is radon?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters enclosed spaces such as some buildings (particularly basements), caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m^{-3}). The Government advises householders that, where the radon level exceeds the Action Level, measures should be taken to reduce the concentration.

Radon in workplaces

The Ionising Radiation Regulations, 1999, require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293)**: Radon in the workplace.** BRE publications may be obtained from the BRE Bookshop, Tel: 01923 664262, email: bookshop@bre.co.ukwebsite: www.brebookshop.com

Contact Details

Keyworth (KW) Office
British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Tel: 0115 9363143
Fax: 0115 9363276
Email: enquiries@bgs.ac.uk

Wallingford (WL) Office
British Geological Survey
Maclean Building
Wallingford
Oxford
OX10 8BB
Tel: 01491 838800
Fax: 01491 692345
Email: hydroenq@bgs.ac.uk

Murchison House (MH) Office
British Geological Survey
Murchison House
West Mains Road
Edinburgh
EH9 3LA
Tel: 0131 650 0282
Fax: 0131 650 0252
Email: enquiry@bgs.ac.uk

Terms and Conditions

General Terms & Conditions

This Report is supplied in accordance with the GeoReports Terms & Conditions available on the BGS website at www.bgs.ac.uk/georeports and also available from the BGS Central Enquiries Desk at the above address.

Important notes about this Report

- The data, information and related records supplied in this Report by BGS can only be indicative and should not be taken as a substitute for specialist interpretations, professional advice and/or detailed site investigations. You must seek professional advice before making technical interpretations on the basis of the materials provided.
- Geological observations and interpretations are made according to the prevailing understanding of the subject at the time. The quality of such observations and interpretations may be affected by the availability of new data, by subsequent advances in knowledge, improved methods of interpretation, and better access to sampling locations.
- Raw data may have been transcribed from analogue to digital format, or may have been acquired by means of automated measuring techniques. Although such processes are subjected to quality control to ensure reliability where possible, some raw data may have been processed without human intervention and may in consequence contain undetected errors.
- Detail, which is clearly defined and accurately depicted on large-scale maps, may be lost when small-scale maps are derived from them.
- Although samples and records are maintained with all reasonable care, there may be some deterioration in the long term.
- The most appropriate techniques for copying original records are used, but there may be some loss of detail and dimensional distortion when such records are copied.
- Data may be compiled from the disparate sources of information at BGS's disposal, including material donated to BGS by third parties, and may not originally have been subject to any verification or other quality control process.
- Data, information and related records, which have been donated to BGS, have been produced for a specific purpose, and that may affect the type and completeness of the data recorded and any interpretation. The nature and purpose of data collection, and the age of the resultant material may render it unsuitable for certain applications/uses. You must verify the suitability of the material for your intended usage.
- If a report or other output is produced for you on the basis of data you have provided to BGS, or your own data input into a BGS system, please do not rely on it as a source of information about other areas or geological features, as the report may omit important details.
- The topography shown on any map extracts is based on the latest OS mapping and is not necessarily the same as that used in the original compilation of the BGS geological map, and to which the geological linework available at that time was fitted.
- Note that for some sites, the latest available records may be quite historical in nature, and while every effort is made to place the analysis in a modern geological context, it is possible in some cases that the detailed geology at a site may differ from that described.

Report issued by
BGS Enquiry Service

APPENDIX E

Exploratory Hole Records

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

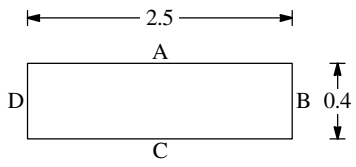
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP101
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	05-12-12 05-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.20			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.	0.10	ES	
0.20-0.90			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone..	0.60	ES	
0.90-2.60			Soft and Firm grey locally orange brown sligltly sandy fissured SILT. Rust coloured staining on some fissure surfaces.	1.00	HV	65, 62 kN/m2
				1.20	D	
				2.50	D	
2.60-3.20			Compact grey locally orange brown sligltly sandy fissured SILT. Rust coloured staining on some fissure surfaces.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

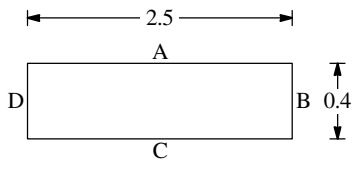
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				**TP102**
Job No: 12151J	Date: 05-12-12 05-12-12	Ground Level (m):	Co-Ordinates ():	
Contractor:				Sheet: 1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.25-1.45			Soft becoming firm below 0.7 m grey locally orange brown slightly sandy SILT/CLAY. Cobbles of Limestone noted below 1.3 m.	0.50	ES	
				0.95	D	
				1.00	HV	65, 62 kN/m2
1.45-1.50			Moderately Weak LIMESTONE and IRONSTONE			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client: Banner Homes	Method/ Trial Pit excavated using JCB Plant Used: 3CX with 0.3 m bucket	Logged By: CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

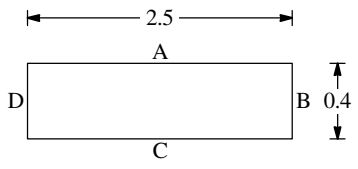
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				**TP103**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	05-12-12 05-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.	0.10	ES	
0.25-0.75			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone..	0.50	ES	
0.75-3.00			Firm to stiff becoming stiff below 1.2 m grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces. Becoming slightly gravelly below 2.2 m, gravel is angular medium to coarse of limestone and ironstone.	0.80	HV	65, 62 kN/m2
				1.25	HV	74, 76 kN/m2

Shoring/Support:
Stability:



GENERAL REMARKS

Slight seepage at 2.7 m

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

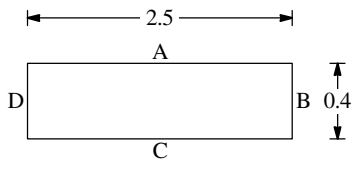
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				**TP104**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	05-12-12 05-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
				0.20	ES	
0.25-0.75			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone..			
0.75-1.80			Firm to stiff becoming stiff below 1.2 m grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces. Becoming slightly gravelly below 1.6 m, gravel is angular medium to coarse of limestone and ironstone.	0.80	ES	
				0.80	HV	62, 68 kN/m2
				1.00	D	
				1.20	HV	105, 100 kN/m2
1.80-1.85			Moderately weak LIMESTONE and IRONSTONE- Recovered as angular cobbles.	1.75	D	

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

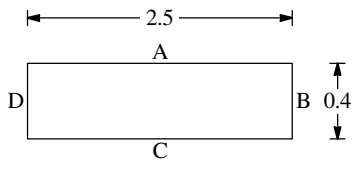
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				**TP105**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	05-12-12 05-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.30			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.	0.20	ES	
0.30-0.60			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone..			
0.60-2.30			Stiff becoming very stiff below 1.5 m grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces.	0.75	HV	115, 120 kN/m2
				0.90	D	
				1.20	HV	>120 kN/m2
2.30-2.40			Moderately weak LIMESTONE and IRONSTONE recovered as angular cobbles.			

Shoring/Support:
Stability:



GENERAL REMARKS

Groundwater encountered at 2.3 m

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

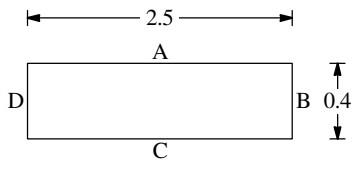
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP106
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	05-12-12 05-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.25-0.50			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone. Rare cobble of limestone noted.	0.40	ES	
0.50-1.70			Firm becoming stiff below 1 m grey locally orange brown sligltly sandy fissured SILT/CLAY. Rust coloured staining on some fissure surfaces. Occasional angular coars egravel of limestone below 1 m	1.10 1.10	D HV	 95, 90 kN/m2
1.70-3.20			Compact grey locally orange brown slightly sandy fissured SILT. Rust coloured staining on some fissure surfaces.	2.20	D	
3.20-4.00			Brown very clayey angular GRAVEL AND COBBLE of Limestone and Ironstone.			

