Soil Site Report

Extended Soil Report

Sample Soil Report 5km

Easting: 482598
Northing: 261291
Site Area: 5km x 5km

Prepared for: Caroline Keay, Cranfield University
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Citation

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About this report

This Soil Site Report identifies and describes the properties and capacities of the soil at your specified location as recorded in the National Soil Map for England and Wales. It has been produced by Cranfield University's National Soil Resources Institute.

The National Soil Map represents the most accurate and comprehensive source of information about the soil at the national coverage in England and Wales. It maps the distribution of soil mapping units (termed soil associations) which are defined in terms of the main soil types (or soil series) that were recorded for each soil association during field soil survey. Each soil association is named after its principal soil series and these bear the location name from where they were first described (e.g. Windsor). Each of these soil associations have differing environmental characteristics (physical, chemical and biological) and it is by mapping these properties that the range of thematic maps in this report have been produced.

Soil types and properties vary locally, as well as at the landscape scale. It is not possible to identify precisely the soil conditions at a specific location without first making a site visit. We have therefore provided you with information about the range of soil types we have identified at and around your selected location. Schematic diagrams are also provided to aid accurate identification of the soil series at your site.

Whilst an eight-figure national grid reference should be accurate to within 100m, a single rural Postcode can cover a relatively large geographical area. Postcodes can therefore be a less precise basis for specifying a location. The maps indicate the bounded area the reports relate to.

Your Site Soil Report will enable you to:

- identify the soils most likely to be present at and immediately around your specified location;
- understand the patterns of soil variation around your location and how these correlate with changes in landscape;
- identify the nature and properties of each soil type present within the area;
- understand the relevant capacities and limitations of each of the soils and how these might impact on a range of factors such as surface water quality.

Table of Contents

Table of Contents continued

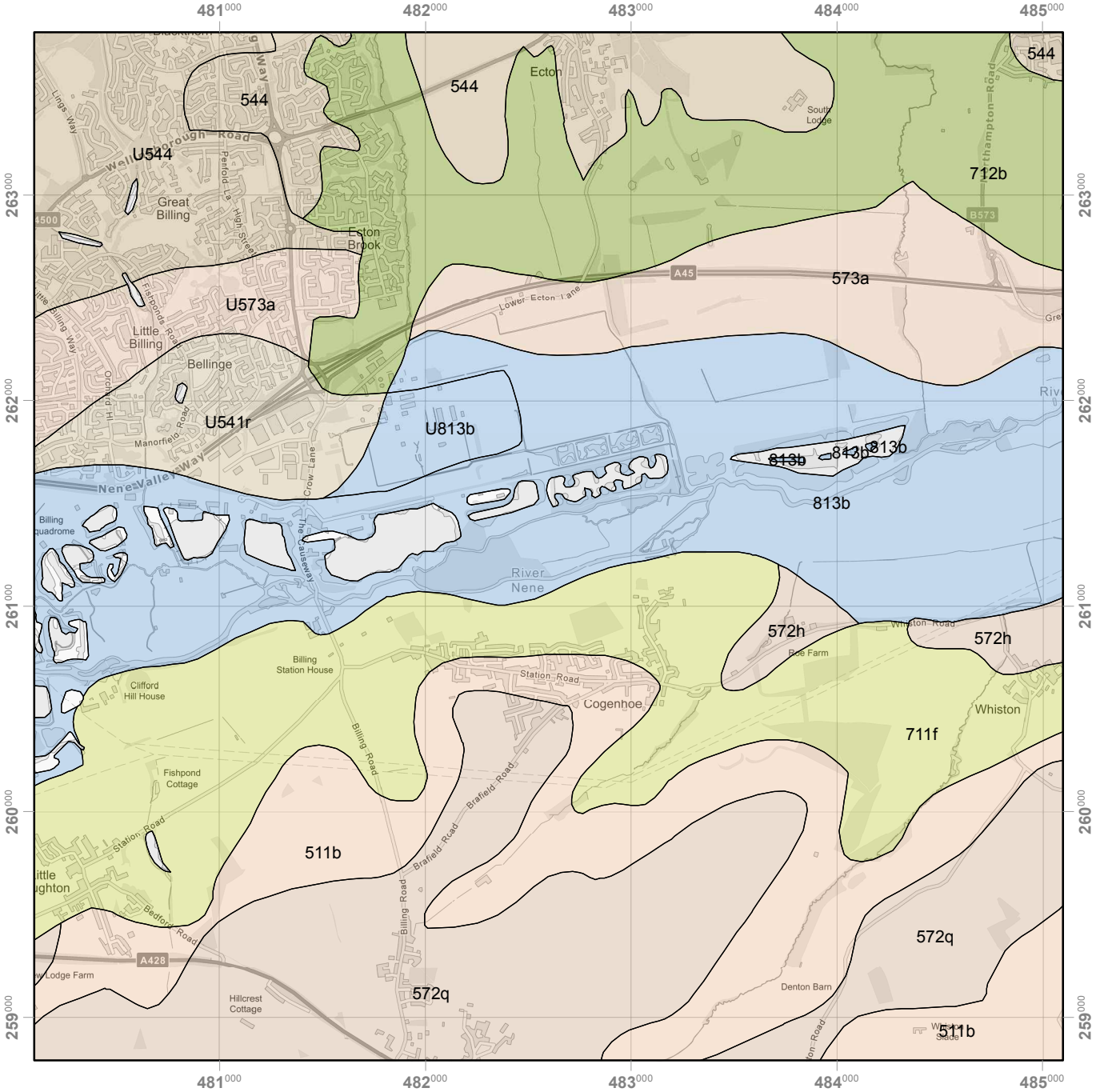
1. Soil Thematic Maps

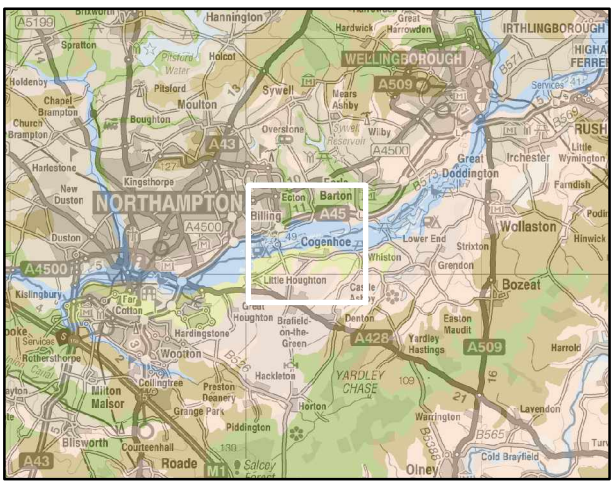
This section contains a series of maps of the area surrounding your selected location, presenting a number of themes relating to the characteristics of the soils. These provide an overview of the nature and condition of the local soil conditions. It is these conditions that may be used to infer the response of an area to certain events (with the soil as a receptor), such as pollution contamination from a chemical spill, or an inappropriate pesticide application and the likelihood of these materials passing though the soil to groundwater. Other assessments provide an insight into the way a location may impact, by corrosive attack or ground movement, upon structures or assets within the ground, for example building or engineering foundations or pipes and street furniture.

Soil is a dynamic environment with many intersecting processes, chemical, physical and biological at play. Even soils 'sealed' over by concrete and bitumen are not completely dormant. The way soils respond to events and actions can vary considerably according to the properties of the soil as well as other related factors such as land-use, vegetation, topography and climate. There are many threats facing our national soil resource today and importance should be given to identifying the best measures aimed towards soil protection, ensuring the usage of soils in the most sustainable way. This report is therefore a useful snapshot of the soil properties for your given area, providing a summary of a broad range of ground conditions

Figure 1: Location of study area

1a Soils - Spatial Distribution





Soils - Spatial Distribution Key

511b Moreton
Well drained calcareous clayey and fine loamy soils over limestone, in places shallow and brashy.

541r WICK 1
Deep well drained coarse loamy and sandy soils locally over gravel.

544 BANBURY
Well drained brashy fine and coarse loamy ferruginous soils over ironstone.

572h OXPASTURE
Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.

572q ASHLEY
Fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging associated with similar but wetter soils.

573a WATERSTOCK
Deep permeable mainly fine loamy soils variably affected by groundwater.

711f WICKHAM 2
Slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils.

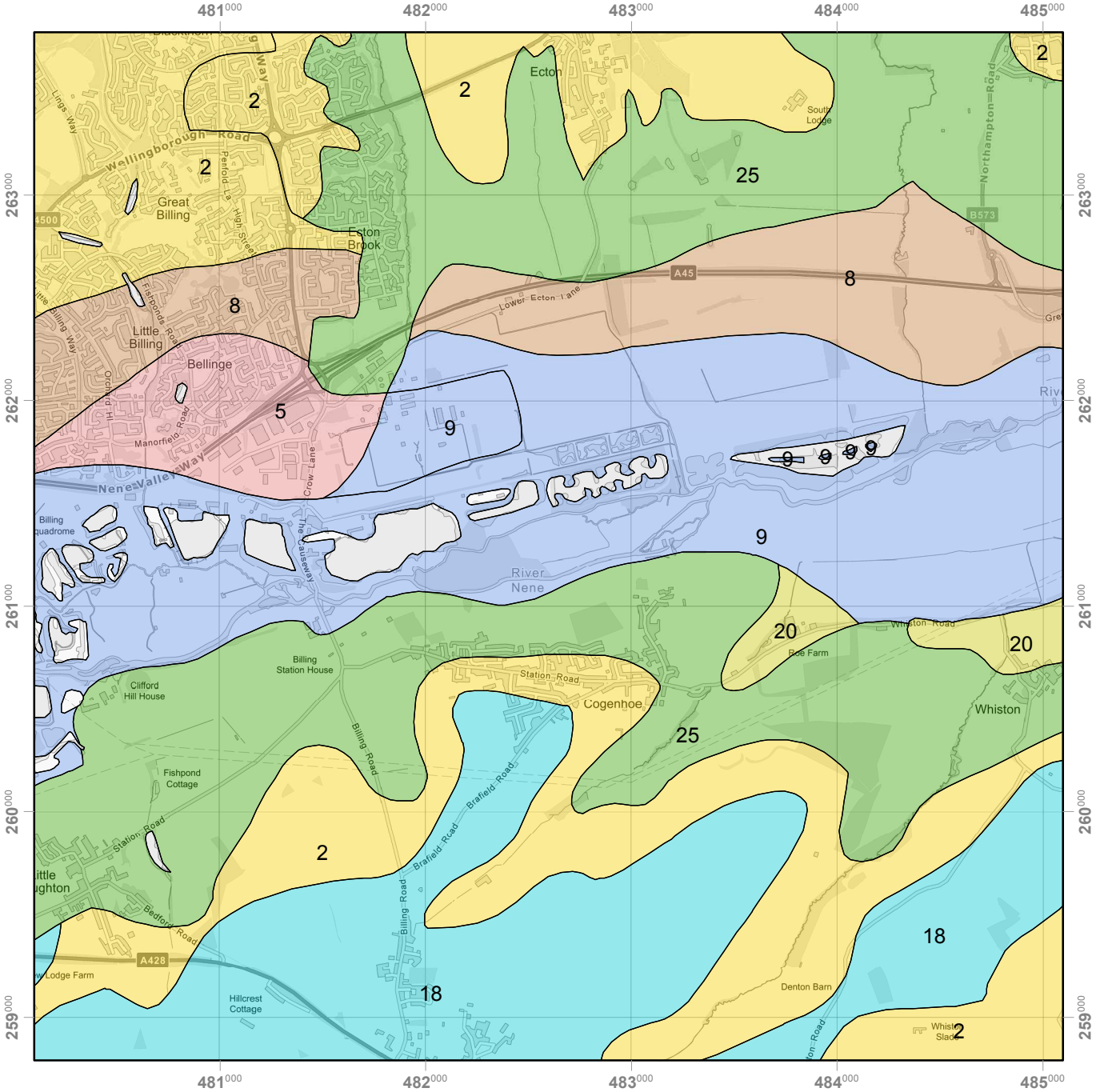
712b DENCHWORTH
Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

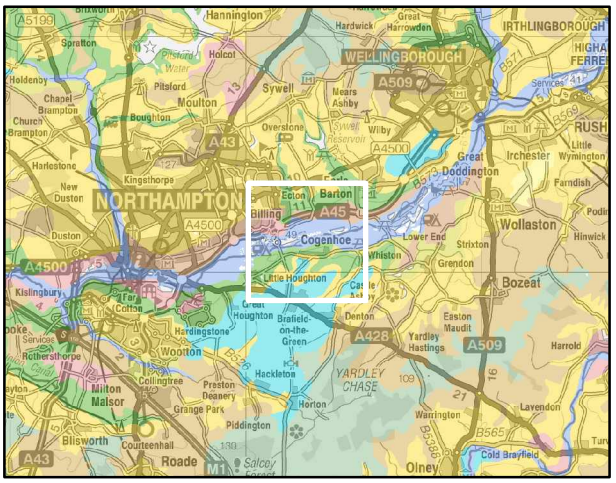
813b FLADBURY 1
Stoneless clayey soils, in places calcareous variably affected by groundwater.

SOIL ASSOCIATION DESCRIPTION

Soil associations represent a group of soil series (soil types) which are typically found occurring together, associated in the landscape (Avery, 1973; 1980; Clayden and Hollis, 1984). Soil associations may occur in many geographical locations around the country where the environmental conditions are comparable. For each of these soil associations, a collection of soil types (or soil series) are recorded together with their approximate proportions within the association. Soil associations have codes as well as textual names, thus code '554a' refers to the 'Frilford' association. Where a code is prefixed with 'U', the area is predominantly urbanised (e.g. 'U571v'). The soil associations for your location, as mapped above, are described in more detail in Section 2: Soil Association Descriptions.

1b Hydrology of Soil Type (HOST)





Hydrology of Soil Type (HOST) Key

2 Free draining permeable soils on 'brashy' or dolomitic limestone substrates with high permeability and moderate storage capacity

5 Free draining permeable soils in unconsolidated sands or gravels with relatively high permeability and high storage capacity

8 Free draining permeable soils in unconsolidated loams or clays with groundwater at less than 2m from the surface

9 Soils seasonally waterlogged by fluctuating groundwater and with relatively slow lateral saturated conductivity

18 Slowly permeable soils with slight seasonal waterlogging and moderate storage capacity over slowly permeable substrates with negligible storage

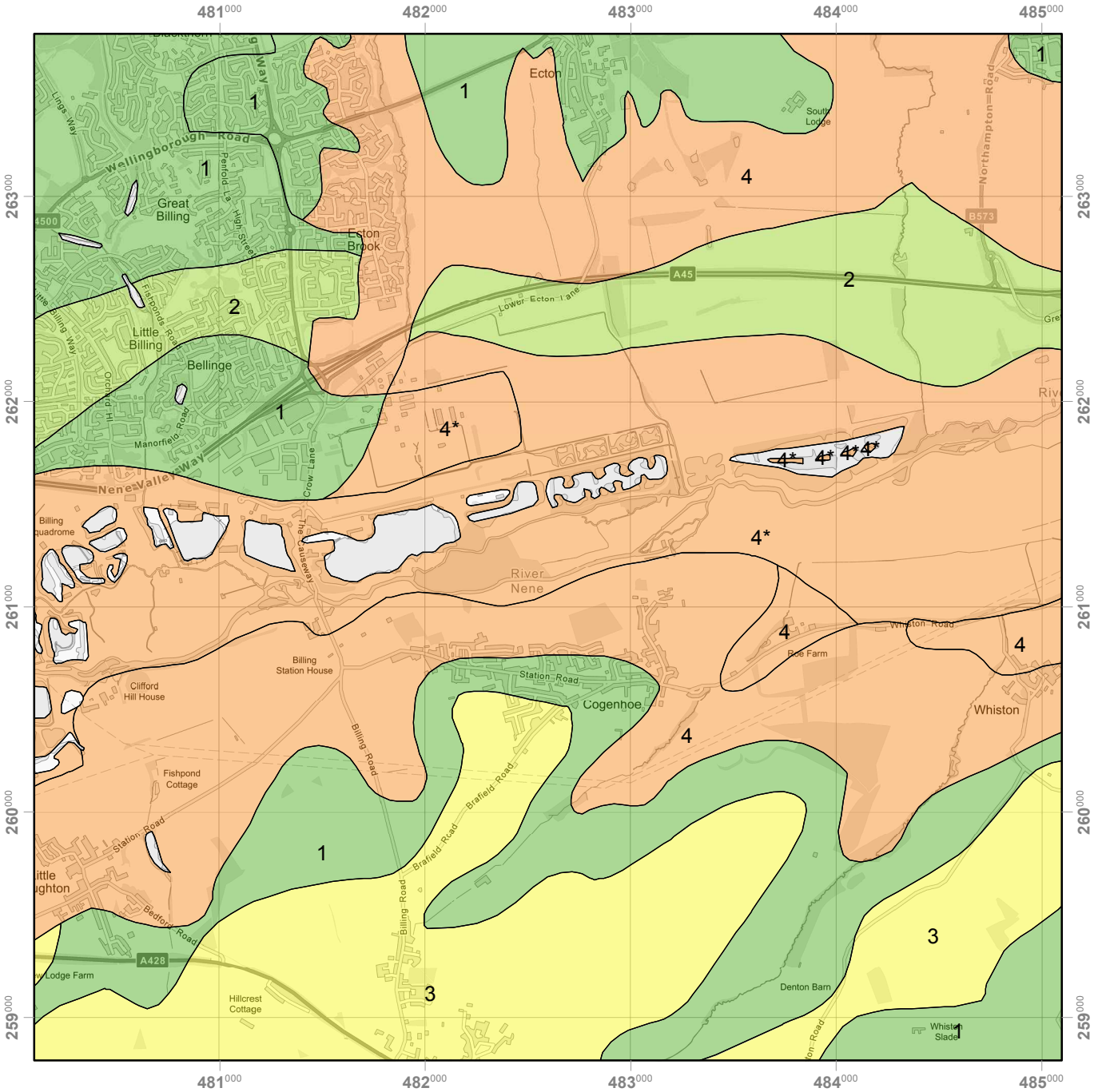
20 Slowly permeable soils with slight seasonal waterlogging and moderate storage capacity over impermeable clay substrates with no storage capacity

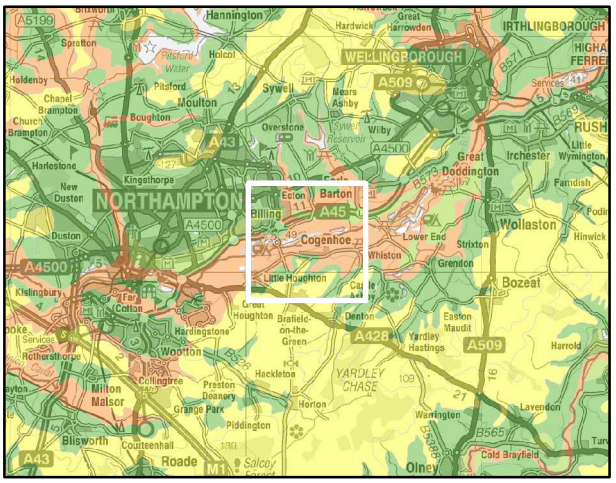
25 Slowly permeable, seasonally waterlogged soils over impermeable clay substrates with no storage capacity

HOST CLASS DESCRIPTION

The Hydrology of Soil Types (HOST) classification describes the dominant pathways of water movement through the soil and, where appropriate, the underlying substrate. Eleven drainage models are defined according to the permeability of the soil and its substrate and the depth to a groundwater table, where one is present (Boorman et al,1995). These are further subdivided into 29 HOST classes to which all soil series have been assigned. These classes identify the way soil water flows are partitioned, with water passing over, laterally through, or vertically down the soil column. Analysis of the river hydrograph and the extent of soil series for several hundred gauged catchments allowed mean values for catchment hydrological variables to be identified for each HOST class, The HOST classification is widely used to predict river flows and the frequency and severity of flood events and also to model the behaviour of diffuse pollutants (Hollis et al, 1995).

1c Ground Movement Potential





Ground Movement Potential Key


1 Very low


2 Low


3 Moderate


4 High

* If a High class is starred, a Very High ground movement potential is likely to be achieved if these soils are drained to an effective depth of at least two metres.

GROUND MOVEMENT POTENTIAL DESCRIPTION

Clay-related ground movement is the most widespread cause of foundation failure in the UK and is linked to seasonal swelling and shrinkage of the clay. The content of clay within the soils of your selected area has therefore a direct bearing upon the likelihood of ground movement.

Among the inorganic particles that constitute the solid component of any soil, clay particles are the smallest and defined as being less than 0.002 mm - equivalent spherical diameter (esd) in size. Clay particles occur in most kinds of soil but they only begin to exert a predominant influence on the behaviour of the whole soil where there is more than 35 per cent (by weight) of clay-sized material present.

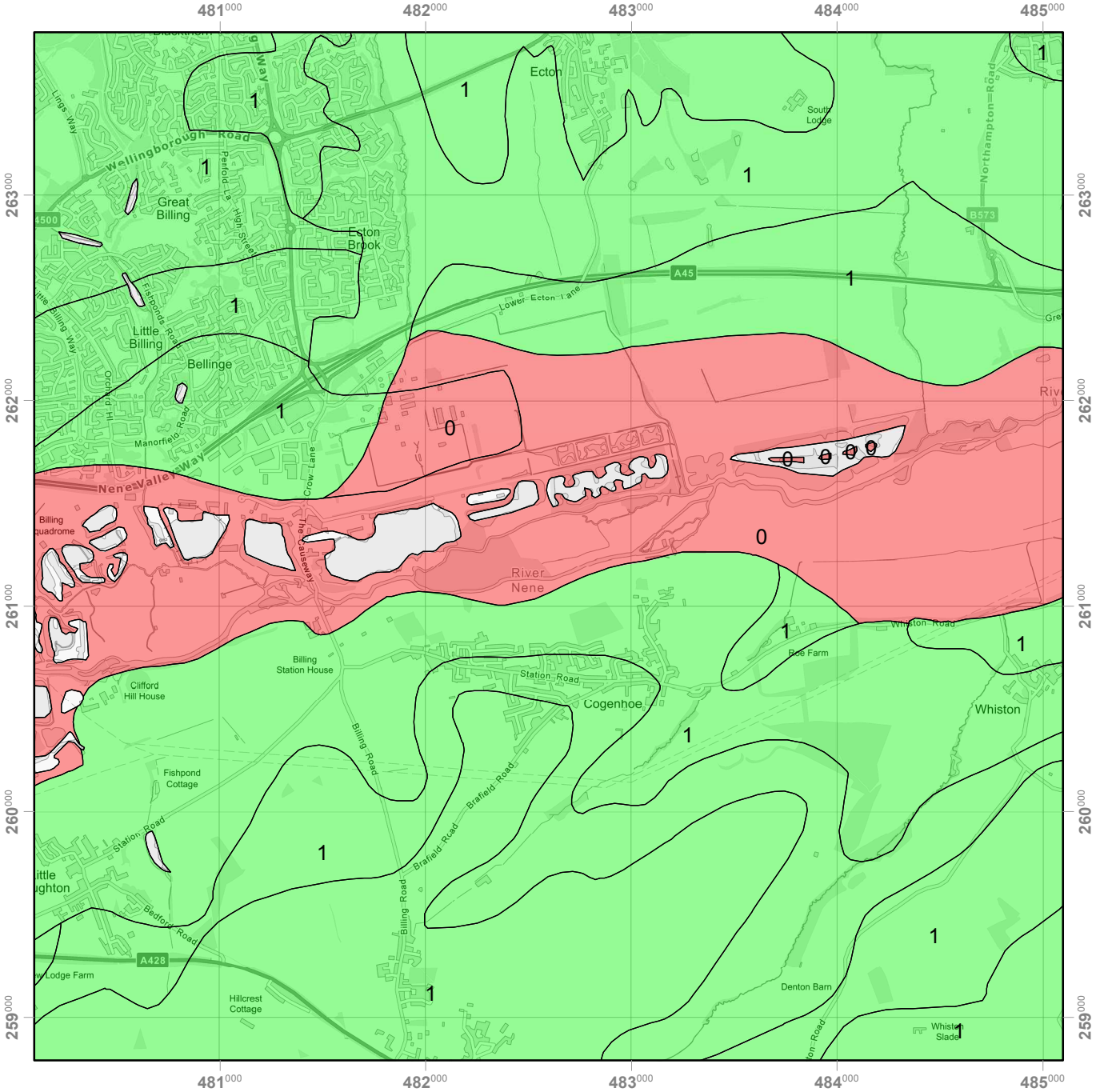
Because clay particles are very small and commonly platy in shape they have an immense surface area onto which water can be attracted, relative to the total volume of the soil material. In addition to surface attraction or inter-crystalline absorption of water, some clay minerals, those with three layers of atoms (most other kinds of clay have only two layers of atoms) are able to absorb and hold additional water between these layers. It is these types of clay mineral, which are widespread in British soils and commonly known as smectites that have the greatest capacity to shrink and swell.

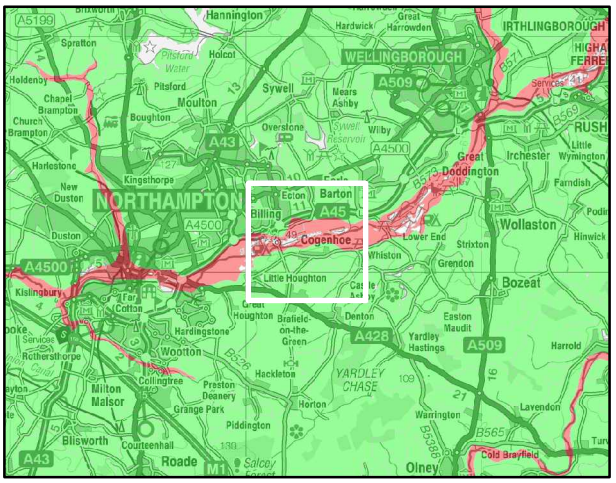
In a natural undisturbed condition, the moisture content of deep subsoil clay does not change greatly through the year and consequently there are no changes in volume leading to shrinkage and swelling. However, when clays are exposed at or near the ground surface and especially when vegetation is rooting in them seasonal moisture and volume changes can be dramatic. Plants and trees transpire moisture from the soil to support their growth and transfer necessary nutrients into their structures. Surface evaporation also takes place from soil and plant structures, and the combination of evaporation from surfaces and transpiration by plants and trees is termed evapotranspiration. Thus, the layer of soil material down to 2m depth into which plants will root is critical when assessing the vulnerability of land to subsidence.

Whenever soil moisture is continuously being replenished by rainfall, the soil moisture reserves will be unaffected by the removal of moisture by plants as there is no net loss. However, in many parts of Britain, particularly in the south and east, summer rainfall is small and is exceeded by evapotranspiration. Water reserves are then not sufficiently replenished by rainfall and so a soil moisture deficit develops. The water removed from a clayey soil by evapotranspiration leads to a reduction in soil volume and the consequent shrinkage causes stress in the soil materials leading in turn to stress on building foundations that are resting in the soil (Hallett, et al, 1994).

The foundations themselves may then move and thus cause damage to building structures. This problem can be exacerbated by the fact that the soil beneath the structure may not dry out uniformly, so that any lateral pressure exerted on the building foundation is made effectively greater. This assessment identifies the likelihood of soil conditions being prone to ground movement given these other factors.

1d Flood Vulnerability





Flood Vulnerability Key

0 Major risk

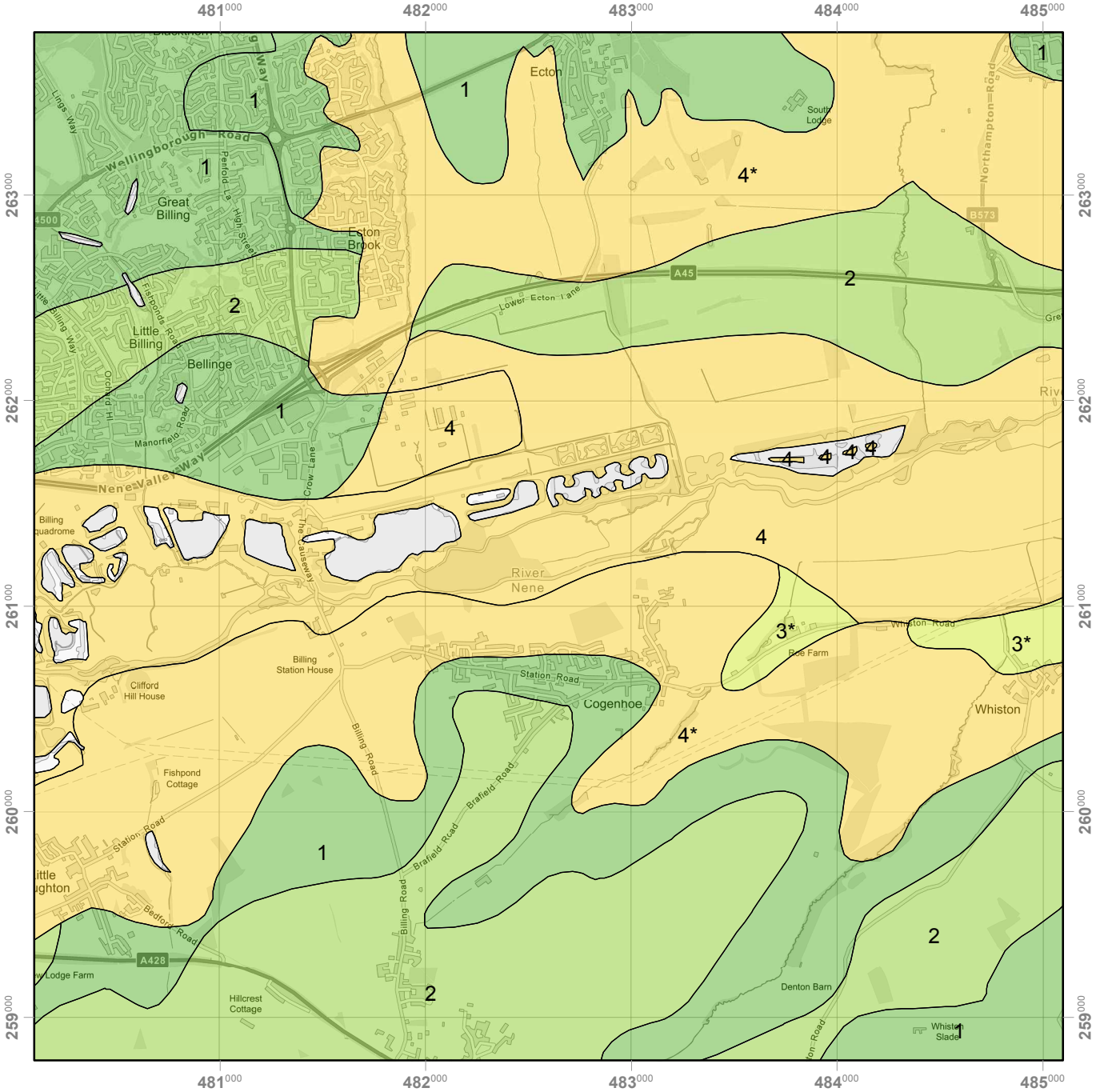
1 Minor risk

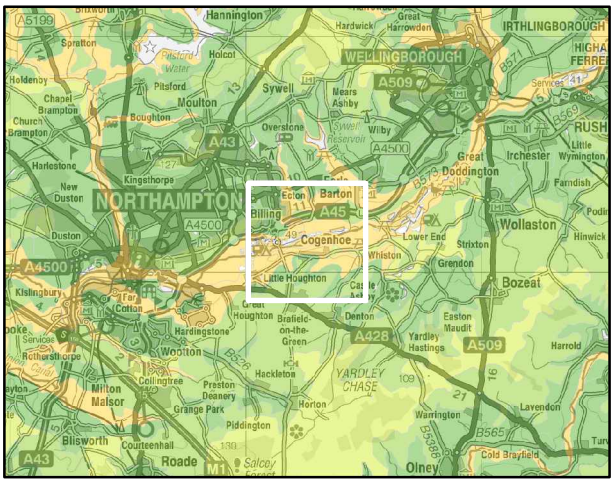
FLOOD VULNERABILITY DESCRIPTION

The inundation of properties by flood water can occur in a number of circumstances. Surface run-off can collect on low-lying land from upslope following heavy rainfall. More commonly rivers, lakes and/or the sea extend beyond their normal limits as a result of prolonged or intense rainfall, unusually high tides and/or extreme wind events. Water damage to properties and their contents is compounded by the deposition of sediment suspended in the flood waters. The spatial distribution of such waterborne sediment (or alluvium as defined in soil science) is one basis upon which land that has been subject to historical flooding can be mapped, and this forms a basis for present-day flooding risk assessment.

Both riverine and marine alluvium are identified as distinct soil parent materials within the British soil classifications. Combining soil map units that are dominated by soil series developed in alluvium across Great Britain identifies most of the land that is vulnerable to flooding. This assessment does not account for man-made flood defence measures, showing instead the areas where once water has stood.

1e Risk of Corrosion to Ferrous Iron





Risk of Corrosion to Ferrous Iron Key


1 Non-aggressive


2 Slightly Aggressive


3 Moderately Aggressive


4 Highly Aggressive

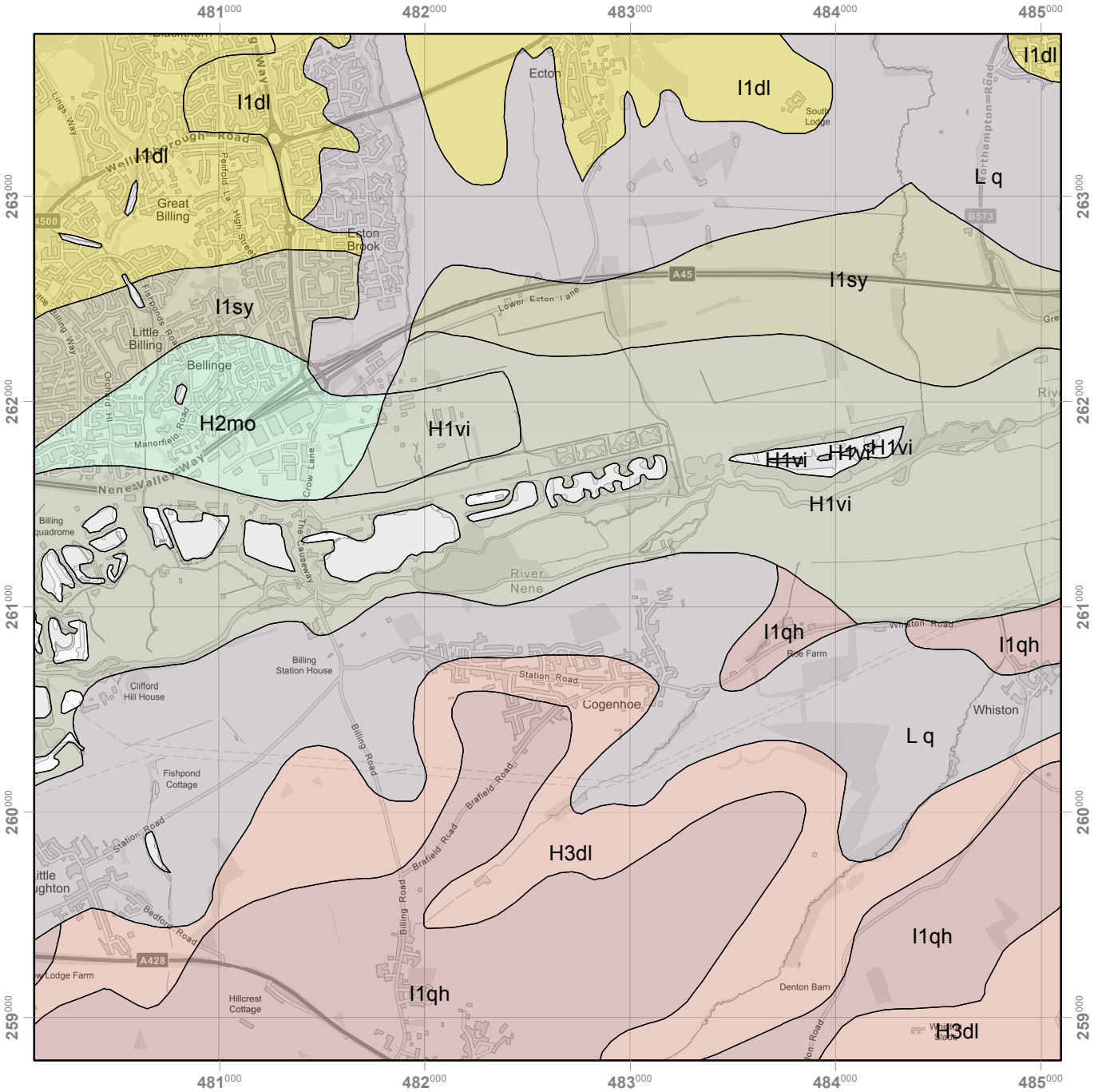
* If a class is starred, it is assumed that there are moderate amounts of sulphate in the soil. If there is abundant sulphate present, the soil may be one class more aggressive. Conversely, if there is very little sulphate, the soil may be one class less aggressive to

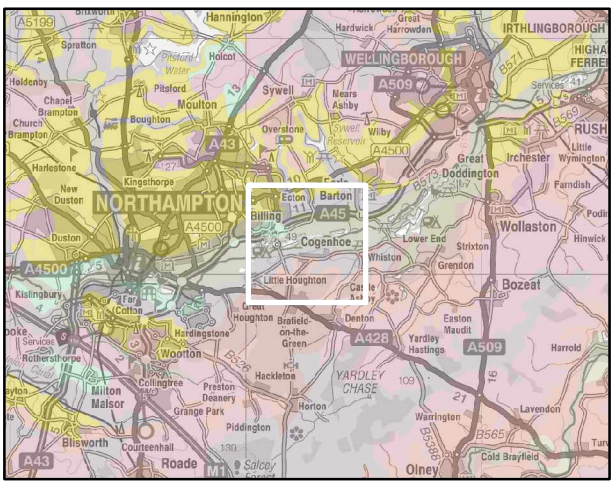
buried ferrous iron.

