GeoEssex
Promoting the geology and landscape of Essex

Uttlesford District Council
Report on Local Geological Sites

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Cover photographs:

Top: Road sign at Stansted Mountfitchet indicating the former existence of a nearby chalk pit and lime kiln. *Photo: G. Lucy*

Middle: Limefields Chalk Pit on the Little Walden Road, Saffron Walden. *Photo: G. Lucy*

Bottom: The Leper Stone, Newport. *Photo: M. Ralph*

1. Introduction

The rocks beneath the Essex landscape are a record of the county's prehistory. They provide evidence for ancient rivers, volcanoes, deserts, glaciers and deep seas. Some rocks also contain remarkable fossils, from subtropical sharks and crocodiles to Ice Age hippos and mammoths. The geology of Essex is a story that stretches back over 100 million years.

GeoEssex

GeoEssex is the primary source of information about the geology and physical landscape of Essex. The GeoEssex team, or 'Steering Group', consists of professional and amateur geologists, representatives from local authorities, geological and natural history societies, and from Natural England, the Government's nature conservation body.

GeoEssex promotes geology in all its aspects, from quarries, cliffs and boulders to spas, springs and building stones. The fascinating and often magical world of geology is all around us, if only we know where to look.

A primary task of GeoEssex is to identify the best places in Essex to find out about the Earth's distant past and the landscape processes going on today. These sites are called Local Geological Sites, or LoGS (formerly called Regionally Important Geological Sites or RIGS).

GeoEssex aims to advocate and represent geodiversity in planning processes and other initiatives.

A magnificent example of a Jurassic ammonite found in the boulder clay (also known as glacial till) near Saffron Walden and now on display in Saffron Walden Museum.

It was brought to Essex by the Anglian ice sheet some 450,000 years ago.

Whole specimens like this are very rare, but pieces of ammonites, and the bullet-shaped fossils known as belemnites, can be commonly found in local fields.

Photo: G. Lucy

Geodiversity

What is geodiversity and why is it important?

Geodiversity is an integral part of the natural environment. It is the variety of rocks, fossils, minerals, landforms and soil, and all the natural processes that shape the landscape.

The only record of the history of our planet lies in the rocks beneath our feet. Here, and only here, can we trace the cycles of change that have shaped the Earth in the past, and that will continue to do so in the future. This is particularly true in Essex, where the record of climate change during the Ice Age is preserved in our quarries and coastal cliffs. The record is unique and much of it is surprisingly fragile.

Apart from the obvious benefits of providing mineral resources such as sand, gravel, chalk and clay, the diversity of the geology is what shapes the landscape, influencing soils and, in turn, influencing all of our habitats and species. Geodiversity also has a cultural role to play, influencing the character of our built environment through building stones, providing inspiration to art, and helping to define where we live and our 'sense of place'. It is the link between geology, landscape, nature and people.

Local and national Geodiversity Action Plans

The UK Geodiversity Action Plan (UKGAP) sets out a shared framework for geodiversity action across the UK. It establishes a common aim, themes and targets which link national, regional and local activities. It encompasses how geodiversity can inspire people and what needs to happen to conserve Britain's geodiversity. The Plan for Essex has been drawn up within this framework.

The Local Geodiversity Action Plan (LGAP) for Essex sets out a framework for geodiversity action. It is an essential document to conserve the County's geodiversity.

The Essex Local Geodiversity Action Plan aims to:

- *Identify, conserve and enhance the best sites that represent the geological history of an area in a scientific, educational, recreational and cultural setting;*
- *Promote geological sites and make geoconservation relevant to people;*
- *Provide a local geodiversity audit (an audit of sites and skills);*
- *Influence local planning policy.*

2. The Geology of Essex

Compared to most other parts of Britain the rocks of Essex and adjoining counties are young in geological terms. Even the oldest surface rock in Essex (the Chalk) is only about 80 million years old. Much older rocks are, however, present at depth. We have some idea about these ancient rocks because of the records of boreholes that have been sunk in search of coal and oil.