Shoring/Support:
Stability:



GENERAL REMARKS

Slight Seepage at 3.6 m

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

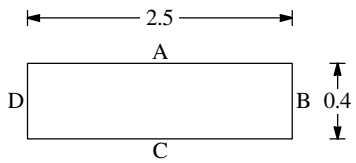
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP107
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	05-12-12 05-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.25-0.40			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone. Rare cobble of limestone noted.			
0.40-0.70			Brown very clayey angular GRAVEL AND COBBLE of Limestone and Ironstone.	0.50	ES	
0.70-1.30			Stiff grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces.	0.75	HV	>120 kN/m2
				1.10	D	
1.30-2.45			Stiff grey locally orange brown sligltly sandy slightly gravelly fissured CLAY. Rust coloured staining on some fissure surfaces.	1.50	HV	>120 kN/m2
2.45-2.50			Moderately weak LIMESTONE and IRONSTONE.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

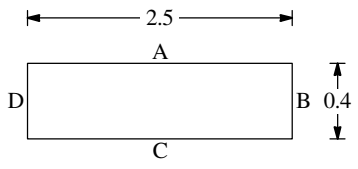
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP108
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	05-12-12 05-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.25-1.40			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone.			
1.40-2.20			Stiff grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces.	1.80	HV	110, 104 kN/m2
2.20-3.10			Stiff grey locally orange brown sligltly sandy fissured SILT/CLAY. Rust coloured staining on some fissure surfaces.	2.50	HV	>120 kN/m2
3.10-3.20			Moderately weak LIMESTONE and IRONSTONE recovered as angular cobbles.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

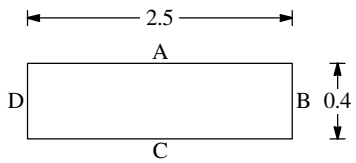
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP109
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	05-12-12 05-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.25-0.90			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone.	0.20	ES	
0.90-1.55			Brown very clayey angular GRAVEL AND COBBLE of Limestone and Ironstone.	1.20	ES	
1.55-3.00			Stiff grey locally orange brown sligltly sandy fissured SILT/CLAY. Rust coloured staining on some fissure surfaces.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

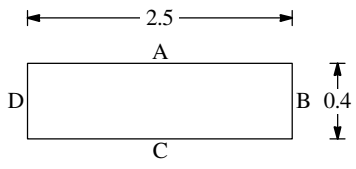
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				**TP110**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	05-12-12 05-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.30			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.	0.15	ES	
0.30-0.90			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone.			
0.90-1.55			Brown very clayey angular GRAVEL AND COBBLE of Limestone and Ironstone.	1.10	ES	
1.55-1.60			Moderately weak LIMESTONE and IRONSTONE recovered as angular gravel and cobble.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

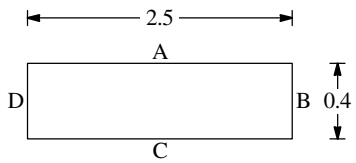
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP111
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	06-12-12 06-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.20			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.20-0.68			Stiff brown locally orange brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone and ironstone.	0.50 0.50	D ES	
0.68-0.70			Moderately weak LIMESTONE and IRONSTONE recovered as angular gravel and cobble.	0.60	HV	104, 116 kN/m2

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

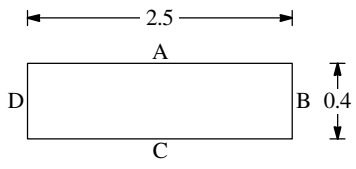
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP112
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	06-12-12 06-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.30			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.	0.15	ES	
0.30-1.60			Stiff becoming very stiff below 1.5 m grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces.	0.70	ES	
				0.80	HV	>120 kN/m2
				1.40	D	
1.60-2.10			Compact grey locally orange brown slightly gravelly SILT. Gravel is anglar medium to coarse of Ironstone and limestone.	1.80	D	
2.10-2.15			Moderately weak LIMESTONE and IRONSTONE recovered as angular cobbles.			

Shoring/Support:
Stability:



GENERAL REMARKS

Slight seepage at 2.1 m

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

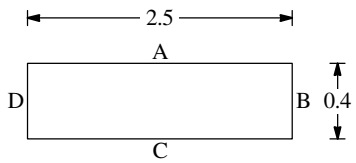
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				**TP113**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	06-12-12 06-12-12			
Contractor				Sheet
				1 of 1

STRATA					SAMPLES & TESTS		
					Depth	No	Remarks/Tests
Depth	No		DESCRIPTION				
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.				
					0.20	ES	
0.25-0.65			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone..				
0.65-1.22			Stiff grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces.				
					0.80	HV	71, 69 kN/m2
					1.00	D	
					1.00	ES	
1.22-1.25			Moderately weak LIMESTONE and IRONSTONE recovered as angular cobbles.		1.20	HV	74, 70 kN/m2

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

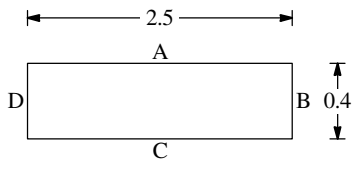
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP114
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	06-12-12 06-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.20			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.	0.10	ES	
0.20-0.65			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone..	0.50	ES	
0.65-2.10			Stiff grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces.	0.80	HV	90, 76 kN/m2
				1.00	D	
				1.10	HV	90, 87 kN/m2
				1.70	HV	95, 98 kN/m2
				2.00	D	
2.10-2.15			Moderately weak LIMESTONE and IRONSTONE recovered as angular cobbles.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

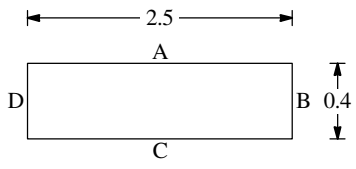
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP115
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	06-12-12 06-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.	0.10	ES	
0.25-0.40			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone.			
0.40-0.85			Brown very clayey angular GRAVEL AND COBBLE of Limestone and Ironstone.			
0.85-2.60			Stiff grey locally orange brown sligltly sandy fissured SILT/CLAY. Rust coloured staining on some fissure surfaces.	1.20	D	
2.60-2.65			Moderately weak LIMESTONE and IRONSTONE recovered as angular cobbles.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

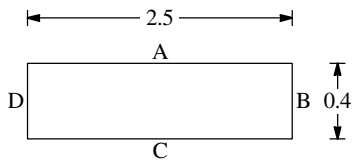
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP116
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	06-12-12 06-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.25-0.40			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone.			
0.40-0.50			Weak grey LIMESTONE.	0.40	ES	
0.50-3.50			Stiff grey locally orange brown sligltly sandy fissured SILT/CLAY. Rust coloured staining on some fissure surfaces.	0.95	D	
				1.75	D	

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

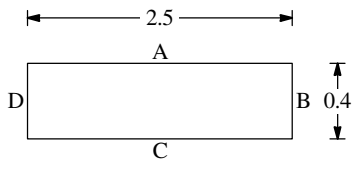
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP117
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	06-12-12 06-12-12			
Contractor				Sheet
				1 of 1

Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.	0.10	J	
0.20-0.65		Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone.			
0.65-0.95		Brown very clayey angular GRAVEL AND COBBLE of Limestone and Ironstone.	0.60 0.60	D ES	
0.95-1.90		Stiff grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces.	1.10	HV	110, 102 kN/m2
			1.60	D	
			1.80	HV	100, 110 kN/m2
1.90-2.90		Stiff grey locally orange brown sligltly sandy fissured SILT/CLAY. Rust coloured staining on some fissure surfaces.			
2.90-2.95		Moderately weak LIMESTONE and IRONSTONE recovered as angular cobbles.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

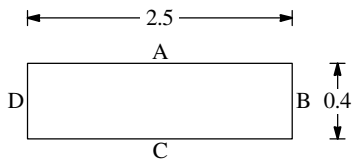
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP118
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	06-12-12 06-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.	0.10	ES	
0.25-0.65			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone..			
0.65-1.95			Stiff grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces.	1.00	ES	
				1.20	HV	78, 84 kN/m2
				1.75	D	
				1.80	HV	92, 102 kN/m2
1.95-2.00			Moderately weak LIMESTONE and IRONSTONE recovered as angular cobbles.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

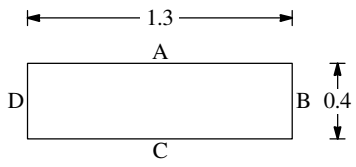
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP119
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	07-12-12 07-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
Depth	No		DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.20-0.45			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone. Rare cobble of limestone noted.			
0.45-1.70			Firm becoming stiff below 1 m grey locally orange brown sligltly sandy fissured SILT/CLAY. Rust coloured staining on some fissure surfaces. Occasional angular coars egravel of limestone below 1 m			
1.70-2.50			Compact grey locally orange brown slightly sandy fissured SILT. Rust coloured staining on some fissure surfaces.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

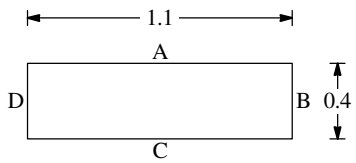
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				**TP120**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	07-12-12 07-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
				Depth	No	Remarks/Tests
Depth	No		DESCRIPTION			
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.25-0.80			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone. Rare cobble of limestone noted.			
0.80-1.35			Brown very clayey angular GRAVEL AND COBBLE of Limestone and Ironstone.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

Brownfield Consultancy
The Cottage, Mill Lane
Fenny Compton, CV47 2YF
Phone: 07852881086

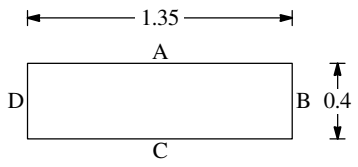
TRIAL PIT LOG

The Brownfield Consultancy

Project				TRIAL PIT No
Bodicote				TP121
Job No	Date	Ground Level (m)	Co-Ordinates ()	
12151J	07-12-12 07-12-12			
Contractor				Sheet
				1 of 1

STRATA				SAMPLES & TESTS		
Depth	No		DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25			TOPSOIL: Soft to firm brown slightly sandy CLAY with occasional roots and rootlets and rare subangular medium gravel of limestone.			
0.25-0.60			Firm brown slightly sandy locally slightly gravelly CLAY. Gravel is angular, fine and medium of limestone..			
0.60-2.15			Stiff 1.5 m grey locally orange brown sligltly sandy fissured CLAY. Rust coloured staining on some fissure surfaces.			
2.15-2.20			Moderately weak LIMESTONE and IRONSTONE recovered as angular cobbles.			