RISK OF CORROSION TO FERROUS IRON DESCRIPTION

Buried iron pipes and other infrastructure corrode at rates that are influenced by soil conditions (Jarvis and Hedges, 1994). Soil acidity, sulphide content, aeration and wetness all influence the corrosivity of the soil. These factors are used to map 5 major classes of relative corrosivity.

1f Pesticide Leaching Risk





Pesticide Leaching Risk Key

H1vi Slowly permeable soil; groundwater at very shallow depth (60cm)

H2mo Sandy soil with low organic matter; groundwater at moderate depth

H3dl Moderately shallow soil over soft limestone with deep groundwater

I1dl Deep loamy soil over soft limestone with deep groundwater

I1qh Slowly permeable soils with relatively high storage capacity over soft substrates of low or negligible storage capacity that sometimes conceal groundwater bearing rocks at depth

I1sy Deep loamy soil; groundwater at shallow depth

L q Impermeable soils over soft substrates of low or negligible storage capacity that sometimes conceal groundwater bearing rocks at depth

PESTICIDE LEACHING CLASS DESCRIPTION

The natural permeability and water regime of soils are influential in determining the fate and behaviour of pesticides applied to the crop and soil surface (Hollis et al, 1995). A system of vulnerability assessment was devised as part of the national system for Policy and Practice for the Protection of Groundwater. This divided soils into three primary vulnerability classes.

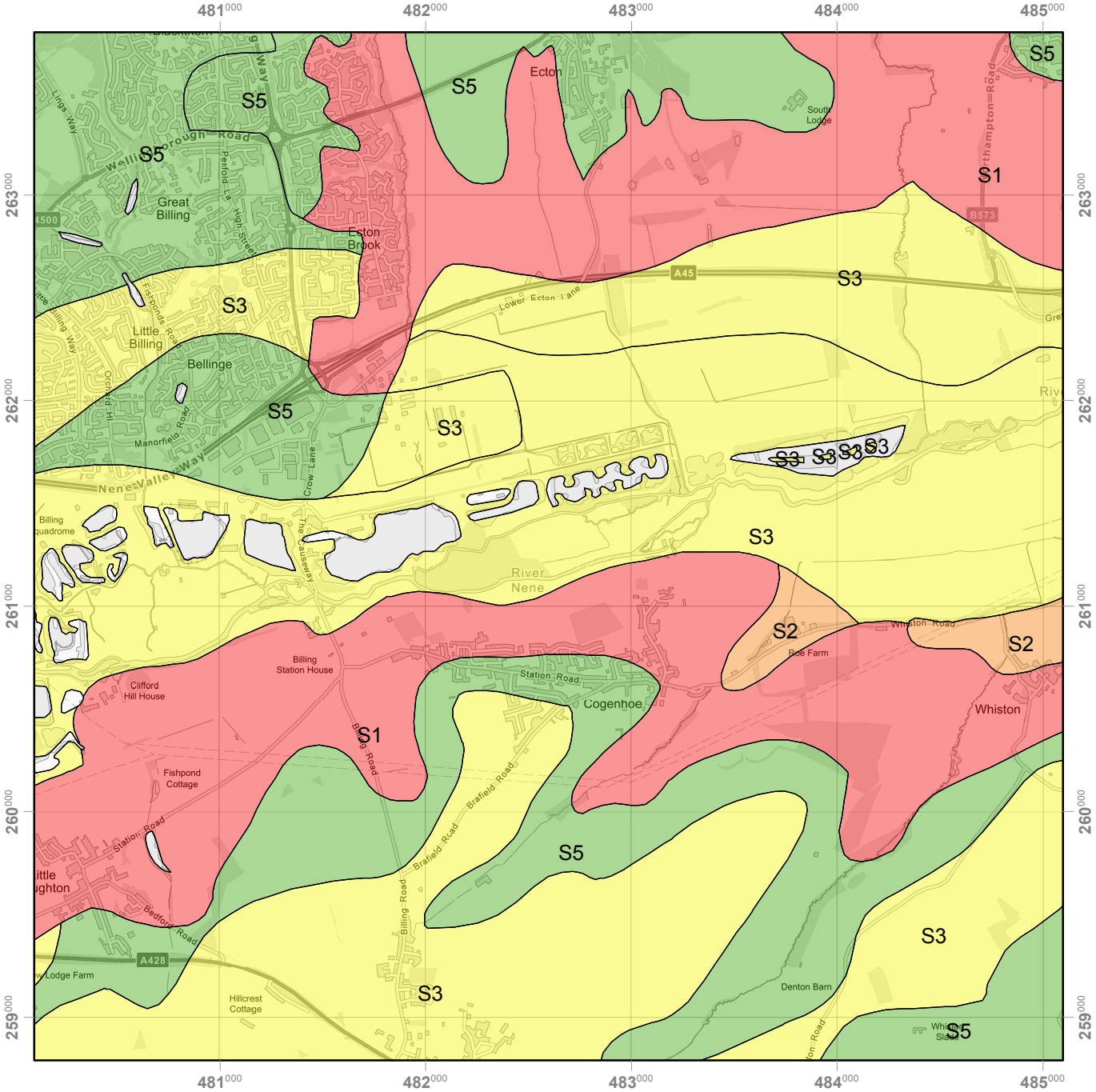
H - Soils of high leaching capacity with little ability to attenuate non-adsorbed pesticide leaching which leave underlying groundwater vulnerable to pesticide contamination.

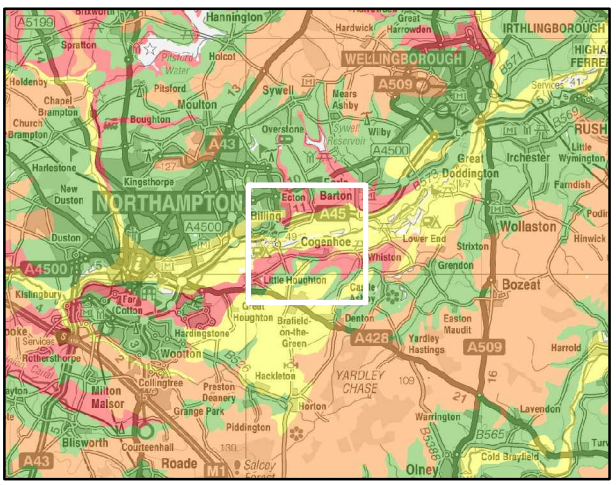
I - Soils of intermediate leaching capacity with a moderate ability to attenuate pesticide leaching.

L - Soils of low leaching capacity through which pesticides are unlikely to leach.

The primary classes have been further subdivided into nearly forty subclasses. These subclasses, with their descriptions, are mapped above. These classes do not account for differences in land cultivation, which can also have a significant impact on pesticide behaviour.

1g Pesticide Runoff Risk





Pesticide Runoff Risk Key

S1 Very high run-off potential.

S2 High run-off potential.

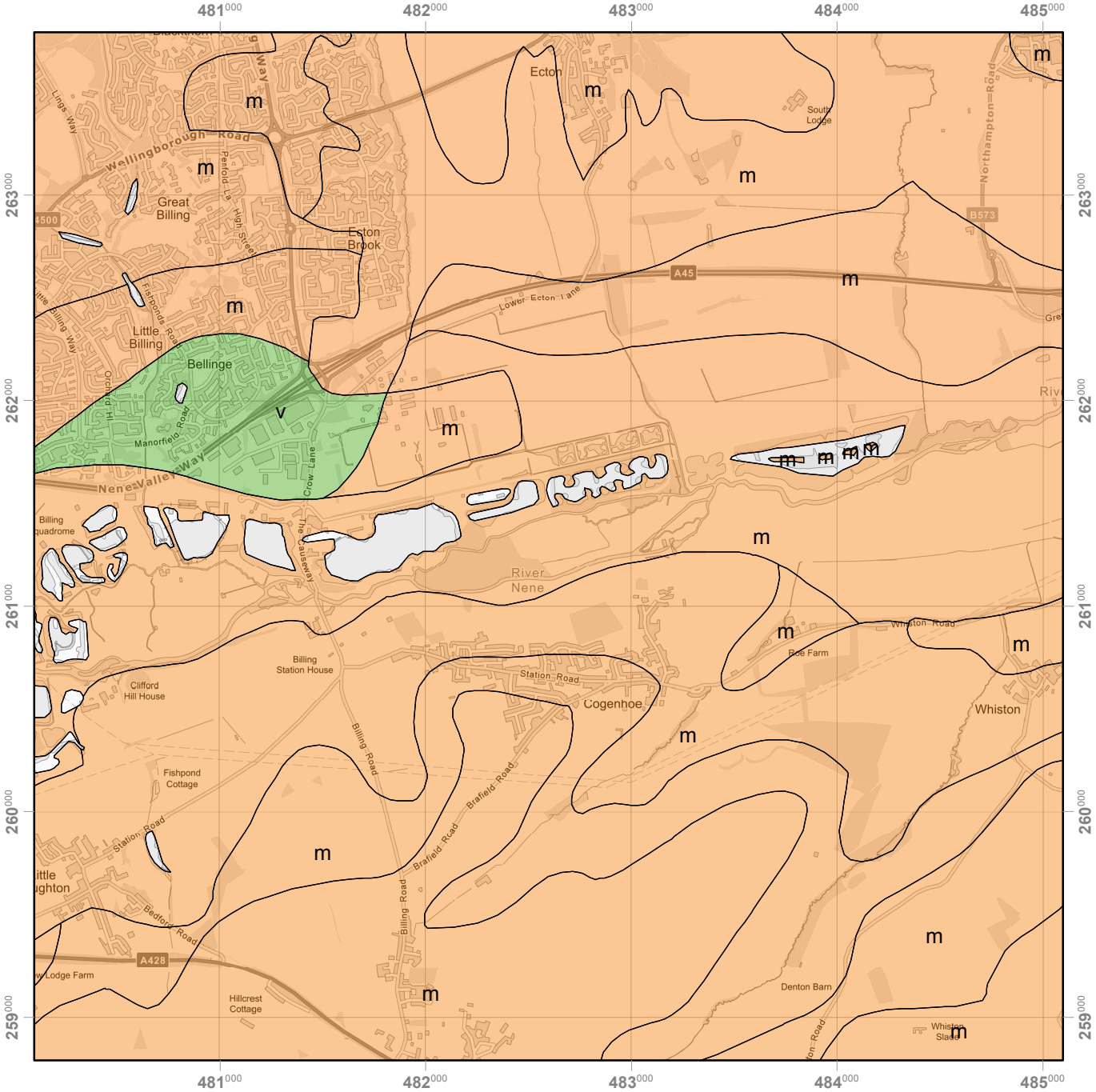
S3 Moderate run-off potential.

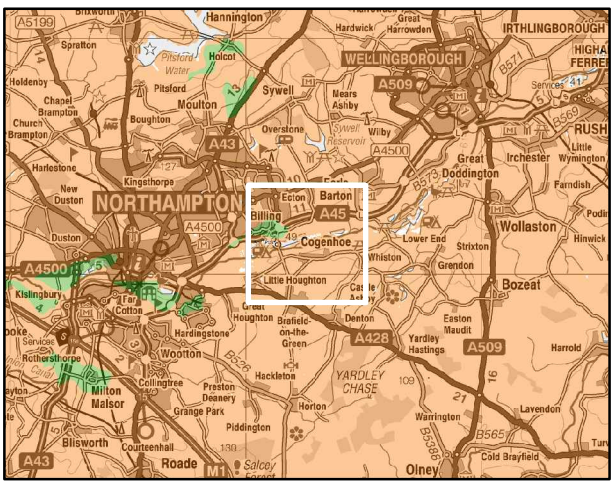
S5 Very low run-off potential.

PESTICIDE RUNOFF RISK DESCRIPTION

The physical properties and natural water regime of soils influence the speed and extent of lateral water movement over and through the soil at different depths (Hollis et al, 1995). At as result, soils can be classed according to the potential for pesticide run-off. Five runoff potential classes are identified for mineral soils and a further two for peat soils.

1h Potential for pesticide Adsorption





Potential for pesticide Adsorption Key

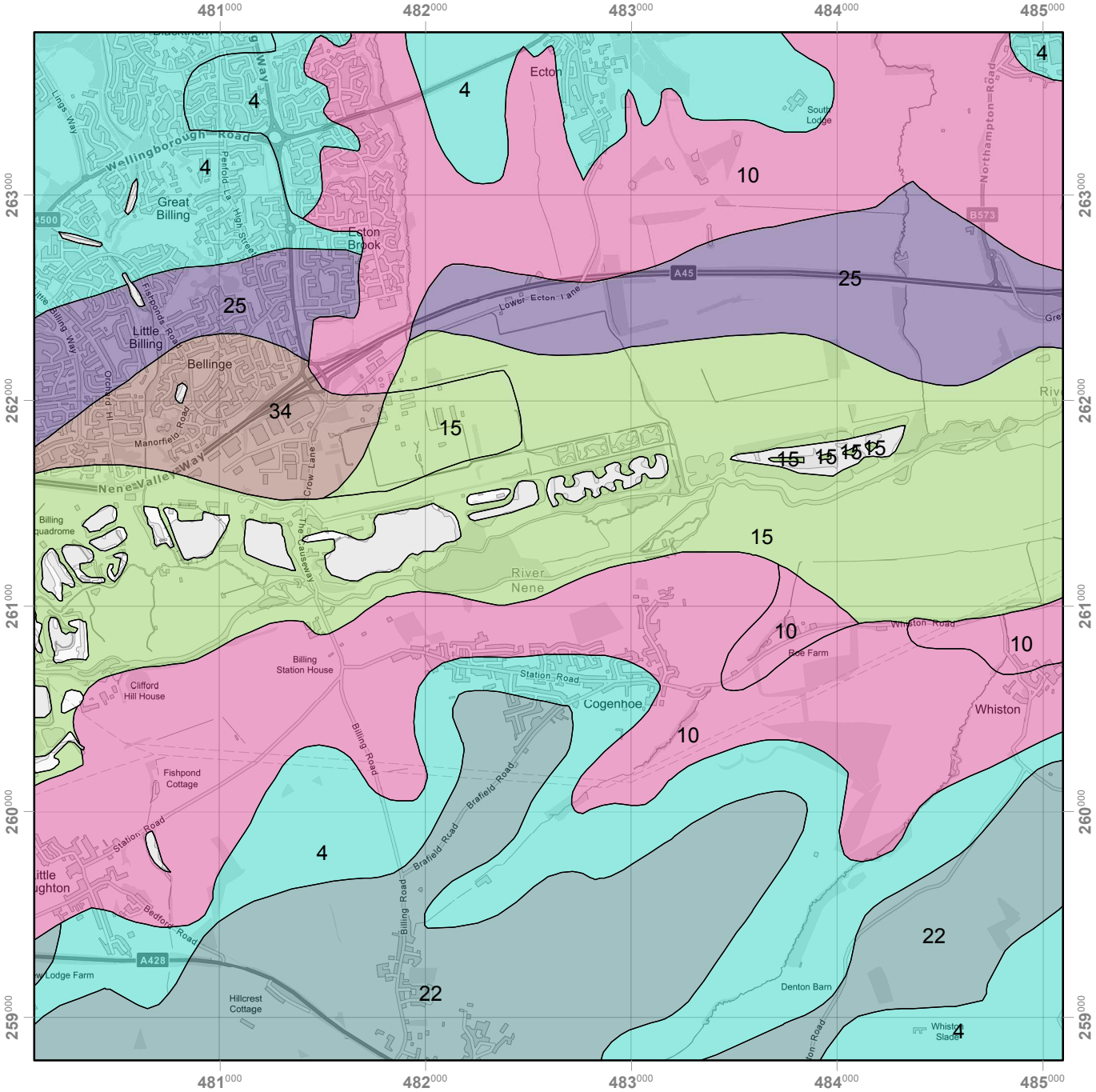
m Moderate adsorption potential.

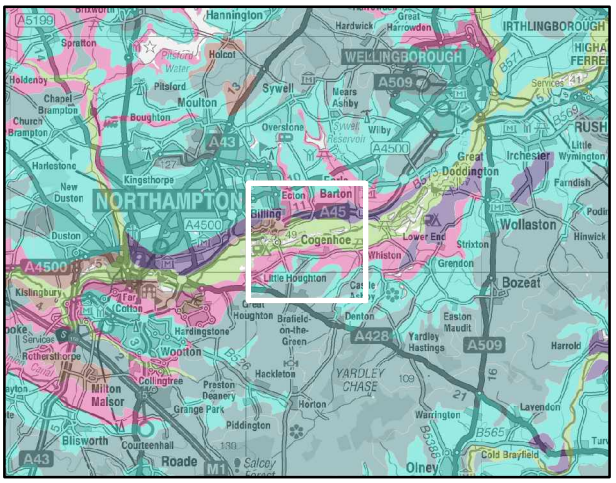
v Very low adsorption potential.

POTENTIAL FOR PESTICIDE ADSORPTION DESCRIPTION

The physical properties and natural water regime of soils influence the speed and extent of lateral water movement over and through the soil at different depths (Hollis et al, 1995). The mineral soil classes are further subdivided according to their potential for pesticide adsorption.

1i Hydrogeological Rock Type





Hydrogeological Rock Type Key


4 soft Magnesian, brashy or Oolitic limestone and ironstone


10 very soft massive clays


15 river alluvium


22 till and compact Head

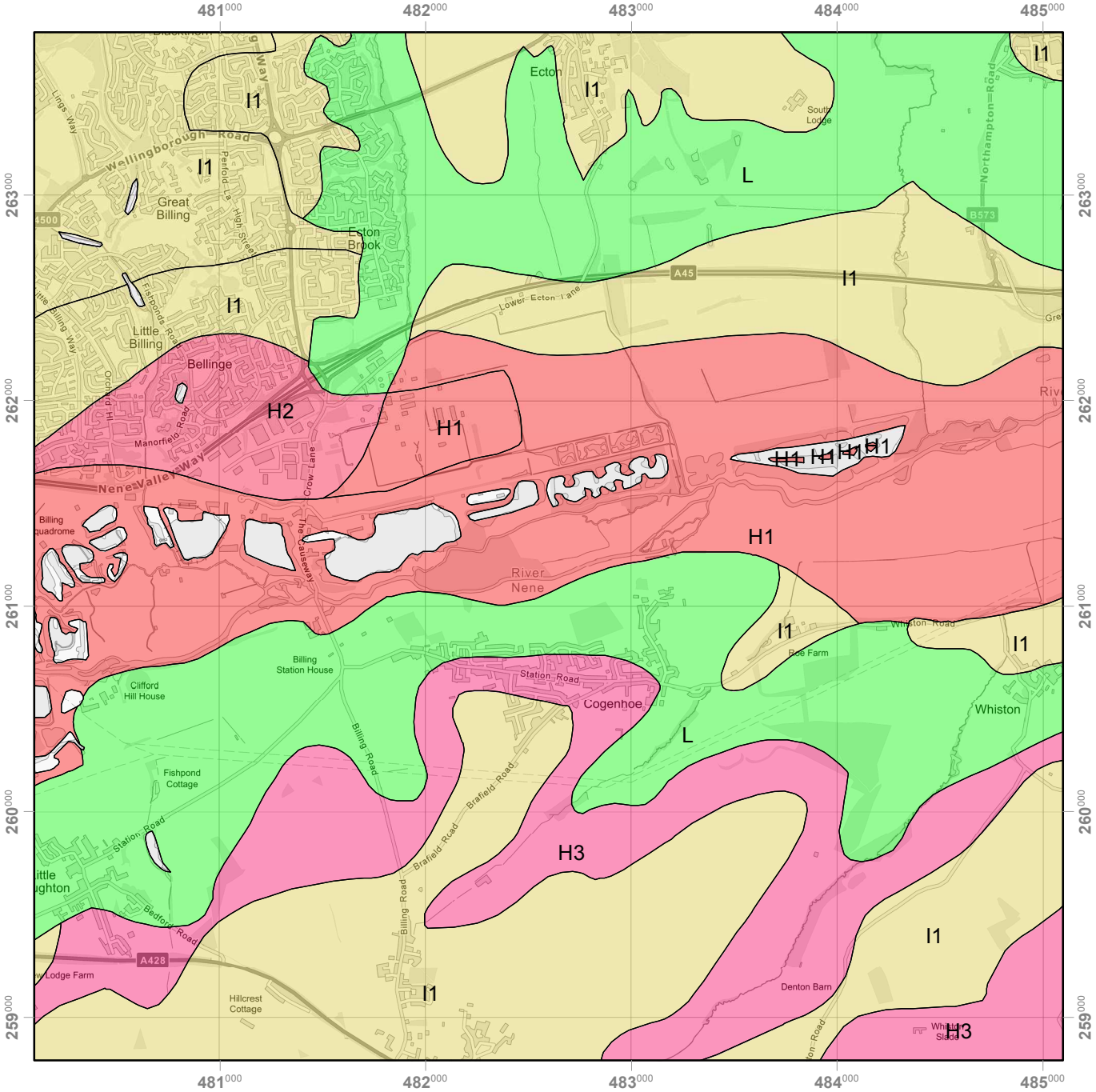

25 loamy drift

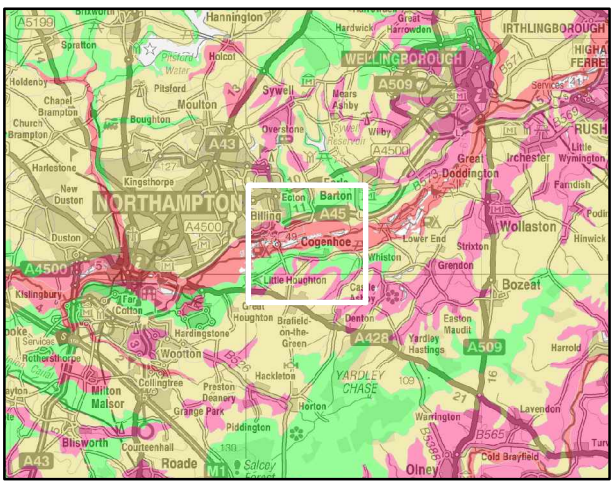

34 sand

HYDROGEOLOGICAL ROCK TYPE DESCRIPTION

The hydrogeological classification of the soil parent materials provides a framework for distinguishing between soil substrates according to their general permeability and whether they are likely to overlie an aquifer. Every soil series has been assigned one of the 32 substrate classes and each of these is characterised according to its permeability (being characterised as permeable, slowly permeable or impermeable). For further information, see Boorman et al (1995).

1j Ground Water Protection Policy (GWPP)





Ground Water Protection Policy (GWPP) Key

H1 Soils of high leaching potential, which readily transmit liquid discharges because they are either shallow, or susceptible to rapid bypass flow directly to rock, gravel or groundwater

H2 Deep, permeable coarse textured soils of high leaching potential, which readily transmit a wide range of pollutants because of their rapid drainage and low attenuation potential

H3 Coarse textured or moderately shallow soils of high leaching potential, which readily transmit non-adsorbed pollutants and liquid discharges but which have some ability to attenuate adsorbed pollutants because of their relatively large organic matter or clay content

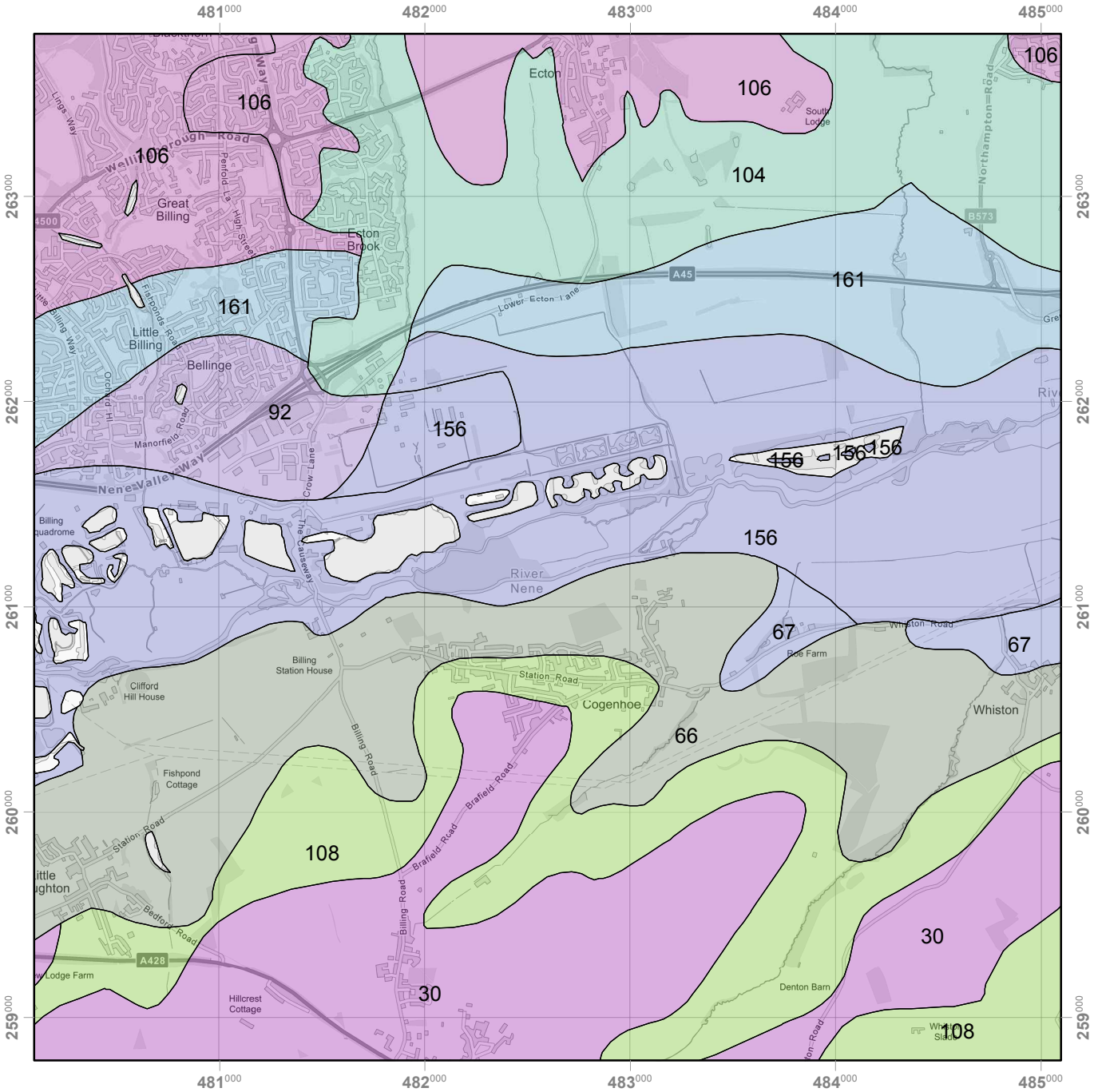
I1 Soils of intermediate leaching potential which have a moderate ability to attenuate a wide range of diffuse source pollutants but in which it is possible that some non-adsorbed diffuse source pollutants and liquid discharges could penetrate the soil layer

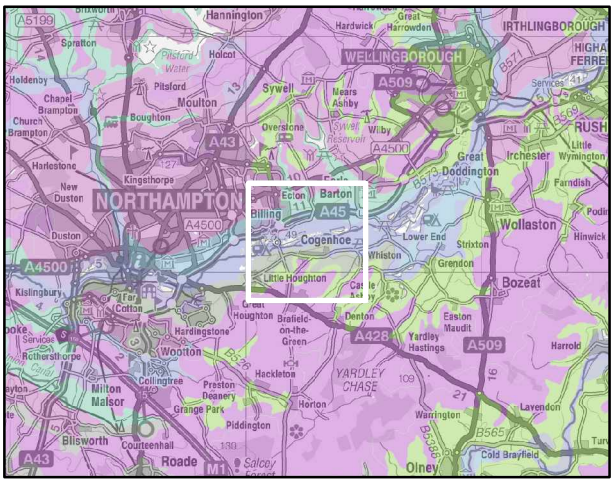
L Soils in which pollutants are unlikely to penetrate the soil layer either because water movement is largely horizontal or because they have a large ability to attenuate diffuse source pollutants

GWPP LEACHING CLASS DESCRIPTION

The Ground Water Protection Policy classes describe the leaching potential of pollutants through the soil (Hollis, 1991; Palmer et al, 1995). The likelihood of pollutants reaching ground water is described. Different classes of pollutants are described, including liquid discharges adsorbed and non-adsorbed pollutants.

1k Soil Parent Material





Soil Parent Material Key


30 Chalky till


66 Drift over Jurassic and Cretaceous clay or mudstone


67 Drift over Jurassic and Cretaceous clay shale


92 Glaciofluvial or river terrace drift


104 Jurassic and Cretaceous clay


106 Jurassic and Cretaceous ironstone


108 Jurassic clay and limestone

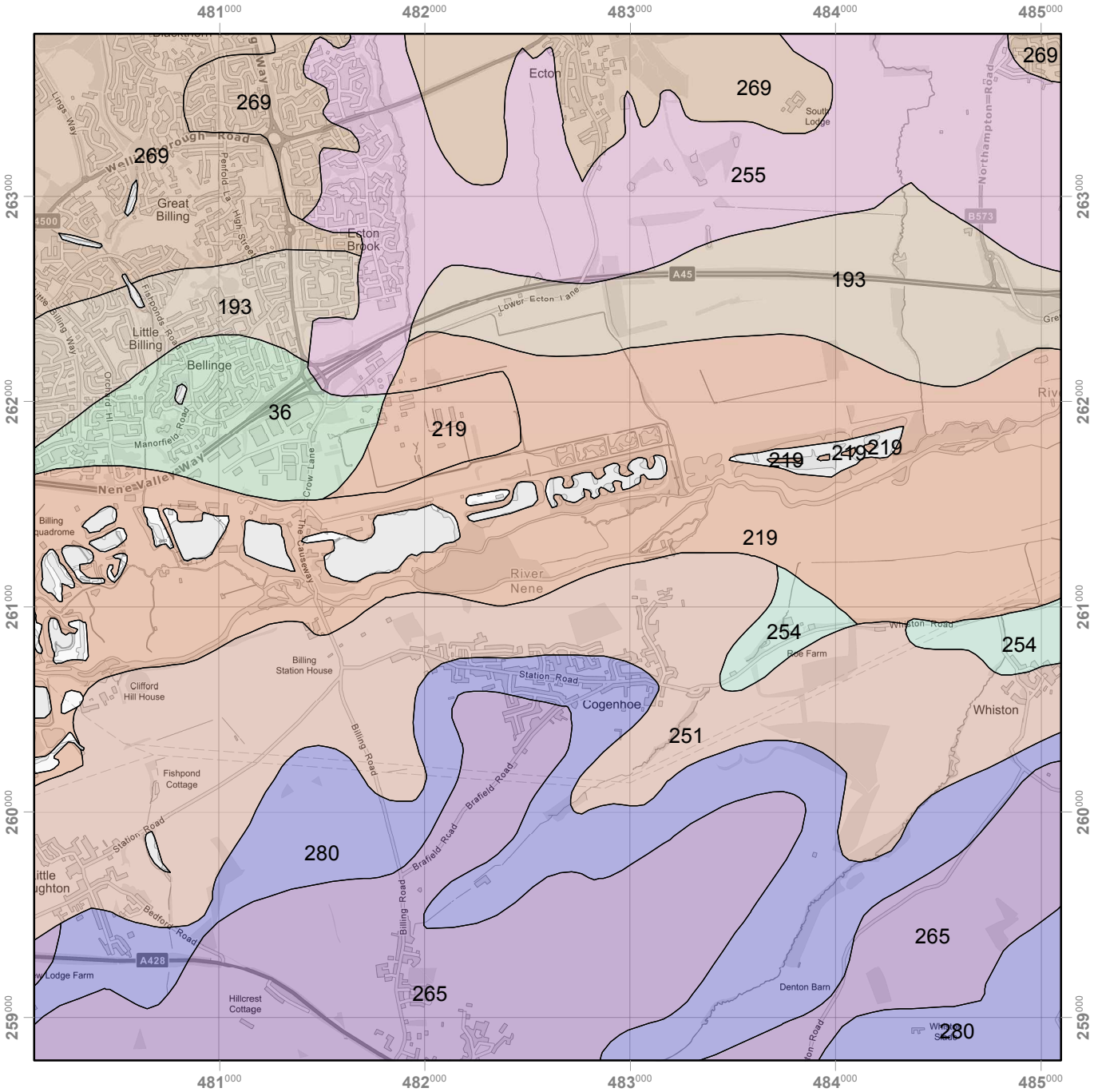

156 River alluvium

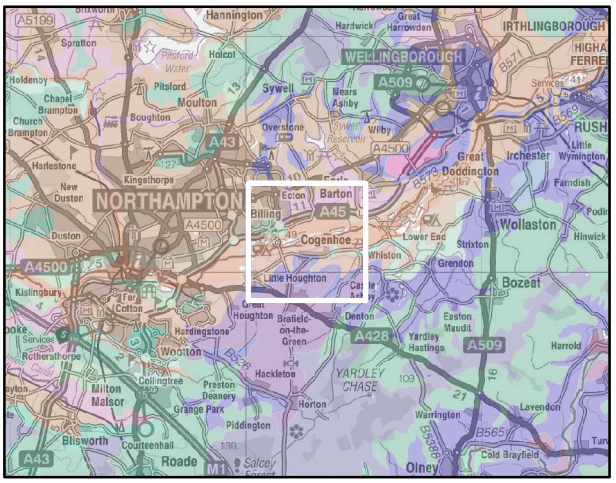

161 River terrace drift

SOIL PARENT MATERIAL DESCRIPTION

Along with the effects of climate, relief, organisms and time, the underlying geology or 'parent material' has a very strong influence on the development of the soils of England and Wales. Through weathering, rocks contribute inorganic mineral grains to the soils and thus exhibit control on the soil texture. During the course of the creation of the national soil map, soil surveyors noted the parent material underlying each soil in England and Wales. It is these general descriptions of the regional geology which is provided in this map.

1l Expected Crops and Land Use





Expected Crops and Land Use Key

36 Cereals and some horticultural crops in drier lowlands; stock rearing and dairying in Cumbria.

193 Short term grassland and cereals; some field vegetables and fruit in drier districts; dairying in Dorset and Somerset.

219 Stock rearing on permanent grassland; cereals where flood risk low.

251 Winter cereals and grassland in the Midlands; cereals in the Eastern Region dairying in the South West.

254 Winter cereals and short term grassland dairying in moist lowlands of the South West.

255 Winter cereals and short term grassland in drier lowlands; dairying on permanent grassland in moist districts.

265 Winter cereals and some short term grassland; some sugar beet in the Eastern Region.

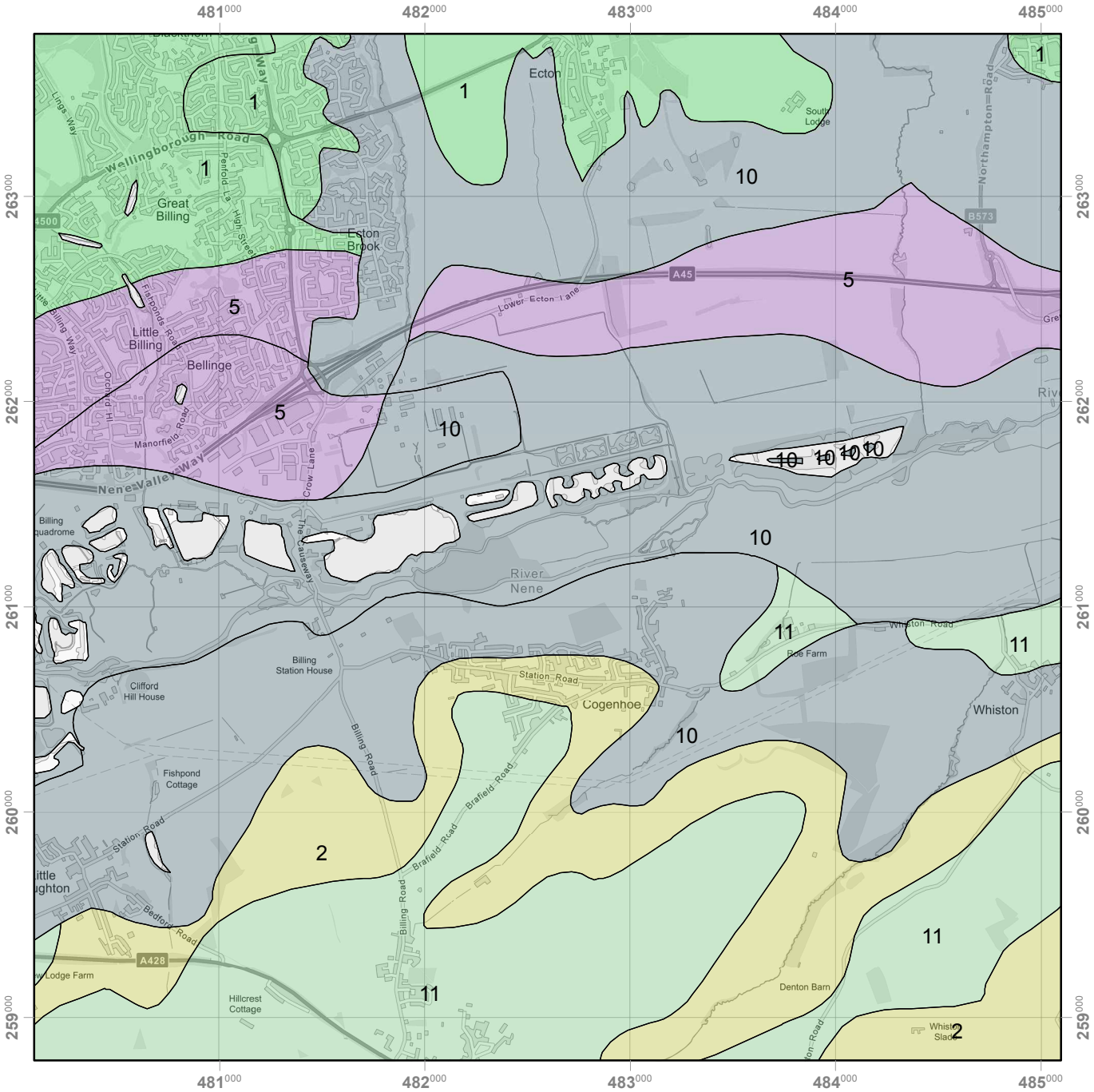
269 Winter cereals with short term grassland, some potatoes; permanent grassland on valley slopes; some sugar beet In Eastern Region.