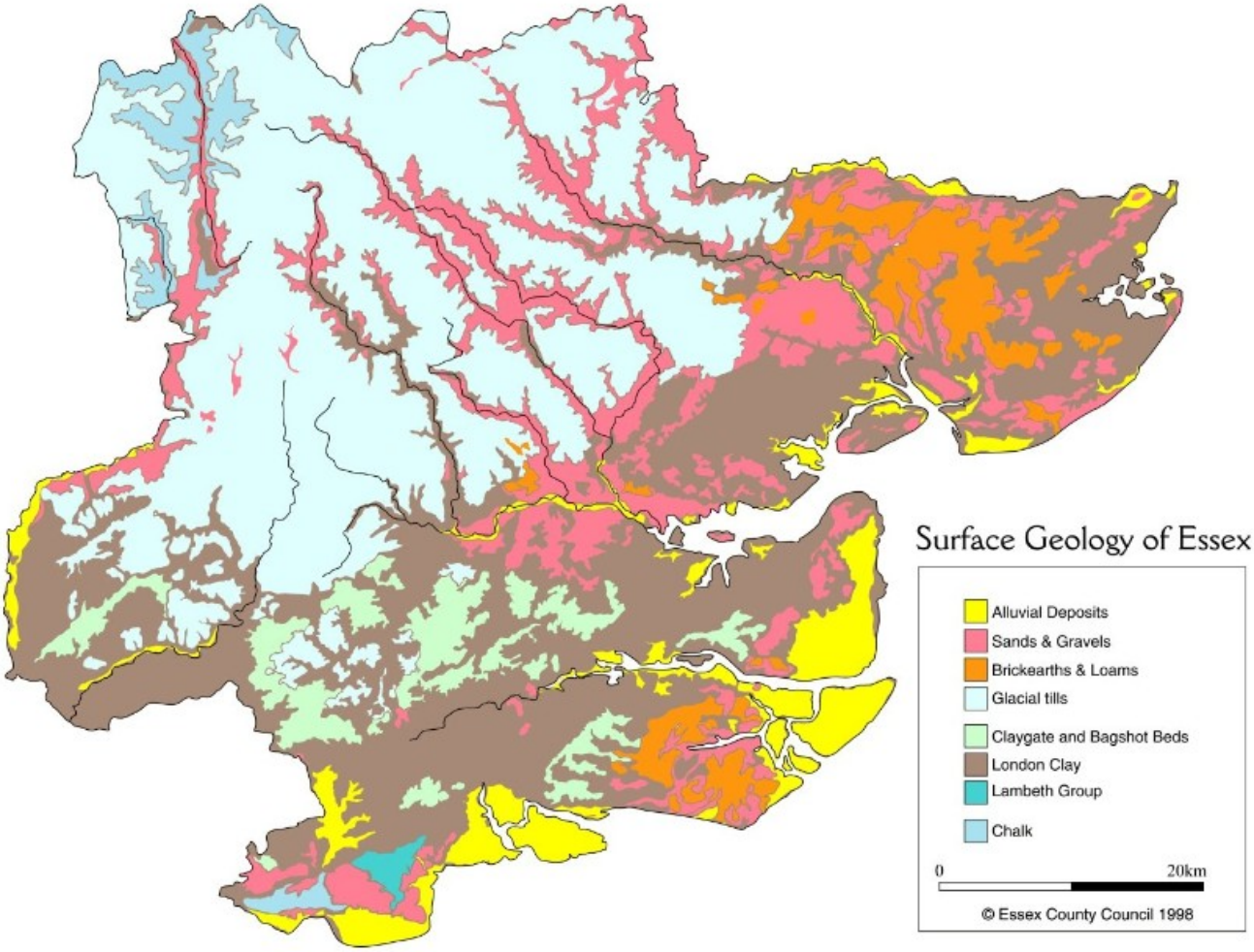
The surface rocks of Essex that were formed before the Ice Age (from the Chalk to the Red Crag) are described as the 'bedrock' or 'solid' geology. Much of this bedrock geology is concealed beneath the deposits left behind by glaciers and rivers during the Ice Age. The material laid down during the Ice Age is known as 'Superficial' or 'drift' deposits.