Shoring/Support:
Stability:



GENERAL REMARKS

No Groundwater encountered

All dimensions in metres Scale 1:25	Client Banner Homes	Method/ Trial Pit excavated using JCB Plant Used 3CX with 0.3 m bucket	Logged By CG

BROWNFIELD TP 12151J BODICOTE.GPJ GINT STD AGS 3_1.GDT 15/1/13

APPENDIX F

Geotechnical Laboratory Test Results

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL13/0111

Client's Reference: Report Date: 10 January 2013

Client Name: Discovery CE
The Granary
Broadwell
Rugby
Warwickshire
CV23 8HF

For the attention of: Cathal Gilespie

Contract Title: Bodicote

Date Received: 08/01/2013
Date Commenced: 08/01/2013
Date Completed: 10/01/2013

Notes: Observations and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

[redacted]

R Gunson (Director) | A Watkins (Director) | M Beastall (Laboratory Manager)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Depth m	Description of Sample
TP101		D	2.50	Brown sandy silty CLAY.
TP103		D	1.00	Brown sandy silty CLAY.
TP104		D	1.75	Brown sandy silty CLAY.
TP105		D	0.90	Brown sandy silty CLAY.
TP105		D	2.00	Brown sandy silty CLAY.
TP106		D	1.10	Brown sandy silty CLAY.
TP106		D	2.20	Brown very sandy slightly clayey SILT.
TP107		D	1.10	Brown sandy silty CLAY.
TP108		D	1.60	Brown sandy CLAY.
TP108		D	2.80	Brown gravelly sandy silty CLAY.

PSL
Professional Soils Laboratory

Compiled by	Date	Checked by	Date	Approved by	Date
	10/01/13		10/01/13		10/01/13

BODICOTE.

Contract No: PSL13/0111

Client Ref:

SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Depth m	Moisture Content % Clause 3.2	Bulk Density Mg/m^3 Clause 7.2	Dry Density Mg/m^3 Clause 7.2	Particle Density Mg/m^3 Clause 8.	Liquid Limit % Clause 4.3/4.4	Plastic Limit % Clause 5.	Plasticity Index % Clause 6.	% Passing .425mm	Remarks
TP101		D	2.50	24				42	23	19	100	Intermediate plasticity CI.
TP103		D	1.00	25				46	26	20	100	Intermediate plasticity CI.
TP104		D	1.75	23				40	22	18	100	Intermediate plasticity CI.
TP105		D	0.90	30				58	30	28	100	High plasticity CH.
TP105		D	2.00	20				48	24	24	100	Intermediate plasticity CI.
TP106		D	1.10	22				39	22	17	100	Intermediate plasticity CI.
TP106		D	2.20	25					NP			
TP107		D	1.10	24				47	24	23	100	Intermediate plasticity CI.
TP108		D	1.60	26				55	23	32	100	High plasticity CH.
TP108		D	2.80	21				35	24	11	86	Intermediate plasticity CI.

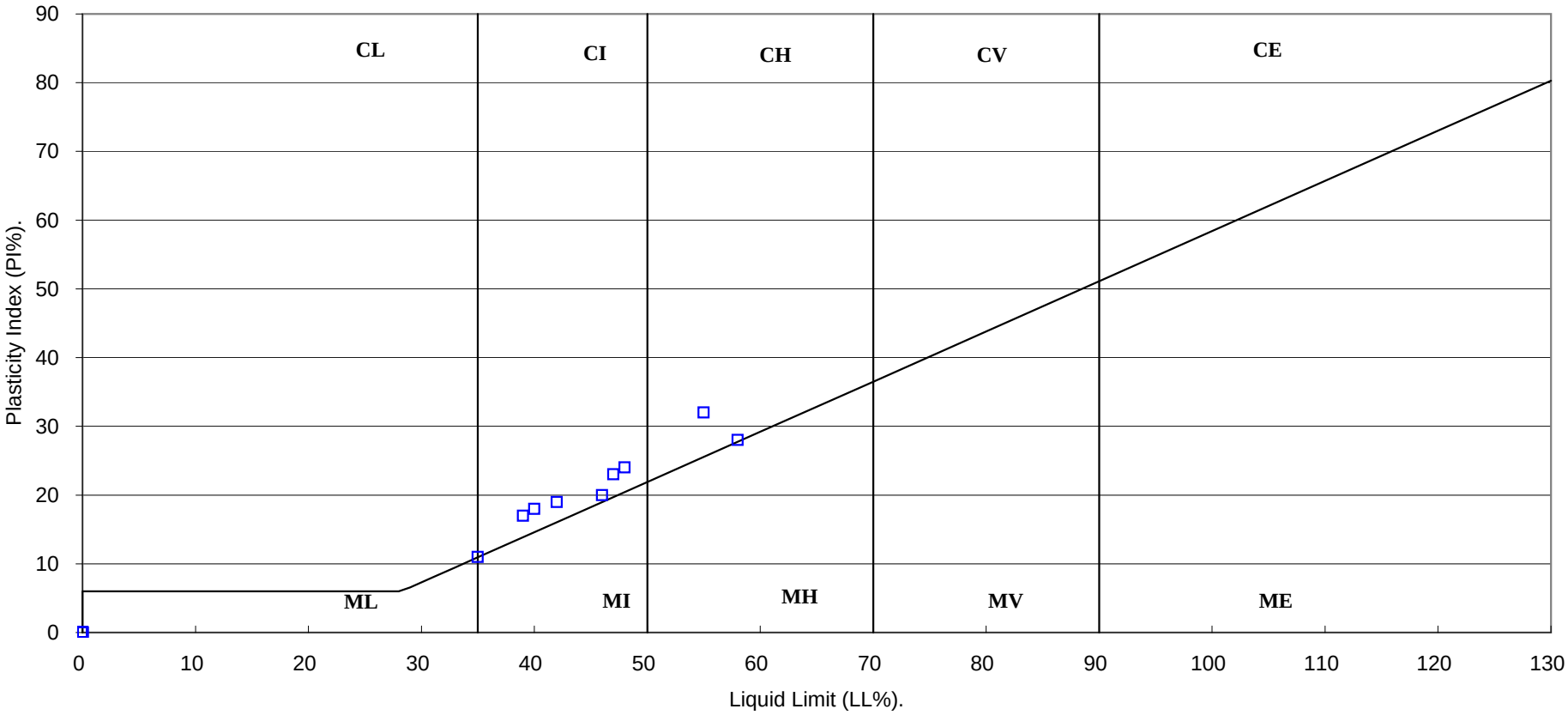
SYMBOLS : NP : Non Plastic *** : Liquid Limit and Plastic Limit Wet Sieved.**

PSL
Professional Soils Laboratory

Compiled by	Date	Checked by	Date	Approved by	Date
	10/01/13		10/01/13		10/01/13
BODICOTE.				Contract No:	PSL13/0111
				Client Ref:	

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



	Compiled by	Date	Checked by	Date	Approved by	Date
PSL Professional Soils Laboratory		10/01/13		10/01/13		10/01/13
	BODICOTE.				Contract No:	PSL13/0111
					Client Ref:	

APPENDIX G

Chemical Laboratory Results

PBET Results

Cathal Gillespie
Discovery CE
The Granary
Broadwell House Farm
Broadwell
Rugby
Warwickshire
CV23 8HF

t: 01926 813909

e: c.gillespie@dce-services.co.uk

i2 Analytical Ltd.
Building 19,
BRE,
Garston,
Watford,
WD25 9XX

t: 01923 67 00 20
f: 01923 67 00 30
e: reception@i2analytical.com

Analytical Report Number : 12-38437

Replaces Analytical Report Number : 12-38437, issue no. 1

Project / Site name:	Bodicote	**Samples received on:**	14/12/2012
Your job number:	12151J	**Samples instructed on:**	14/12/2012
Your order number:		**Analysis completed by:**	24/12/2012
Report Issue Number:	2	**Report issued on:**	08/01/2013
Samples Analysed:	1 2 stage wac sample - 16 soil samples		

Signed: [redacted]

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed: [redacted]