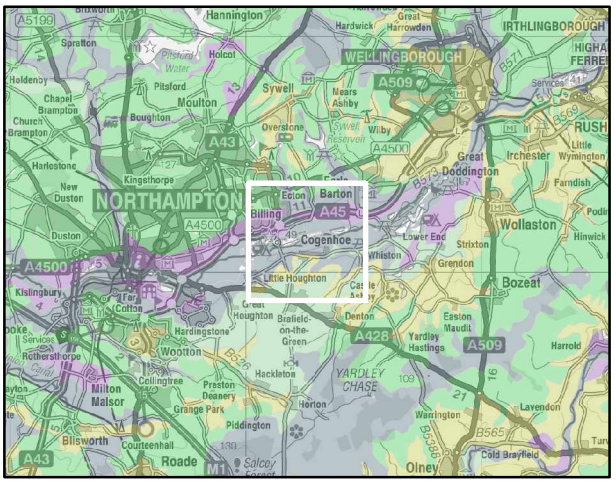
280 Winter cereals; some short term grassland and potatoes.

EXPECTED CROPS AND LAND USE DESCRIPTION

Individual soils are commonly associated with particular forms of land cover and land use. Whilst the soil surveyors were mapping the whole of England and Wales, they took careful note of the range of use to which the land was being put. This map shows the most common forms of land use found on each soil unit.

1m Natural Soil Fertility





Natural Soil Fertility Key


1 High


2 Lime-rich


5 Low

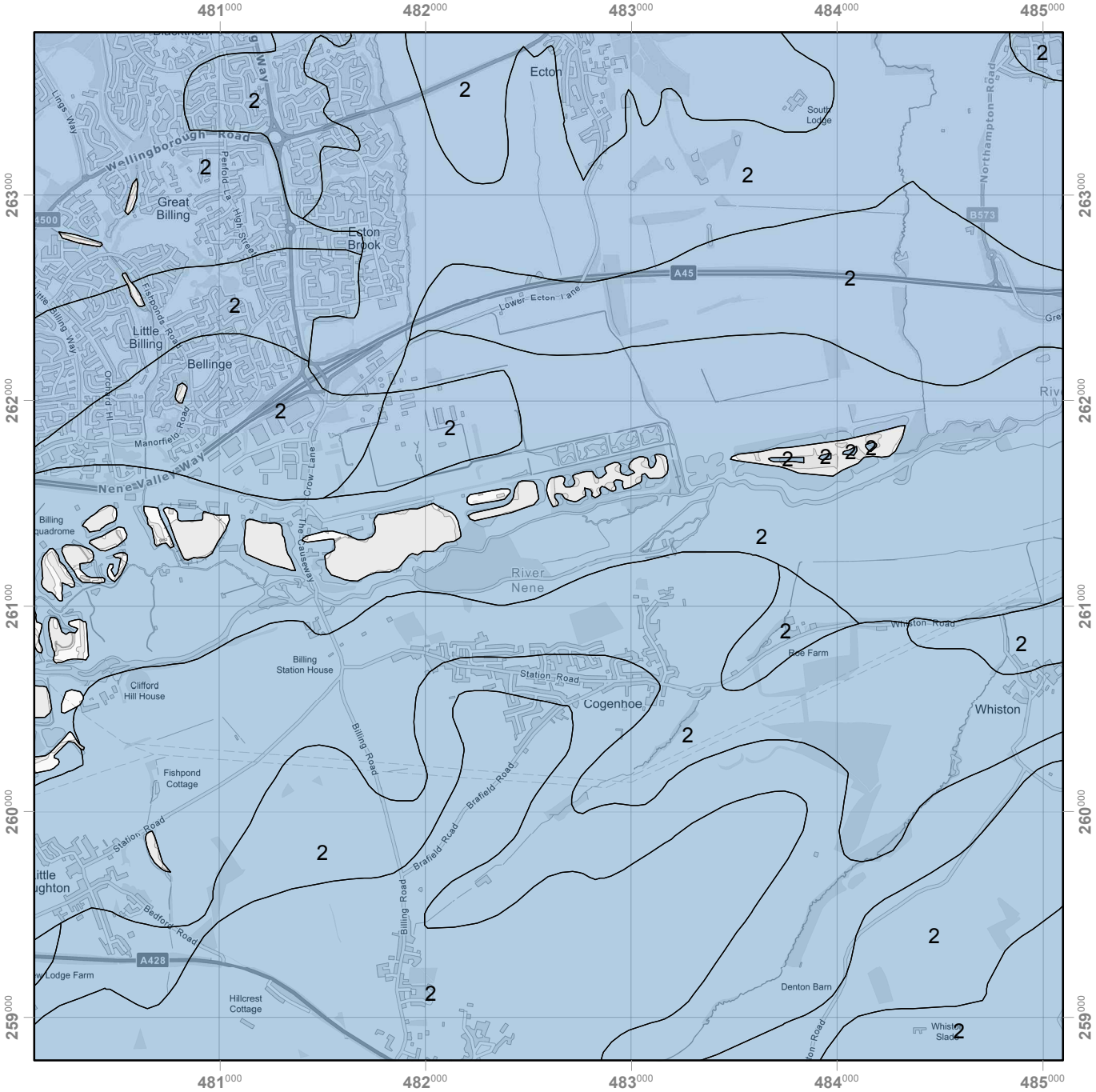

10 Moderate

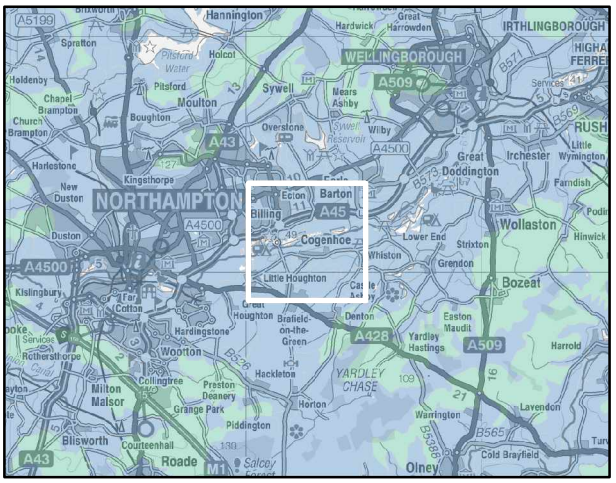

11 Moderate to high

NATURAL SOIL FERTILITY DESCRIPTION

Soil fertility can be greatly altered by land management especially through the application of manures, lime and mineral fertilisers. What is shown in this map, however, is the likely natural fertility of each soil type. Soils that are very acid have low numbers of soil-living organisms and support heathland and acid woodland habitats. These are shown as of very low natural fertility. Soils identified as of low natural fertility are usually acid in reaction and are associated with a wide range of habitat types. The moderate class contains neutral to slightly acid soils, again with a wide range of potential habitats. Soil of high natural fertility are both naturally productive and able to support the base-rich pastures and woodlands that are now rarely encountered. Lime-rich soils contain chalk and limestone in excess, and are associated with downland, herb-rich pastures and chalk and limestone woodlands.

1n Simple Topsoil Texture





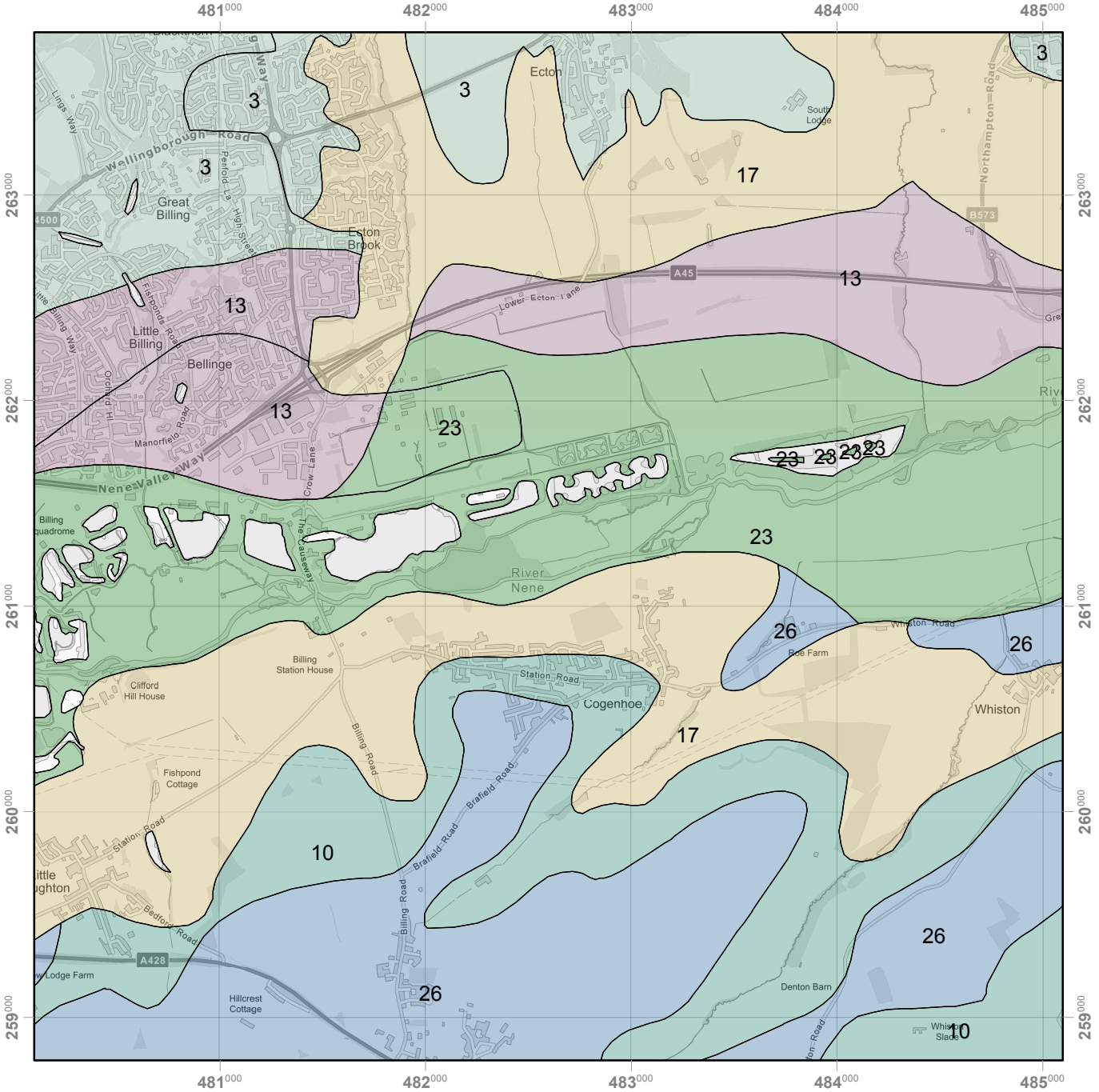
Simple Topsoil Texture Key

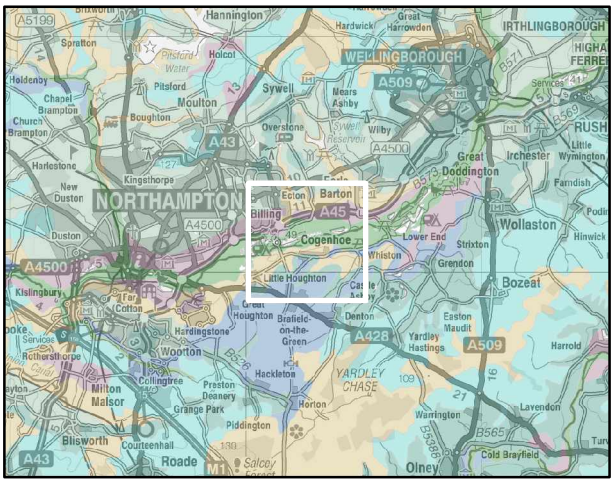
2 Loamy

SIMPLE TOPSOIL TEXTURE DESCRIPTION

Soil texture is a term used in soil science to describe the physical composition of the soil in terms of the size of mineral particles in the soil. Specifically, we are concerned with the relative proportions of sand, silt and clay. Soil texture can vary between each soil layer or horizon as one moves down the profile. This map indicates the soil texture group of the upper 30 cm of the soil. `Light? soils have more sand grains and are described as sandy, while `heavy? soils have few sand grains but a lot of extremely small particles and are described as clayey. Loamy soils have a mix of sand, silt and clay-sized particles and are intermediate in character. Soils with a surface layer that is dominantly organic are described as Peaty. A good understanding of soil texture can enable better land management.

1o Typical habitats





Typical habitats Key

- 3 Base-rich pastures and deciduous woodlands
- 10 Herb-rich chalk and limestone pastures; lime-rich deciduous woodlands
- 13 Neutral and acid pastures and deciduous woodlands; acid communities such as bracken and gorse in the uplands
- 17 Seasonally wet pastures and woodlands
- 23 Wet flood meadows with wet carr woodlands in old river meanders
- 26 Wide range of pasture and woodland types

TYPICAL HABITATS DESCRIPTION

There is a close relationship between vegetation and the underlying soil. Information about the types of broad habitat associated with each soil type is provided in this map. Soil fertility, pH, drainage and texture are important factors in determining the types of habitats which can be established. Elevation above sea level and sometimes even the aspect, the orientation of a hillslope, can affect the species present. This map does not take into account the recent land management, but provides the likely natural habitats assuming good management has been carried out.

2. Soil Association Descriptions

The following pages describe the following soil map units, (soil associations), in more detail.

Moreton 511b
Well drained calcareous clayey and fine loamy soils over limestone, in places shallow and brashy.

WICK 1 541r
Deep well drained coarse loamy and sandy soils locally over gravel.

BANBURY 544
Well drained brashy fine and coarse loamy ferruginous soils over ironstone.

OXPASTURE 572h
Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.

ASHLEY 572q
Fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging associated with similar but wetter soils.

WATERSTOCK 573a
Deep permeable mainly fine loamy soils variably affected by groundwater.

WICKHAM 2 711f
Slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils.

DENCHWORTH 712b
Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

FLADBURY 1 813b
Stoneless clayey soils, in places calcareous variably affected by groundwater.

The soil associations are described in terms of their texture and drainage properties and potential risks may be identified. The distribution of the soils across England and Wales are provided. Further to this, properties of each association's component soil series are described in relation to each other. Lastly, schematic diagrams of each component series are provided for greater understanding and in-field verification purposes.

Moreton (511b)

Well drained calcareous clayey and fine loamy soils over limestone, in places shallow and brashy.

a. General Description

Well drained calcareous clayey and fine loamy soils over limestone, in places shallow and brashy.Some deeper slowly permeable calcareous clayey soils. The major landuse on this association is defined as Winter cereals; some short term grassland and potatoes.

b. Distribution (England and Wales)

The Moreton association covers 276 km² of England and Wales which accounts for 0.18% of the landmass. The distribution of this association is shown in figure 2. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

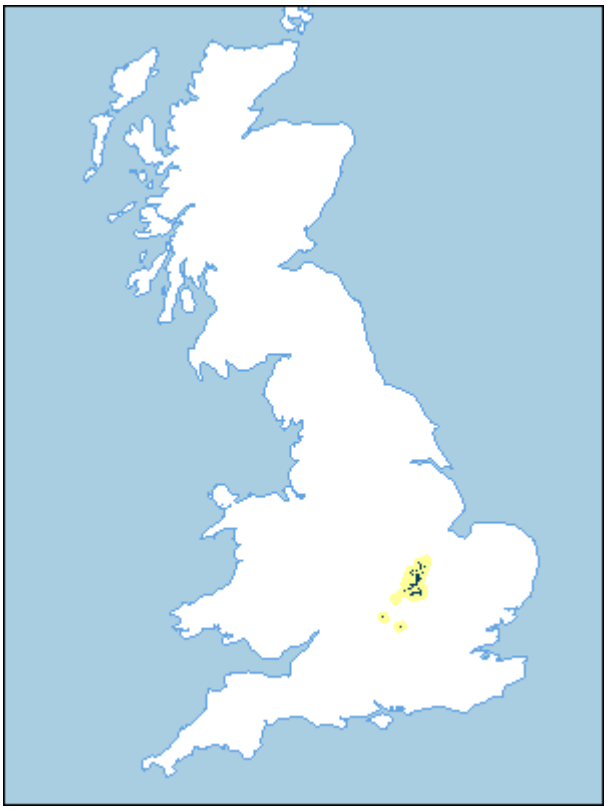


Figure 2: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the Moreton association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 1.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

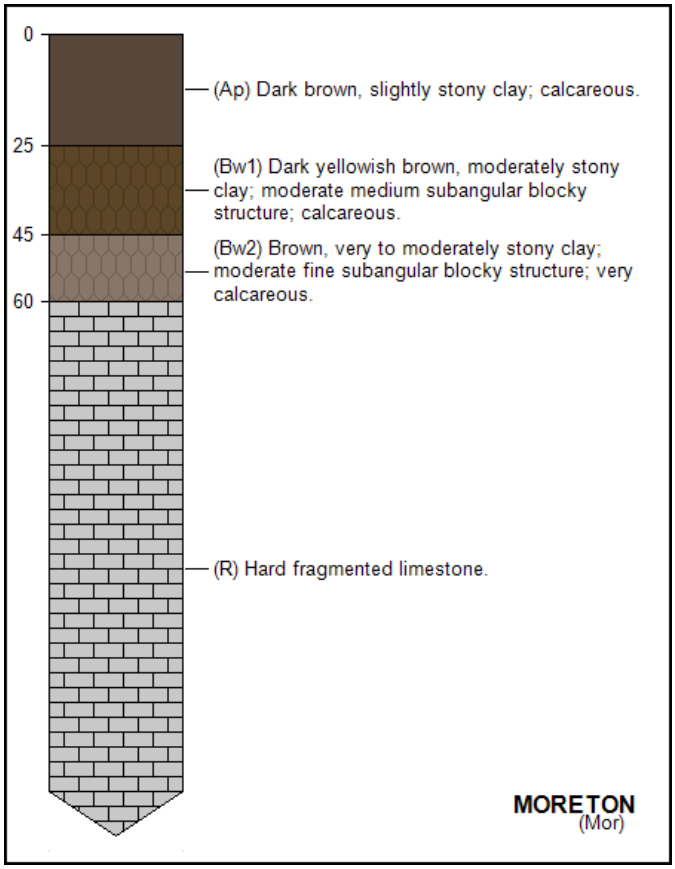
Table 1: The component soil series of the Moreton soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

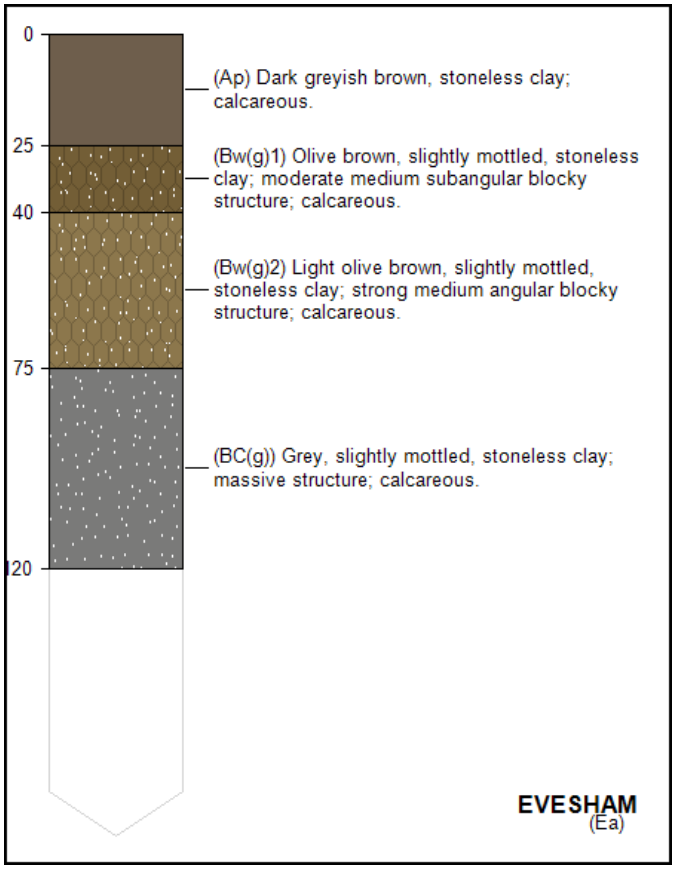
Soil Series	Description	Area %
MORETON (Mor)	clayey material over lithoskeletal limestone	32%
EVESHAM (Ea)	swelling clayey material passing to clay or soft mudstone	22%
ABERFORD (aF)	medium loamy material over lithoskeletal limestone	10%
ELMTON (eT)	medium loamy lithoskeletal limestone	10%
HASELOR (Hb)	swelling clayey material passing to clay with interbedded limestone	10%
SHERBORNE (Si)	clayey lithoskeletal limestone	10%
OTHER	other minor soils	6%

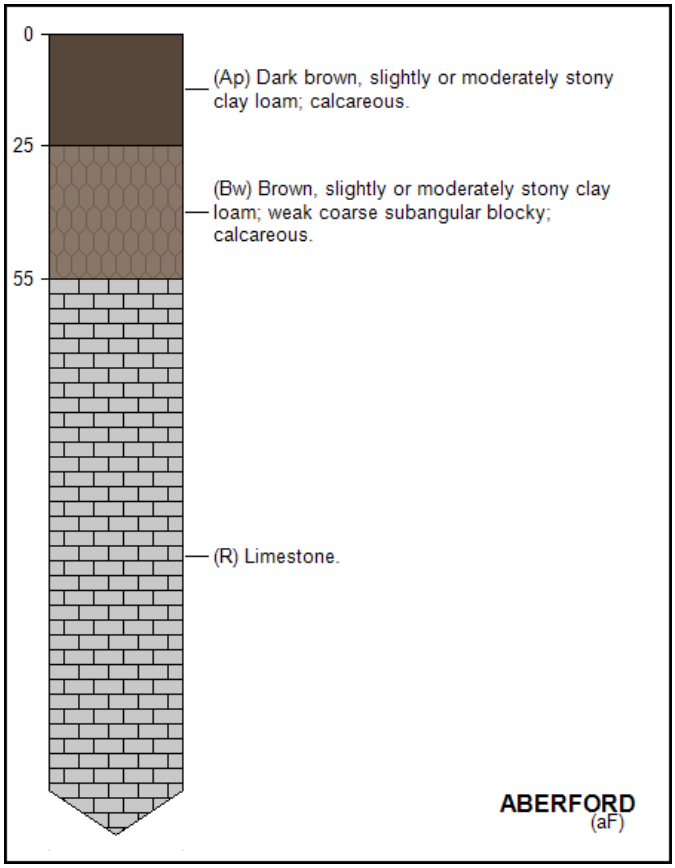
Moreton (511b)

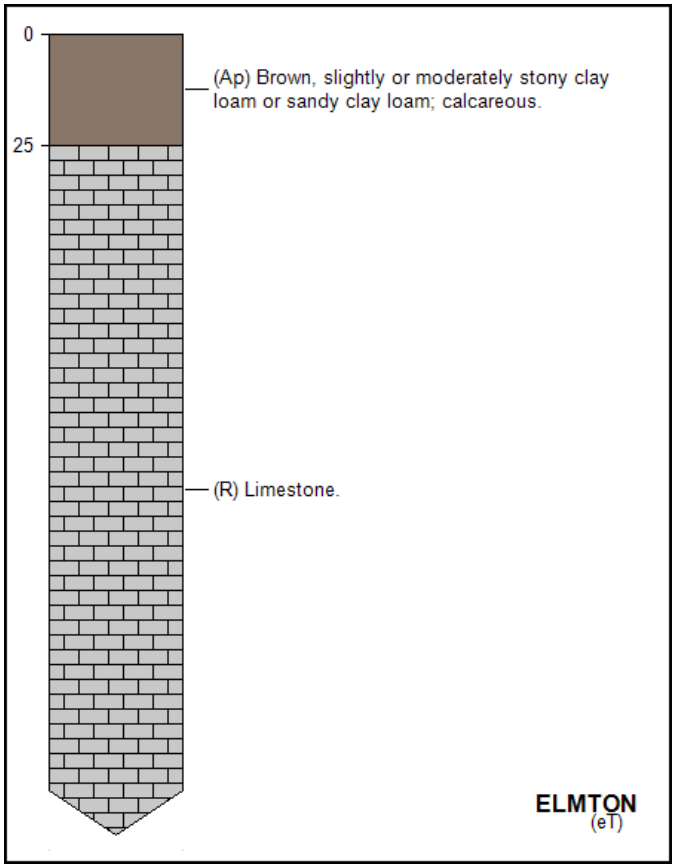
Well drained calcareous clayey and fine loamy soils over limestone, in places shallow and brashy.

d. Moreton Component Series Profiles





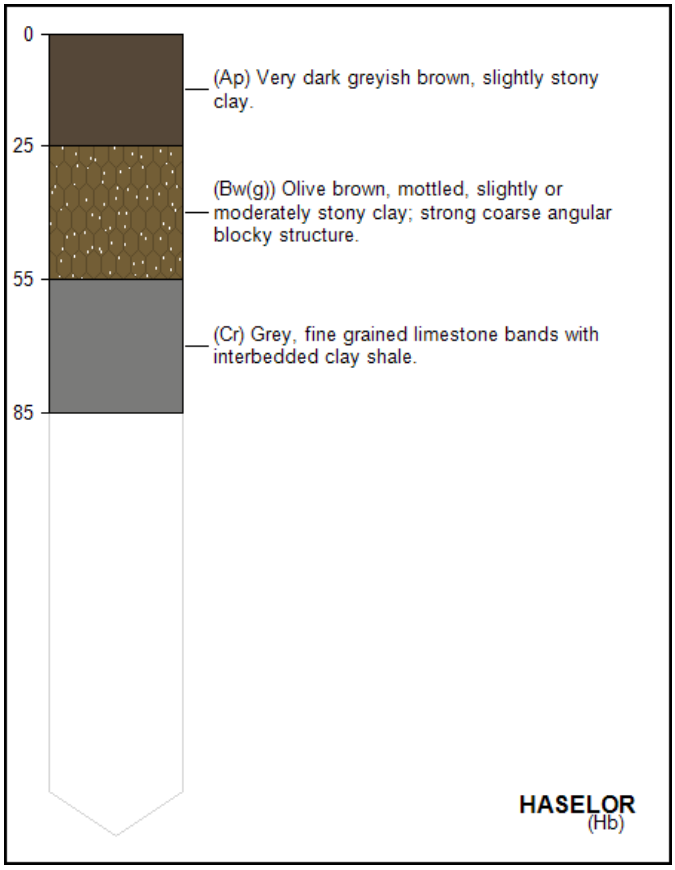


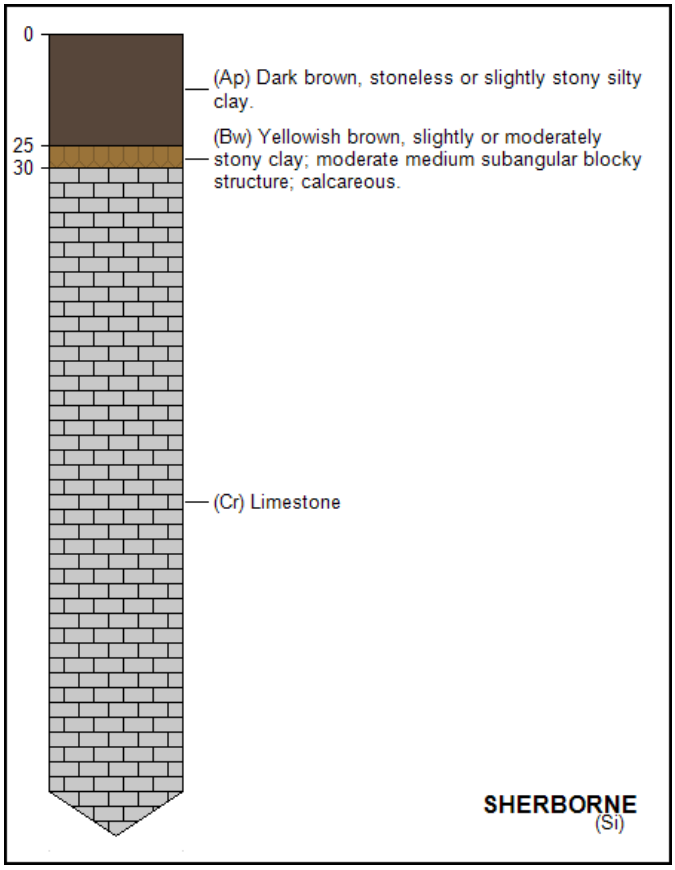


Moreton (511b)

Well drained calcareous clayey and fine loamy soils over limestone, in places shallow and brashy.

d. Moreton Component Series Profiles continued





WICK 1 (541r)

Deep well drained coarse loamy and sandy soils locally over gravel.

a. General Description

Deep well drained coarse loamy and sandy soils locally over gravel.Some similar soils affected by groundwater.
The major landuse on this association is defined as Cereals and some horticultural crops in drier lowlands; stock rearing and dairying in Cumbria.

b. Distribution (England and Wales)

The WICK 1 association covers 2531 km² of England and Wales which accounts for 1.67% of the landmass. The distribution of this association is shown in figure 3. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

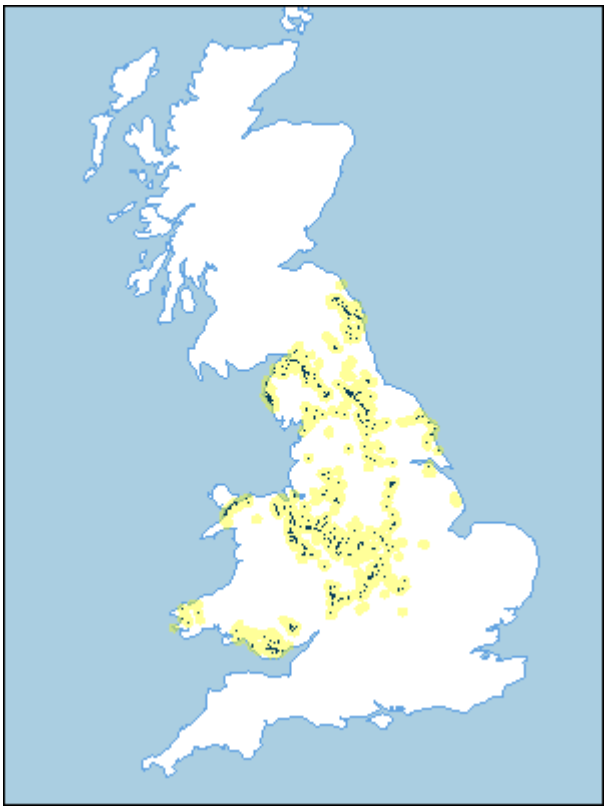


Figure 3: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the WICK 1 association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 2.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

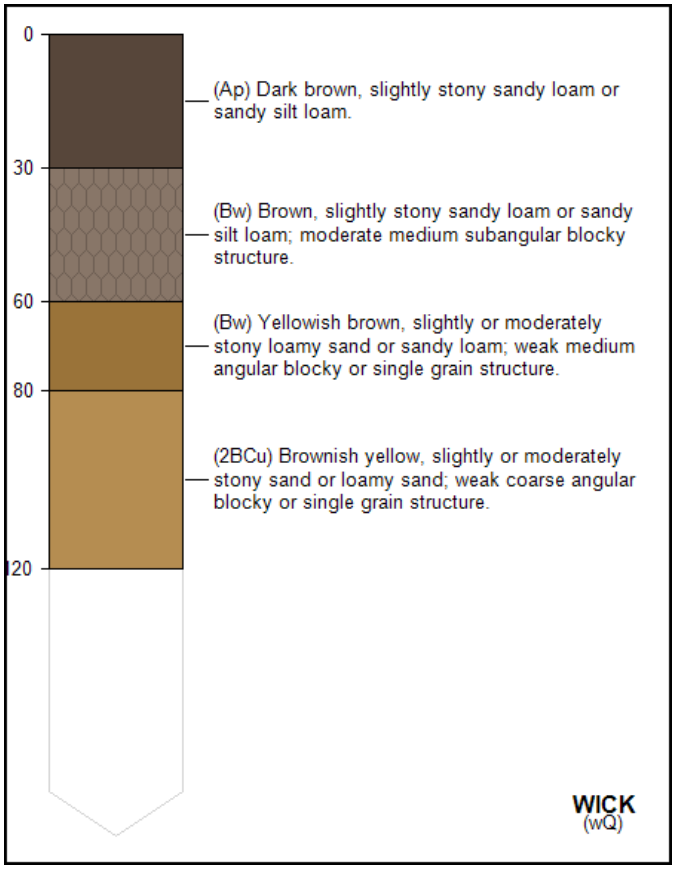
Table 2: The component soil series of the WICK 1 soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

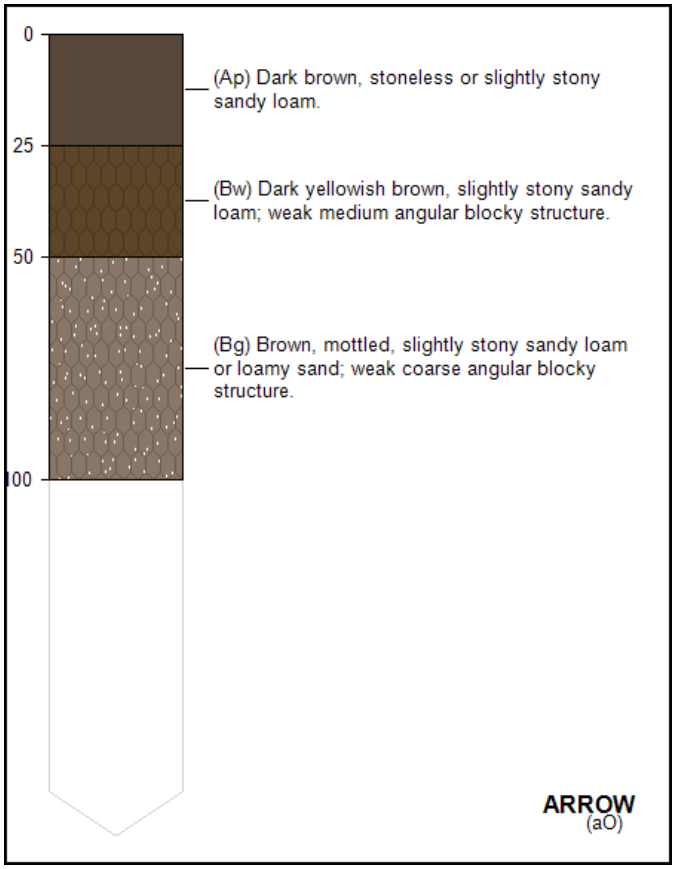
Soil Series	Description	Area %
WICK (wQ)	light loamy drift with siliceous stones	45%
ARROW (aO)	light loamy drift with siliceous stones	20%
NEWPORT (Na)	sandy drift with siliceous stones	15%
OTHER	other minor soils	20%

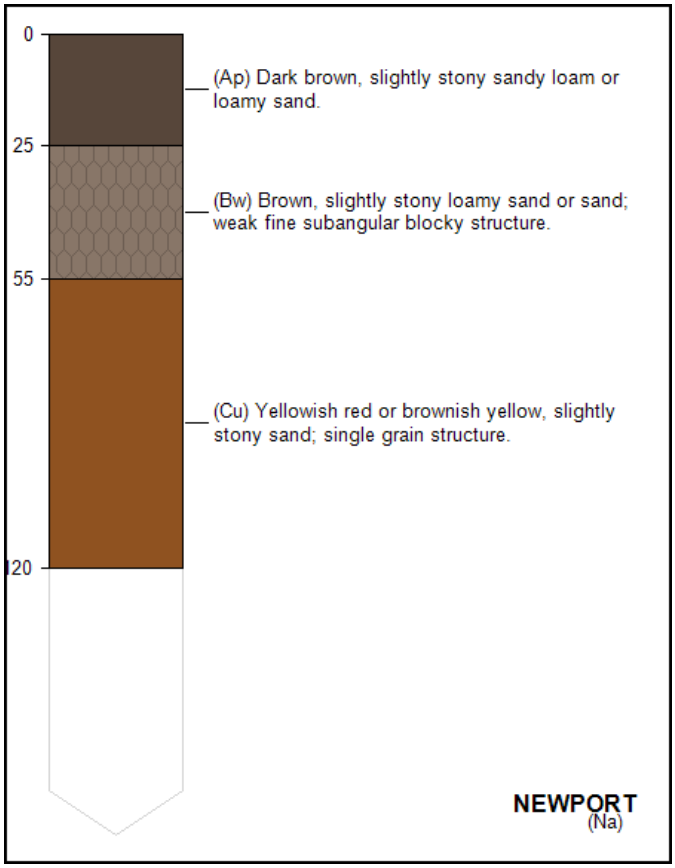
WICK 1 (541r)

Deep well drained coarse loamy and sandy soils locally over gravel.

d. WICK 1 Component Series Profiles







BANBURY (544)

Well drained brashy fine and coarse loamy ferruginous soils over ironstone.

a. General Description

Well drained brashy fine and coarse loamy ferruginous soils over ironstone.Some deep fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.
The major landuse on this association is defined as Winter cereals with short term grassland, some potatoes; permanent grassland on valley slopes; some sugar beet In Eastern Region.

b. Distribution (England and Wales)

The BANBURY association covers 712 km² of England and Wales which accounts for 0.47% of the landmass. The distribution of this association is shown in figure 4. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