Era	Period or Epoch		Approx. age in millions of years	Geological formations in Essex
Caenozoic	Quaternary Ice Age	Holocene	0.01	Recent peat and alluvium
		Pleistocene	0.45	River terrace deposits and brickearth (loess)
				Boulder clay (till) and glacial gravel
			1	Kesgrave (Thames) sands and gravels
				Norwich Crag (Chillesford Sand)
			2.4	Red Crag
	Pliocene		10	*No evidence of rocks of this age in Essex but derived Miocene and Pliocene fossils are found in the Red Crag*
	Miocene			
	Oligocene		20	
	Eocene		50	Bagshot Sand
				Claygate Beds
				London Clay (includes the Harwich Formation)
	Palaeocene		55	Lambeth Group (Woolwich and Reading Beds)
				Thanet Sand
Mesozoic	Cretaceous		80	Chalk
			100	Gault and Upper Greensand (Beneath Essex)
	Jurassic		150	*No evidence of rocks of these ages beneath Essex with the exception of Jurassic Oxford Clay in a graben (a sunken part of the crust bordered by faults) beneath East Tilbury.*
	Triassic		220	
Palaeozoic	Permian		250	
	Carboniferous		300	
	Devonian		400	Shales and mudstones dating from these periods occur at depth (about 300 meters) beneath Essex
	Silurian		420	
	Ordovician		450	*No evidence beneath Essex, however, boreholes have not been drilled deep enough to confirm.*
	Cambrian		500	
Pre-Cambrian	Precambrian		Age of Earth 4,600	

Geological Map of Essex

Geological map of Essex showing all the rocks exposed at the surface - bedrock and superficial deposits. An example of a superficial deposit is boulder clay or glacial till left behind by the Anglian Ice Sheet during the Ice Age (shown in pale blue).

Map based on published maps with the permission of the British Geological Survey



Essex through geological time

It is difficult to know where to begin with our geological story but the earliest evidence we have is the hard rocks deep beneath Essex that were formed some 400 million years ago in the Silurian and Devonian periods (part of the Palaeozoic era) and form what is known as the 'Palaeozoic basement' of Essex.

Deserts to Dinosaurs

- For a very long time (and before the age of the dinosaurs) these hard Silurian and Devonian rocks formed the surface of the land that was eventually to become Essex. During the Permian and Triassic periods Essex was a desert upland in the middle of a vast continent known as Pangea.
- By 200 million years ago, at the start of the Jurassic period, tropical seas had spread around this land forming a dinosaur-infested, forested island.

Buried Island

- If you could dig down 1000 feet (300 metres) under Essex you would reach the hard rocks of that dinosaur island.
- All trace of forests and animals from this time have been swept away from the eroded surface of the island, so there are no dinosaur fossils in Essex.
- By 100 million years ago, in the Cretaceous period, the sea flooded across the island to spread **Gault** Clay and **Greensand**. The sea then deepened to deposit hundreds of metres of soft white limestone known as **Chalk** all over the island as well as much of what is now Britain.

Pebbles and Clay

- The North Atlantic Ocean, which did not previously exist, began to open out to the west, the land of Essex lifted, chalk hills were worn down and flints were eroded out. Billions of these flints were tumbled on beaches to form layers of sand and beautifully-rounded pebbles across our area.
- Around 50 million years ago, in the Eocene period, a deep sea fed by muddy rivers spread across what is now Essex and London depositing a great thickness of clay known as **London Clay** on the sea floor, together with the remains of many plants such as palms and cinnamon, and animals including birds, sharks, turtles, and tiny horses. Atlantic volcanoes poured their ash into this sea.

The Alps and the Thames

- Colliding continents pushed up south and mid-Essex, bending the crust to form the vale of the Thames river system through mid-Essex. About 2.4 million years ago offshore sandbanks formed red shelly sandstone layers across north Essex known as the **Red Crag**.
- Global cooling led to the Ice Age (the Pleistocene epoch), with many warm periods such as the one we are in right now, which is known as the Holocene. As the sea retreated, the ancestral River Thames spread a succession of flint-rich river gravels across the middle of Essex, through Harlow, Chelmsford and Colchester, and out across the area where the North Sea is now.