Rexona [redacted]
Customer Services Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239817	239818	239819	239820	239821
Sample Reference				TP102	TP112	TP101	TP103	TP109
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.70	0.10	0.50	0.20
Date Sampled				05/12/2012	06/12/2012	05/12/2012	05/12/2012	05/12/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	20	22	17	24
Total mass of sample received	kg	0.001	NONE	0.49	0.49	0.51	0.53	0.52
General Inorganics								
pH	pH Units	N/A	MCERTS	-	-	-	-	-
Water Soluble Sulphate as SO_4 (2:1)	g/l	0.0025	MCERTS	-	-	-	-	-
Water Soluble Sulphate as SO_4 (2:1)	mg/kg	2.5	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	0.4	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.2	MCERTS	-	< 0.20	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	-
Fluorene	mg/kg	0.2	MCERTS	-	< 0.20	-	-	-
Phenanthrene	mg/kg	0.2	MCERTS	-	< 0.20	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	-
Fluoranthene	mg/kg	0.2	MCERTS	-	< 0.20	-	-	-
Pyrene	mg/kg	0.2	MCERTS	-	< 0.20	-	-	-
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	< 0.20	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	-
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	-	< 0.20	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	-	< 0.20	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	-	< 0.20	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Coronene	mg/kg	0.05	NONE	-	< 0.05	-	-	-
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	-	< 1.6	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	47	27	110
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	70
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	4.9
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	-	< 4.0
Chromium (III)	mg/kg	1	NONE	-	-	-	-	240
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	87	57	240
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	17
Lead (aqua regia extractable)	mg/kg	2	MCERTS	-	-	32	15	36
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	-	-	45	31	94
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	360
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	-	-	-	-	210

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239817	239818	239819	239820	239821
Sample Reference				TP102	TP112	TP101	TP103	TP109
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.70	0.10	0.50	0.20
Date Sampled				05/12/2012	06/12/2012	05/12/2012	05/12/2012	05/12/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Petroleum Hydrocarbons								
Mineral Oil (C10 - C40)	mg/kg	10	NONE	-	< 10	-	-	-
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.02	NONE	-	< 0.02	-	-	-
PCB Congener 52	mg/kg	0.02	NONE	-	< 0.02	-	-	-
PCB Congener 101	mg/kg	0.02	NONE	-	< 0.02	-	-	-
PCB Congener 118	mg/kg	0.02	NONE	-	< 0.02	-	-	-
PCB Congener 138	mg/kg	0.02	NONE	-	< 0.02	-	-	-
PCB Congener 153	mg/kg	0.02	NONE	-	< 0.02	-	-	-
PCB Congener 180	mg/kg	0.02	NONE	-	< 0.02	-	-	-
Total PCBs	mg/kg	0.3	NONE	-	< 0.30	-	-	-
Organochlorine Pesticides (OCP)								
Aldrin	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Alpha-BHC(Lindane)	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Beta-BHC(Lindane)	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Chlordane (sum of cis & trans isomers)	mg/kg	0.01	NONE	< 0.01	-	-	-	-
DDD	mg/kg	0.01	NONE	< 0.01	-	-	-	-
DDE	mg/kg	0.01	NONE	< 0.01	-	-	-	-
DDT	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Dieldrin	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Endosulphan I	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Endosulphan II	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Endosulphan Sulphate	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Endrin	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Gamma-BHC	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Heptachlor	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Heptachlor epoxide	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Hexachlorobenzene	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Hexachlorocyclohexane	mg/kg	0.01	NONE	< 0.01	-	-	-	-
pp-Methoxychlor	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Propyzamide	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Organophosphorus Pesticides (OPP)								
Azinphos methyl	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Diazinon	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Dichlorvos	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Dimethoate	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Etion	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Fenitrothion	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Malathion	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Mevinphos	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Parathion	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Pirimiphos methyl	mg/kg	0.01	NONE	< 0.01	-	-	-	-

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239822	239823	239824	239825	239826
Sample Reference				TP115	TP114	TP110	TP107	TP116
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.50	0.15	0.50	0.40
Date Sampled				06/12/2012	06/12/2012	05/12/2012	05/12/2012	06/12/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	23	20	22	22	20
Total mass of sample received	kg	0.001	NONE	0.49	0.52	0.49	0.46	0.52
General Inorganics								
pH	pH Units	N/A	MCERTS	-	-	-	-	6.5
Water Soluble Sulphate as SO_4 (2:1)	g/l	0.0025	MCERTS	-	-	-	-	0.015
Water Soluble Sulphate as SO_4 (2:1)	mg/kg	2.5	MCERTS	-	-	-	-	15
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.2	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.2	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.2	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.2	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Coronene	mg/kg	0.05	NONE	-	-	-	-	-
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	-	-	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	98	73	210	70	46
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	61	-	44	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	3.2	-	3.1	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1.2	-	0.7	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	-
Chromium (III)	mg/kg	1	NONE	230	180	360	160	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	230	180	360	160	100
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	15	-	17	-
Lead (aqua regia extractable)	mg/kg	2	MCERTS	39	22	33	27	31
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	100	92	150	92	52
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	270	-	250	-
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	-	170	-	210	-

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239822	239823	239824	239825	239826
Sample Reference				TP115	TP114	TP110	TP107	TP116
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.50	0.15	0.50	0.40
Date Sampled				06/12/2012	06/12/2012	05/12/2012	05/12/2012	06/12/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
Mineral Oil (C10 - C40)	mg/kg	10	NONE	-	-	-	-	-
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 52	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 101	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 118	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 138	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 153	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 180	mg/kg	0.02	NONE	-	-	-	-	-
Total PCBs	mg/kg	0.3	NONE	-	-	-	-	-
Organochlorine Pesticides (OCP)								
Aldrin	mg/kg	0.01	NONE	-	-	-	-	-
Alpha-BHC(Lindane)	mg/kg	0.01	NONE	-	-	-	-	-
Beta-BHC(Lindane)	mg/kg	0.01	NONE	-	-	-	-	-
Chlordane (sum of cis & trans isomers)	mg/kg	0.01	NONE	-	-	-	-	-
DDD	mg/kg	0.01	NONE	-	-	-	-	-
DDE	mg/kg	0.01	NONE	-	-	-	-	-
DDT	mg/kg	0.01	NONE	-	-	-	-	-
Dieldrin	mg/kg	0.01	NONE	-	-	-	-	-
Endosulphan I	mg/kg	0.01	NONE	-	-	-	-	-
Endosulphan II	mg/kg	0.01	NONE	-	-	-	-	-
Endosulphan Sulphate	mg/kg	0.01	NONE	-	-	-	-	-
Endrin	mg/kg	0.01	NONE	-	-	-	-	-
Gamma-BHC	mg/kg	0.01	NONE	-	-	-	-	-
Heptachlor	mg/kg	0.01	NONE	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.01	NONE	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.01	NONE	-	-	-	-	-
Hexachlorocyclohexane	mg/kg	0.01	NONE	-	-	-	-	-
pp-Methoxychlor	mg/kg	0.01	NONE	-	-	-	-	-
Propyzamide	mg/kg	0.01	NONE	-	-	-	-	-
Organophosphorus Pesticides (OPP)								
Azinphos methyl	mg/kg	0.01	NONE	-	-	-	-	-
Diazinon	mg/kg	0.01	NONE	-	-	-	-	-
Dichlorvos	mg/kg	0.01	NONE	-	-	-	-	-
Dimethoate	mg/kg	0.01	NONE	-	-	-	-	-
Etion	mg/kg	0.01	NONE	-	-	-	-	-
Fenitrothion	mg/kg	0.01	NONE	-	-	-	-	-
Malathion	mg/kg	0.01	NONE	-	-	-	-	-
Mevinphos	mg/kg	0.01	NONE	-	-	-	-	-
Parathion	mg/kg	0.01	NONE	-	-	-	-	-
Pirimiphos methyl	mg/kg	0.01	NONE	-	-	-	-	-

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239827	239828	239829	239830	239831
Sample Reference				TP106	TP111	TP101	TP114	TP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.50	1.20	2.00	1.10
Date Sampled				05/12/2012	06/12/2012	05/12/2012	06/12/2012	05/12/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	22	19	19	17	24
Total mass of sample received	kg	0.001	NONE	0.50	0.56	1.2	0.99	0.45
General Inorganics								
pH	pH Units	N/A	MCERTS	-	-	6.9	7.0	7.0
Water Soluble Sulphate as SO_4 (2:1)	g/l	0.0025	MCERTS	-	-	0.0079	0.026	0.052
Water Soluble Sulphate as SO_4 (2:1)	mg/kg	2.5	MCERTS	-	-	7.9	26	52
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.2	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.2	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.2	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.2	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Coronene	mg/kg	0.05	NONE	-	-	-	-	-
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	-	-	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	49	30	-	-	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	-	-
Chromium (III)	mg/kg	1	NONE	-	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	130	71	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Lead (aqua regia extractable)	mg/kg	2	MCERTS	23	16	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	56	39	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	-	-	-	-	-