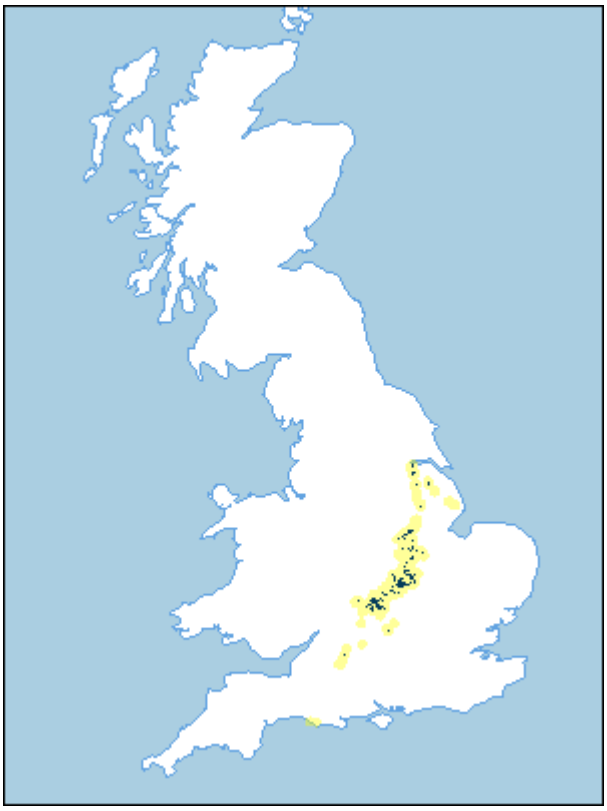


Figure 4: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the BANBURY association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 3.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

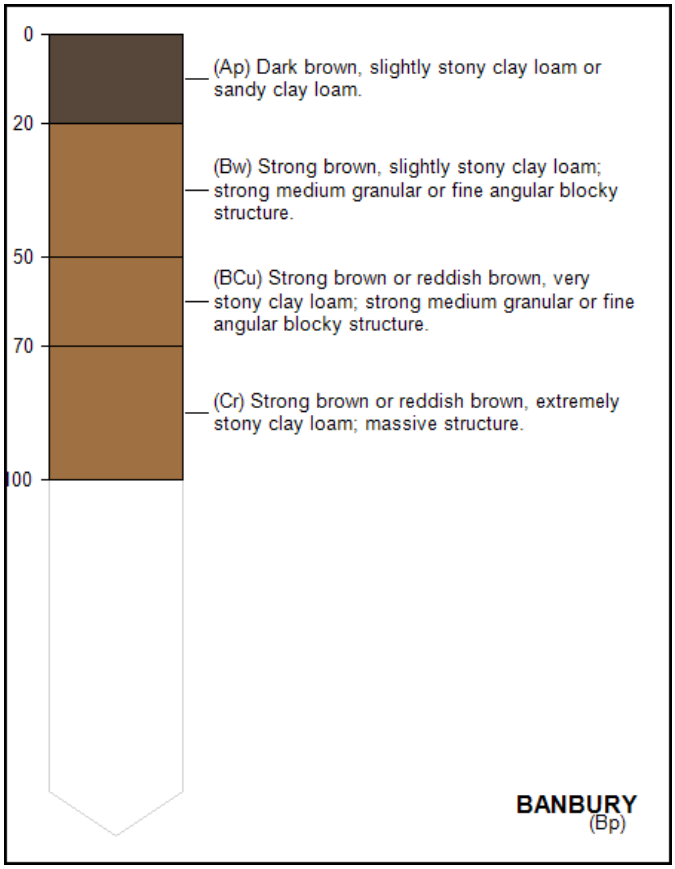
Table 3: The component soil series of the BANBURY soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

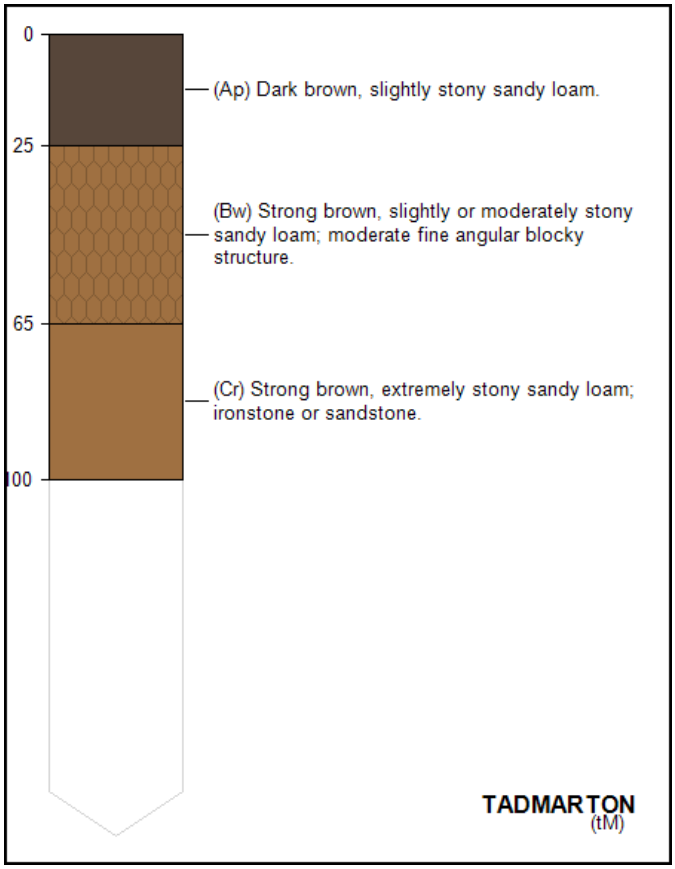
Soil Series	Description	Area %
BANBURY (Bp)	ferruginous medium loamy material over lithoskeletal ironstone	50%
TADMARTON (tM)	ferruginous light loamy material over lithoskeletal ironstone	25%
IRONDOWN (Ir)	ferruginous medium loamy or medium silty drift over clayey material passing to clay or soft mudstone	15%
OTHER	other minor soils	10%

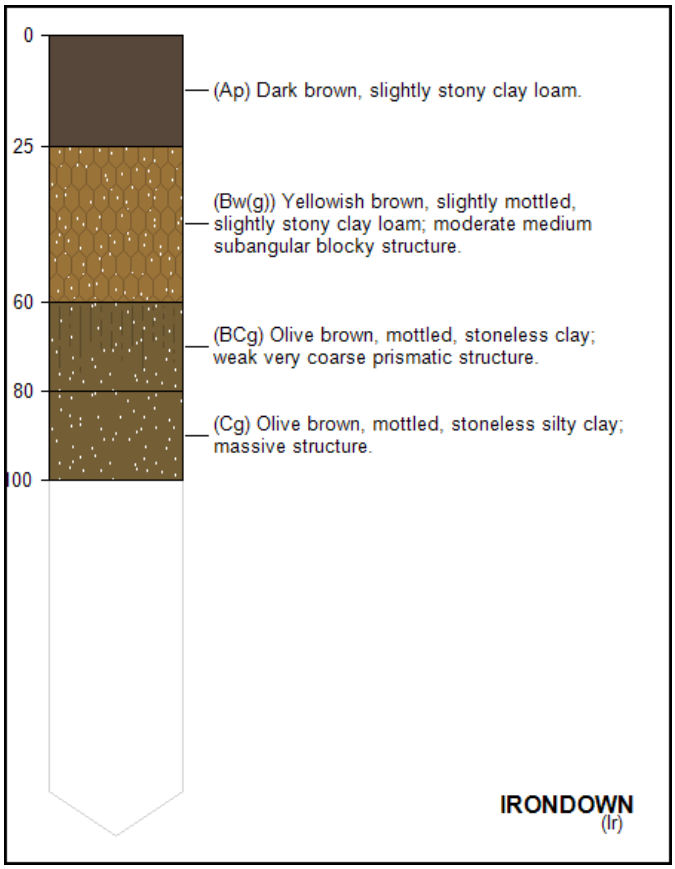
BANBURY (544)

Well drained brashy fine and coarse loamy ferruginous soils over ironstone.

d. BANBURY Component Series Profiles







OXPASTURE (572h)

Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.

a. General Description

Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.Some slowly permeable seasonally waterlogged clayey soils.
The major landuse on this association is defined as Winter cereals and short term grassland dairying in moist lowlands of the South West.

b. Distribution (England and Wales)

The OXPASTURE association covers 491 km² of England and Wales which accounts for 0.32% of the landmass. The distribution of this association is shown in figure 5. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

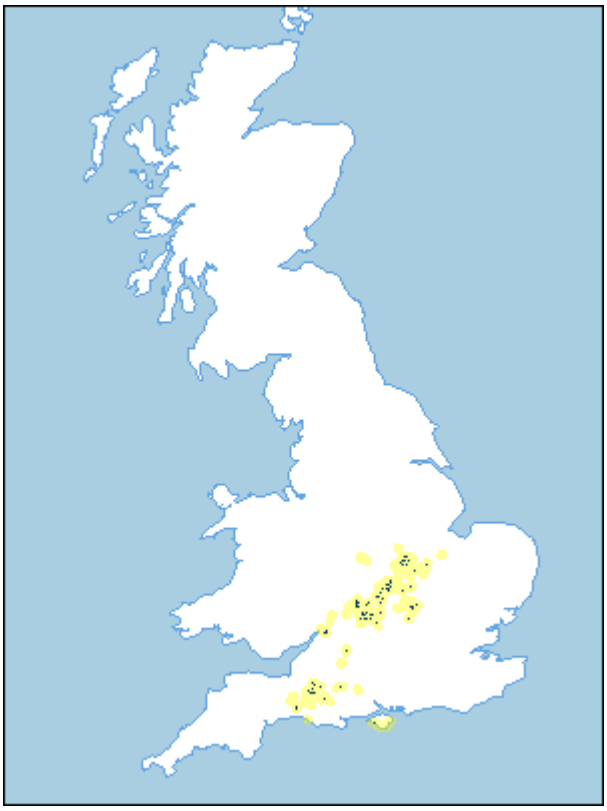


Figure 5: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the OXPASTURE association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 4.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

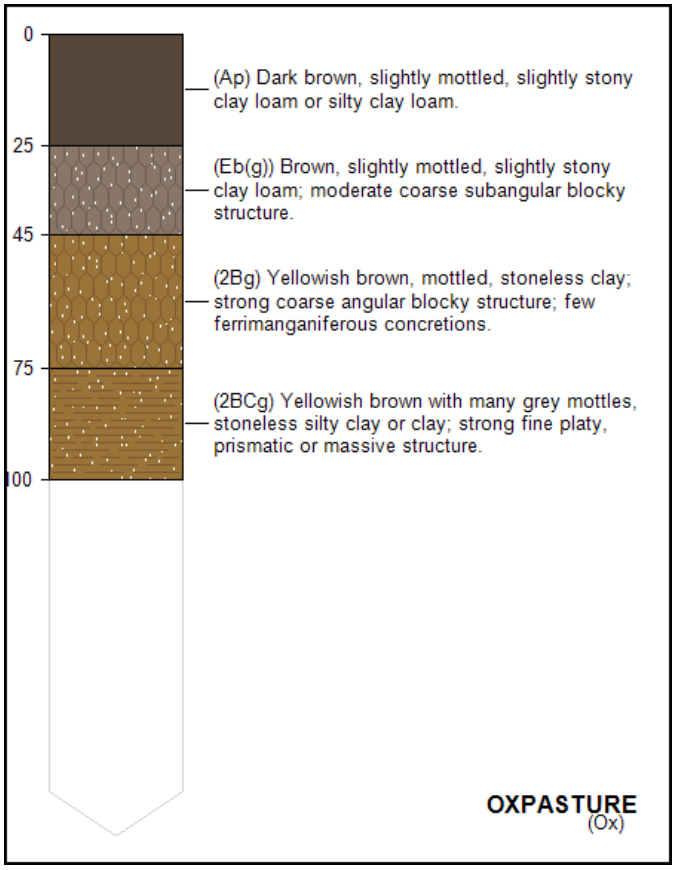
Table 4: The component soil series of the OXPASTURE soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

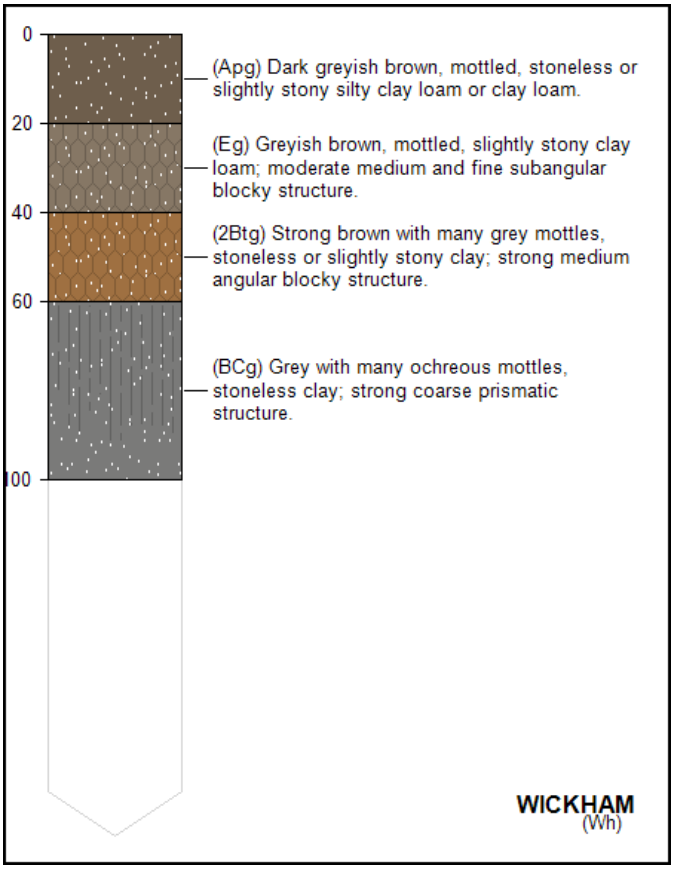
Soil Series	Description	Area %
OXPASTURE (Ox)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone	42%
WICKHAM (Wh)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone	18%
DENCHWORTH (Da)	swelling clayey material passing to clay or soft mudstone	10%
HOLDENBY (HM)	clayey drift material passing to clay or soft mudstone	10%
OTHER	other minor soils	20%

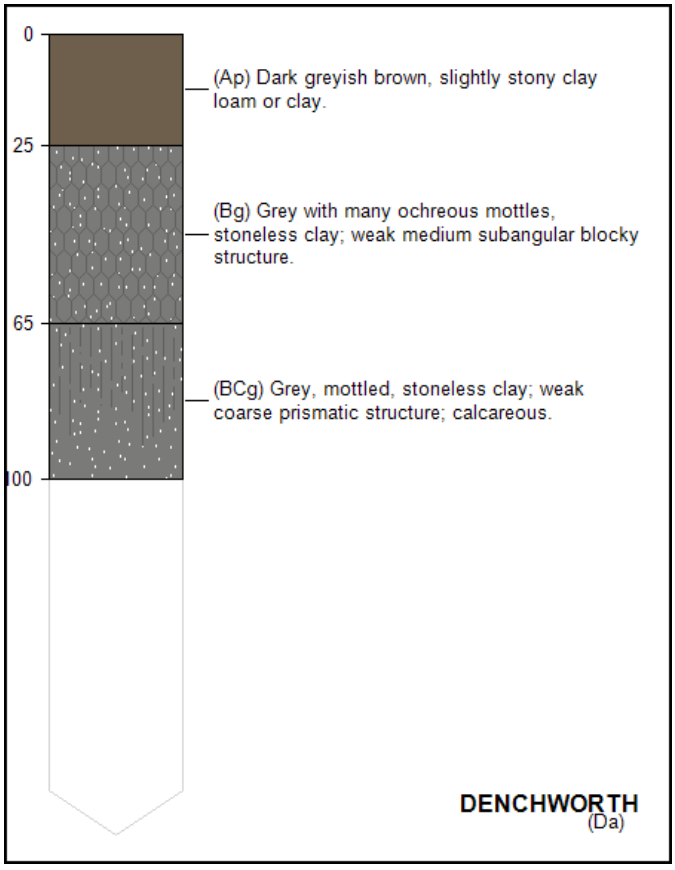
OXPASTURE (572h)

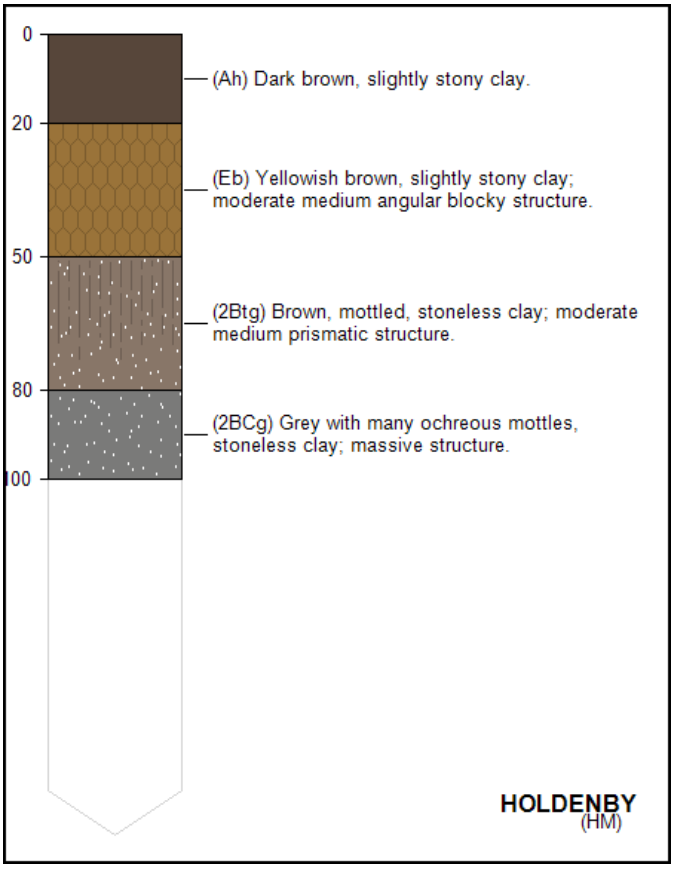
Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.

d. OXPASTURE Component Series Profiles









ASHLEY (572q)

Fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging associated with similar but wetter soils.

a. General Description

Fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging associated with similar but wetter soils.Some calcareous and non-calcareous slowly permeable clayey soils.
The major landuse on this association is defined as Winter cereals and some short term grassland; some sugar beet in the Eastern Region.

b. Distribution (England and Wales)

The ASHLEY association covers 471 km² of England and Wales which accounts for 0.31% of the landmass. The distribution of this association is shown in figure 6. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

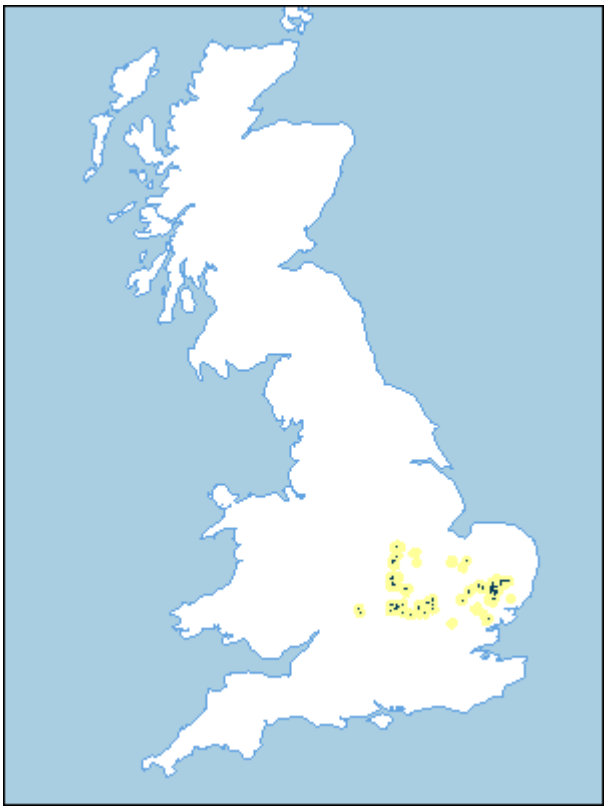


Figure 6: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the ASHLEY association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 5.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

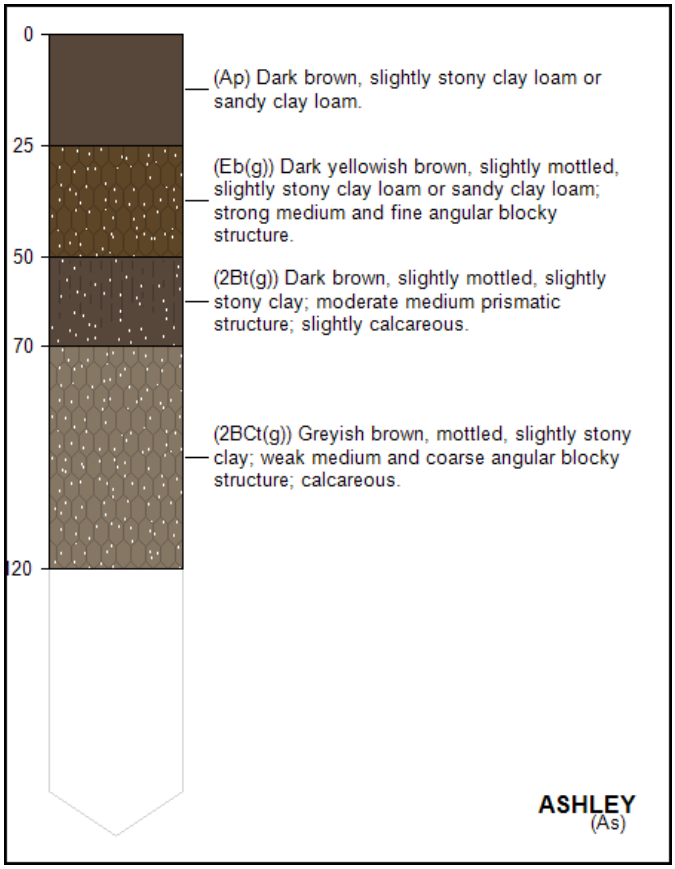
Table 5: The component soil series of the ASHLEY soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

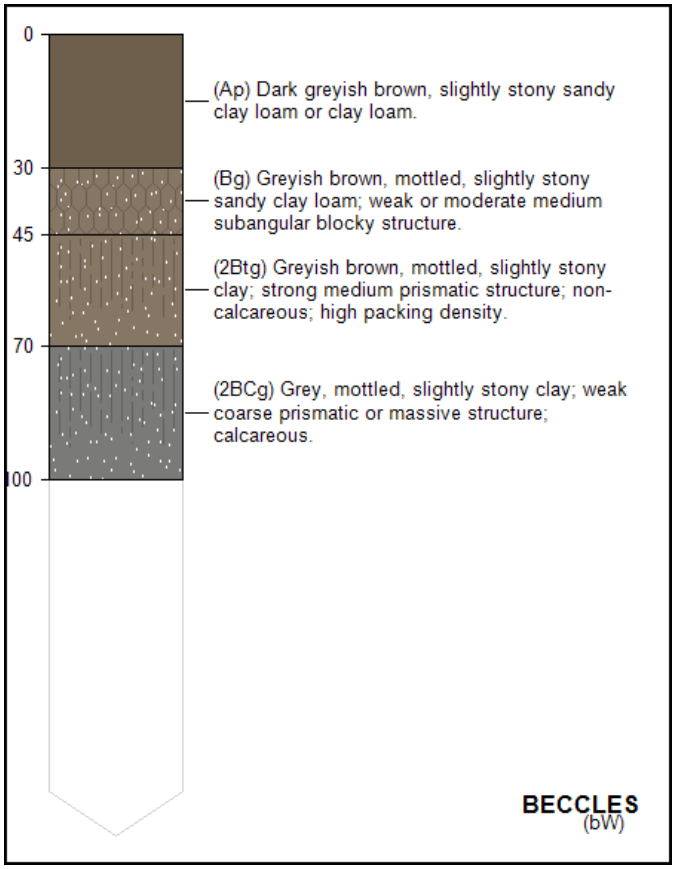
Soil Series	Description	Area %
ASHLEY (As)	medium loamy over clayey chalky drift	55%
BECCLES (bW)	medium loamy over clayey chalky drift	10%
FAULKBOURNE (fK)	clayey chalky drift	10%
HANSLOPE (Hn)	clayey chalky drift	10%
OTHER	other minor soils	15%

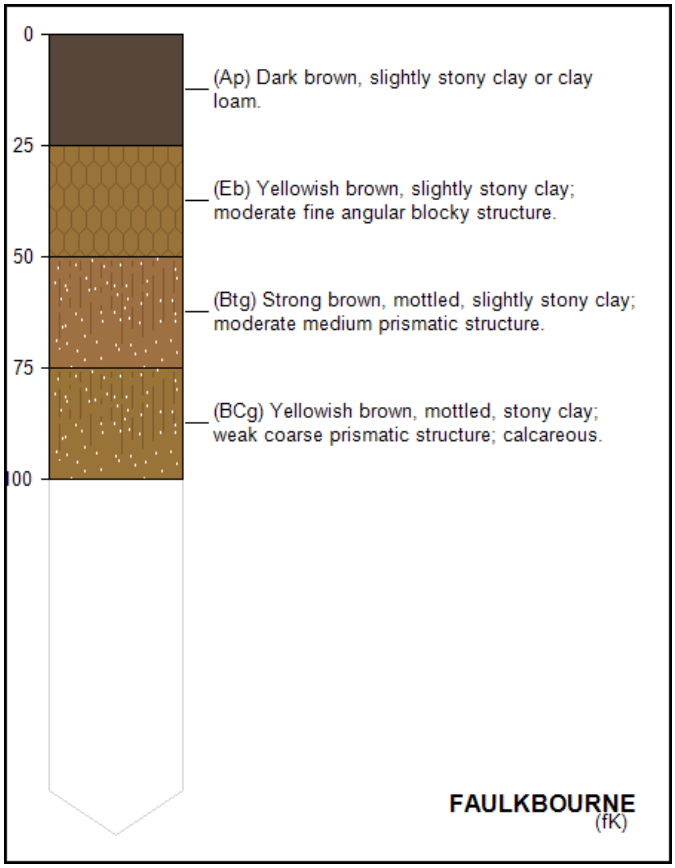
ASHLEY (572q)

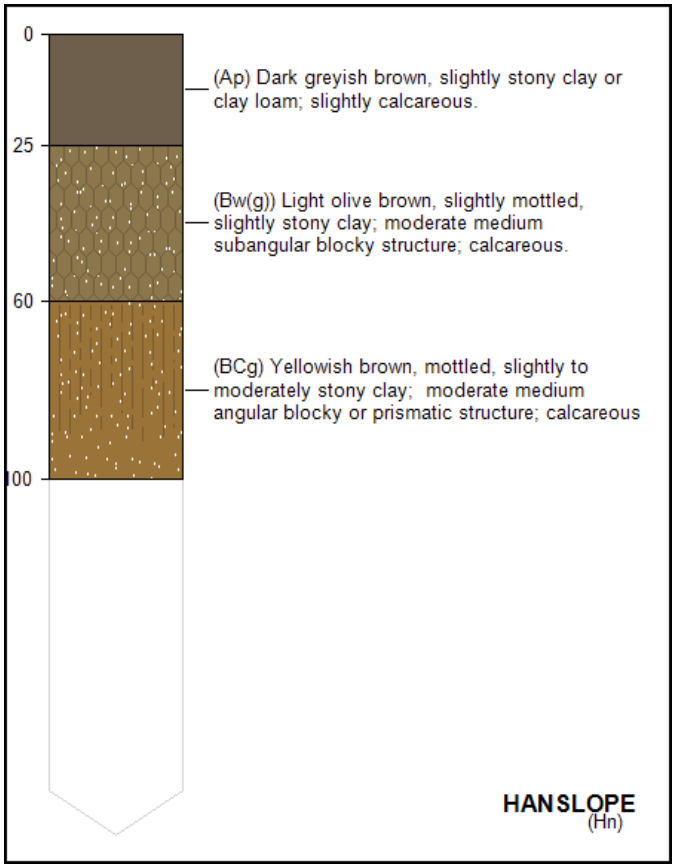
Fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging associated with similar but wetter soils.

d. ASHLEY Component Series Profiles









WATERSTOCK (573a)

Deep permeable mainly fine loamy soils variably affected by groundwater.

a. General Description

Deep permeable mainly fine loamy soils variably affected by groundwater.Some deep well drained fine and coarse loamy soils.
The major landuse on this association is defined as Short term grassland and cereals; some field vegetables and fruit in drier districts; dairying in Dorset and Somerset.

b. Distribution (England and Wales)

The WATERSTOCK association covers 248 km² of England and Wales which accounts for 0.16% of the landmass. The distribution of this association is shown in figure 7. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

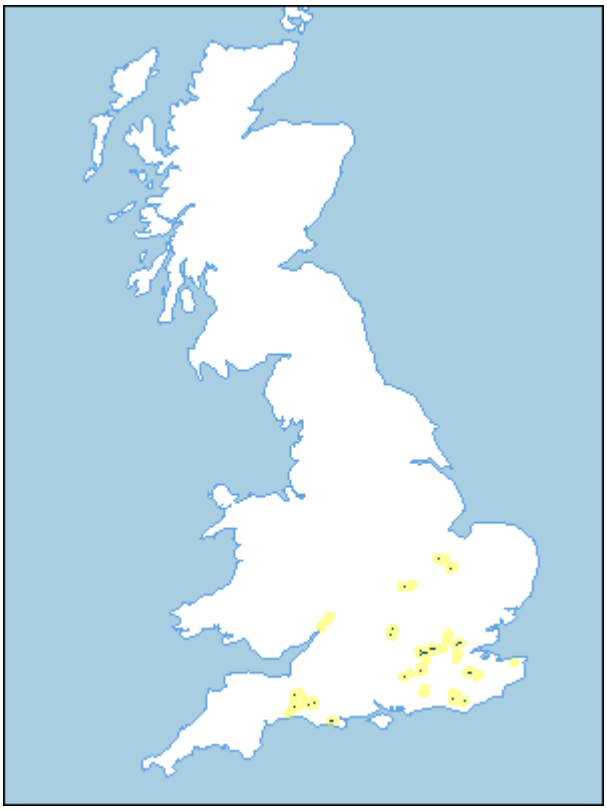


Figure 7: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the WATERSTOCK association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 6.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

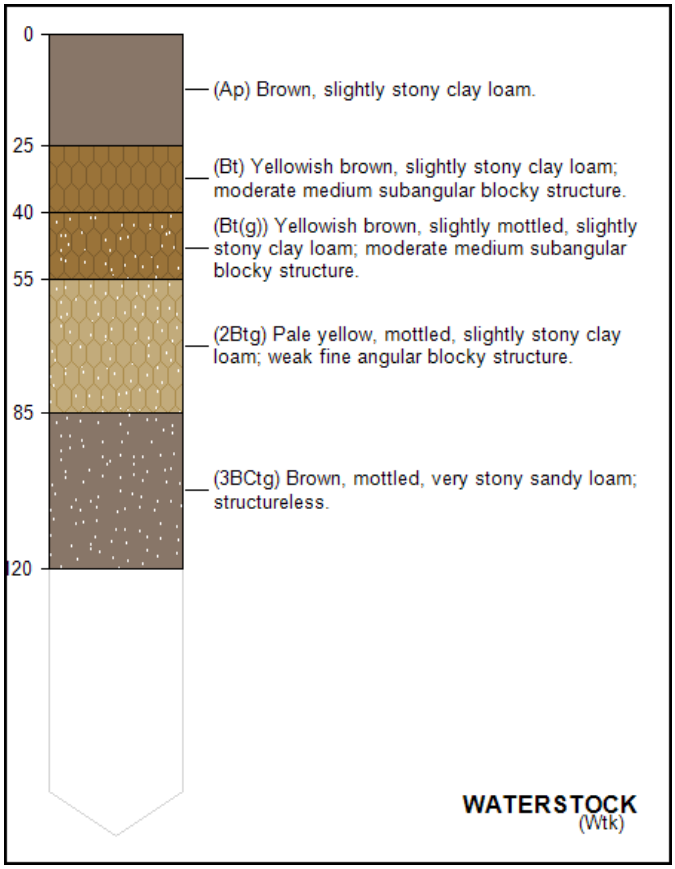
Table 6: The component soil series of the WATERSTOCK soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

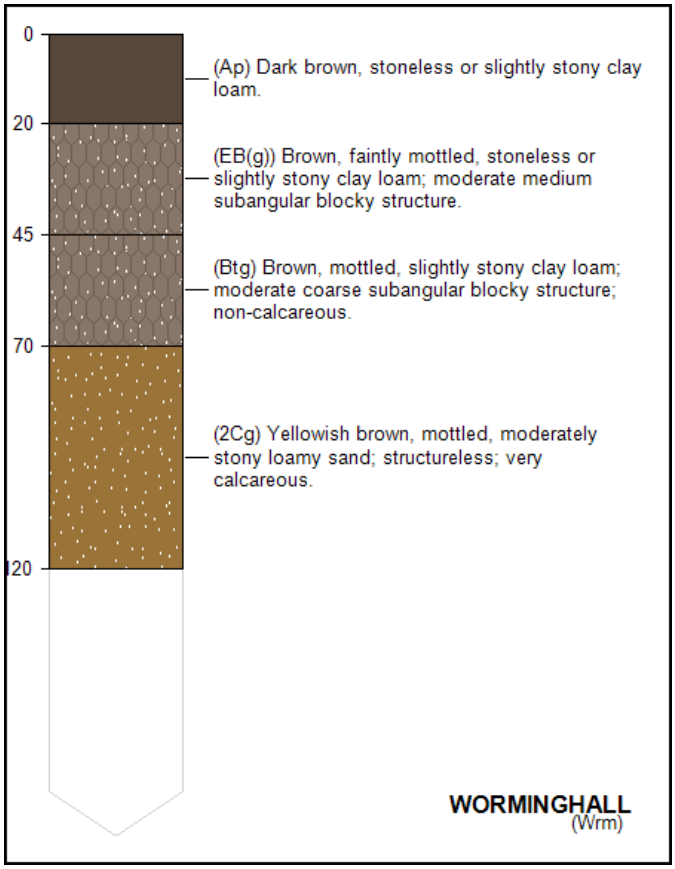
Soil Series	Description	Area %
WATERSTOCK (Wtk)	medium loamy drift with siliceous stones	30%
WORMINGHALL (Wrm)	medium loamy over sandy drift with siliceous stones	20%
LUDFORD (LF)	medium loamy drift with siliceous stones	15%
MAPLESTEAD (MM)	light loamy drift with siliceous stones	10%
SHABBINGTON (Shb)	medium loamy drift with siliceous stones	10%
OTHER	other minor soils	15%

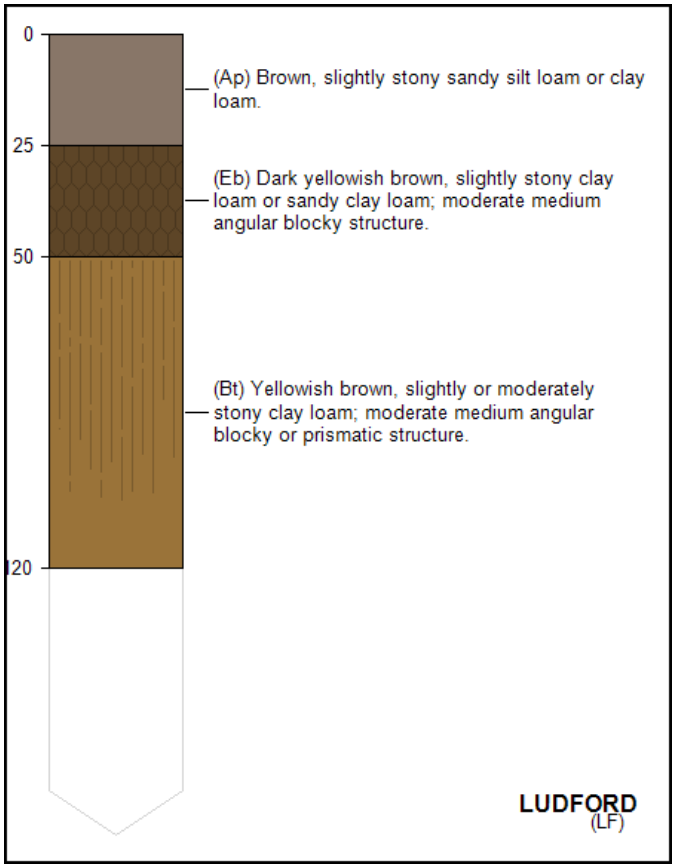
WATERSTOCK (573a)

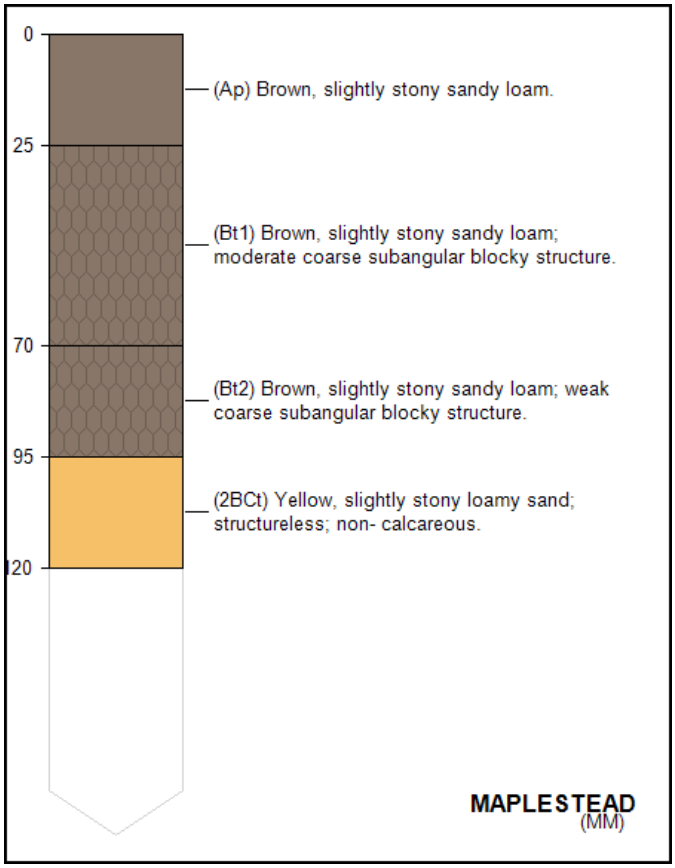
Deep permeable mainly fine loamy soils variably affected by groundwater.