Ice and people cover Essex

- During an exceptionally cold stage 450,000 years ago a gigantic ice sheet covered most of Britain and Essex as far south as Hornchurch. The moving ice diverted the Thames towards its present-day course and dumped its load of boulder clay, or glacial till, on top of these old Thames gravels.
- During the past million years of the Ice Age, there have been numerous cold and warm stages and humans have migrated to and from Essex, together with the animals they have hunted. They have left thousands of flint tools and tool-making debris on the banks of the ever-changing Thames and its tributaries. Thus, in south Essex we have the best geo-environmental and archaeological record in Europe of the last half a million years.

3. Background to Geological Site designation in Uttlesford

What is special about Essex Geodiversity?

Essex is an area of predominantly subdued relief with gentle slopes, the result of its underlying geology of soft, relatively young rocks. These generally yield fertile soils. The result is an attractive 'lived in' landscape dominated by arable agriculture, but still retaining forested and heathland areas, particularly where gravels and sands, many of glacial and fluvial origin, have yielded poorer soils.

Although lacking the more dramatic geology and landforms of many 'hard rock' areas, Essex geology and geomorphology is still of great interest, possessing abundant evidence of the huge environmental and biodiversity changes that our area has witnessed over the last 100 million years. Among the key themes are dramatic and sometimes long-lasting changes in the distribution of land and sea, major shifts in climate, and mass species extinctions. Many of these phenomena are of great relevance today, and so an understanding of our past is essential in interpreting the challenges to come.

Geodiversity's influence on Essex's development

Essex's geodiversity has exerted a major influence on land use, agriculture and landscape.

The distribution of less fertile ancient river and glacial gravels has been a major influence on historical land use, resulting in the preservation through to the present day of extensive tracts of woodland and to a lesser extent heathland, in a predominantly arable county. These are of great significance both for biodiversity and recreation.

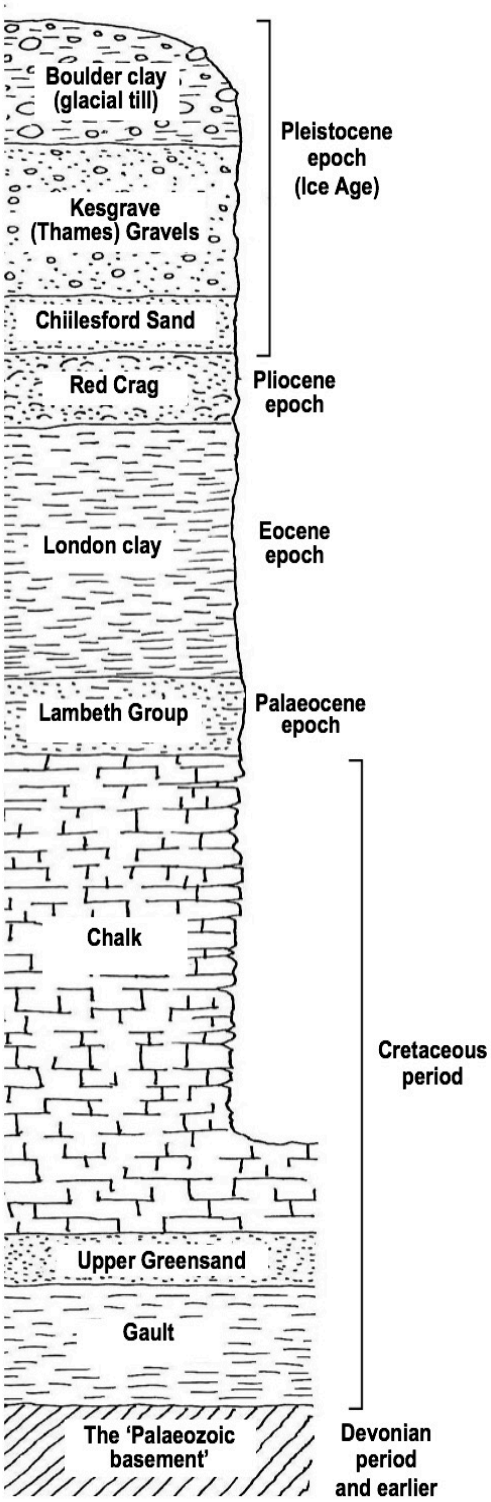
The chalky boulder clay, or glacial till, found north and west of Chelmsford is highly suitable for cereal cultivation, especially wheat. London Clay outcrops south of Chelmsford, providing soils less suitable for arable agriculture and more suited to pasture. The brickearth of the Tendring district is the basis of the rich agricultural land of this peninsula.