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239827	239828	239829	239830	239831
Sample Reference				TP106	TP111	TP101	TP114	TP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.50	1.20	2.00	1.10
Date Sampled				05/12/2012	06/12/2012	05/12/2012	06/12/2012	05/12/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
Mineral Oil (C10 - C40)	mg/kg	10	NONE	-	-	-	-	-
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 52	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 101	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 118	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 138	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 153	mg/kg	0.02	NONE	-	-	-	-	-
PCB Congener 180	mg/kg	0.02	NONE	-	-	-	-	-
Total PCBs	mg/kg	0.3	NONE	-	-	-	-	-
Organochlorine Pesticides (OCP)								
Aldrin	mg/kg	0.01	NONE	-	-	-	-	-
Alpha-BHC(Lindane)	mg/kg	0.01	NONE	-	-	-	-	-
Beta-BHC(Lindane)	mg/kg	0.01	NONE	-	-	-	-	-
Chlordane (sum of cis & trans isomers)	mg/kg	0.01	NONE	-	-	-	-	-
DDD	mg/kg	0.01	NONE	-	-	-	-	-
DDE	mg/kg	0.01	NONE	-	-	-	-	-
DDT	mg/kg	0.01	NONE	-	-	-	-	-
Dieldrin	mg/kg	0.01	NONE	-	-	-	-	-
Endosulphan I	mg/kg	0.01	NONE	-	-	-	-	-
Endosulphan II	mg/kg	0.01	NONE	-	-	-	-	-
Endosulphan Sulphate	mg/kg	0.01	NONE	-	-	-	-	-
Endrin	mg/kg	0.01	NONE	-	-	-	-	-
Gamma-BHC	mg/kg	0.01	NONE	-	-	-	-	-
Heptachlor	mg/kg	0.01	NONE	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.01	NONE	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.01	NONE	-	-	-	-	-
Hexachlorocyclohexane	mg/kg	0.01	NONE	-	-	-	-	-
pp-Methoxychlor	mg/kg	0.01	NONE	-	-	-	-	-
Propyzamide	mg/kg	0.01	NONE	-	-	-	-	-
Organophosphorus Pesticides (OPP)								
Azinphos methyl	mg/kg	0.01	NONE	-	-	-	-	-
Diazinon	mg/kg	0.01	NONE	-	-	-	-	-
Dichlorvos	mg/kg	0.01	NONE	-	-	-	-	-
Dimethoate	mg/kg	0.01	NONE	-	-	-	-	-
Etion	mg/kg	0.01	NONE	-	-	-	-	-
Fenitrothion	mg/kg	0.01	NONE	-	-	-	-	-
Malathion	mg/kg	0.01	NONE	-	-	-	-	-
Mevinphos	mg/kg	0.01	NONE	-	-	-	-	-
Parathion	mg/kg	0.01	NONE	-	-	-	-	-
Pirimiphos methyl	mg/kg	0.01	NONE	-	-	-	-	-

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239832				
Sample Reference				TP117				
Sample Number				None Supplied				
Depth (m)				0.60				
Date Sampled				06/12/2012				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	25				
Total mass of sample received	kg	0.001	NONE	0.45				
General Inorganics								
pH	pH Units	N/A	MCERTS	7.1				
Water Soluble Sulphate as SO_4 (2:1)	g/l	0.0025	MCERTS	0.024				
Water Soluble Sulphate as SO_4 (2:1)	mg/kg	2.5	MCERTS	23				
Total Organic Carbon (TOC)	%	0.1	MCERTS	-				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-				
Acenaphthylene	mg/kg	0.2	MCERTS	-				
Acenaphthene	mg/kg	0.1	MCERTS	-				
Fluorene	mg/kg	0.2	MCERTS	-				
Phenanthrene	mg/kg	0.2	MCERTS	-				
Anthracene	mg/kg	0.1	MCERTS	-				
Fluoranthene	mg/kg	0.2	MCERTS	-				
Pyrene	mg/kg	0.2	MCERTS	-				
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-				
Chrysene	mg/kg	0.05	MCERTS	-				
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-				
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	-				
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-				
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	-				
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	-				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-				
Coronene	mg/kg	0.05	NONE	-				
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	-				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-				
Boron (water soluble)	mg/kg	0.2	MCERTS	-				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-				
Chromium (hexavalent)	mg/kg	4	MCERTS	-				
Chromium (III)	mg/kg	1	NONE	-				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-				
Lead (aqua regia extractable)	mg/kg	2	MCERTS	-				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-				
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	-				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	-				

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239832				
Sample Reference				TP117				
Sample Number				None Supplied				
Depth (m)				0.60				
Date Sampled				06/12/2012				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	-				
Toluene	µg/kg	1	MCERTS	-				
Ethylbenzene	µg/kg	1	MCERTS	-				
p & m-xylene	µg/kg	1	MCERTS	-				
o-xylene	µg/kg	1	MCERTS	-				
Petroleum Hydrocarbons								
Mineral Oil (C10 - C40)	mg/kg	10	NONE	-				
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.02	NONE	-				
PCB Congener 52	mg/kg	0.02	NONE	-				
PCB Congener 101	mg/kg	0.02	NONE	-				
PCB Congener 118	mg/kg	0.02	NONE	-				
PCB Congener 138	mg/kg	0.02	NONE	-				
PCB Congener 153	mg/kg	0.02	NONE	-				
PCB Congener 180	mg/kg	0.02	NONE	-				
Total PCBs	mg/kg	0.3	NONE	-				
Organochlorine Pesticides (OCP)								
Aldrin	mg/kg	0.01	NONE	-				
Alpha-BHC(Lindane)	mg/kg	0.01	NONE	-				
Beta-BHC(Lindane)	mg/kg	0.01	NONE	-				
Chlordane (sum of cis & trans isomers)	mg/kg	0.01	NONE	-				
DDD	mg/kg	0.01	NONE	-				
DDE	mg/kg	0.01	NONE	-				
DDT	mg/kg	0.01	NONE	-				
Dieldrin	mg/kg	0.01	NONE	-				
Endosulphan I	mg/kg	0.01	NONE	-				
Endosulphan II	mg/kg	0.01	NONE	-				
Endosulphan Sulphate	mg/kg	0.01	NONE	-				
Endrin	mg/kg	0.01	NONE	-				
Gamma-BHC	mg/kg	0.01	NONE	-				
Heptachlor	mg/kg	0.01	NONE	-				
Heptachlor epoxide	mg/kg	0.01	NONE	-				
Hexachlorobenzene	mg/kg	0.01	NONE	-				
Hexachlorocyclohexane	mg/kg	0.01	NONE	-				
pp-Methoxychlor	mg/kg	0.01	NONE	-				
Propyzamide	mg/kg	0.01	NONE	-				
Organophosphorus Pesticides (OPP)								
Azinphos methyl	mg/kg	0.01	NONE	-				
Diazinon	mg/kg	0.01	NONE	-				
Dichlorvos	mg/kg	0.01	NONE	-				
Dimethoate	mg/kg	0.01	NONE	-				
Etion	mg/kg	0.01	NONE	-				
Fenitrothion	mg/kg	0.01	NONE	-				
Malathion	mg/kg	0.01	NONE	-				
Mevinphos	mg/kg	0.01	NONE	-				
Parathion	mg/kg	0.01	NONE	-				
Pirimiphos methyl	mg/kg	0.01	NONE	-				

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239833				
Sample Reference				TP112				
Sample Number				None Supplied				
Depth (m)				0.70				
Date Sampled				06/12/2012				
Time Taken				None Supplied				
Analytical Parameter (Two-stage Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General 2:1								
Sulphate as SO_4	mg/l	0.2	NONE	3.7				
Monohydric Phenols	mg/l	0.16	NONE	< 0.16				
Chloride	mg/l	4	NONE	< 4.0				
Fluoride	mg/l	0.05	NONE	0.89				
Dissolved Organic Carbon	mg/l	0.1	NONE	6.9				
Total Dissolved Solids	mg/l	4	NONE	60				
Arsenic	mg/l	0.01	NONE	< 0.010				
Cadmium	mg/l	0.0005	NONE	< 0.0005				
Chromium	mg/l	0.001	NONE	0.0030				
Lead	mg/l	0.005	NONE	< 0.0050				
Mercury	mg/l	0.0015	NONE	< 0.0015				
Selenium	mg/l	0.01	NONE	< 0.010				
Copper	mg/l	0.001	NONE	0.0017				
Nickel	mg/l	0.001	NONE	< 0.0010				
Zinc	mg/l	0.001	NONE	< 0.0010				
Antimony	mg/l	0.005	NONE	< 0.0050				
Molybdenum	mg/l	0.003	NONE	< 0.0030				
Barium	mg/l	0.005	NONE	0.017				
General 2:1								
Sulphate as SO_4	mg/kg	0.5	NONE	7.3				
Monohydric Phenols	mg/kg	0.4	NONE	< 0.40				
Chloride	mg/kg	12	NONE	< 12				
Fluoride	mg/kg	0.05	NONE	1.8				
Dissolved Organic Carbon	mg/kg	0.3	NONE	14				
Total Dissolved Solids	mg/kg	12	NONE	120				
Arsenic	mg/kg	0.03	NONE	< 0.030				
Cadmium	mg/kg	0.0015	NONE	< 0.0015				
Chromium	mg/kg	0.003	NONE	0.0061				
Lead	mg/kg	0.015	NONE	< 0.015				
Mercury	mg/kg	0.005	NONE	< 0.0050				
Selenium	mg/kg	0.03	NONE	< 0.030				
Copper	mg/kg	0.003	NONE	0.0035				
Nickel	mg/kg	0.002	NONE	< 0.0020				
Zinc	mg/kg	0.003	NONE	< 0.0030				
Antimony	mg/kg	0.015	NONE	< 0.015				
Molybdenum	mg/kg	0.01	NONE	< 0.010				
Barium	mg/kg	0.015	NONE	0.033				