d. WATERSTOCK Component Series Profiles





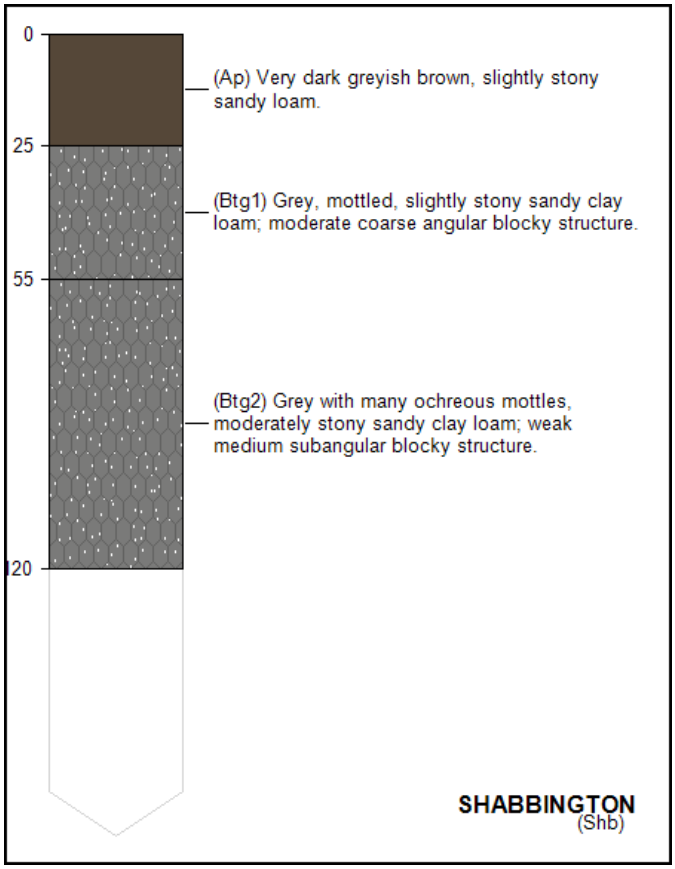




WATERSTOCK (573a)

Deep permeable mainly fine loamy soils variably affected by groundwater.

d. WATERSTOCK Component Series Profiles continued



WICKHAM 2 (711f)

Slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils.

a. General Description

Slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils.Small areas of slowly permeable calcareous soils on steeper slopes.
The major landuse on this association is defined as Winter cereals and grassland in the Midlands; cereals in the Eastern Region dairying in the South West.

b. Distribution (England and Wales)

The WICKHAM 2 association covers 1485 km² of England and Wales which accounts for 0.98% of the landmass. The distribution of this association is shown in figure 8. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

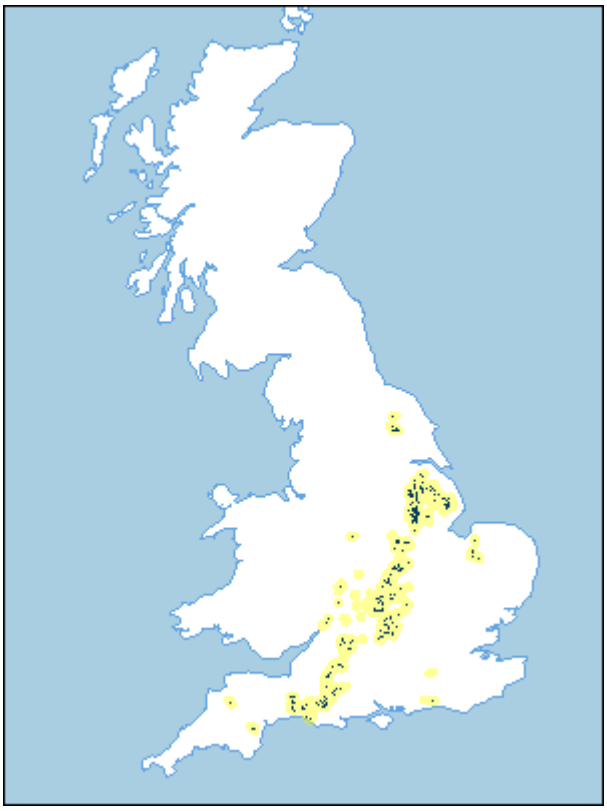


Figure 8: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the WICKHAM 2 association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 7.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

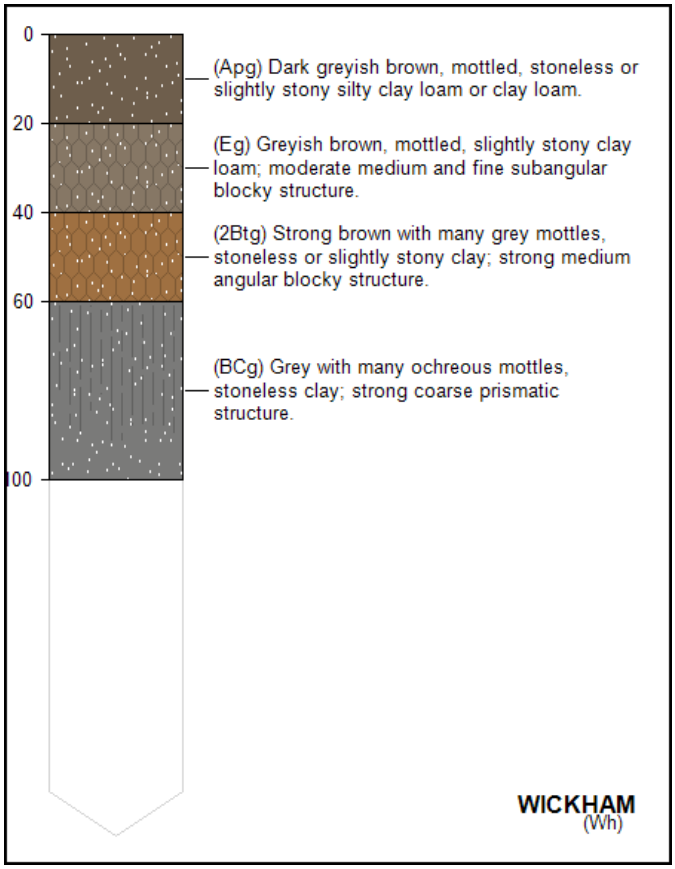
Table 7: The component soil series of the WICKHAM 2 soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

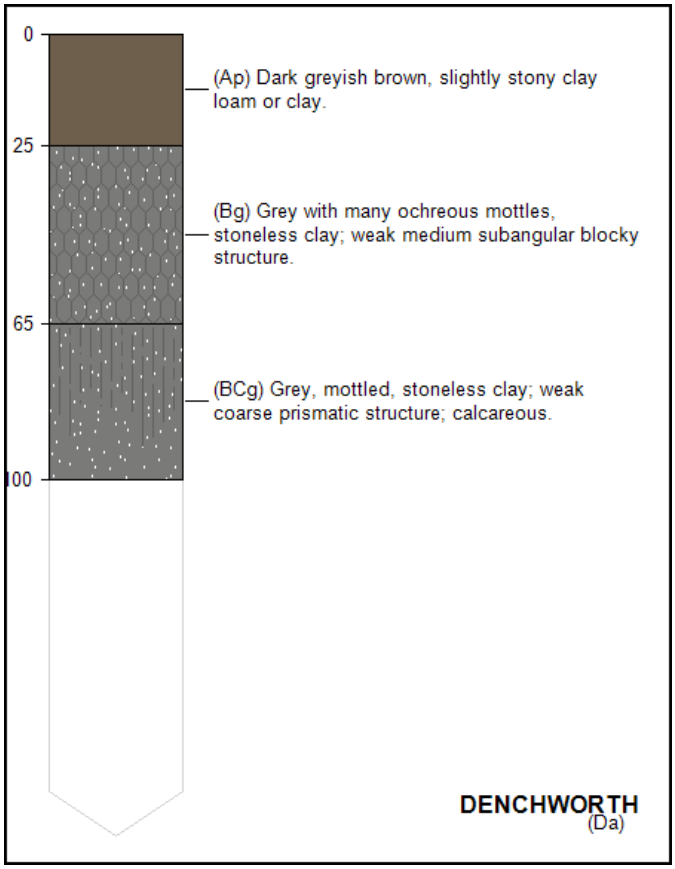
Soil Series	Description	Area %
WICKHAM (Wh)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone	50%
DENCHWORTH (Da)	swelling clayey material passing to clay or soft mudstone	15%
OXPASTURE (Ox)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone	15%
EVESHAM (Ea)	swelling clayey material passing to clay or soft mudstone	10%
OTHER	other minor soils	10%

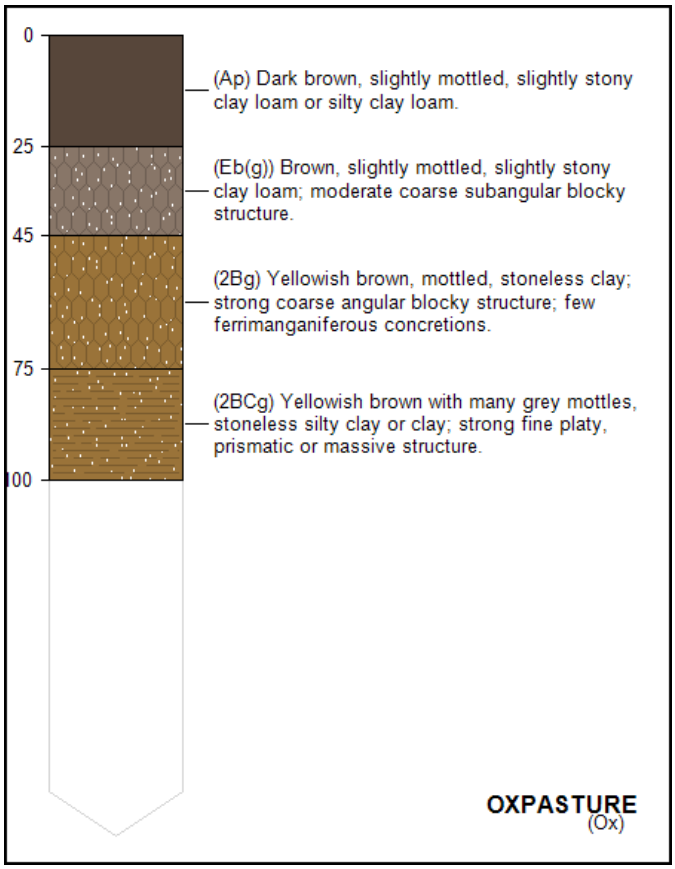
WICKHAM 2 (711f)

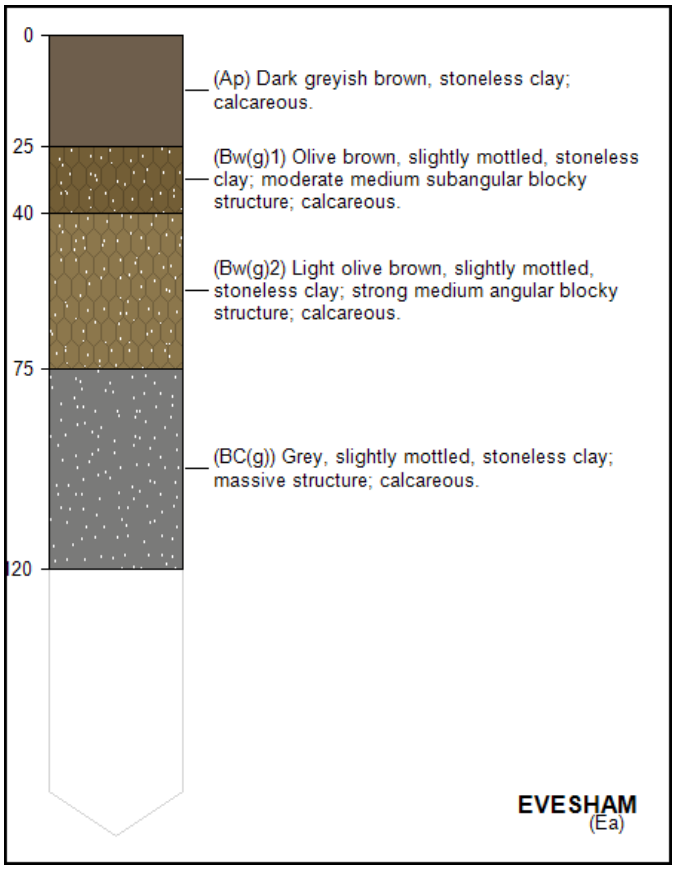
Slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils.

d. WICKHAM 2 Component Series Profiles









DENCHWORTH (712b)

Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

a. General Description

Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.Some fine loamy over clayey soils with only slight seasonal waterlogging and some slowly permeable calcareous clayey soils.
The major landuse on this association is defined as Winter cereals and short term grassland in drier lowlands; dairying on permanent grassland in moist districts.

b. Distribution (England and Wales)

The DENCHWORTH association covers 3469 km² of England and Wales which accounts for 2.29% of the landmass. The distribution of this association is shown in figure 9. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

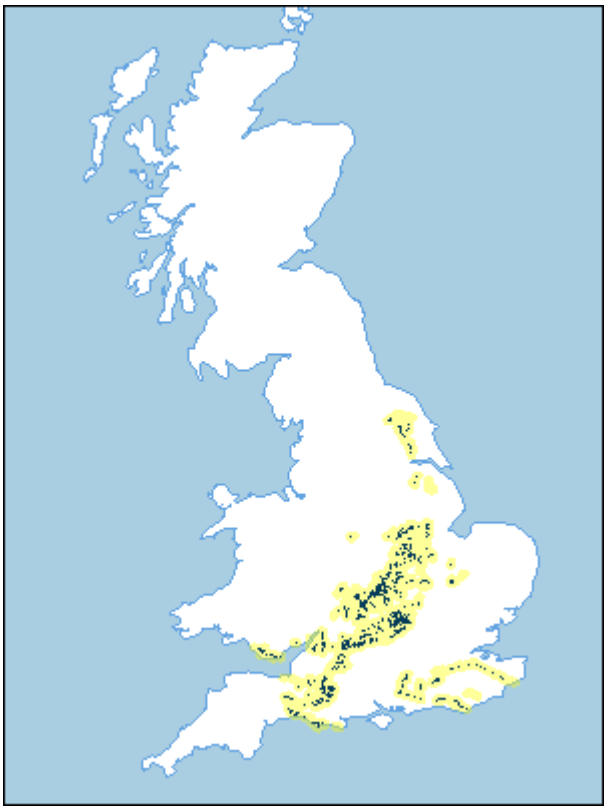


Figure 9: Association Distribution

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the DENCHWORTH association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 8.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

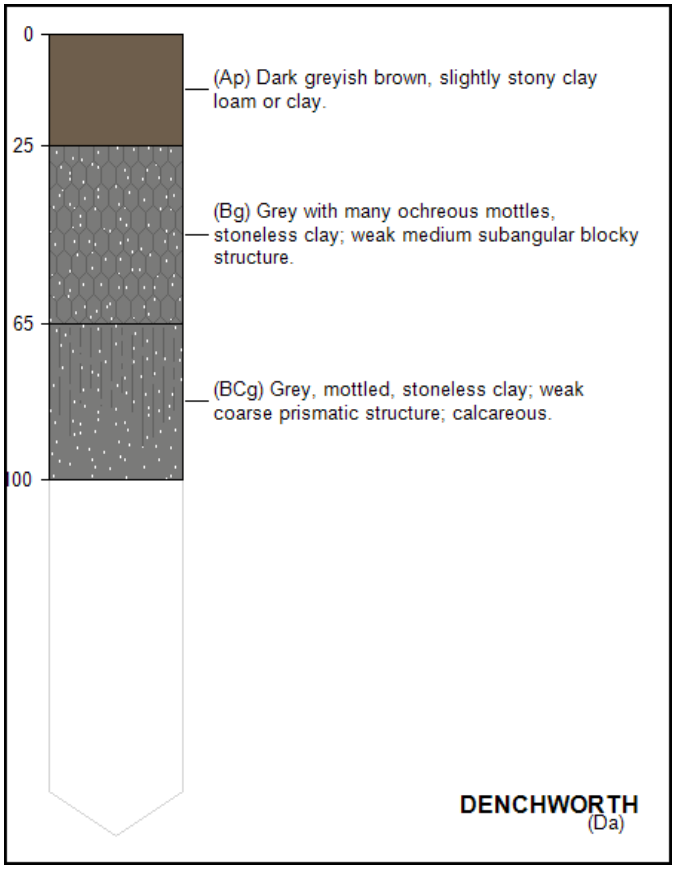
Table 8: The component soil series of the DENCHWORTH soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

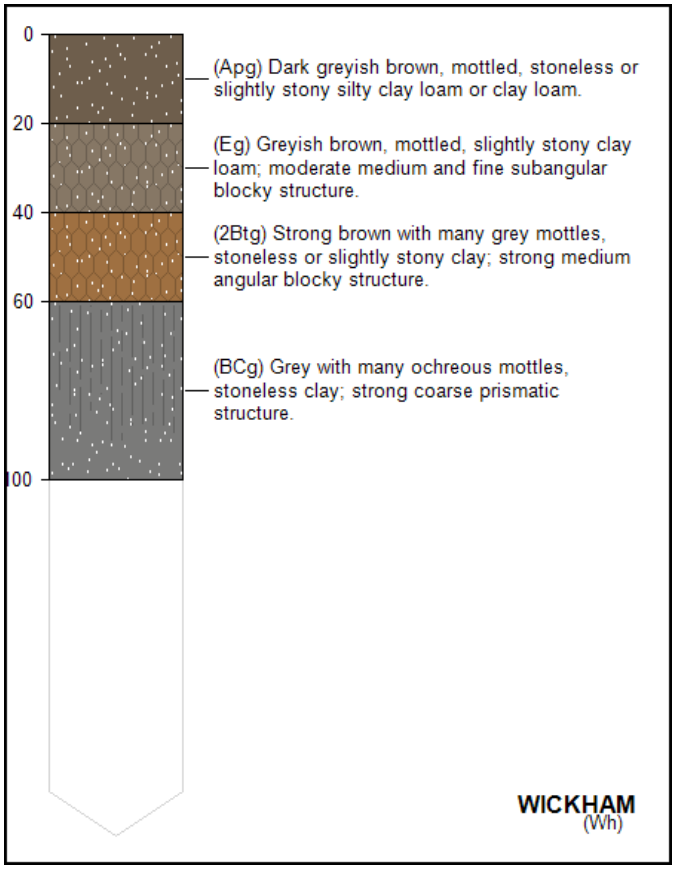
Soil Series	Description	Area %
DENCHWORTH (Da)	swelling clayey material passing to clay or soft mudstone	38%
WICKHAM (Wh)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone	19%
LAWFORD (LD)	swelling clayey drift material passing to clay or soft mudstone	15%
EVESHAM (Ea)	swelling clayey material passing to clay or soft mudstone	14%
OXPASTURE (Ox)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone	14%

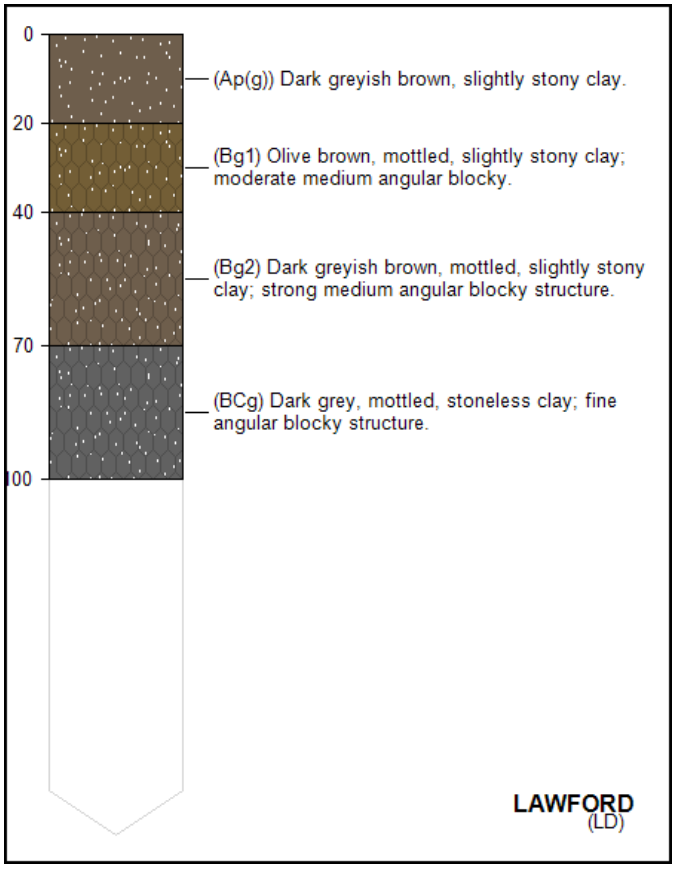
DENCHWORTH (712b)

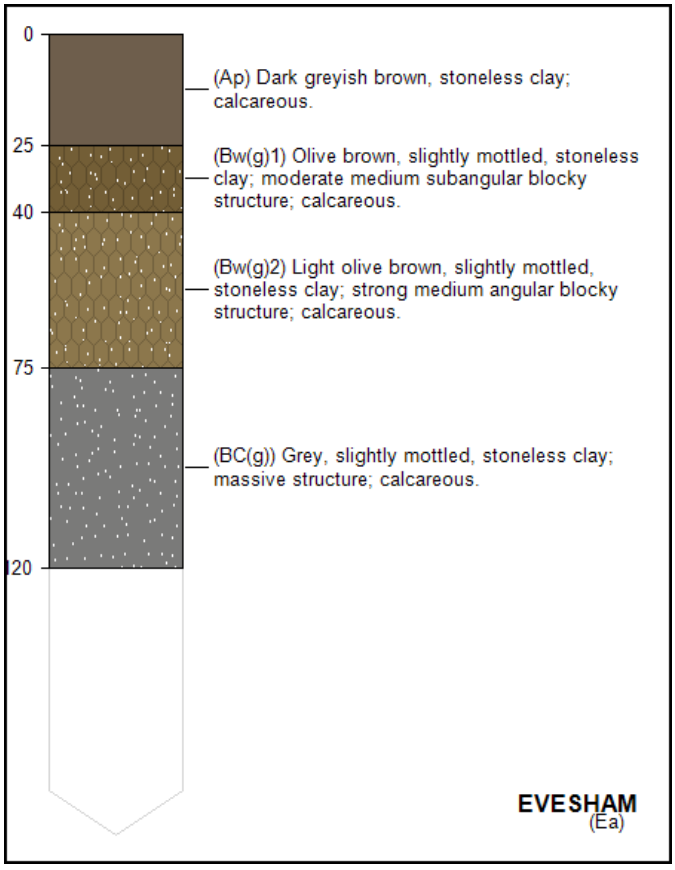
Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

d. DENCHWORTH Component Series Profiles





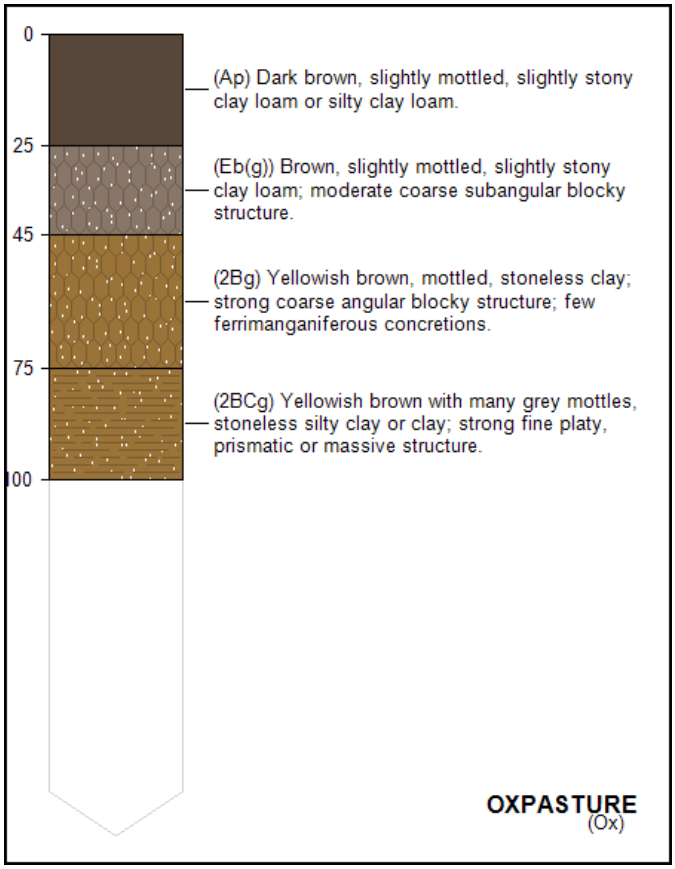




DENCHWORTH (712b)

Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

d. DENCHWORTH Component Series Profiles continued



FLADBURY 1 (813b)

Stoneless clayey soils, in places calcareous variably affected by groundwater.

a. General Description

Stoneless clayey soils, in places calcareous variably affected by groundwater.
The major landuse on this association is defined as Stock rearing on permanent grassland; cereals where flood risk low.

b. Distribution (England and Wales)

The FLADBURY 1 association covers 821 km² of England and Wales which accounts for 0.54% of the landmass. The distribution of this association is shown in figure 10. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the FLADBURY 1 association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occuring in your site in Table 9.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

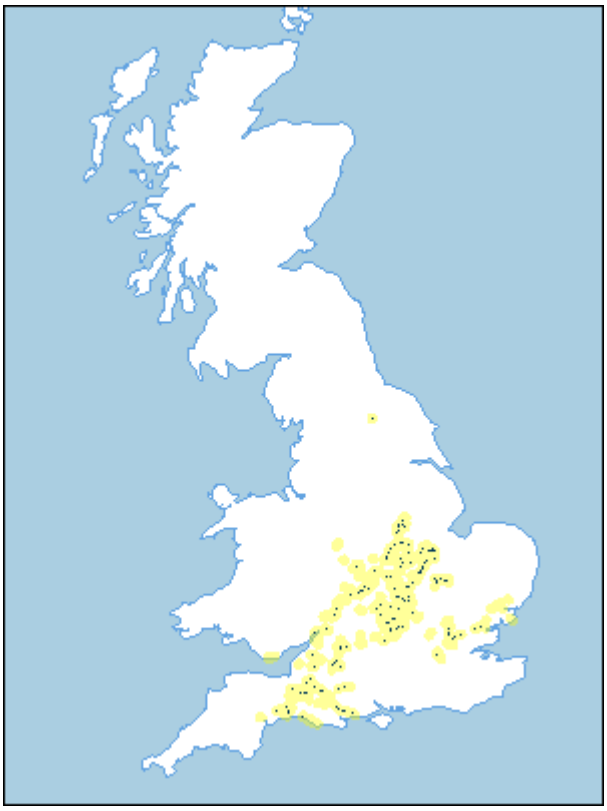


Figure 10: Association Distribution

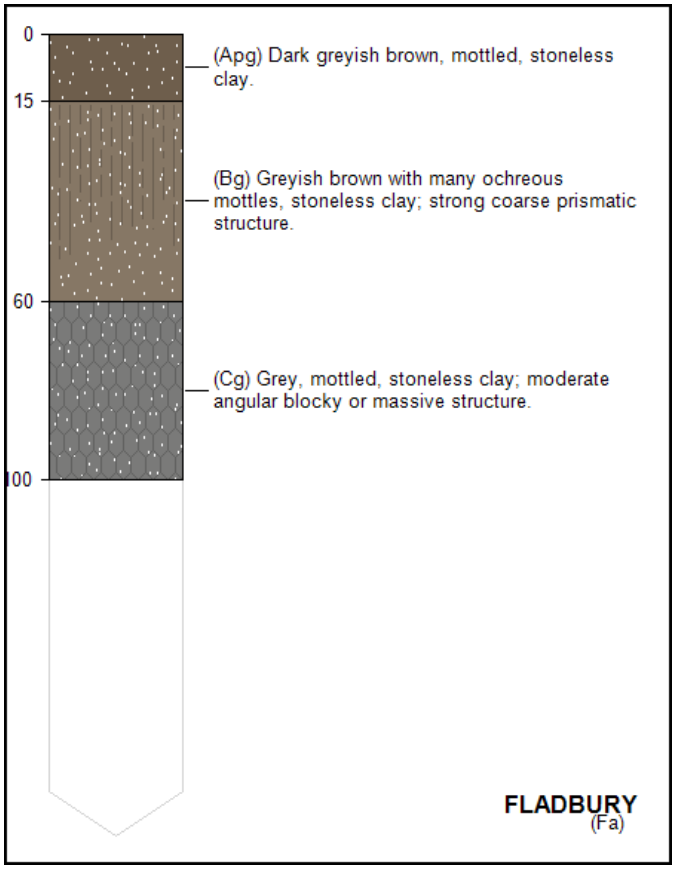
Table 9: The component soil series of the FLADBURY 1 soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

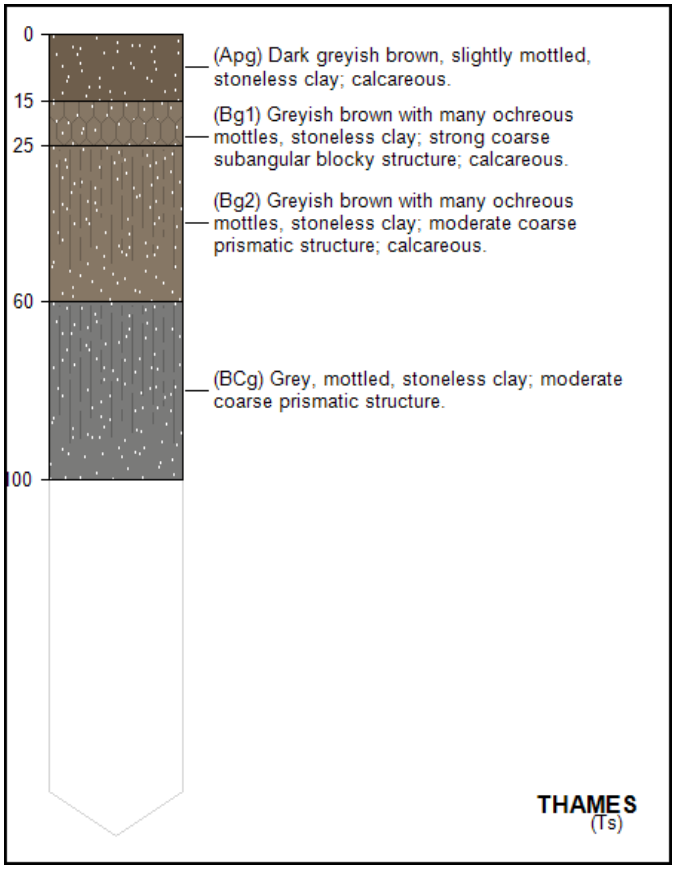
Soil Series	Description	Area %
FLADBURY (Fa)	clayey river alluvium	70%
THAMES (Ts)	clayey river alluvium	15%
WYRE (wH)	clayey river alluvium	15%

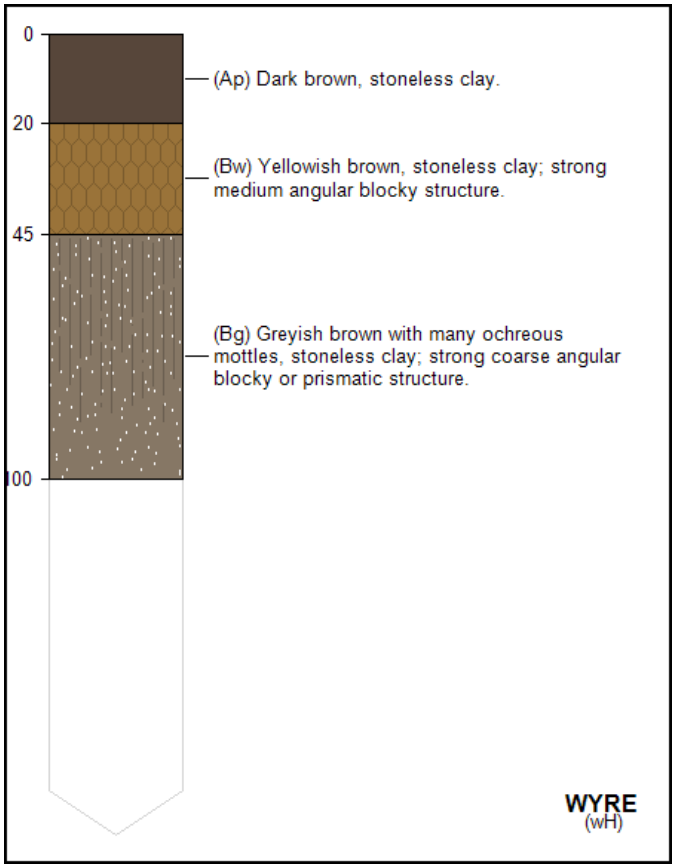
FLADBURY 1 (813b)

Stoneless clayey soils, in places calcareous variably affected by groundwater.

d. FLADBURY 1 Component Series Profiles







3. Soil Series Properties

The following pages describe the following soil series in more detail:

ABERFORD (aF)	medium loamy material over lithoskeletal limestone
ARROW (aO)	light loamy drift with siliceous stones
ASHLEY (As)	medium loamy over clayey chalky drift
BANBURY (Bp)	ferruginous medium loamy material over lithoskeletal ironstone
BECCLES (bW)	medium loamy over clayey chalky drift
DENCHWORTH (Da)	swelling clayey material passing to clay or soft mudstone
ELMTON (eT)	medium loamy lithoskeletal limestone
EVESHAM (Ea)	swelling clayey material passing to clay or soft mudstone
FAULKBOURNE (fK)	clayey chalky drift
FLADBURY (Fa)	clayey river alluvium
HANSLOPE (Hn)	clayey chalky drift
HASELOR (Hb)	swelling clayey material passing to clay with interbedded limestone
HOLDENBY (HM)	clayey drift material passing to clay or soft mudstone
IRONDOWN (Ir)	ferruginous medium loamy or medium silty drift over clayey material passing to clay or soft mudstone
LAWFORD (LD)	swelling clayey drift material passing to clay or soft mudstone
LUDFORD (LF)	medium loamy drift with siliceous stones
MAPLESTEAD (MM)	light loamy drift with siliceous stones
MORETON (Mor)	clayey material over lithoskeletal limestone
NEWPORT (Na)	sandy drift with siliceous stones
OXPASTURE (Ox)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone
SHABBINGTON (Shb)	medium loamy drift with siliceous stones
SHERBORNE (Si)	clayey lithoskeletal limestone
TADMARTON (tM)	ferruginous light loamy material over lithoskeletal ironstone
THAMES (Ts)	clayey river alluvium
WATERSTOCK (Wtk)	medium loamy drift with siliceous stones
WICK (wQ)	light loamy drift with siliceous stones
WICKHAM (Wh)	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone
WORMINGHALL (Wrm)	medium loamy over sandy drift with siliceous stones
WYRE (wH)	clayey river alluvium

SOIL PROPERTY DEFINITIONS

The following terms are used in the report.

DROCK (Depth to rock (cm))
Depth (cm) to rock. 999 implies no rock

DGLEY (Depth to gleying (cm))
Depth to gleyed horizon (cm). 999 implies NO gleyed horizon present.