In earlier times rivers penetrating deep inland, together with proximity to the Continent, provided a succession of invaders and colonisers – from Palaeolithic peoples, through to Roman, Viking and Saxon - with easy access.

Chalk for the manufacture of Portland cement and clay for brick-making has brought wealth and employment to south Essex, and the deposits of the ancestral Thames and its tributaries have provided Essex with a source of gravel and sand for construction since Roman times. A special kind of gravel naturally cemented by iron called ferricrete was used extensively as a building stone and is found in many medieval churches.

The geology of Uttlesford district

Below is an imaginary cliff (not to scale) showing Uttlesford's rocks in the order in which they were deposited, but not all of them are present everywhere in the district.



The oldest rock formation at the surface is the **Chalk** which underlies the whole of Essex. At least 300 metres of chalk forms the Chiltern Hills and their continuation as the hills of north west Essex. The Chalk was laid down as a limy mud on the floor of a tropical sea during the age of the dinosaurs and is between 80 and 100 million years old. The sea was teeming with life such as fish, sponges, corals, sea urchins and giant marine reptiles. The smallest creatures were microscopic marine algae; in fact the Chalk is almost entirely made up of their tiny shells. A notable feature of the Chalk is the layers of hard, black flint nodules that occur at regular intervals throughout the Upper Chalk. At the base of the Chalk is the **Upper Greensand** and **Gault** which is exposed at the surface in Cambridgeshire. At greater depth is what is known as the '**Palaeozoic basement**' consisting of ancient, hard slates around 400 million years old.

Above the Chalk is a formation known as the **Lambeth Group**, which consists of estuarine sands and clays (the Woolwich, Reading and Thanet Beds) present at the surface in a band across Uttlesford separating Chalk in the north from the London Clay in the south. These rocks are, however mostly buried by the much younger boulder clay which blankets the whole area (see below). Above the Lambeth Group is the **London Clay** which dates from a time when Essex was covered by a subtropical sea. It contains numerous fossils such as sharks teeth. The lower part of the London Clay also contains seams of volcanic ash probably from volcanoes in Scotland that were active at this time.

The London Clay is succeeded by the sands of the **Red Crag** which were laid down in a shallow sea about 2 million years ago just before the Ice Age.

The Ice Age is represented by the **Norwich Crag (Chillesford Sand)** followed by the **Kesgrave Sands and Gravels**, laid down by the Thames when it flowed across central Essex. During the coldest period of the Ice Age the Anglian ice sheet spread south into Essex, blocking the early Thames and laying down **boulder clay** or **till**, which is our youngest and most recent geological formation.

The Ice Age in Uttlesford

The geological processes that created the world are still happening and rocks are still being formed. We live in a warm spell (an interglacial) in a complex cycle of climate change called the Ice Age. Sooner or later the world will again be plunged into another cold period (a glaciation), when most of the northern hemisphere will again be in the grip of ice. The Ice Age has so far witnessed a dozen or more of these warm phases, or interglacials, of 10,000-20,000 years duration interspersed with cold periods, or glaciations, each lasting about 80,000 years. But before the world is gripped by another glaciation it is likely to get much warmer, caused by human-induced (anthropogenic) global warming.