Analytical Report Number: 12-38437

Project / Site name: Bodicote

Lab Sample Number				239833				
Sample Reference				TP112				
Sample Number				None Supplied				
Depth (m)				0.70				
Date Sampled				06/12/2012				
Time Taken				None Supplied				
Analytical Parameter (Two-stage Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General 8:1								
Sulphate as SO_4	mg/l	0.2	NONE	1.1				
Monohydric Phenols	mg/l	0.13	NONE	< 0.13				
Chloride	mg/l	4	NONE	< 4.0				
Fluoride	mg/l	0.05	NONE	0.87				
Dissolved Organic Carbon	mg/l	0.1	NONE	3.6				
Total Dissolved Solids	mg/l	4	NONE	30				
Arsenic	mg/l	0.01	NONE	< 0.010				
Cadmium	mg/l	0.0005	NONE	< 0.0005				
Chromium	mg/l	0.001	NONE	0.0010				
Lead	mg/l	0.005	NONE	< 0.0050				
Mercury	mg/l	0.0015	NONE	< 0.0015				
Selenium	mg/l	0.01	NONE	< 0.010				
Copper	mg/l	0.003	NONE	< 0.0030				
Nickel	mg/l	0.001	NONE	< 0.0010				
Zinc	mg/l	0.001	NONE	< 0.0010				
Antimony	mg/l	0.005	NONE	< 0.0050				
Molybdenum	mg/l	0.003	NONE	< 0.0030				
Barium	mg/l	0.005	NONE	0.0090				
General 10:1								
Sulphate as SO_4	mg/kg	1	NONE	13				
Monohydric Phenols	mg/kg	0.5	NONE	< 0.50				
Chloride	mg/kg	15	NONE	< 15				
Fluoride	mg/kg	0.2	NONE	8.7				
Dissolved Organic Carbon	mg/kg	0.5	NONE	39				
Total Dissolved Solids	mg/kg	15	NONE	330				
Arsenic	mg/kg	0.05	NONE	< 0.050				
Cadmium	mg/kg	0.002	NONE	< 0.0020				
Chromium	mg/kg	0.005	NONE	0.012				
Lead	mg/kg	0.02	NONE	< 0.020				
Mercury	mg/kg	0.01	NONE	< 0.010				
Selenium	mg/kg	0.04	NONE	< 0.040				
Copper	mg/kg	0.002	NONE	0.0062				
Nickel	mg/kg	0.005	NONE	< 0.0050				
Zinc	mg/kg	0.004	NONE	< 0.0040				
Antimony	mg/kg	0.02	NONE	< 0.020				
Molybdenum	mg/kg	0.02	NONE	< 0.020				
Barium	mg/kg	0.02	NONE	0.096				

Analytical Report Number : 12-38437

Project / Site name: Bodicote

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 2 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
239817	TP102	None Supplied	0.50	Light brown sandy clay.
239818	TP112	None Supplied	0.70	Light brown sandy clay.
239819	TP101	None Supplied	0.10	Brown sandy clay.
239820	TP103	None Supplied	0.50	Brown sandy clay.
239821	TP109	None Supplied	0.20	Brown sandy clay with vegetation.
239822	TP115	None Supplied	0.10	Brown sandy clay with vegetation.
239823	TP114	None Supplied	0.50	Brown sandy clay.
239824	TP110	None Supplied	0.15	Brown sandy clay.
239825	TP107	None Supplied	0.50	Brown sandy clay with vegetation.
239826	TP116	None Supplied	0.40	Brown sandy clay.
239827	TP106	None Supplied	0.40	Brown sandy clay.
239828	TP111	None Supplied	0.50	Light brown sandy clay with vegetation.
239829	TP101	None Supplied	1.20	Light brown sandy clay.
239830	TP114	None Supplied	2.00	Light brown clay and sand.
239831	TP110	None Supplied	1.10	Brown sandy clay.
239832	TP117	None Supplied	0.60	Brown sandy clay.

Analytical Report Number : 12-38437

Project / Site name: Bodicote

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS
Chloride in WAC leachate	Determination of chloride in leachate by Gallery discrete analyser.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L080-PL	W	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	D	NONE
Dissolved organic carbon in WAC leachate	Determination of dissolved organic carbon in leachate by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L037-PL	W	NONE
Fluoride in WAC leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L033-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Metals in WAC leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	NONE
Mineral Oil (Soil)		in-house method	L064-PL		NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols (Phenol Index) in WAC leachate	Determination of phenols in leachate by continuous flow analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	NONE
Organochlorine pesticides in soil	Determination of organochlorine pesticides in soil by GC-MS	In-house method	L095-UK	W	NONE
Organophosphorous pesticides in soil	Determination of organophosphorous pesticides in soil by GC-MS	In-house method	L095-UK	W	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE

Analytical Report Number : 12-38437

Project / Site name: Bodicote

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Stones not passing through a 10 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in WAC leachate	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total dissolved solids in WAC leachate	Determination of total dissolved solids in leachate by electrometric measurement.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L004-PL	W	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Jim Twaddle
The Brownfield Consultancy
The Cottage
Mill Lane
Fenny Compton
CV47 2YF

t: 01295 770188

e: jim.twaddle@brownfieldconsultancy.co.uk

i2 Analytical Ltd.
Building 19,
BRE,
Garston,
Watford,
WD25 9XX

t: 01923 67 00 20
f: 01923 67 00 30
e: reception@i2analytical.com

Analytical Report Number : 13-38683

Project / Site name:	Bodicote	**Samples received on:**	14/12/2012
Your job number:	12151J	**Samples instructed on:**	04/01/2013
Your order number:		**Analysis completed by:**	16/01/2013
Report Issue Number:	1	**Report issued on:**	16/01/2013
Samples Analysed:	2 soil samples		

Signed: [redacted]

Dr Claire [redacted]
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed: [redacted]

Rexona Rahman
Customer Services Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 13-38683

Project / Site name: Bodicole

Lab Sample Number				241480	241481	241481D	CRM	
Sample Reference				TP114	TP110			
Sample Number				239823	239824			
Depth (m)				0.50	0.15	Duplicate	-	
Date Sampled				05/12/2012	05/12/2012			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	96	96	96	-	
Moisture Content	%	N/A	NONE	18	22	22	-	
Total mass of sample received	kg	0.001	NONE	0.52	0.49	0.49	-	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	64	220	220	104	
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	-	160	160	80	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	230	-		356	

Bioaccessibility Testing - Unified BARGE Bioaccessibility Method Data

Stomach Phase								
Arsenic (Bioaccessible)	mg/kg	1	None	**4.2**	**5.8**	**5.8**	**5.0**	
Arsenic Bioaccessible Fraction	%	-	None	**6.5**	**2.6**	**2.6**	**4.8**	
Nickel (Bioaccessible)	mg/kg	1	None	**-**	**4.4**	**4.7**	**11.9**	
Nickel Bioaccessible Fraction	%	-	None	**-**	**2.8**	**2.9**	**14.9**	
Vanadium (Bioaccessible)	mg/kg	1	None	**10.7**	**-**	**-**	**7.7**	
Vanadium Bioaccessible Fraction	%	-	None	**4.7**	**-**	**-**	**2.2**	
Stomach and Intestine Phase								
Arsenic (Bioaccessible)	mg/kg	1	None	3.7	5.7	5.7	4.0	
Arsenic Bioaccessible Fraction	%	-	None	5.8	2.6	2.6	3.9	
Nickel (Bioaccessible)	mg/kg	1	None	-	3.7	3.6	7.3	
Nickel Bioaccessible Fraction	%	-	None	-	2.3	2.3	9.1	
Vanadium (Bioaccessible)	mg/kg	1	None	2.8	-	-	2.9	
Vanadium Bioaccessible Fraction	%	-	None	1.2	-	-	0.8	

Bioaccessibiltiy Summary Data (Maximum value) Stomach Phase (S) or Stomach and Intestine Phase (SI)

Arsenic Bioaccessible Fraction	%	-	None	**6.5**	**2.6**	**2.6**	**4.8**	
Nickel Bioaccessible Fraction	%	-	None	-	**2.8**	**2.9**	**14.9**	
Vanadium Bioaccessible Fraction	%	-	None	**4.7**	**-**	**-**	**2.2**	

Analytical Report Number : 13-38683

Project / Site name: Bodicole

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 2 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
241480	TP114	239823	0.50	Light brown clay and sand with vegetation and stones.
241481	TP110	239824	0.15	Light brown clay and sand.