DIMP_DP (Depth to slowly permeable layer (downward percolation) (cm))
Depth (cm) to slowly permeable layer, i.e. in which effectively there is no downward percolation of water - 999 implies NO slowly permeable layer

DIMP_UD (Depth to slowly permeable layer (upward diffusion) (cm))
Depth (cm) to slowly permeable layer - upward diffusion, i.e. in which effectively there is no upward movement of water - 999 implies NO slowly permeable layer

IAC_DP (Integrated air capacity (IAC) (mm))
Integrated air capacity (downward percolation), a measurement of the volume of air in moist soils (0.05 bar suction) integrated from the surface to either an impermeable horizon, bedrock or 1m whichever is the shallowest, used for estimating the water storage potential of a soil

SPR (Standard percentage runoff (SPR) (%))
Standard Percentage Run-off. Dimensionless variable (range 0 to 100 %) that represents the percentage of rainfall that causes the short-term increase in flow at the catchment outlet seen after the storm event

BFI (Base flow index (BFI) (0 to 1))
Baseflow index. Dimensionless variable (range 0 to 1) that expresses the fraction of the average flow volume (in a river), represented by the contribution from groundwater storage

AWC (Available water (AWC) (mm))
Available water to 1m for a specific soil type, water available between suctions 5 and 1500kPa

AP_GRASS (Available water for grass (mm))
Available water (AP) in the profile for grass (mm); water available between suctions 5 and 1500 kPa

AP_CEREAL (Available water for cereal (mm))
Available water (AP) in the profile for cereals (mm); water available between suctions 5 and 1500 kPa

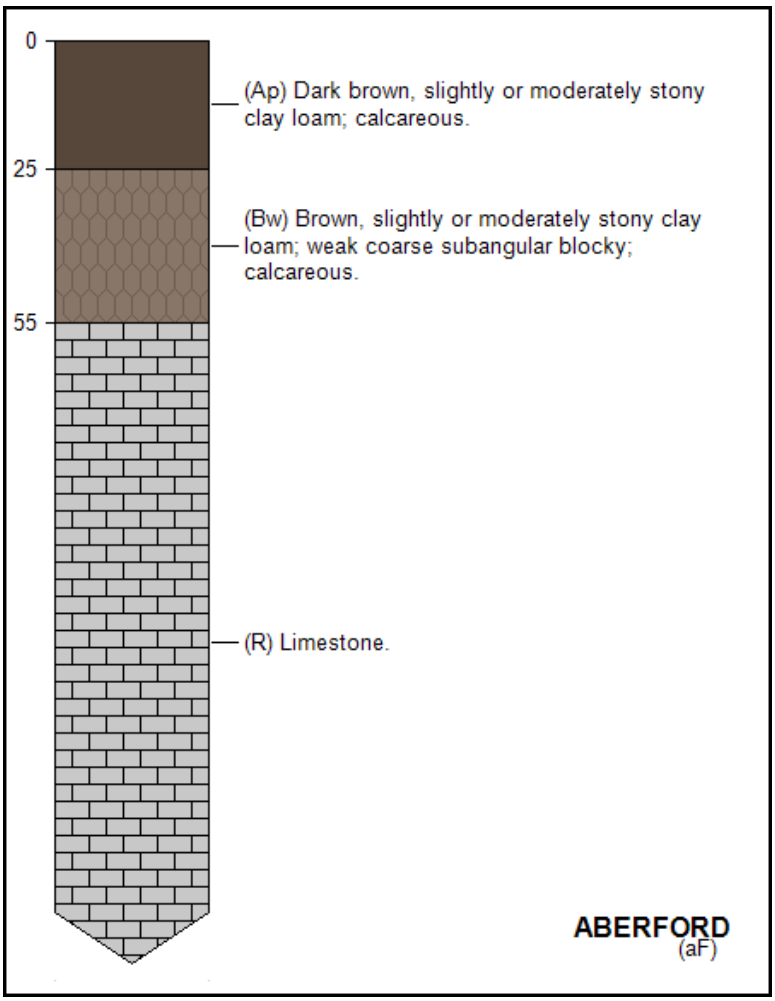
AP_SB (Available water for sugar (mm))
Available water (AP) in the profile for sugar beet (mm); water available between suctions 5 and 1500 kPa

AP_POT (Available water for potatoes (mm))
Available water (AP) in the profile for potatoes (mm); water available between suctions 5 and 1500 kPa

5.11 ABERFORD (aF) (1)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	1 brown calcareous earths	Non-alluvial, with calcareous loamy or clayey subsoils without significant clay enrichment.
Soil Subgroup:	1 typical brown calcareous earths	(unmottled)
Soil Series:	Aberford series	medium loamy material over lithoskeletal limestone

Property	**Value**
Depth to rock (cm)	55
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	169
Standard percentage runoff (SPR) (%)	2
Base flow index (BFI) (0 to 1)	0.98
Available water (AWC) (mm)	115
Available water for grass (mm)	115
Available water for cereal (mm)	115
Available water for sugar (mm)	115
Available water for potatoes (mm)	115

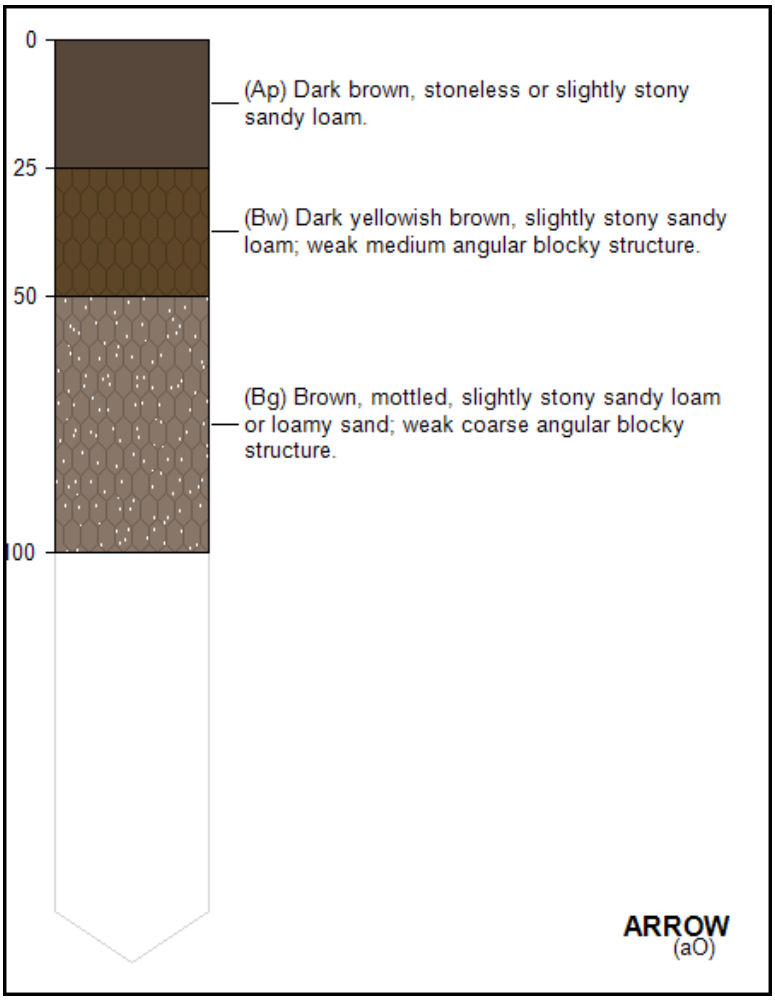


* not present within 150cm

5.43 ARROW (aO) (32)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	4 brown earths	Non-alluvial, with non-calcareous loamy or clayey subsoils without significant clay enrichment.
Soil Subgroup:	3 gleyic brown earths	(faintly mottled with permeable subsoil)
Soil Series:	Arrow series	light loamy drift with siliceous stones

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	188
Standard percentage runoff (SPR) (%)	21
Base flow index (BFI) (0 to 1)	0.79
Available water (AWC) (mm)	145
Available water for grass (mm)	130
Available water for cereal (mm)	140
Available water for sugar (mm)	170
Available water for potatoes (mm)	105

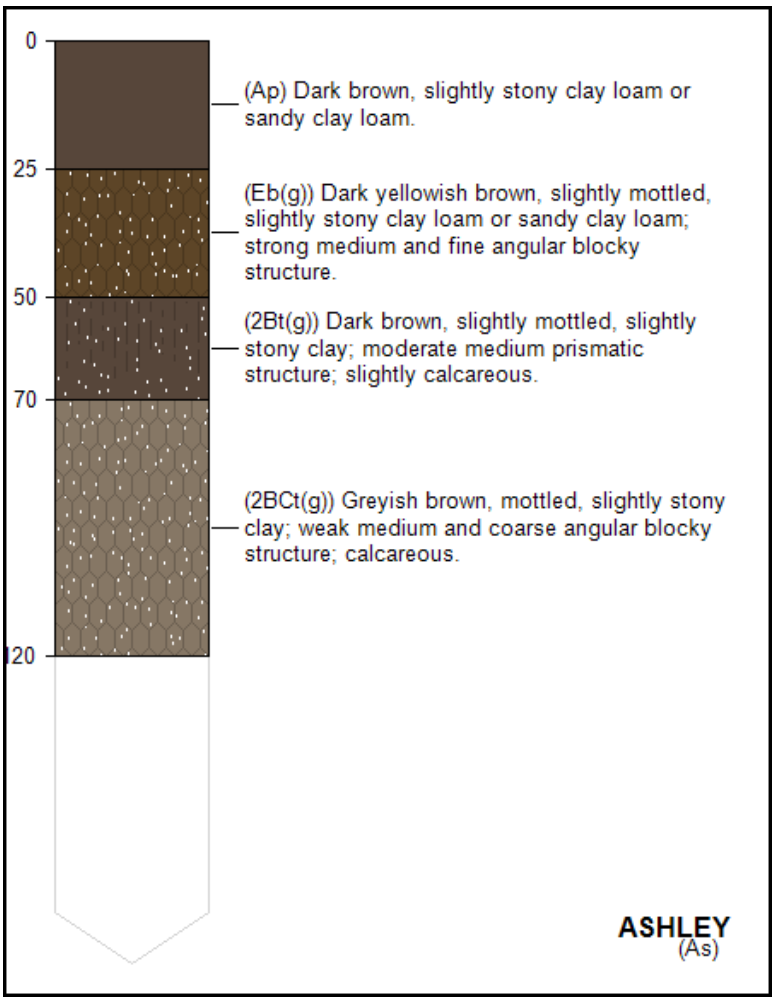


* not present within 150cm

5.72 ASHLEY (As) (25)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	7 argillic brown earths	Loamy or clayey with an ordinary clay-enriched subsoil.
Soil Subgroup:	2 stagnogleyic argillic brown earths	(faintly mottled with slowly permeable subsoil)
Soil Series:	Ashley series	medium loamy over clayey chalky drift

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	46
Depth to slowly permeable layer (upward diffusion) (cm)	46
Integrated air capacity (IAC) (mm)	92
Standard percentage runoff (SPR) (%)	47
Base flow index (BFI) (0 to 1)	0.52
Available water (AWC) (mm)	140
Available water for grass (mm)	120
Available water for cereal (mm)	125
Available water for sugar (mm)	155
Available water for potatoes (mm)	105

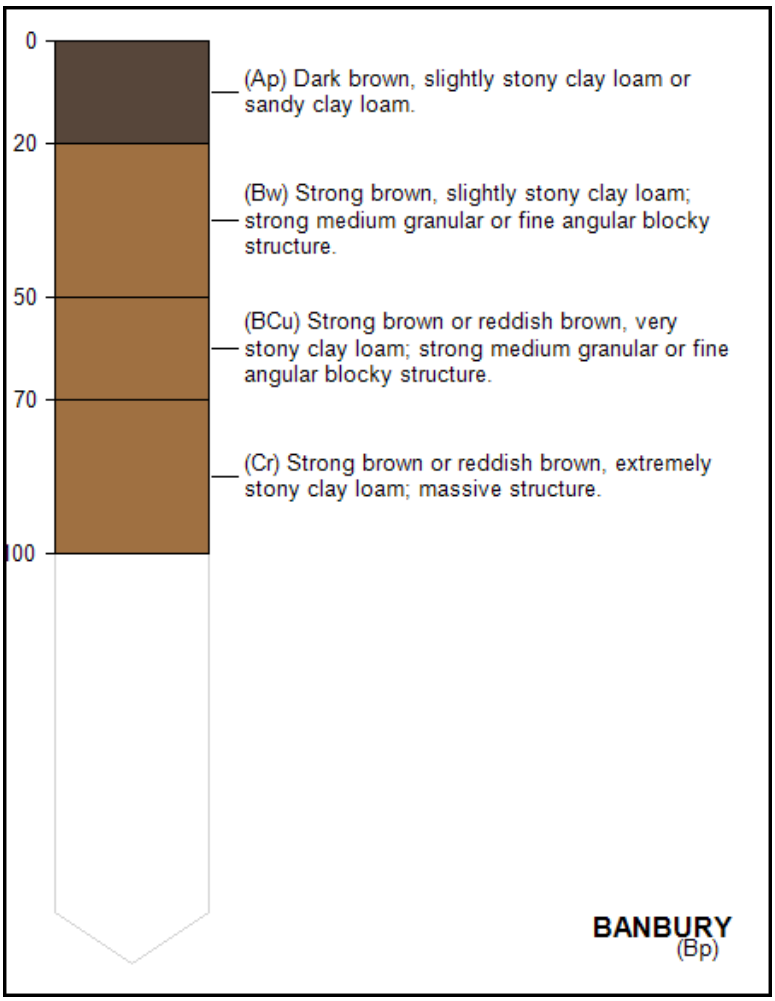


* not present within 150cm

5.44 BANBURY (Bp) (101)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	4 brown earths	Non-alluvial, with non-calcareous loamy or clayey subsoils without significant clay enrichment.
Soil Subgroup:	4 ferritic brown earths	(unmottled with bright ochreous iron-rich subsoil)
Soil Series:	Banbury series	ferruginous medium loamy material over lithoskeletal ironstone

Property	**Value**
Depth to rock (cm)	70
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	157
Standard percentage runoff (SPR) (%)	2
Base flow index (BFI) (0 to 1)	0.98
Available water (AWC) (mm)	120
Available water for grass (mm)	120
Available water for cereal (mm)	115
Available water for sugar (mm)	120
Available water for potatoes (mm)	120

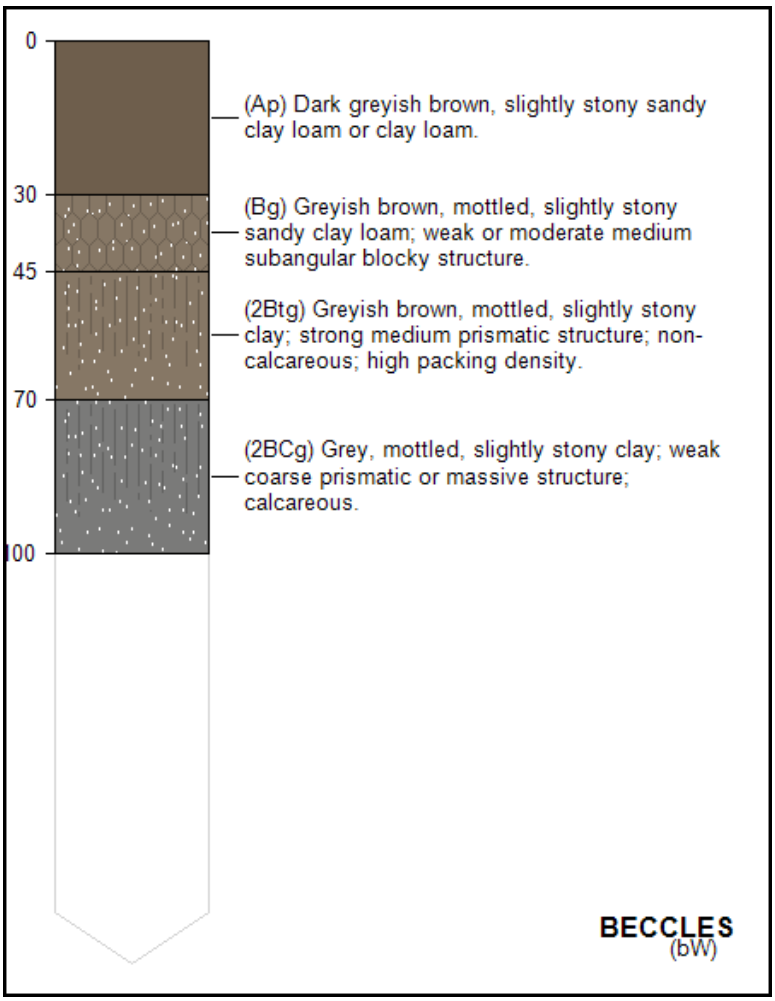


* not present within 150cm

7.11 BECCLES (bW) (112)

Major soil group:	07 surface-water gley soils	Seasonally waterlogged slowly permeable soils, formed above 3 m 0.D. and prominently mottled above 40 cm depth. They have no relatively permeable material starting within and extending below 1 m of the surface.
Soil group:	1 stagnogley soils	With a distinct topsoil. They are found mainly in lowland Britain.
Soil Subgroup:	1 typical stagnogley soils	(with ordinary clay enriched subsoil)
Soil Series:	Beccles series	medium loamy over clayey chalky drift

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	25
Depth to slowly permeable layer (downward percolation) (cm)	38
Depth to slowly permeable layer (upward diffusion) (cm)	38
Integrated air capacity (IAC) (mm)	66
Standard percentage runoff (SPR) (%)	40
Base flow index (BFI) (0 to 1)	0.31
Available water (AWC) (mm)	135
Available water for grass (mm)	120
Available water for cereal (mm)	120
Available water for sugar (mm)	150
Available water for potatoes (mm)	100

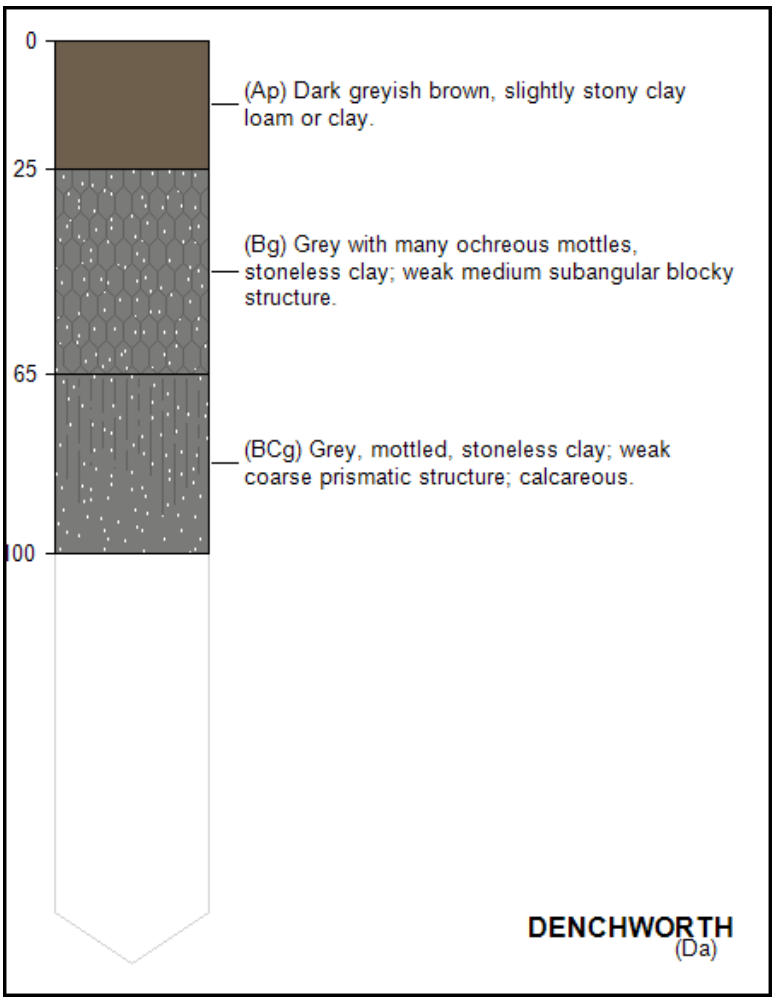


* not present within 150cm

7.12 DENCHWORTH (Da) (306)

Major soil group:	07 surface-water gley soils	Seasonally waterlogged slowly permeable soils, formed above 3 m 0.D. and prominently mottled above 40 cm depth. They have no relatively permeable material starting within and extending below 1 m of the surface.
Soil group:	1 stagnogley soils	With a distinct topsoil. They are found mainly in lowland Britain.
Soil Subgroup:	2 pelo-stagnogley soils	(clayey)
Soil Series:	Denchworth series	swelling clayey material passing to clay or soft mudstone

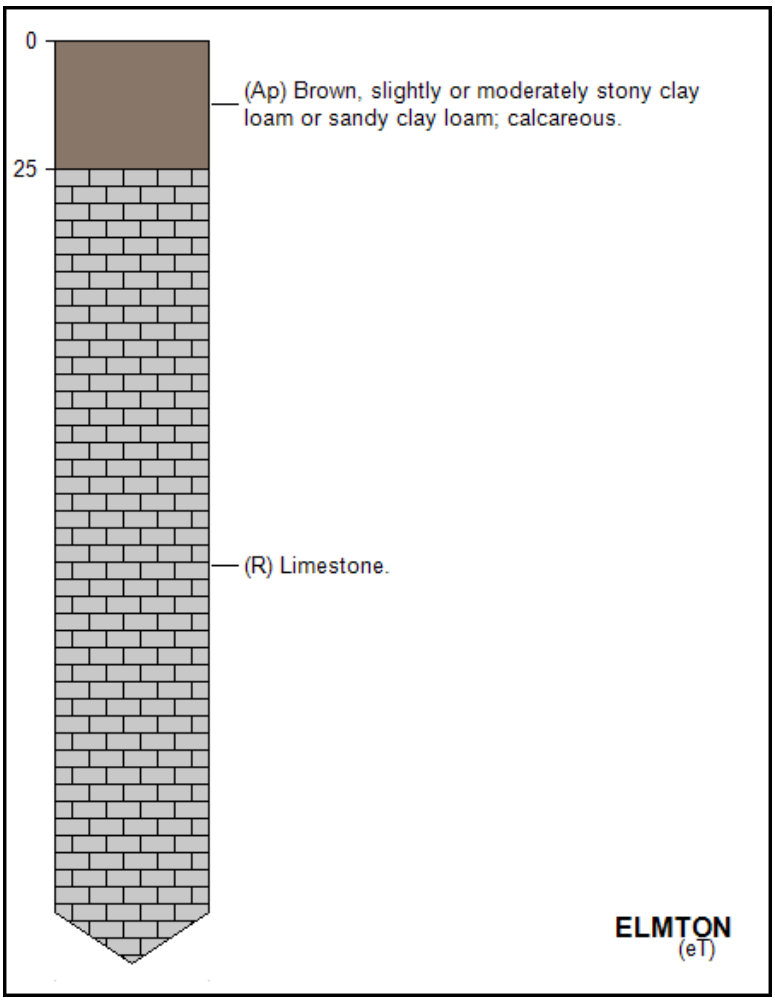
Property	Value
Depth to rock (cm)	100
Depth to gleying (cm)	25
Depth to slowly permeable layer (downward percolation) (cm)	27
Depth to slowly permeable layer (upward diffusion) (cm)	27
Integrated air capacity (IAC) (mm)	51
Standard percentage runoff (SPR) (%)	50
Base flow index (BFI) (0 to 1)	0.17
Available water (AWC) (mm)	160
Available water for grass (mm)	140
Available water for cereal (mm)	135
Available water for sugar (mm)	170
Available water for potatoes (mm)	115



3.43 ELMTON (eT) (425)

Major soil group:	03 lithomorphic soils	Shallow, with a distinct, humose or peaty topsoil, but no subsurface horizons more than 5 cm thick (other than a bleached horizon). Normally over bedrock, very stony rock rubble or little altered soft unconsolidated deposits within 30 cm depth.
Soil group:	4 rendzinas	Calcareous, over chalk, or extremely calcareous rock rubble or soft unconsolidated deposits.
Soil Subgroup:	3 brown rendzinas	(with brownish distinct topsoil that is not extremely calcareous)
Soil Series:	Elmton series	medium loamy lithoskeletal limestone

Property	Value
Depth to rock (cm)	25
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	195
Standard percentage runoff (SPR) (%)	2
Base flow index (BFI) (0 to 1)	0.98
Available water (AWC) (mm)	85
Available water for grass (mm)	85
Available water for cereal (mm)	80
Available water for sugar (mm)	85
Available water for potatoes (mm)	85

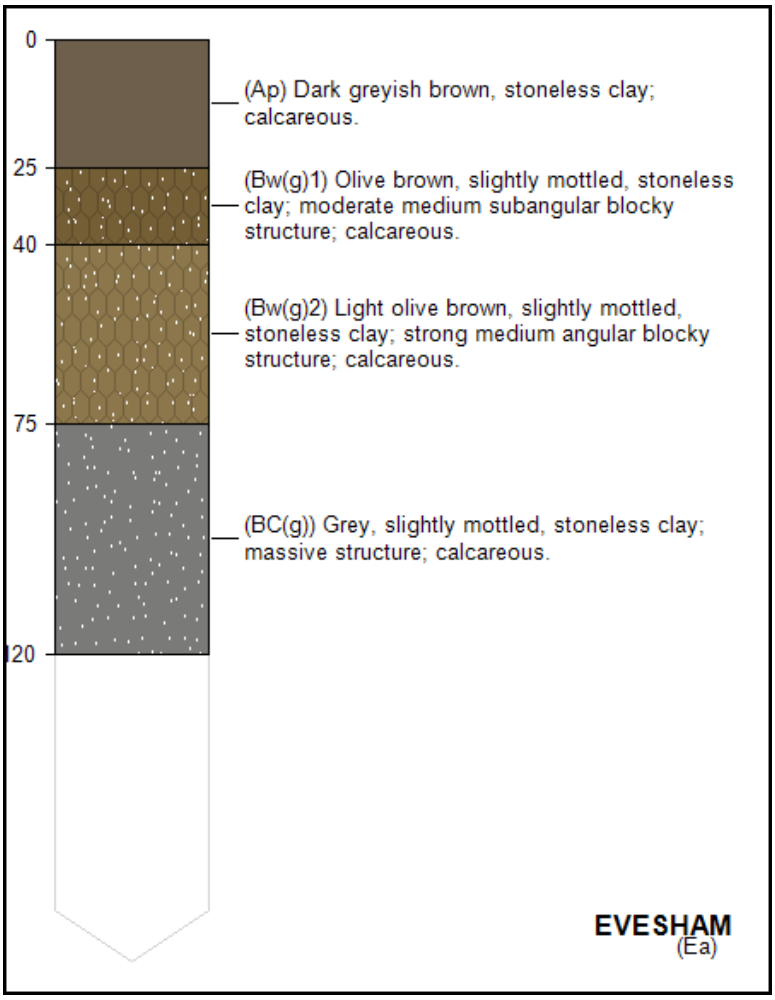


* not present within 150cm

4.11 EVESHAM (Ea) (419)

Major soil group:	04 pelosols	Non-alluvial clayey soils that crack deeply in dry seasons, but are slowly permeable when wet. They have a coarse blocky or prismatic structure and no prominently mottled non-calcareous subsurface horizons within 40 cm depth.
Soil group:	1 calcareous pelosols	With calcareous subsoil and no clay-enriched subsurface horizon.
Soil Subgroup:	1 typical calcareous pelosols	(Not subdivided below group level)
Soil Series:	Evesham series	swelling clayey material passing to clay or soft mudstone

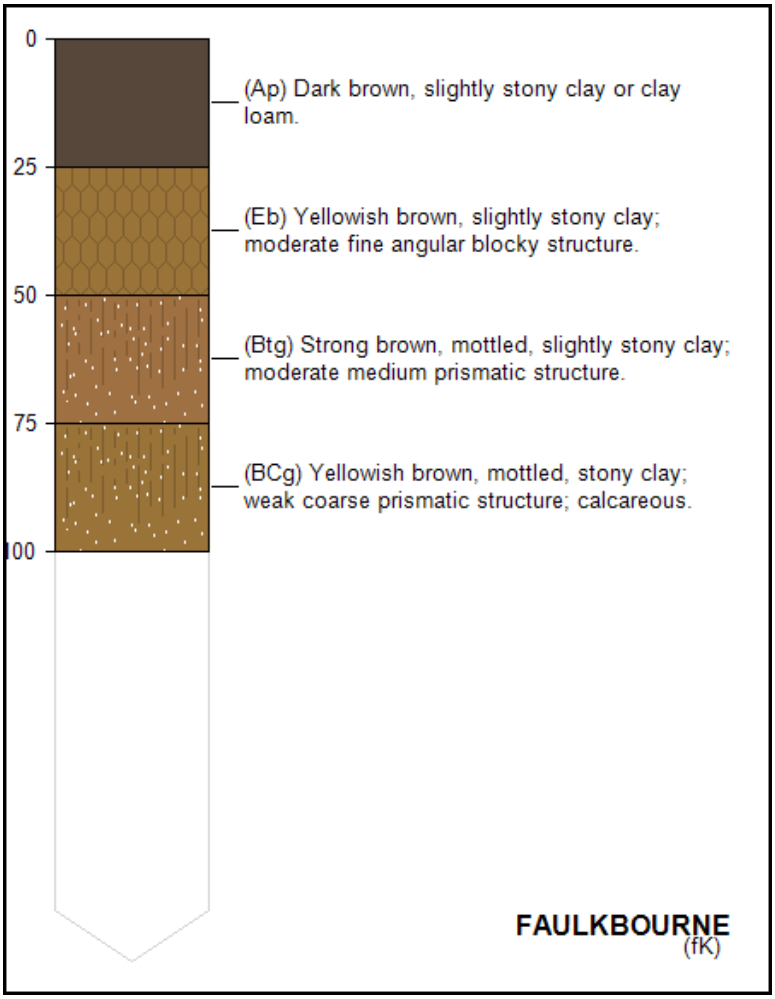
Property	Value
Depth to rock (cm)	80
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	24
Depth to slowly permeable layer (upward diffusion) (cm)	24
Integrated air capacity (IAC) (mm)	59
Standard percentage runoff (SPR) (%)	60
Base flow index (BFI) (0 to 1)	0.22
Available water (AWC) (mm)	150
Available water for grass (mm)	125
Available water for cereal (mm)	120
Available water for sugar (mm)	160
Available water for potatoes (mm)	105



4.31 FAULKBOURNE (fK) (525)

Major soil group:	04 pelosols	Non-alluvial clayey soils that crack deeply in dry seasons, but are slowly permeable when wet. They have a coarse blocky or prismatic structure and no prominently mottled non-calcareous subsurface horizons within 40 cm depth.
Soil group:	3 argillic pelosols	With a clay-enriched subsurface horizon.
Soil Subgroup:	1 typical argillic pelosols	(Not subdivided below group level)
Soil Series:	Faulkbourne series	clayey chalky drift

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	41
Depth to slowly permeable layer (upward diffusion) (cm)	41
Integrated air capacity (IAC) (mm)	65
Standard percentage runoff (SPR) (%)	47
Base flow index (BFI) (0 to 1)	0.34
Available water (AWC) (mm)	125
Available water for grass (mm)	115
Available water for cereal (mm)	115
Available water for sugar (mm)	140
Available water for potatoes (mm)	95

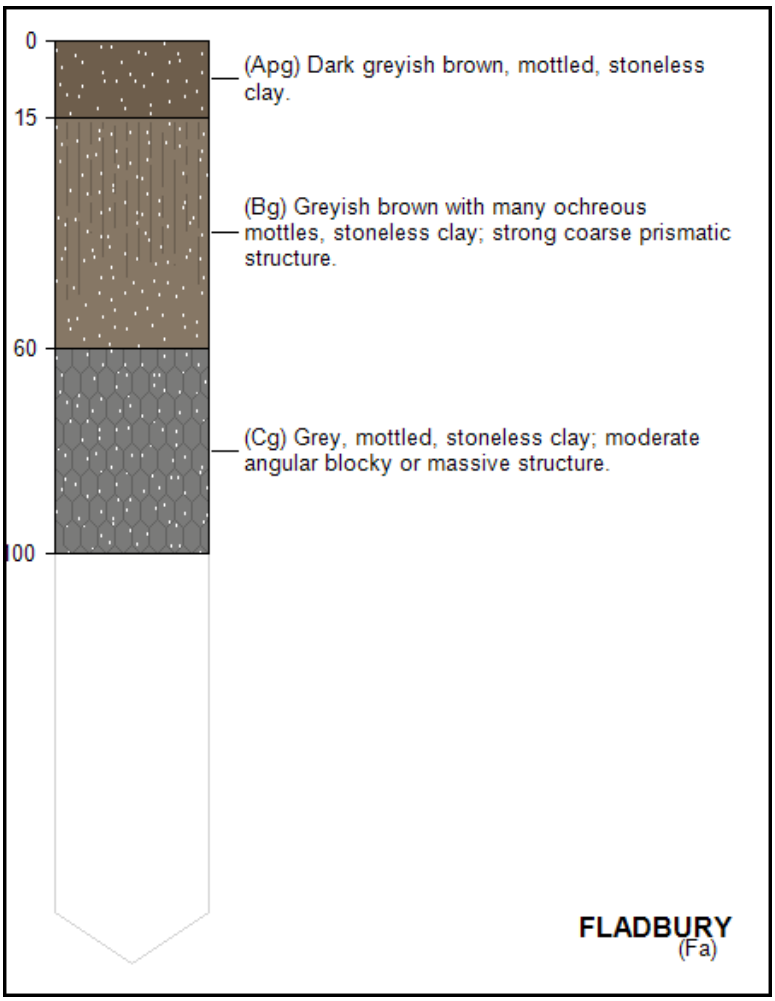


* not present within 150cm

8.13 FLADBURY (Fa) (505)

Major soil group:	08 ground-water gley soils	Seasonally waterlogged soils affected by a shallow fluctuating groundwater-table. They are developed mainly within or over permeable material and have prominently mottled or greyish coloured horizons within 40 cm depth Most occupy low-lying or depressional sites.
Soil group:	1 alluvial gley soils	With distinct topsoil, in loamy or clayey recent alluvium more than 30 cm thick.
Soil Subgroup:	3 pelo-alluvial gley soils	(clayey with non-calcareous subsoil)
Soil Series:	Fladbury series	clayey river alluvium

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	15
Depth to slowly permeable layer (downward percolation) (cm)	54
Depth to slowly permeable layer (upward diffusion) (cm)	54
Integrated air capacity (IAC) (mm)	51
Standard percentage runoff (SPR) (%)	25
Base flow index (BFI) (0 to 1)	0.73
Available water (AWC) (mm)	170
Available water for grass (mm)	145
Available water for cereal (mm)	145
Available water for sugar (mm)	190
Available water for potatoes (mm)	120

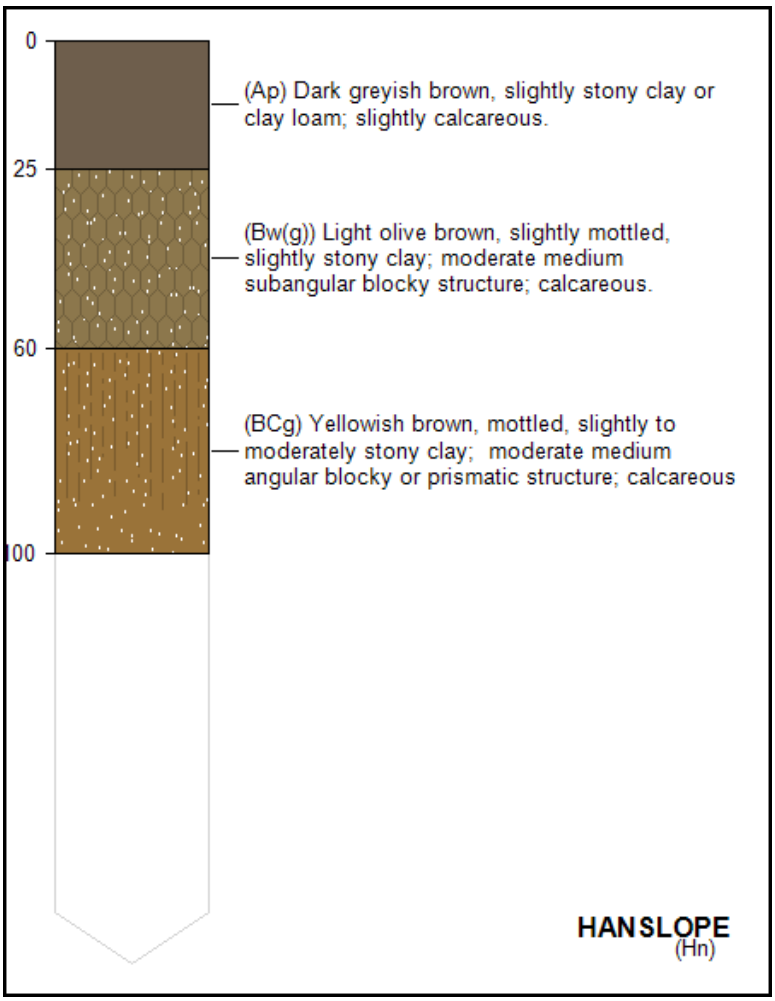


* not present within 150cm

4.11 HANSLOPE (Hn) (707)

Major soil group:	04 pelosols	Non-alluvial clayey soils that crack deeply in dry seasons, but are slowly permeable when wet. They have a coarse blocky or prismatic structure and no prominently mottled non-calcareous subsurface horizons within 40 cm depth.
Soil group:	1 calcareous pelosols	With calcareous subsoil and no clay-enriched subsurface horizon.
Soil Subgroup:	1 typical calcareous pelosols	(Not subdivided below group level)
Soil Series:	Hanslope series	clayey chalky drift

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	21
Depth to slowly permeable layer (upward diffusion) (cm)	21
Integrated air capacity (IAC) (mm)	59
Standard percentage runoff (SPR) (%)	47
Base flow index (BFI) (0 to 1)	0.34
Available water (AWC) (mm)	125
Available water for grass (mm)	115
Available water for cereal (mm)	115
Available water for sugar (mm)	140
Available water for potatoes (mm)	95

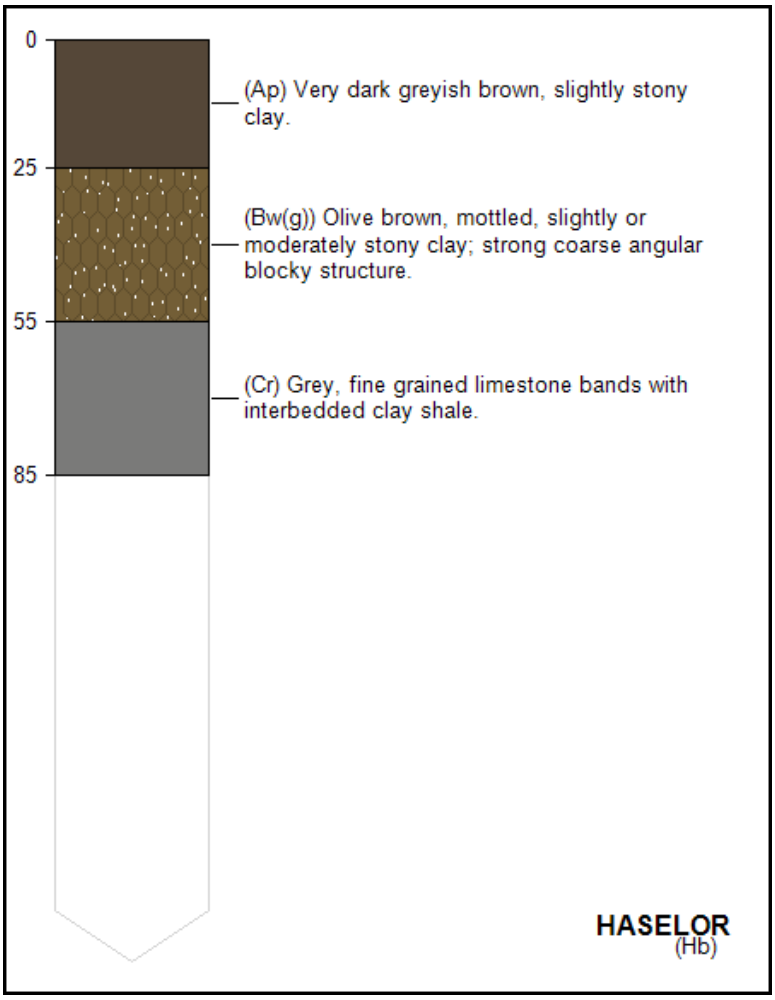


* not present within 150cm

4.11 HASELOR (Hb) (711)

Major soil group:	04 pelosols	Non-alluvial clayey soils that crack deeply in dry seasons, but are slowly permeable when wet. They have a coarse blocky or prismatic structure and no prominently mottled non-calcareous subsurface horizons within 40 cm depth.
Soil group:	1 calcareous pelosols	With calcareous subsoil and no clay-enriched subsurface horizon.
Soil Subgroup:	1 typical calcareous pelosols	(Not subdivided below group level)
Soil Series:	Haselor series	swelling clayey material passing to clay with interbedded limestone