The Ice Age started around two million years ago when the world's climate, which had been slowly cooling for tens of millions of years, flipped into an unstable state. The oldest Ice Age deposit in Essex was laid down in a shallow sea and is known as the **Chillesford Sand** which occurs at the base of gravel pits in Uttlesford and adjoining areas. The next is the **Kesgrave Sands and Gravels** which were laid down by an early River Thames when it was a much larger river and flowed north of London, through central Essex, Suffolk and Norfolk. This lasted until about 450,000 years ago when the great Anglian ice sheet spread south into the region diverting the Thames to its present course. These old Thames gravels are present between Stansted and Dunmow and contain 'erratic' pebbles from as far away as North Wales and even Cornwall. They also contain large sarsen stones and boulders of Hertfordshire puddingstone.

On top of the Thames gravels is a great thickness of **boulder clay**, or glacial till, left behind by the ice sheet and forming a distinct plateau over much of Uttlesford. Boulder clay contains various glacial erratics, which include fine fossils such as Jurassic ammonites brought to Essex from the Midlands by the ice. Colossal volumes of melt water were continually released from the ice sheet and in north Essex, steep-sided valleys were cut into the chalk bedrock beneath the ice. These buried 'tunnel valleys' are now completely filled with sand and gravel and hidden by a covering of boulder clay. In Newport one of these buried valleys passes beneath your feet and is some 100 metres deep, almost half of this depth being below present sea level. Various modern rivers have bench-like terraces of river gravel and clay (alluvium) on either side of their valleys that often contain spectacular fossils from the Ice Age such as mammoth and woolly rhinoceros.

Typical chalky boulder clay or glacial till.

Boulder clay contains rocks brought south by the ice sheet and known as glacial erratics. Numerous fragments and pebbles of chalk can be seen in this picture, plus a small sarsen stone.

Photo: G. Lucy

Sarsens and puddingstones

Named after its resemblance to a plum pudding, Hertfordshire puddingstone is a remarkable rock for several reasons. It is a type of rock called a conglomerate, made up of well-rounded flint pebbles, up to 5 centimetres in diameter, bound together in a hard, quartz 'cement', or matrix. It is easily distinguished from concrete by the extreme hardness of the matrix. What makes Hertfordshire puddingstone special is that it is homogeneous - the pebbles and the enclosing matrix are the same hardness - therefore when a piece is broken the plane of fracture passes through, rather than around, the pebbles. This is very significant and means that it is an unbelievably tough rock.

Hertfordshire puddingstone has the same origin as sarsen stones, in fact sarsens have been described as puddingstone without the pebbles. They are both extremely hard rocks originating in or close to Essex and known collectively by geologists as silcretes, which simply means that they are cemented by silica (quartz).

The sand and pebbles that make up sarsens and puddingstone were originally flint nodules, which were stripped from the Chalk by millions of years of erosion and pounded together on beaches that have long since vanished. These ancient rounded beach pebbles were then laid down as pebble seams of the Lambeth Group about 55 million years ago and later raised above sea level. Around this time the climate of Essex was very warm - probably similar to the present-day climate in the Kalahari Desert - and water containing dissolved silica was drawn to the surface. The sand and pebble beds became cemented by silica (in the form of quartz) to form these tough sandstones and conglomerates.

The fine boulder of Hertfordshire puddingstone in Ugley Green.

Photo: G. Lucy

Geodiversity and National Planning Policy

The importance of geodiversity as an integral part of nature conservation and the planning system is reflected in The National Planning Policy Framework (NPPF), and in legislation – Wildlife & Countryside Act 1981 and Countryside and Rights of Way Act 2000.

The NPPF states that:

> (1) "the planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, geological conservation interests and soils" (Paragraph 109);
>
> (2) "local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged" (Paragraph 113); and
>
> (3) "to minimise impacts on biodiversity and geodiversity, planning policies should aim to prevent harm to geological conservation interests" (Paragraph 117).

Site designations

The most important geodiversity sites have been declared as **Sites of Special Scientific Interest** (SSSIs) which are statutorily protected for their scientific importance (there is only one geological SSSI in the Uttlesford district).

The next tier of geodiversity sites are known as **Local Geological Sites** (LoGS) These have replaced the earlier 'Regionally Important Geological Sites' (RIGS) terminology in line with government guidance.