Analytical Report Number : 13-38683

Project / Site name: Bodicole

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK	W	NONE
Stones content of soil	Stones not passing through a 250 µm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK	D	NONE

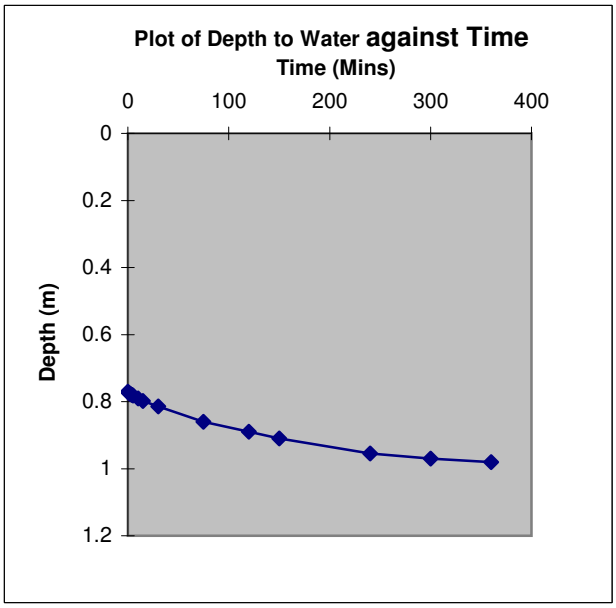
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Testing was carried out in accordance with the BARGE UBM protocol. The model used was the fasted model, in accordance with recommended protocol. Each batch of samples comprised one duplicate and one certified reference material, the data for both are reported. Both the the duplicate and certified reference material results meet the method defined criteria.

Bioaccessibile Fraction (%) is calculated as follows: $\frac{\text{Element (bioaccessible)}}{\text{Element (total aqua regia extractable)}} \times 100$

APPENDIX H

Soakaway Results



Time Elapsed (t) mins	Depth below Ground level at time t (m)
0	0.77
1	0.774
2	0.776
3	0.778
4	0.78
5	0.782
10	0.79
15	0.798
30	0.814
75	0.86
120	0.89
150	0.91
240	0.955
300	0.97
360	0.98

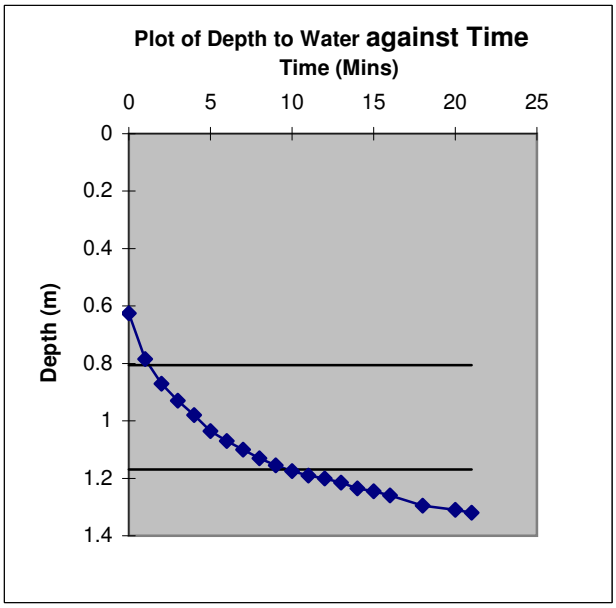
Trial Pit No:	TP119
Date:	07/12/2012

Test Details

Length of Trial Pit **a** (m):	1.3
Width of Trial Pit **b** (m):	0.4
Depth of Trial Pit **D** (m):	2.5
Test Strata:	SILTS
Maximum Effective Depth (m)	0.77
Volume Outflow between 75% and 25% effective depth ((Vp75-25)m3)	N/A
Time for water to fall from 75% to 25% effective depth ((Tp75-25)mins)	N/A
Outflow Area ((Ap50) m2)	N/A
Soil Infiltration rate ((f)m/s)	N/A

Remarks: Soakage rate insuffient to allow infiltration rate to be calculated

Soakaway Test	**Project** **Oxford Road, Bodicote**	**Contract** **12160J**
The Brownfield Consultancy		**Figure** A1

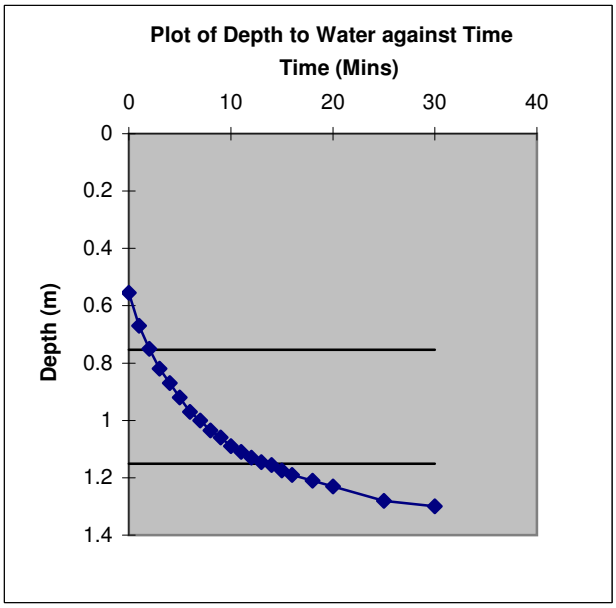


Time Elapsed (t) mins	Depth below Ground level at time t (m)
0	0.625
1	0.785
2	0.87
3	0.93
4	0.98
5	1.035
6	1.07
7	1.1
8	1.13
9	1.155
10	1.175
11	1.19
12	1.2
13	1.215
14	1.235
15	1.245
16	1.26
18	1.295
20	1.31
21	1.32

Trial Pit No:	TP120 - Test 1	
Date:	07/12/2012	
Test Details		
Length of Trial Pit **a** (m):		1.1
Width of Trial Pit **b** (m):		0.4
Depth of Trial Pit **D** (m):		1.35
Test Strata:	IRONSTONE	
Maximum Effective Depth (m)		0.625
Volume Outflow between 75% and 25% effective depth ((Vp75-25)m3)		0.1595
Time for water to fall from 75% to 25% effective depth ((Tp75-25)mins)		8.4375
Outflow Area ((Ap50) m2)		1.5275
Soil Infiltration rate ((f)m/s)		2.06E-04

Remarks:

Soakaway Test	**Project**	**Contract**
	Oxford Road, Bodicote	**12160J**
The Brownfield Consultancy		**Figure** A2



Time Elapsed (t) mins	Depth below Ground level at time t (m)
0	0.555
1	0.67
2	0.75
3	0.82
4	0.87
5	0.92
6	0.97
7	1
8	1.035
9	1.06
10	1.09
11	1.11
12	1.13
13	1.145
14	1.155
15	1.175
16	1.19
18	1.21
20	1.23
25	1.28
30	1.3

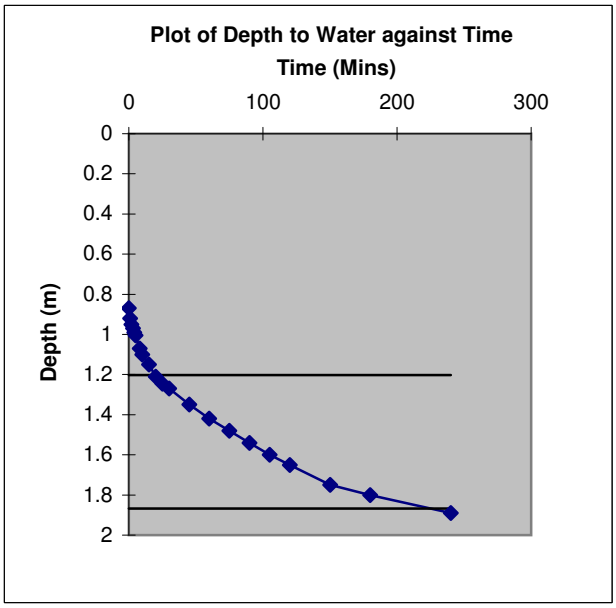
Trial Pit No:	TP120 - Test 2
Date:	07/12/2012