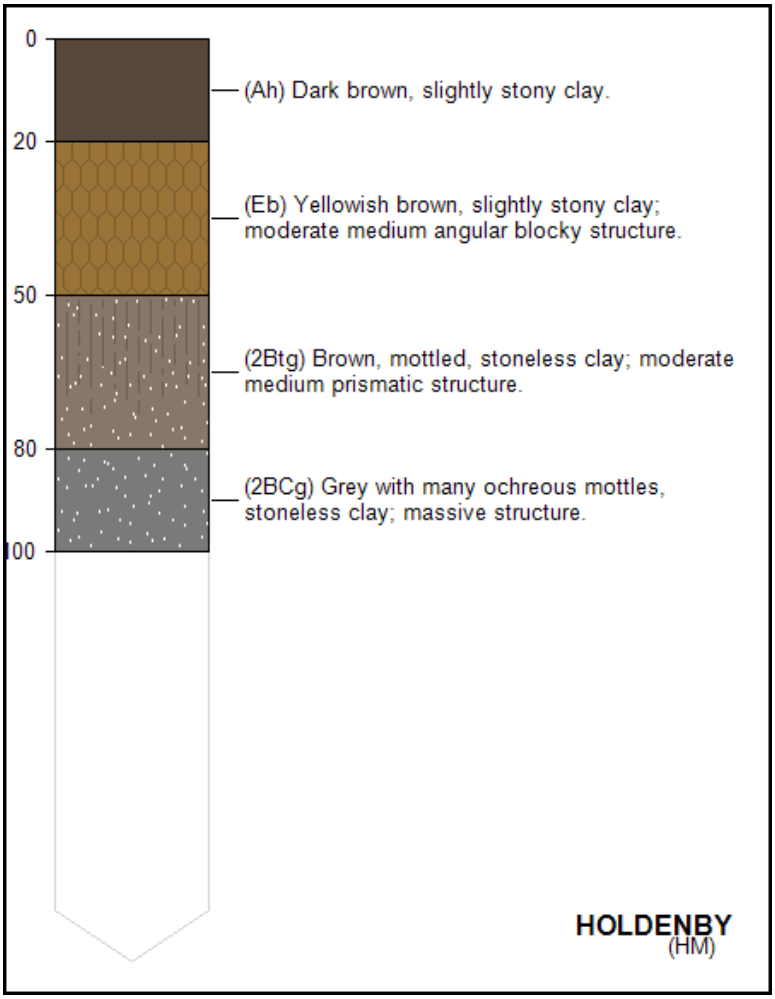
Property	Value
Depth to rock (cm)	55
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	43
Depth to slowly permeable layer (upward diffusion) (cm)	43
Integrated air capacity (IAC) (mm)	45
Standard percentage runoff (SPR) (%)	60
Base flow index (BFI) (0 to 1)	0.22
Available water (AWC) (mm)	125
Available water for grass (mm)	115
Available water for cereal (mm)	110
Available water for sugar (mm)	130
Available water for potatoes (mm)	100



4.31 HOLDENBY (HM) (766)

Major soil group:	04 pelosols	Non-alluvial clayey soils that crack deeply in dry seasons, but are slowly permeable when wet. They have a coarse blocky or prismatic structure and no prominently mottled non-calcareous subsurface horizons within 40 cm depth.
Soil group:	3 argillic pelosols	With a clay-enriched subsurface horizon.
Soil Subgroup:	1 typical argillic pelosols	(Not subdivided below group level)
Soil Series:	Holdenby series	clayey drift material passing to clay or soft mudstone

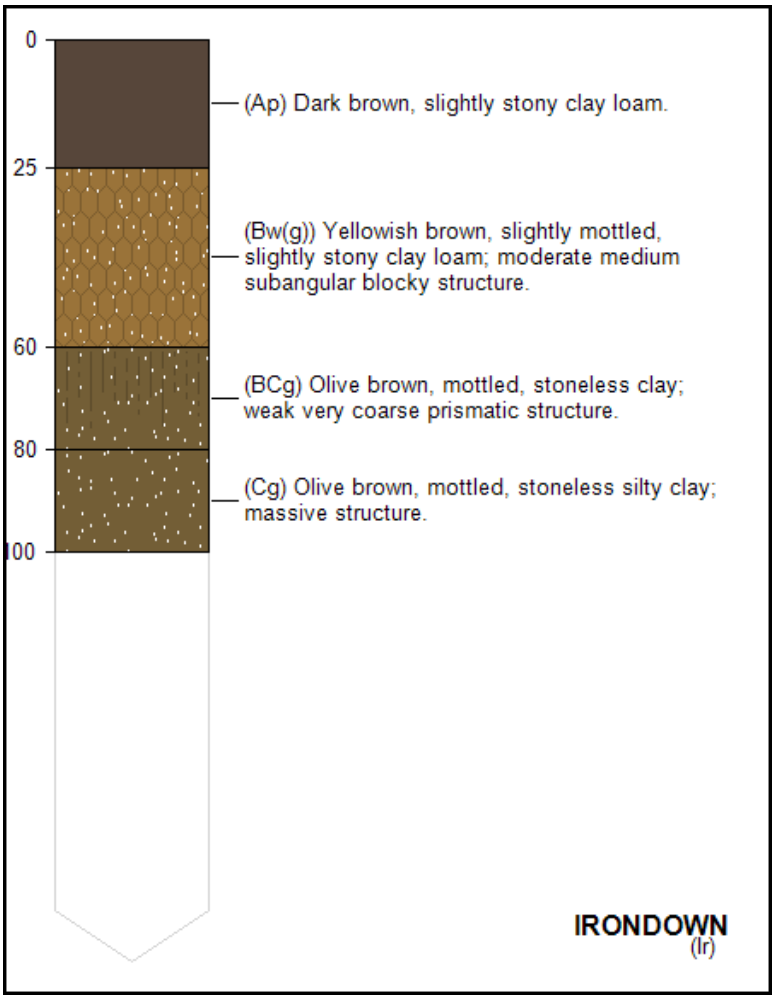
Property	Value
Depth to rock (cm)	100
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	51
Depth to slowly permeable layer (upward diffusion) (cm)	51
Integrated air capacity (IAC) (mm)	73
Standard percentage runoff (SPR) (%)	60
Base flow index (BFI) (0 to 1)	0.22
Available water (AWC) (mm)	150
Available water for grass (mm)	125
Available water for cereal (mm)	120
Available water for sugar (mm)	160
Available water for potatoes (mm)	105



5.45 IRONDOWN (Ir) (802)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	4 brown earths	Non-alluvial, with non-calcareous loamy or clayey subsoils without significant clay enrichment.
Soil Subgroup:	5 stagnogleyic ferritic brown earths	(faintly mottled with bright ochreous iron-rich slowly permeable subsoil)
Soil Series:	Irondown series	ferruginous medium loamy or medium silty drift over clayey material passing to clay or soft mudstone

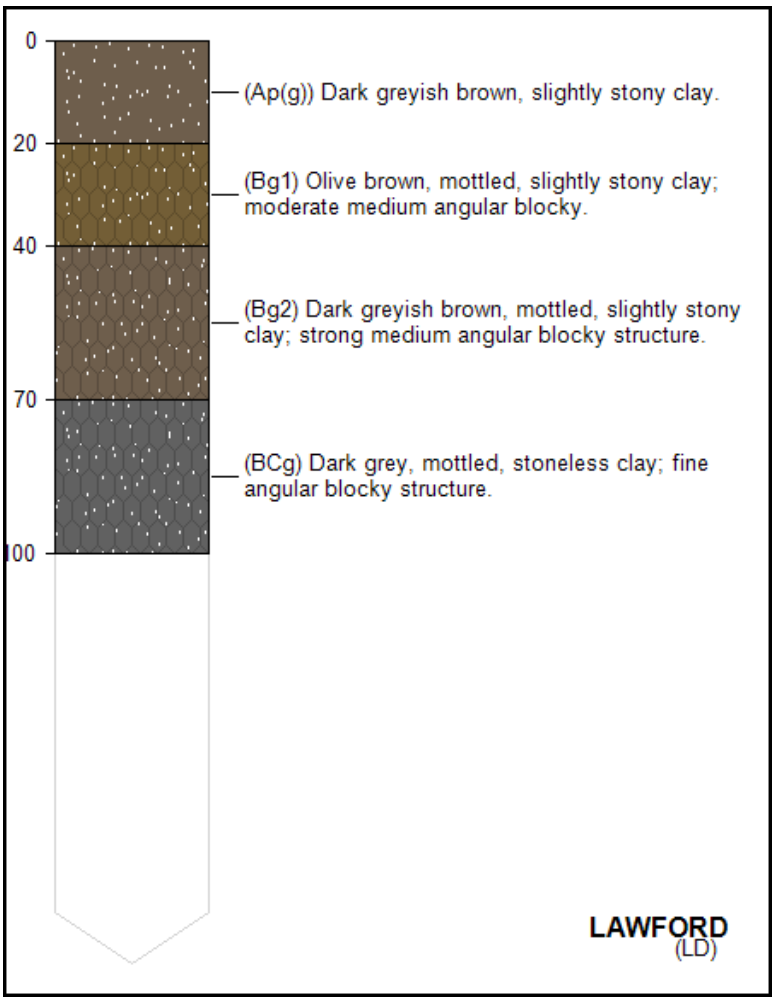
Property	Value
Depth to rock (cm)	100
Depth to gleying (cm)	57
Depth to slowly permeable layer (downward percolation) (cm)	57
Depth to slowly permeable layer (upward diffusion) (cm)	57
Integrated air capacity (IAC) (mm)	78
Standard percentage runoff (SPR) (%)	47
Base flow index (BFI) (0 to 1)	0.52
Available water (AWC) (mm)	145
Available water for grass (mm)	125
Available water for cereal (mm)	125
Available water for sugar (mm)	160
Available water for potatoes (mm)	105



7.12 LAWFORD (LD) (1137)

Major soil group:	07 surface-water gley soils	Seasonally waterlogged slowly permeable soils, formed above 3 m 0.D. and prominently mottled above 40 cm depth. They have no relatively permeable material starting within and extending below 1 m of the surface.
Soil group:	1 stagnogley soils	With a distinct topsoil. They are found mainly in lowland Britain.
Soil Subgroup:	2 pelo-stagnogley soils	(clayey)
Soil Series:	Lawford series	swelling clayey drift material passing to clay or soft mudstone

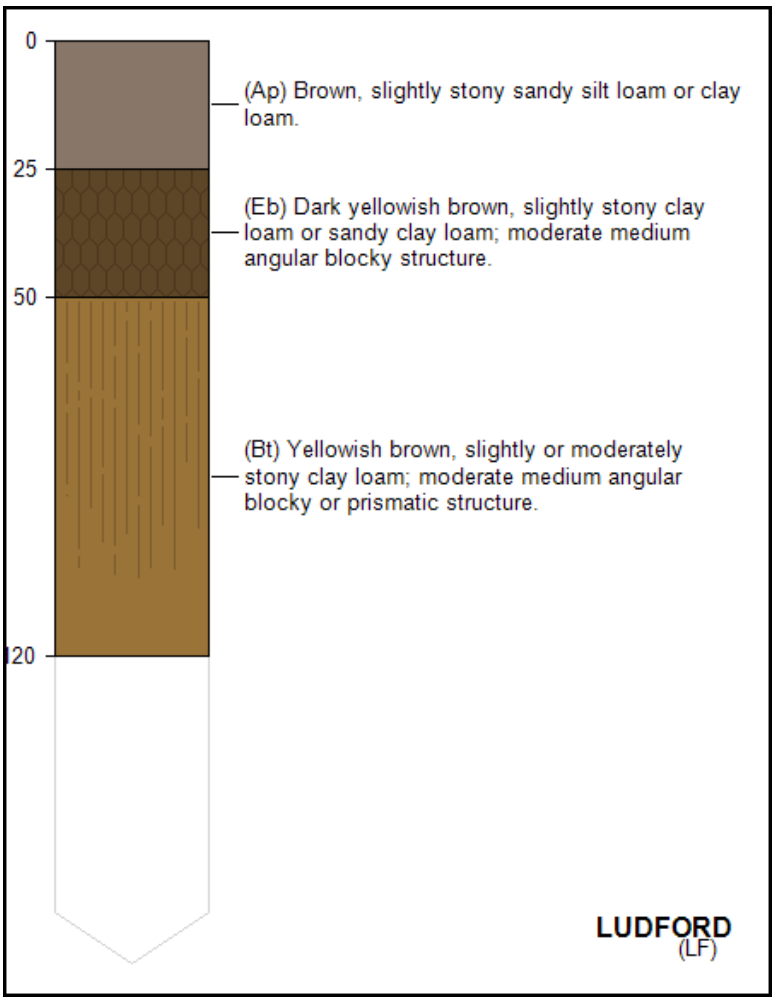
Property	Value
Depth to rock (cm)	100
Depth to gleying (cm)	25
Depth to slowly permeable layer (downward percolation) (cm)	25
Depth to slowly permeable layer (upward diffusion) (cm)	25
Integrated air capacity (IAC) (mm)	55
Standard percentage runoff (SPR) (%)	50
Base flow index (BFI) (0 to 1)	0.17
Available water (AWC) (mm)	170
Available water for grass (mm)	140
Available water for cereal (mm)	130
Available water for sugar (mm)	175
Available water for potatoes (mm)	120



5.71 LUDFORD (LF) (1138)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	7 argillic brown earths	Loamy or clayey with an ordinary clay-enriched subsoil.
Soil Subgroup:	1 typical argillic brown earths	(unmottled)
Soil Series:	Ludford series	medium loamy drift with siliceous stones

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	124
Standard percentage runoff (SPR) (%)	34
Base flow index (BFI) (0 to 1)	0.64
Available water (AWC) (mm)	150
Available water for grass (mm)	140
Available water for cereal (mm)	135
Available water for sugar (mm)	175
Available water for potatoes (mm)	110

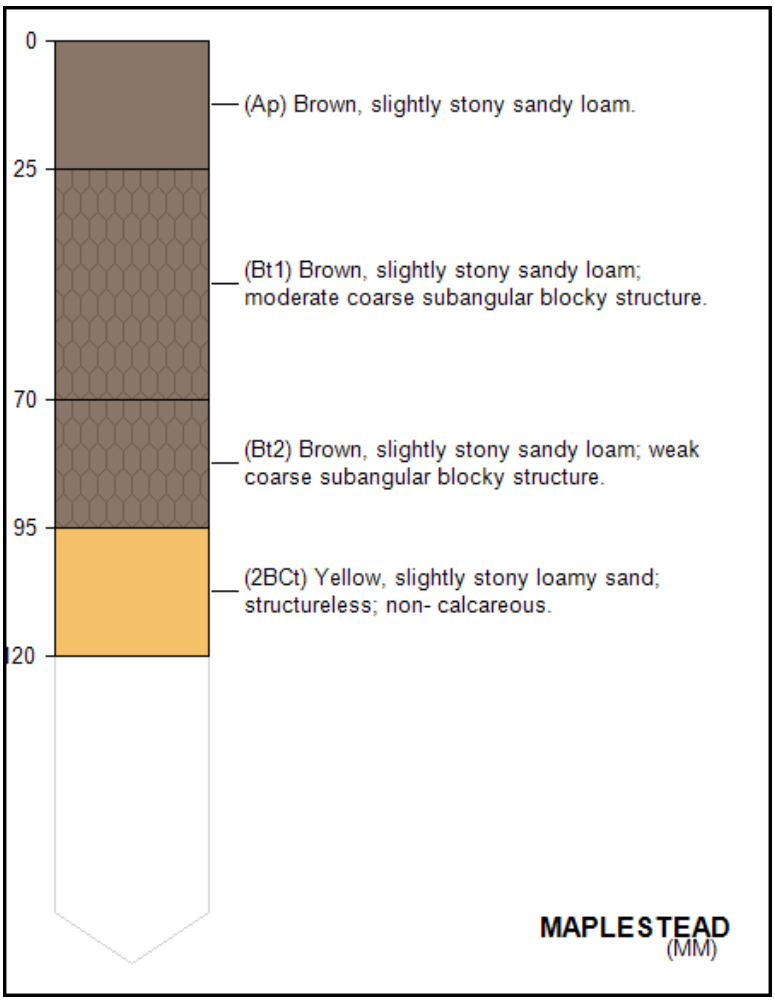


* not present within 150cm

5.71 MAPLESTEAD (MM) (1264)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	7 argillic brown earths	Loamy or clayey with an ordinary clay-enriched subsoil.
Soil Subgroup:	1 typical argillic brown earths	(unmottled)
Soil Series:	Maplestead series	light loamy drift with siliceous stones

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	132
Standard percentage runoff (SPR) (%)	12
Base flow index (BFI) (0 to 1)	0.88
Available water (AWC) (mm)	145
Available water for grass (mm)	135
Available water for cereal (mm)	140
Available water for sugar (mm)	170
Available water for potatoes (mm)	110

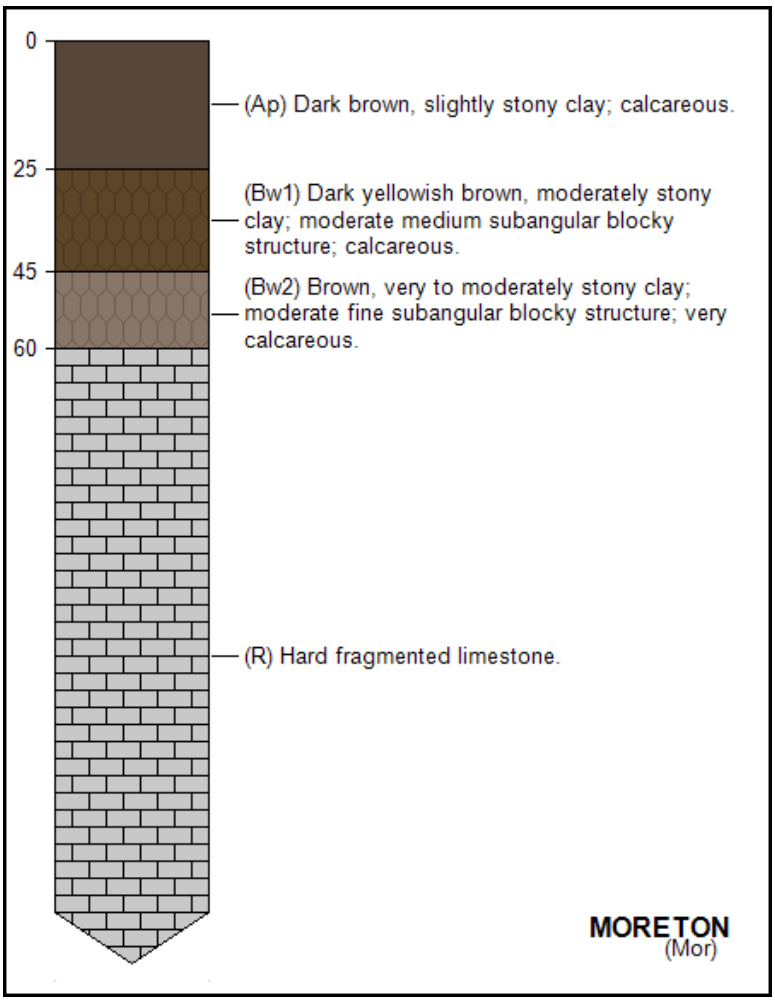


* not present within 150cm

5.11 MORETON (Mor) (1260)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	1 brown calcareous earths	Non-alluvial, with calcareous loamy or clayey subsoils without significant clay enrichment.
Soil Subgroup:	1 typical brown calcareous earths	(unmottled)
Soil Series:	Moreton series	clayey material over lithoskeletal limestone

Property	Value
Depth to rock (cm)	60
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	175
Standard percentage runoff (SPR) (%)	2
Base flow index (BFI) (0 to 1)	0.98
Available water (AWC) (mm)	95
Available water for grass (mm)	95
Available water for cereal (mm)	95
Available water for sugar (mm)	95
Available water for potatoes (mm)	95

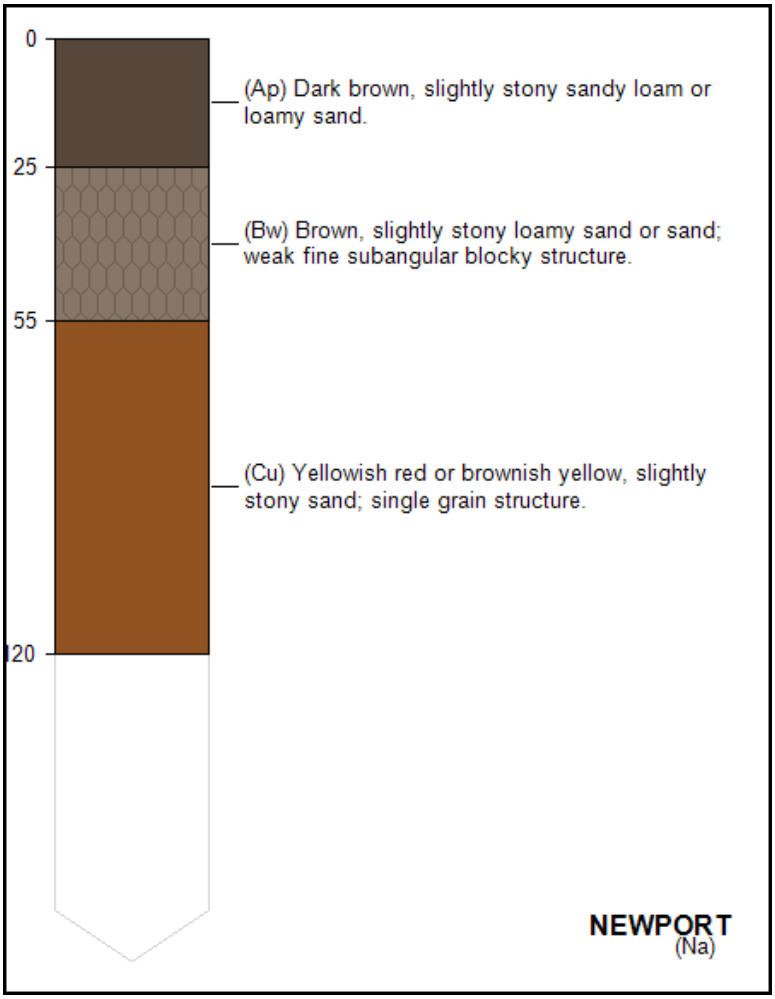


* not present within 150cm

5.51 NEWPORT (Na) (1310)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	5 brown sands	Non-calcareous sandy or sandy gravelly.
Soil Subgroup:	1 typical brown sands	(unmottled with no clay-enriched subsoil)
Soil Series:	Newport series	sandy drift with siliceous stones

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	256
Standard percentage runoff (SPR) (%)	12
Base flow index (BFI) (0 to 1)	0.88
Available water (AWC) (mm)	95
Available water for grass (mm)	85
Available water for cereal (mm)	95
Available water for sugar (mm)	110
Available water for potatoes (mm)	70

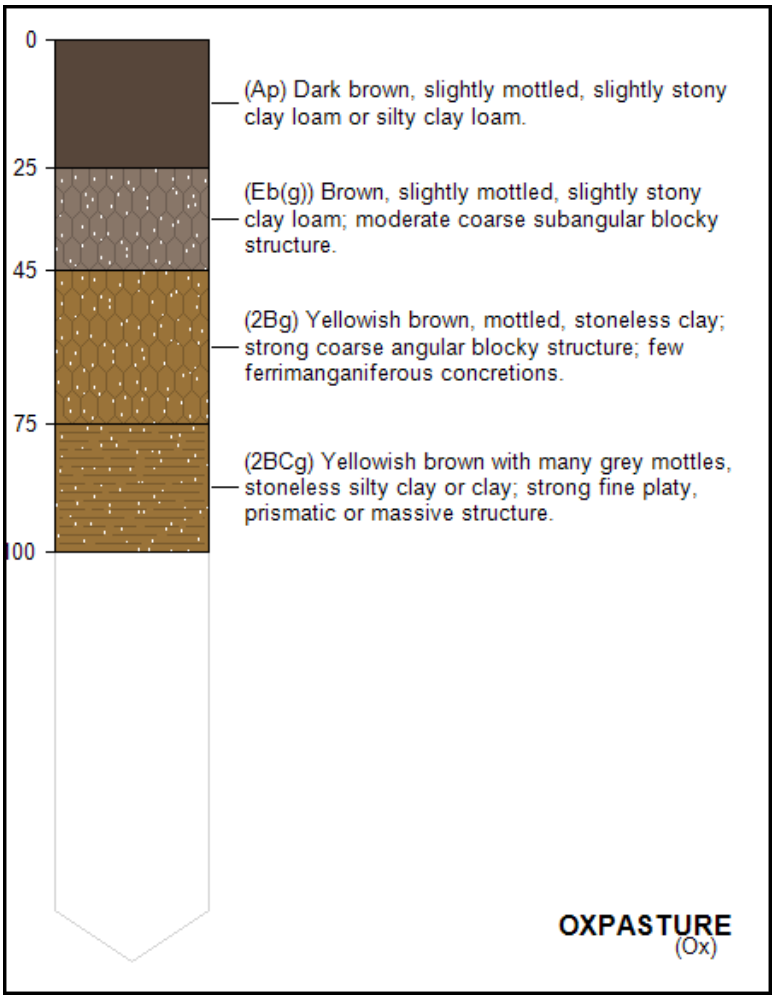


* not present within 150cm

5.72 OXPASTURE (Ox) (1412)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	7 argillic brown earths	Loamy or clayey with an ordinary clay-enriched subsoil.
Soil Subgroup:	2 stagnogleyic argillic brown earths	(faintly mottled with slowly permeable subsoil)
Soil Series:	Oxpasture series	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone

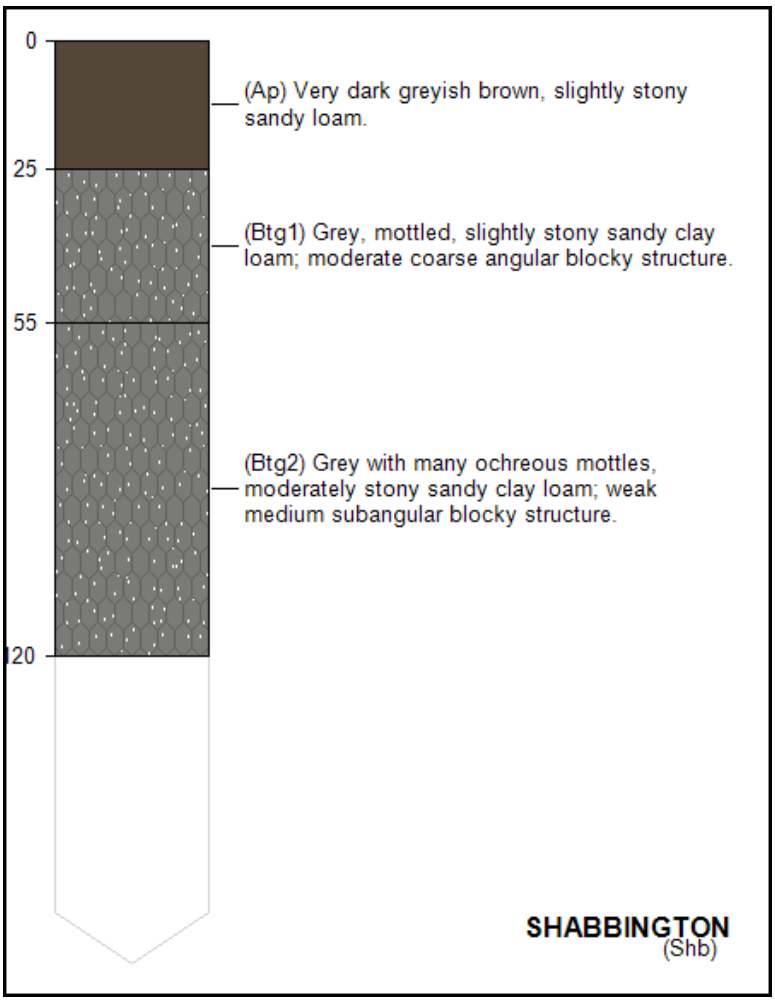
Property	Value
Depth to rock (cm)	100
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	43
Depth to slowly permeable layer (upward diffusion) (cm)	43
Integrated air capacity (IAC) (mm)	80
Standard percentage runoff (SPR) (%)	47
Base flow index (BFI) (0 to 1)	0.52
Available water (AWC) (mm)	145
Available water for grass (mm)	130
Available water for cereal (mm)	130
Available water for sugar (mm)	165
Available water for potatoes (mm)	105



8.41 SHABBINGTON (Shb) (1882)

Major soil group:	08 ground-water gley soils	Seasonally waterlogged soils affected by a shallow fluctuating groundwater-table. They are developed mainly within or over permeable material and have prominently mottled or greyish coloured horizons within 40 cm depth Most occupy low-lying or depressional sites.
Soil group:	4 argillic gley soils	With a distinct topsoil and a clay-enriched subsoil.
Soil Subgroup:	1 typical argillic gley soils	(with loamy topsoil)
Soil Series:	Shabbington series	medium loamy drift with siliceous stones

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	30
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	115
Standard percentage runoff (SPR) (%)	25
Base flow index (BFI) (0 to 1)	0.73
Available water (AWC) (mm)	135
Available water for grass (mm)	130
Available water for cereal (mm)	135
Available water for sugar (mm)	170
Available water for potatoes (mm)	100

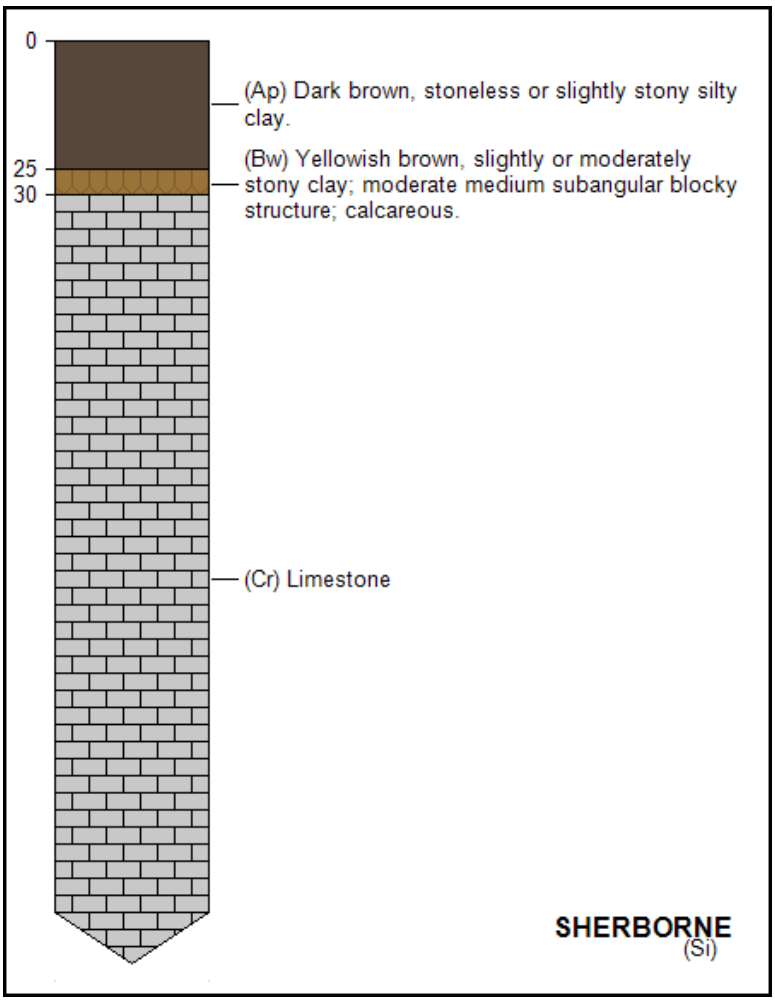


* not present within 150cm

3.43 SHERBORNE (Si) (1819)

Major soil group:	03 lithomorphic soils	Shallow, with a distinct, humose or peaty topsoil, but no subsurface horizons more than 5 cm thick (other than a bleached horizon). Normally over bedrock, very stony rock rubble or little altered soft unconsolidated deposits within 30 cm depth.
Soil group:	4 rendzinas	Calcareous, over chalk, or extremely calcareous rock rubble or soft unconsolidated deposits.
Soil Subgroup:	3 brown rendzinas	(with brownish distinct topsoil that is not extremely calcareous)
Soil Series:	Sherborne series	clayey lithoskeletal limestone

Property	Value
Depth to rock (cm)	25
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	177
Standard percentage runoff (SPR) (%)	2
Base flow index (BFI) (0 to 1)	0.98
Available water (AWC) (mm)	80
Available water for grass (mm)	80
Available water for cereal (mm)	75
Available water for sugar (mm)	80
Available water for potatoes (mm)	80

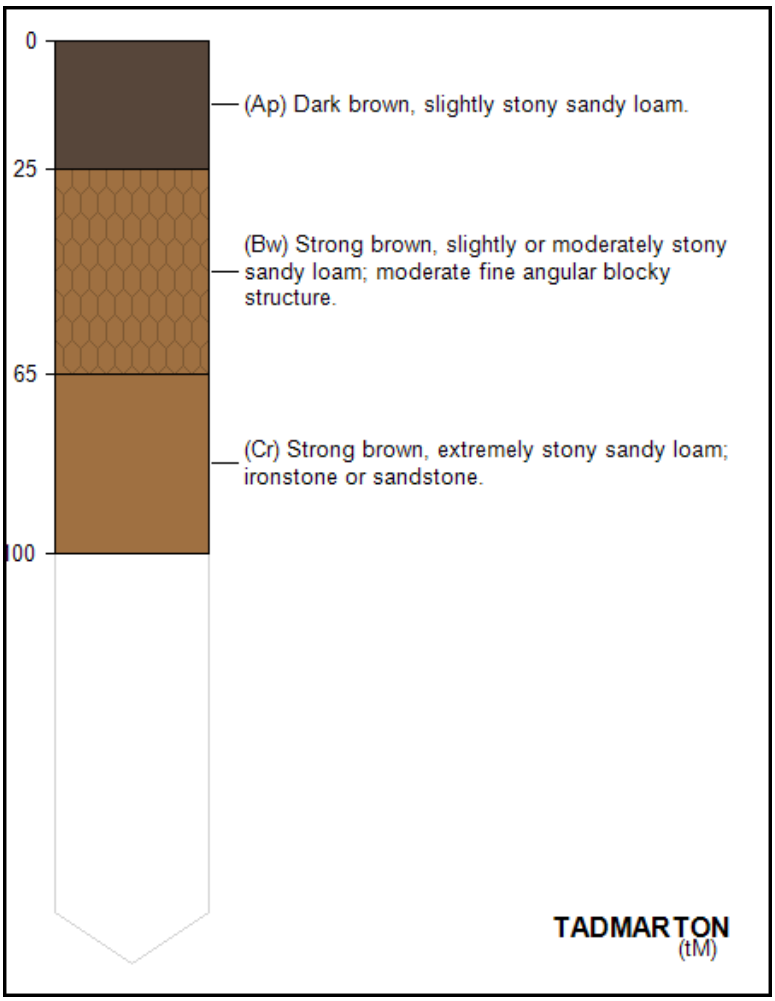


* not present within 150cm

5.44 TADMARTON (tM) (1900)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	4 brown earths	Non-alluvial, with non-calcareous loamy or clayey subsoils without significant clay enrichment.
Soil Subgroup:	4 ferritic brown earths	(unmottled with bright ochreous iron-rich subsoil)
Soil Series:	Tadmarton series	ferruginous light loamy material over lithoskeletal ironstone

Property	Value
Depth to rock (cm)	70
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	174
Standard percentage runoff (SPR) (%)	2
Base flow index (BFI) (0 to 1)	0.98
Available water (AWC) (mm)	115
Available water for grass (mm)	115
Available water for cereal (mm)	110
Available water for sugar (mm)	115
Available water for potatoes (mm)	100

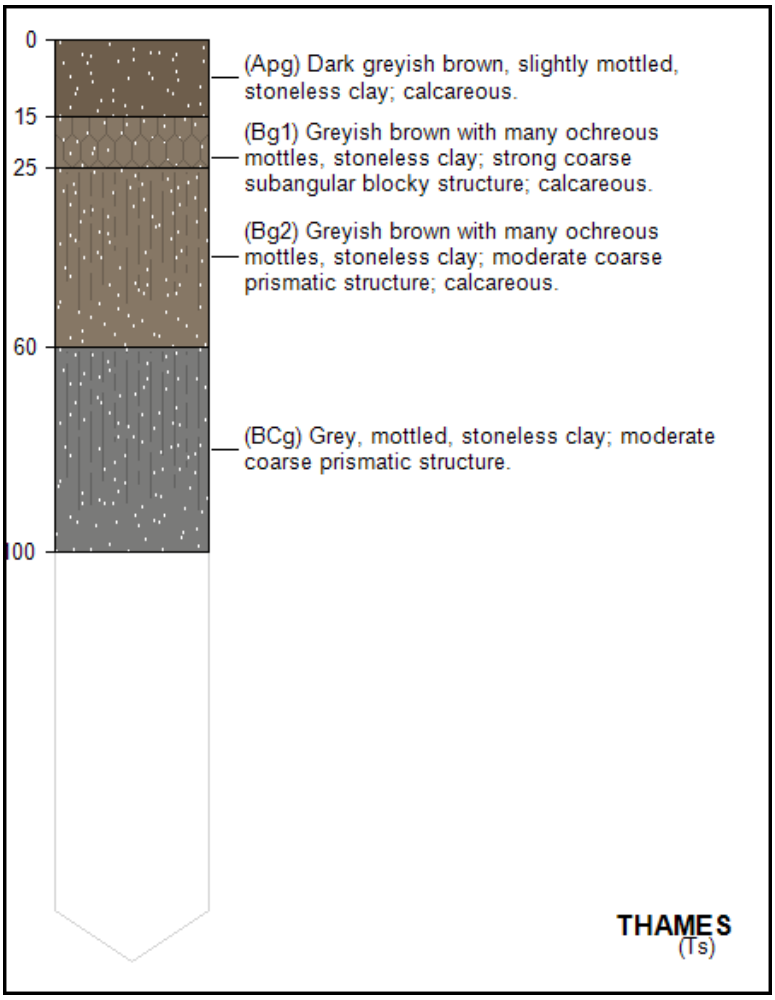


* not present within 150cm

8.14 THAMES (Ts) (1911)

Major soil group:	08 ground-water gley soils	Seasonally waterlogged soils affected by a shallow fluctuating groundwater-table. They are developed mainly within or over permeable material and have prominently mottled or greyish coloured horizons within 40 cm depth Most occupy low-lying or depressional sites.
Soil group:	1 alluvial gley soils	With distinct topsoil, in loamy or clayey recent alluvium more than 30 cm thick.
Soil Subgroup:	4 pelo-calcareous alluvial gley soils	(clayey with calcareous subsoil)
Soil Series:	Thames series	clayey river alluvium