Local Geological Sites (LoGS) are broadly equivalent to Local Wildlife Sites ('LoWS') but have a broader remit as they can be designated for their scientific, educational, historical and recreational benefits. Typical Essex LoGS include quarries, pits, walls, boulders, cliffs, springs, and river meanders. Local Wildlife Sites and Local Geological Sites are both designed to provide a system of locally-valued, non-statutory sites.

Most importantly, the NPPF gives Local Geological Sites a weighting equal to Local Wildlife Sites, and both are collectively referred to as 'Local Sites'. However, in actuality the attention and priority afforded to the designation and management of LoGS has historically lagged, and continues to lag well behind that of LoWS.

4. Objectives of current report

Supporting Local Planning Authorities

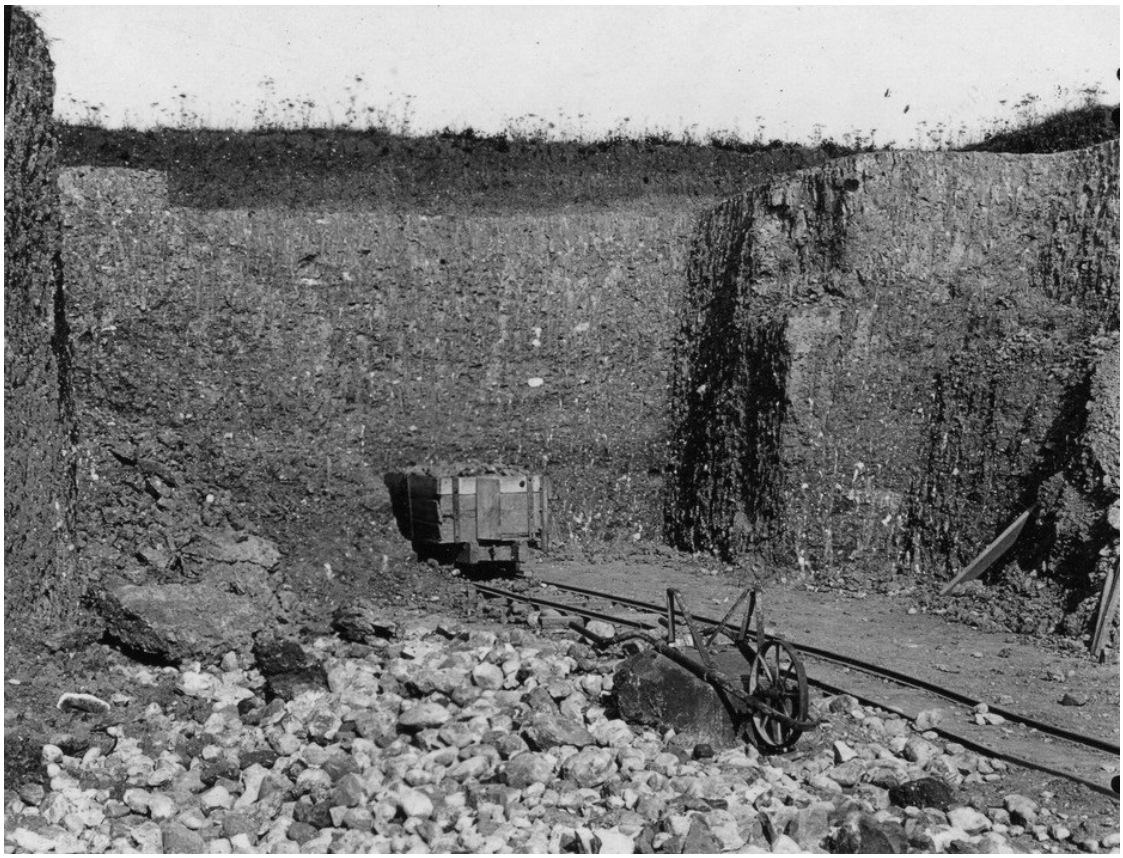
Biodiversity protection is familiar to planning authorities but geodiversity less so. This report will assist planning authorities in meeting their obligations under the National Policy Planning Framework and helping them identify potential development impacts on LoGS.