Test Details

Length of Trial Pit **a** (m):	1.1
Width of Trial Pit **b** (m):	0.4
Depth of Trial Pit **D** (m):	1.35
Test Strata:	IRONSTONE
Maximum Effective Depth (m)	0.555
Volume Outflow between 75% and 25% effective depth ((Vp75-25)m3)	0.1749
Time for water to fall from 75% to 25% effective depth ((Tp75-25)mins)	11.57142857
Outflow Area ((Ap50) m2)	1.6325
Soil Infiltration rate ((f)m/s)	1.54E-04

Remarks:

Soakaway Test	**Project** **Oxford Road, Bodicote**	**Contract** **12160J**
The Brownfield Consultancy		**Figure** A3



Time Elapsed (t) mins	Depth below Ground level at time t (m)
0	0.87
1	0.92
2	0.95
3	0.97
4	0.99
5	1.005
8	1.07
10	1.1
15	1.15
20	1.21
25	1.245
30	1.27
45	1.35
60	1.42
75	1.48
90	1.54
105	1.6
120	1.65
150	1.75
180	1.8
240	1.89

Trial Pit No: TP121

Date: 07/12/2012

Test Details

Length of Trial Pit **a** (m):	1.35
Width of Trial Pit **b** (m):	0.4
Depth of Trial Pit **D** (m):	2.2
Test Strata:	CLAY/LIMESTONE
Maximum Effective Depth (m)	0.87
Volume Outflow between 75% and 25% effective depth ((Vp75-25)m3)	0.3591
Time for water to fall from 75% to 25% effective depth ((Tp75-25)mins)	205.625
Outflow Area ((Ap50) m2)	2.8675
Soil Infiltration rate ((f)m/s)	1.02E-05

Remarks: Note Infiltration likley to be primarily through base in limestone

Soakaway Test	**Project** **Oxford Road, Bodicote**	**Contract** **12160J**
The Brownfield Consultancy		**Figure** A4

APPENDIX I

CLEA Spreadsheets

STEP 5: RESULTS

Find AC | Print Repo

		Ratio of ADE to relevant Health	
		oral HCV	inhal HCV
Number	Chemical	(dimensionless)	(dimensionless)
1	Arsenic	0.39	1.00
2	Nickel	0.00	1.00
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

orts | Back to Guide

	Soil Assessment Criteria			Soil Saturation Limit
Combined	oral HCV	inhal HCV	Combined	
(dimensionless)	mg kg^{-1}	mg kg^{-1}	mg kg^{-1}	mg kg^{-1}
NR	**2.20E+02**	**8.50E+01**	**NR**	NR
NR	**1.37E+04**	**1.27E+02**	**NR**	NR

Pathway Contributions (%)					
direct soil ingestion	sum of consumption of homegrown produce and attached soil	dermal contact (indoor)	dermal contact (outdoor)	inhalation of dust (indoor)	inhalation of dust (outdoor)
%	%	%	%	%	%
16.02	0.00	3.00	79.29	1.69	0.00
24.18	0.00	0.75	19.95	2.56	0.00

inhalation of vapour (indoor)	inhalation of vapour (outdoor)	oral background	inhalation background	Total
%	%	%	%	%
0.00	0.00	0.00	0.00	100.00
0.00	0.00	47.44	2.56	97.44

ADVANCED SETTINGS

Restore Defaults | Back to Menu

Chemical Name	Chemical type	Oral HCV					Inhala	
		Type	µg kg^{-1} BW day^{-1}	Compare with			Type	µg kg^{-1} BW day^{-1}
				Oral exposure	Dermal exposure	Inhalation exposure		
Arsenic	inorganic	ID	3.00E-01	Yes	Yes	No	ID	2.00E-03
Nickel	inorganic	TDI	1.20E+01	Yes	Yes	Yes	TDI	6.00E-03

tion HCV			Combine oral and inhalation AC	Oral MDI for adults	Inhalation MDI for adults	Air-water partition coefficient (K_{aw})	Diffusion coefficient in air	Diffusion coefficient in water
Compare with								
Oral exposure	Dermal exposure	Inhalation exposure		µg day^{-1}	µg day^{-1}	cm^3 cm^{-3}	m^2 s^{-1}	m^2 s^{-1}
No	No	Yes	No	NR	NR	NR	NR	NR
No	No	Yes	No	1.30E+02	6.00E-02	NR	NR	NR

Relative molecular mass	Vapour pressure	Water solubility	K_{oc}	K_{ow}	K_d	Dermal absorption fraction	Soil - plant availability correction
g mol^{-1}	Pa	mg L^{-1}	Log (cm^3 g^{-1})	Log (dimensionless)	cm^3 g^{-1}	dimensionless	dimensionless
NR	NR	1.25E+06	NR	NR	5.00E+02	3.00E-02	NR
NR	NR	2.50E+06	NR	NR	5.00E+02	5.00E-03	NR

Root - shoot correction factor	Root - root store correction factor	Root - tuber correction factor	Root - fruit correction factor	Soil-to-plant concentration factor (green vegetables)	
dimensionless	dimensionless	dimensionless	dimensionless	mg g^{-1} plant (DW or FW basis) over mg g^{-1} DW soil	Type
NR	NR	NR	NR	4.30E-04	numeric fw
NR	NR	NR	NR	3.80E-03	numeric fw

Soil-to-plant concentration factor (root vegetables)		Soil-to-plant concentration factor (tuber vegetables)		Soil-to-plant concentration factor (herbaceous fruit)	
mg g^{-1} plant (DW or FW basis) over mg g^{-1} DW soil	Type	mg g^{-1} plant (DW or FW basis) over mg g^{-1} DW soil	Type	mg g^{-1} plant (DW or FW basis) over mg g^{-1} DW soil	Type
4.00E-04	numeric fw	2.30E-04	numeric fw	3.30E-04	numeric fw
4.30E-03	numeric fw	1.90E-03	numeric fw	2.50E-03	numeric fw

Soil-to-plant concentration factor (shrub fruit)		Soil-to-plant concentration factor (tree fruit)		Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)
mg g^{-1} plant (DW or FW basis) over mg g^{-1} DW soil	Type	mg g^{-1} plant (DW or FW basis) over mg g^{-1} DW soil	Type		
2.00E-04	numeric fw	1.10E-03	numeric fw	0.50	1.0
2.50E-03	numeric fw	3.40E-03	numeric fw	0.50	1.0

Relative bioavailability ($RBA_{soil,tox}$)	
Soil	Airborne dust
0.03	1.00
0.03	1.00

STEP 5: RESULTS

Find AC | Print Repo

		Ratio of ADE to relevant Health	
		oral HCV	inhal HCV
Number	Chemical	(dimensionless)	(dimensionless)
1	Vanadium	0.08	1.00
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

orts | Back to Guide

	Soil Assessment Criteria			Soil Saturation Limit
Combined	oral HCV	inhal HCV	Combined	
(dimensionless)	mg kg^{-1}	mg kg^{-1}	mg kg^{-1}	mg kg^{-1}
NR	**4.89E+03**	**6.08E+02**	**NR**	NR

Pathway Contributions (%)					
direct soil ingestion	sum of consumption of homegrown produce and attached soil	dermal contact (indoor)	dermal contact (outdoor)	inhalation of dust (indoor)	inhalation of dust (outdoor)
%	%	%	%	%	%
46.84	0.00	0.00	0.00	3.16	0.00

inhalation of vapour (indoor)	inhalation of vapour (outdoor)	oral background	inhalation background	Total
%	%	%	%	%
0.00	0.00	46.84	3.16	100.00

APPENDIX J

Limitations

LIMITATIONS

This report is confidential and has been prepared solely for the benefit of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from The Brownfield Consultancy.

Additional information, improved practice or changes in legislation may necessitate this report having to be reviewed in whole or in part after that date. If necessary, this report should be referred back to The Brownfield Consultancy for re-assessment and, if necessary, re-appraisal.

DESK TOP STUDIES

The work comprised a study of available documented information from a variety of sources. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive. Should additional information become available which may affect the opinions expressed in this report, The Brownfield Consultancy reserves the right to review such information and, if warranted, to modify the opinions accordingly.

The evaluation and conclusions do not preclude the existence of contamination, which could not reasonably have been revealed by the current work. Hence this report should be used for information purposes only and should not be construed as a comprehensive characterisation of all site conditions.

INTRUSIVE INVESTIGATIONS

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made.

Where intrusive investigations have been undertaken they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature of sampling, no

investigation technique is capable of identifying all conditions present in all areas. Groundwater levels can fluctuate in response to seasonal variations.

The number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” of contamination where concentrations may be significantly higher than those actually encountered. The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to areas unoccupied by the building(s) on the site and by buried services.

Registered Office:

The Cottage
Mill Lane
Fenny Compton
CV47 2YF

Company No: 8143932

jim.twaddle@brownfieldconsultancy.co.uk