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	15
Depth to slowly permeable layer (downward percolation) (cm)	34
Depth to slowly permeable layer (upward diffusion) (cm)	34
Integrated air capacity (IAC) (mm)	71
Standard percentage runoff (SPR) (%)	25
Base flow index (BFI) (0 to 1)	0.73
Available water (AWC) (mm)	175
Available water for grass (mm)	150
Available water for cereal (mm)	155
Available water for sugar (mm)	200
Available water for potatoes (mm)	120

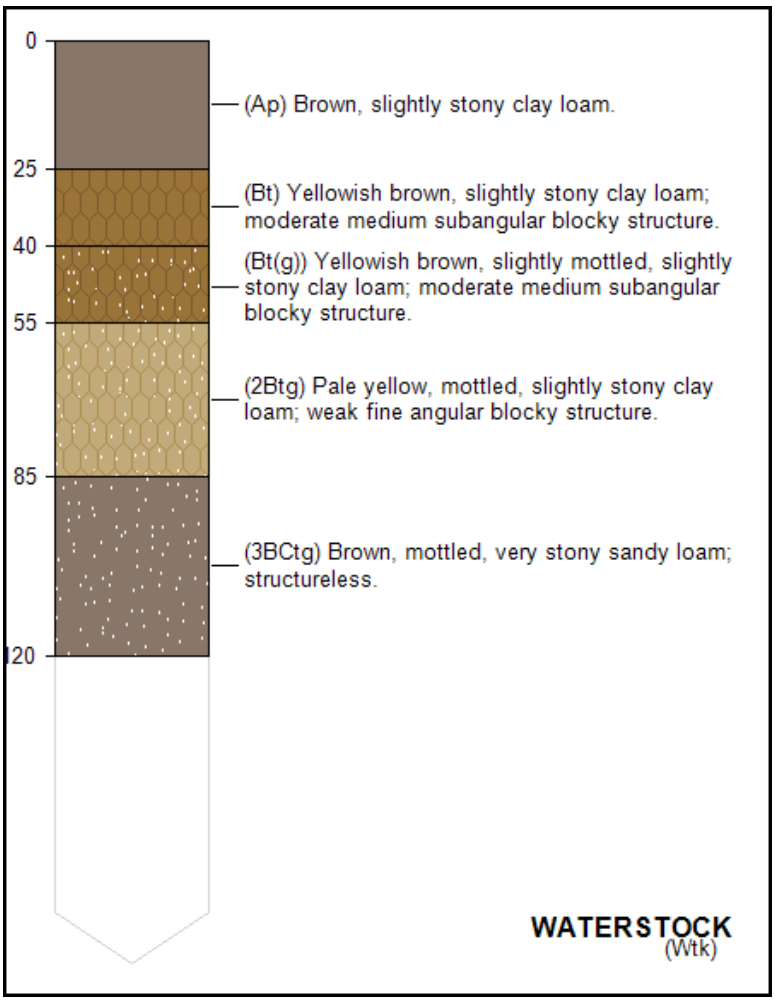


* not present within 150cm

5.73 WATERSTOCK (Wtk) (2280)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	7 argillic brown earths	Loamy or clayey with an ordinary clay-enriched subsoil.
Soil Subgroup:	3 gleyic argillic brown earths	(faintly mottled with permeable subsoil)
Soil Series:	Waterstock series	medium loamy drift with siliceous stones

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	115
Standard percentage runoff (SPR) (%)	30
Base flow index (BFI) (0 to 1)	0.56
Available water (AWC) (mm)	145
Available water for grass (mm)	125
Available water for cereal (mm)	130
Available water for sugar (mm)	150
Available water for potatoes (mm)	105

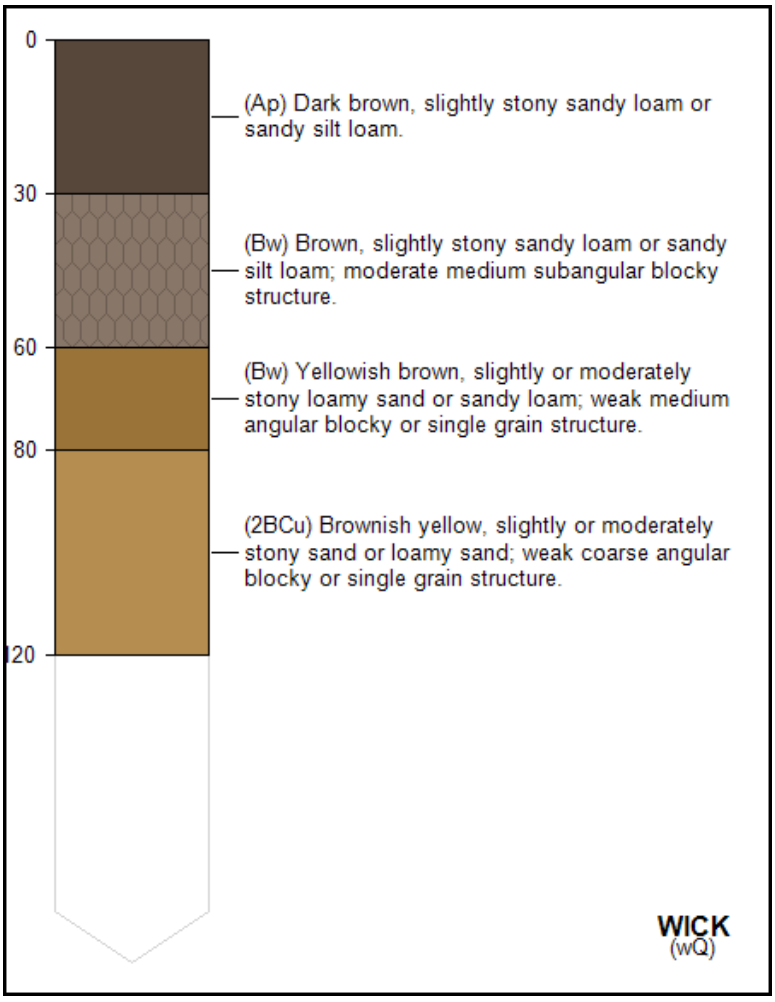


* not present within 150cm

5.41 WICK (wQ) (2225)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	4 brown earths	Non-alluvial, with non-calcareous loamy or clayey subsoils without significant clay enrichment.
Soil Subgroup:	1 typical brown earths	(unmottled)
Soil Series:	Wick series	light loamy drift with siliceous stones

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	n/a*
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	206
Standard percentage runoff (SPR) (%)	12
Base flow index (BFI) (0 to 1)	0.88
Available water (AWC) (mm)	140
Available water for grass (mm)	130
Available water for cereal (mm)	140
Available water for sugar (mm)	165
Available water for potatoes (mm)	100

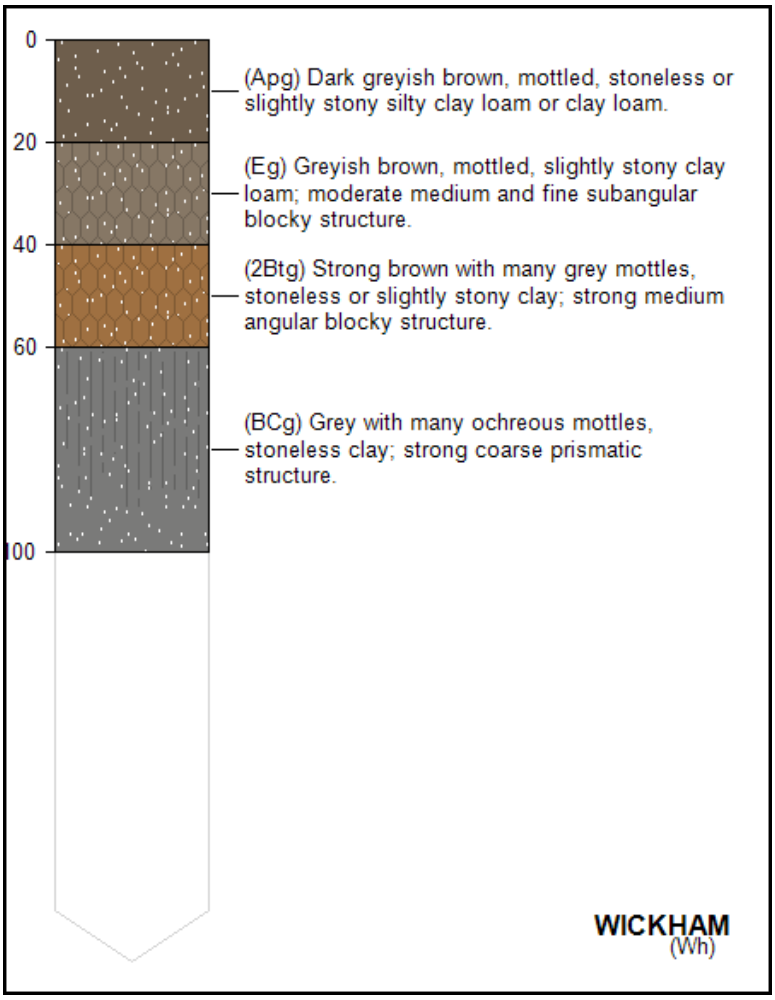


* not present within 150cm

7.11 WICKHAM (Wh) (2227)

Major soil group:	07 surface-water gley soils	Seasonally waterlogged slowly permeable soils, formed above 3 m 0.D. and prominently mottled above 40 cm depth. They have no relatively permeable material starting within and extending below 1 m of the surface.
Soil group:	1 stagnogley soils	With a distinct topsoil. They are found mainly in lowland Britain.
Soil Subgroup:	1 typical stagnogley soils	(with ordinary clay enriched subsoil)
Soil Series:	Wickham series	medium loamy or medium silty drift over clayey material passing to clay or soft mudstone

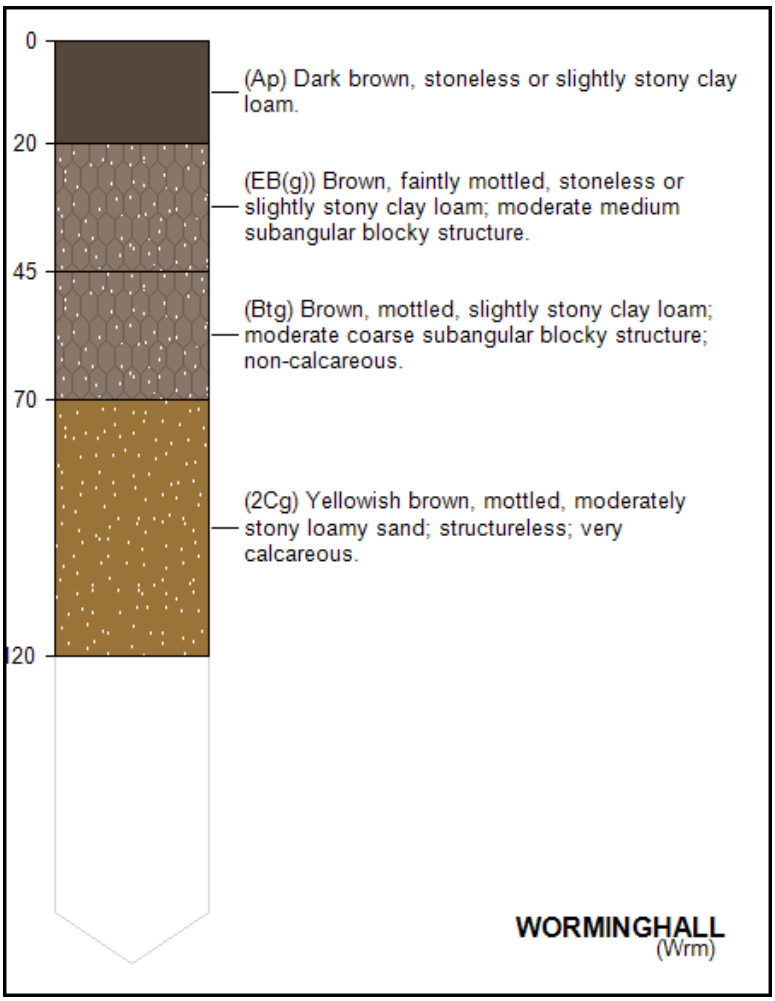
Property	Value
Depth to rock (cm)	100
Depth to gleying (cm)	25
Depth to slowly permeable layer (downward percolation) (cm)	38
Depth to slowly permeable layer (upward diffusion) (cm)	38
Integrated air capacity (IAC) (mm)	69
Standard percentage runoff (SPR) (%)	50
Base flow index (BFI) (0 to 1)	0.17
Available water (AWC) (mm)	145
Available water for grass (mm)	130
Available water for cereal (mm)	130
Available water for sugar (mm)	165
Available water for potatoes (mm)	105



5.73 WORMINGHALL (Wrm) (2283)

Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	7 argillic brown earths	Loamy or clayey with an ordinary clay-enriched subsoil.
Soil Subgroup:	3 gleyic argillic brown earths	(faintly mottled with permeable subsoil)
Soil Series:	Worminghall series	medium loamy over sandy drift with siliceous stones

Property	Value
Depth to rock (cm)	n/a*
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	n/a*
Depth to slowly permeable layer (upward diffusion) (cm)	n/a*
Integrated air capacity (IAC) (mm)	130
Standard percentage runoff (SPR) (%)	21
Base flow index (BFI) (0 to 1)	0.79
Available water (AWC) (mm)	145
Available water for grass (mm)	125
Available water for cereal (mm)	130
Available water for sugar (mm)	150
Available water for potatoes (mm)	105

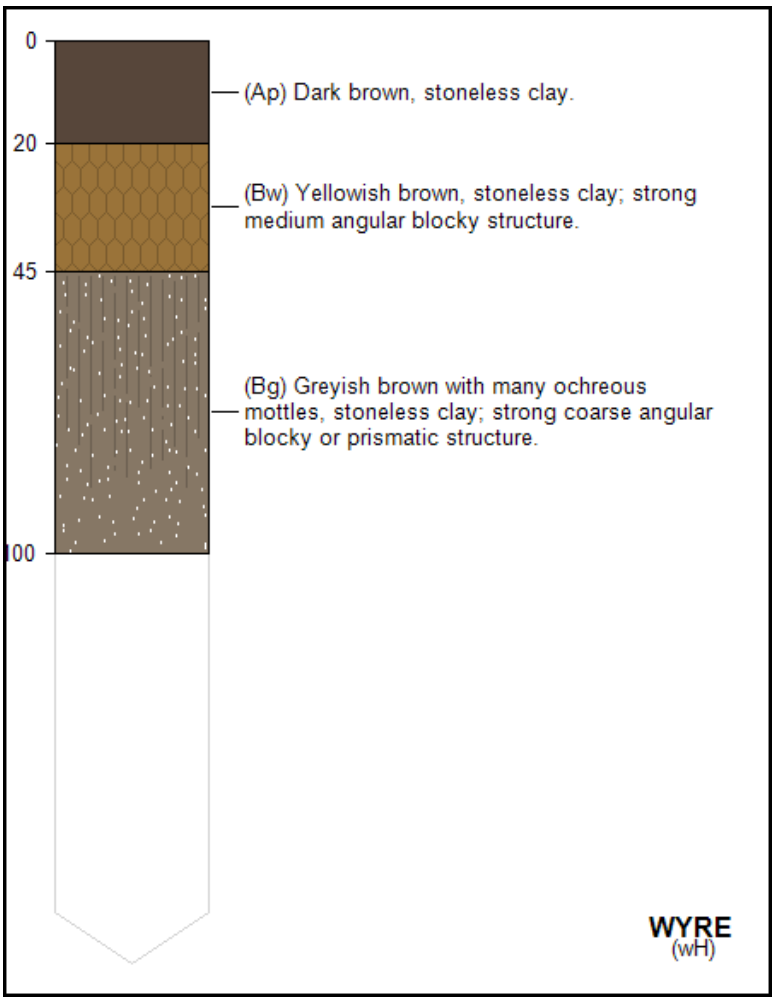


* not present within 150cm

5.63 WYRE (wH) (2253)

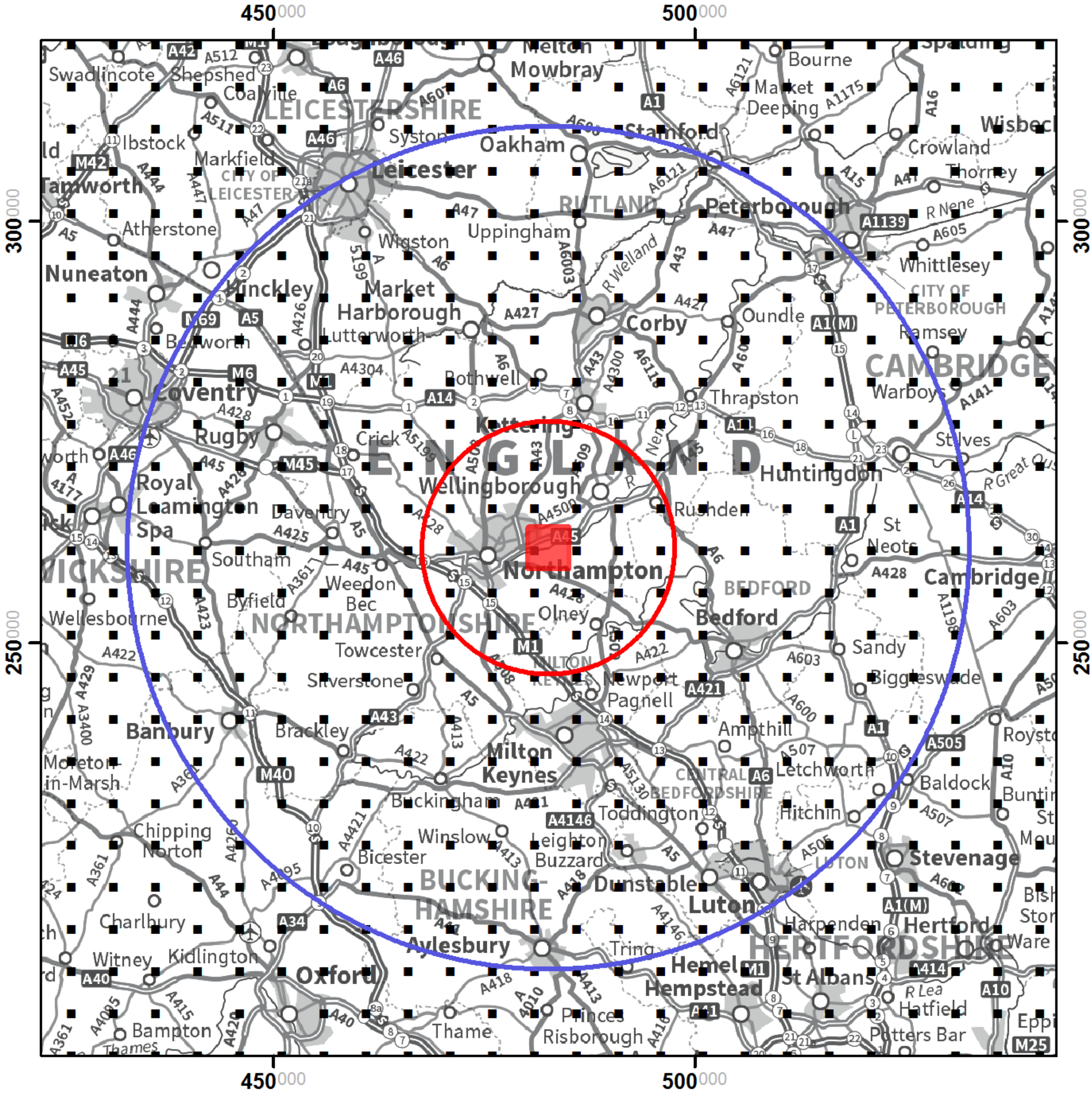
Major soil group:	05 brown soils	With dominantly brownish or reddish subsoils and no prominent mottling or greyish colours (gleying) above 40 cm depth. They are developed mainly on permeable materials at elevations below about 300 m.0.D. Most are in agricultural use.
Soil group:	6 brown alluvial soils	In non-calcareous loamy or clayey alluvium more than 30 cm thick.
Soil Subgroup:	3 pelogleyic brown alluvial soils	(faintly mottled and clayey with slowly permeable subsoil)
Soil Series:	Wyre series	clayey river alluvium

Property	**Value**
Depth to rock (cm)	n/a*
Depth to gleying (cm)	60
Depth to slowly permeable layer (downward percolation) (cm)	35
Depth to slowly permeable layer (upward diffusion) (cm)	35
Integrated air capacity (IAC) (mm)	90
Standard percentage runoff (SPR) (%)	30
Base flow index (BFI) (0 to 1)	0.56
Available water (AWC) (mm)	160
Available water for grass (mm)	145
Available water for cereal (mm)	150
Available water for sugar (mm)	185
Available water for potatoes (mm)	115



* not present within 150cm

4. Topsoil Element Background Levels



Topsoil Element Background Levels Key

- Report area
- 15 km radius - local area
- 50 km radius - regional area
- NSI sample points

TOPSOIL ELEMENT BACKGROUND LEVELS DESCRIPTION

The National Soil Inventory (NSI) covers England and Wales on a 5 km grid and provides detailed information for each intersect of the grid. Collectively NSI data are statistically representative of England and Wales soils. The original sampling was undertaken around 1980 and there were partial resamplings in the mid-1990s. The most up-to-date data is presented here.

Analysis of the NSI samples provides detailed measurements of over 20 elements from the soils, in addition to pH. This data is summarised over three areas to provide you with an understanding of how your site, and your data for it, sits within the local, regional and national context.

Where available, the soil element levels are compared with the Soil Guideline Values and where a soil sample we have analysed has been found in excess of the SGV guidelines for "residential with plant uptake" land, this is displayed in red in the tables which follow.

SGV levels are provided for the following elements: lead, selenium, nickel, mercury, chromium, cadmium and arsenic.

In the following pages, a number of analyses of the topsoil are provided. The majority of analyses have been performed on the full compliment of sample points, however, in some areas, for some elements, only a few samples were analysed as part of subsequent programmes. In order to present the full suite of possible datasets, and accurately convey the validity of the data, the number of actual measured samples is stated for each analysis. Care should be taken where the number of samples is disproportionately low.

a. Analysis Within a 15km Radius (26 Sample Points)

ANALYSES	SAMPLES	MEAN	MIN	MAX	ST.DEV
pH (PH)	26	6.8	4.8	8.2	1.0
Carbon (CARBON)	26	2.9	1.3	7.0	1.4
Aluminium (AL_ACID)	26	33809.1	18770.0	60175.0	9140.1
Arsenic (AS_ACID)	20	8.4	2.8	23.2	5.7
Barium (BA_ACID)	26	130.5	68.0	437.0	76.6
Calcium (CA_ACID)	26	24530.2	1434.0	227545.0	51058.0
Cadmium (CD_ACID)	26	0.8	0.0	1.8	0.6
Cadmium (Extractable) (CD_EDTA)	26	0.2	0.1	0.5	0.1
Cobalt (CO_ACID)	26	15.0	8.1	30.0	5.5
Cobalt (Extractable) (CO_EDTA)	26	1.5	0.2	4.0	1.0
Chromium (CR_ACID)	26	69.1	33.3	221.4	41.2
Copper (CU_ACID)	26	20.2	7.9	55.3	9.4
Copper (Extractable) (CU_EDTA)	26	5.6	1.9	17.8	3.1
Flouride (F_ACID)	16	64.0	0.0	168.7	44.5
Iron (FE_ACID)	26	53360.0	9675.0	180015.0	37772.7
Mercury (HG_ACID)	12	0.1	0.0	0.4	0.1
Potassium (K_ACID)	26	5151.0	1423.0	9149.0	1890.7
Potassium (Extractable) (K_NITRATE)	26	235.9	35.0	457.0	80.5
Magnesium (MG_ACID)	26	3192.2	1162.0	5538.0	1137.4
Magnesium (Extractable) (MG_NITRATE)	26	124.1	42.0	217.0	53.5
Manganese (MN_ACID)	26	616.5	223.0	926.0	165.6
Manganese (Extractable) (MN_EDTA)	26	113.1	32.0	238.0	50.7
Molybdenum (MO_ACID)	20	0.6	0.0	3.5	0.8
Sodium (NA_ACID)	26	211.7	107.0	364.0	70.9
Nickel (NI_ACID)	26	35.3	23.0	71.3	11.9
Nickel (Extractable) (NI_EDTA)	26	2.3	0.8	4.0	0.8
Phosphorus (P_ACID)	26	1171.2	466.0	3122.0	780.4
Phosphorus (Extractable) (P_OLSEN)	26	25.3	5.0	73.0	18.7
Lead (PB_ACID)	26	42.3	20.0	127.0	25.3
Lead (Extractable) (PB_EDTA)	26	13.2	4.8	33.7	8.8
Selenium (SE_ACID)	20	0.4	0.0	0.8	0.2
Strontium (SR_ACID)	26	70.2	6.0	221.0	54.5
Vanadium (V_ACID)	20	93.1	28.3	473.1	95.0
Zinc (ZN_ACID)	26	122.8	60.0	262.0	56.7
Zinc (Extractable) (ZN_EDTA)	26	7.4	1.9	25.8	5.8

for units, see Analyses Denitions (p91)

b. Analysis Within a 50km Radius (301 Sample Points)

ANALYSES	SAMPLES	MEAN	MIN	MAX	ST.DEV
pH (PH)	298	6.9	3.4	8.7	1.0
Carbon (CARBON)	300	3.7	0.7	35.6	3.1
Aluminium (AL_ACID)	300	36449.1	8315.0	70965.0	12332.7
Arsenic (AS_ACID)	146	6.9	0.0	53.6	6.8
Barium (BA_ACID)	300	136.3	44.0	482.0	56.0
Calcium (CA_ACID)	300	19016.3	10.0	265350.0	37107.8
Cadmium (CD_ACID)	300	0.8	0.0	10.7	0.8
Cadmium (Extractable) (CD_EDTA)	299	0.5	0.1	75.0	4.4
Cobalt (CO_ACID)	300	14.0	0.7	66.6	7.1
Cobalt (Extractable) (CO_EDTA)	299	1.5	0.1	10.0	1.2
Chromium (CR_ACID)	300	62.3	0.0	837.8	60.4
Copper (CU_ACID)	300	23.0	5.0	182.4	14.6
Copper (Extractable) (CU_EDTA)	299	6.3	1.4	47.7	4.6
Flouride (F_ACID)	156	59.8	0.0	336.5	39.2
Iron (FE_ACID)	300	46088.3	9675.0	235785.0	31145.7
Mercury (HG_ACID)	122	0.1	0.0	0.6	0.1
Potassium (K_ACID)	300	5876.8	1251.0	13019.0	2275.4
Potassium (Extractable) (K_NITRATE)	298	252.5	28.0	1115.0	152.9
Magnesium (MG_ACID)	300	3792.0	698.0	15599.0	1548.9
Magnesium (Extractable) (MG_NITRATE)	298	144.7	6.0	1060.0	105.3
Manganese (MN_ACID)	300	641.8	80.0	2686.0	369.4
Manganese (Extractable) (MN_EDTA)	299	127.1	12.0	1050.0	106.4
Molybdenum (MO_ACID)	211	0.9	0.0	18.7	1.4
Sodium (NA_ACID)	300	237.0	80.0	1128.0	91.7
Nickel (NI_ACID)	300	37.4	0.0	194.6	20.5
Nickel (Extractable) (NI_EDTA)	299	2.7	0.3	73.2	4.3
Phosphorus (P_ACID)	300	1062.0	172.0	6273.0	723.3
Phosphorus (Extractable) (P_OLSEN)	298	30.4	1.0	190.0	28.9
Lead (PB_ACID)	300	44.2	0.0	444.0	42.1
Lead (Extractable) (PB_EDTA)	299	13.5	2.8	143.1	14.4
Selenium (SE_ACID)	146	0.4	0.0	1.8	0.4
Strontium (SR_ACID)	300	67.2	1.0	581.0	71.7
Vanadium (V_ACID)	211	75.6	5.0	473.1	60.6
Zinc (ZN_ACID)	300	110.4	0.0	434.0	55.1
Zinc (Extractable) (ZN_EDTA)	299	7.7	1.3	108.7	9.7

for units, see Analyses Denitions (p91)

c. National Analysis (5686 Sample Points)

ANALYSES	SAMPLES	MEAN	MIN	MAX	ST.DEV
pH (PH)	5630	6.0	3.1	9.2	1.3
Carbon (CARBON)	5672	6.1	0.1	61.5	8.9
Aluminium (AL_ACID)	5677	26775.3	491.0	79355.0	12772.2
Arsenic (AS_ACID)	2729	4.6	0.0	110.0	5.7
Barium (BA_ACID)	5677	150.0	7.0	3840.0	159.5
Calcium (CA_ACID)	5677	13768.7	0.0	339630.0	37785.0
Cadmium (CD_ACID)	5677	0.7	0.0	40.9	1.0
Cadmium (Extractable) (CD_EDTA)	5655	0.5	0.0	85.0	3.0
Cobalt (CO_ACID)	5677	10.6	0.0	567.0	13.7
Cobalt (Extractable) (CO_EDTA)	5655	1.1	0.0	26.5	1.2
Chromium (CR_ACID)	5677	38.9	0.0	2339.8	43.7
Copper (CU_ACID)	5677	22.6	0.0	1507.7	36.8
Copper (Extractable) (CU_EDTA)	5655	6.4	0.3	431.4	11.1
Flouride (F_ACID)	3320	58.5	0.0	6307.9	186.2
Iron (FE_ACID)	5677	28147.8	395.0	264405.0	16510.5
Mercury (HG_ACID)	2159	0.1	0.0	2.4	0.2
Potassium (K_ACID)	5677	4727.7	60.0	23905.0	2700.2
Potassium (Extractable) (K_NITRATE)	5609	182.0	6.0	2776.0	151.6
Magnesium (MG_ACID)	5677	3648.1	0.0	62690.0	3284.1
Magnesium (Extractable) (MG_NITRATE)	5609	146.0	1.0	1601.0	147.5
Manganese (MN_ACID)	5677	777.0	3.0	42603.0	1068.8
Manganese (Extractable) (MN_EDTA)	5654	159.4	0.0	3108.0	188.6
Molybdenum (MO_ACID)	4417	0.9	0.0	56.3	2.0
Sodium (NA_ACID)	5677	323.3	17.0	25152.0	572.3
Nickel (NI_ACID)	5677	25.4	0.0	1350.2	29.2
Nickel (Extractable) (NI_EDTA)	5655	1.6	0.1	73.2	2.0
Phosphorus (P_ACID)	5677	792.1	41.0	6273.0	433.9
Phosphorus (Extractable) (P_OLSEN)	5604	27.4	0.0	534.0	25.5
Lead (PB_ACID)	5677	73.3	0.0	17365.0	280.6
Lead (Extractable) (PB_EDTA)	5655	27.8	1.2	6056.5	119.7
Selenium (SE_ACID)	2729	0.6	0.0	22.8	0.8
Strontium (SR_ACID)	5677	42.3	0.0	1445.0	67.8
Vanadium (V_ACID)	4428	41.0	0.0	854.4	33.9
Zinc (ZN_ACID)	5677	90.2	0.0	3648.0	104.4
Zinc (Extractable) (ZN_EDTA)	5655	9.6	0.5	712.0	24.6

for units, see Analyses Denitions (p91)

SOIL GUIDELINE VALUES (SGV)

Defra and the Environment Agency have produced soil guideline values (SGVs) as an aid to preliminary assessment of potential risk to human health from land that may be contaminated. SGVs represent 'intervention values', which, if exceeded, act as indicators of potential unacceptable risk to humans, so that more detailed risk assessment is needed.

The SGVs were derived using the Contaminated Land Exposure Assessment (CLEA) model for four land uses:

1. residential (with plant uptake / vegetable growing)
2. residential (without vegetable growing)
3. allotments
4. commercial / industrial

SGVs are only designed to indicate whether further site-specific investigation is needed. Where a soil guideline value is exceeded, it does not mean that there is necessarily a chronic or acute risk to human health.

The values presented in this report represent those from a number of sample points (given in the "Samples" column in each table) providing local, regional and national background levels. Figures which appear in red indicate that a bulked sample from 20m surrounding a sample point, has at a past date, exceeded the SGV for the 'residential with plant uptake' land use.

It is always advisable to perform site specific investigations.

More details on all the SGVs can be found on the Environment Agency Website.

All units are mg/kg which is equivalent to parts per million (ppm)

SUBSTANCE	RESIDENTIAL WITH PLANT UPTAKE	RESIDENTIAL WITHOUT PLANT UPTAKE	ALLOTMENTS	COMMERCIAL /INDUSTRIAL
LEAD	450	450	450	750
SELENIUM	35	260	35	8000
NICKEL	50	75	50	5000
MERCURY	8	15	8	450
CHROMIUM	130	200	130	5000
CADMIUM (pH 6)	1	30	1	1400
CADMIUM (pH 7)	2	30	2	1400
CADMIUM (pH 8)	8	30	8	1400
ARSENIC	20	20	20	500

ANALYSES DEFINITIONS

PH (pH)
pH of soil measure after shaking 10ml of soil for 15 minutes with 25ml of water

CARBON (Carbon)
Organic Carbon (% by wt) measured either by loss-on-ignition for soils estimated to contain more than about 20% organic carbon or by dichromate digestion.

AL_ACID (Aluminium)
Total Aluminium concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

AS_ACID (Arsenic)
Total Arsenic concentration (mg/kg) determined by Hydride Atomic Absorption Spectrometry (AAS), extracted into hydrochloric acid after digestion with nitric acid and ashing with magnesium nitrate

BA_ACID (Barium)
Total Barium concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

CA_ACID (Calcium)
Total Calcium concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

CD_ACID (Cadmium)
Total Cadmium concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

CD_EDTA (Cadmium Extractable)
Extractable Cadmium concentration (mg/l) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) after shaking 10ml of soil with 50ml of 0.05M EDTA at pH 7.0 for 1h at 20 deg. C and then filtering

CO_ACID (Cobalt)
Total Cobalt concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

CO_EDTA (Cobalt Extractable)
Extractable Cobalt concentration (mg/l) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) after shaking 10ml of soil with 50ml of 0.05M EDTA at pH 7.0 for 1h at 20 deg. C and then filtering

CR_ACID (Chromium)
Total Chromium concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

CU_ACID (Copper)
Total Copper concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

CU_EDTA (Copper Extractable)
Extractable Copper concentration (mg/l) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) after shaking 10ml of soil with 50ml of 0.05M EDTA at pH 7.0 for 1h at 20 deg. C and then filtering

ANALYSES DEFINITIONS continued

F_ACID (Flouride)
Flouride extracted with 1mol / l sulphuric acid and determined by Ion Selective Electrode (ISE)

FE_ACID (Iron)
Total Iron concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

HG_ACID (Mercury)
Total Mercury concentration (mg/kg) determined by Hydride Atomic Absorption Spectrometry (AAS), digested in a nitric/sulphuric acid mixture

K_ACID (Potassium)
Total Potassium concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

K_NITRATE (Potassium Extractable)
Extractable Potassium concentration (mg/l) determined by shaking 10ml of air dry soil with 50ml of 1.0M ammonium nitrate for 30mins, filtering and then measuring the concentration by flame photometry

MG_ACID (Magnesium)
Total Magnesium concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

MG_NITRATE (Magnesium Extractable)
Extractable Magnesium concentration (mg/l) determined by shaking 10ml of air dry soil with 50ml of 1.0M ammonium nitrate for 30mins, filtering and then measuring the concentration by flame photometry

MN_ACID (Manganese)
Total Manganese concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

MN_EDTA (Manganese Extractable)
Extractable Manganese concentration (mg/l) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) after shaking 10ml of soil with 50ml of 0.05M EDTA at pH 7.0 for 1h at 20 deg. C and then filtering

MO_ACID (Molybdenum)
Total Molybdenum concentration (mg/kg) determined by Atomic Adsorption Spectrometyr (AAS) in an aqua regia digest

MO_EDTA (Molybdenum Extractable)
Extractable Molybdenum concentration (mg/l) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) after shaking 10ml of soil with 50ml of 0.05M EDTA at pH 7.0 for 1h at 20 deg. C and then filtering

NA_ACID (Sodium)
Total Sodium concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

NI_ACID (Nickel)
Total Nickel concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

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NI_EDTA (Nickel Extractable)
Extractable Nickel concentration (mg/l) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) after shaking 10ml of soil with 50ml of 0.05M EDTA at pH 7.0 for 1h at 20 deg. C and then filtering

P_ACID (Phosphorus)
Total Phosphorus concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

P_OLSON (Phosphorous Extractable)
Extractable Phosphorus concentration (mg/l) determined by shaking 5ml of air dry soil with 100ml of 0.5M sodium bicarbonate for 30mins at 20 deg.C, filtering and then measuring the absorbance at 880 nm colorimetrically with acid ammonium molybdate solution

PB_ACID (Lead)
Total Lead concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

PB_EDTA (Lead Extractable)
Extractable Lead concentration (mg/l) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) after shaking 10ml of soil with 50ml of 0.05M EDTA at pH 7.0 for 1h at 20 deg. C and then filtering

SE_ACID (Selenium)
Total Selenium concentration (mg/kg) determined by Hydride Atomic Absorption Spectrometry (AAS), extracted into hydrochloric acid after digestion with nitric acid and ashing with magnesium nitrate

SR_ACID (Strontium)
Total Strontium concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

V_ACID (Vanadium)
Total Vanadium concentration (mg/kg) determined by Atomic Adsorption Spectrometyr (AAS) in an aqua regia digest

ZN_ACID (Zinc)
Total Zinc concentration (mg/kg) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) in an aqua regia digest

ZN_EDTA (Zinc Extractable)
Extractable Zinc concentration (mg/l) determined by Inductively Coupled Plasma Emission Spectrometry (ICP) after shaking 10ml of soil with 50ml of 0.05M EDTA at pH 7.0 for 1h at 20 deg. C and then filtering

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The GIS data used in the creation of this report is available to lease for use in projects.
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