GeoEssex is therefore seeking to help Local Planning Authorities fulfil their responsibilities with respect to geodiversity.

> "*Local and neighbourhood plans and planning decisions have the potential to affect biodiversity or geodiversity outside as well as inside designated areas of importance for biodiversity or geodiversity"* (extract from: www.gov.uk/guidance/natural-environment)

Further guidance on statutory obligations is given in Circular 06/2005 (*Biodiversity and Geological Conservation*). Geodiversity should be therefore included alongside biodiversity in local authorities' Local Plans. Identifying these non-statutory sites therefore helps local authorities to meet their obligations.

LoGS can also contribute to *sustainability* programmes by providing information about a key element of the environment that contributes to our natural heritage. In addition, the *awareness raising* and *education* function fits well with the principle of community involvement and enabling people to regain their sense of place.



Above. Chalky boulder clay in the former Saffron Walden Cement Works clay pit near Sewards End. Littering the floor of the pit are glacial 'erratics' which are boulders and fossils transported by the ice sheet. The pit was linked to the cement works on the Thaxted Road by a tramway which is now a bridleway. The photograph was taken in 1911. This pit has unfortunately been infilled. Had a section been retained it would have been of significant geological and historical interest today. *Photo © Geologists' Association (Carrick Archive)*

5. Site selection

Site selection and notification to planning authorities

LoGS in Essex are identified by **GeoEssex**, a largely voluntary group composed of representatives from the major Essex geological and conservation bodies and supported by the Essex Field Club, Essex Wildlife Trust, Natural England and Essex County Council (Place Services). The site selection process is based on clearly defined criteria (see below) and includes scientific, educational, historical and aesthetic values. When selecting sites GeoEssex aims to gain the support of landowners whenever possible. The majority of LoGS are on private land and site selection does not infer any right of access.

Like LoWS, proposed LoGS are presented to the Local Sites Partnership (chaired by Essex Wildlife Trust) for endorsement and then passed to local authorities for inclusion in their Local Plans. Local authorities receive a citation and boundary map.

The sites selected as LoGS in the Uttlesford district are summarised below, together with a list of other sites which are potential LoGS. Other sites may be identified in the future, occasioned by housing or other development and restoration following mineral extraction.

Site protection

Like their biodiversity counterparts, LoGS have no statutory protection and the conservation and management of individual sites relies heavily on the support of landowners. Inclusion within local plans also forms a vital role in the protection of LoGS. An example of a comprehensive natural environment policy incorporating geodiversity can be provided on request.

It is recommended that the Local Sites Partnership (c/o Essex Wildlife Trust) should be consulted if any development is proposed that would affect a LoGS.

Site Assessment Criteria

The assessment criteria used for identifying LoGS are based on DEFRA document *Local Sites: Guidance on their identification, selection and site management* (2006). The guidance states that assessment is a matter of judgement but must be based on an understanding of geological principles and processes, and the distribution and abundance of the resource (national, regional and local). Those sites selected must be 'of substantive importance to the geodiversity of the local area'.

There are four value categories: scientific, educational, historical and aesthetic. A site qualifies for notification as a Local Geological Site if it fulfils the criteria under one or more of these categories. Each site is also given a site assessment score. This score is not a measure of the site's value or importance but a relative assessment of the usefulness of the site in promoting geodiversity.

Land Ownership Notification

Where the landowner is identified as a public body e.g. a local authority, Forestry Commission etc., notification is by letter to that authority. For sites under private ownership, where the landowner can be identified, they will be informed by letter.

6. Additional Sources of Information

Scientific literature

If a LoGS has been referred to in the scientific literature these references are of given in the LoGS citation. If a site has been referred to in the scientific literature this means that the site is of historical interest and some of these sites will have potential for research.

Site interpretation

If a site is accessible or simply visible to the general public, it is the aim of GeoEssex to provide interpretive information where possible and practical. This could be in the form of interpretive boards or leaflets. Such interpretation will be with the cooperation of landowners and other interested parties.

Other organisations

GeoEssex www.geoessex.org.uk
Background geological information for Essex, together with a selection of sites in each district (SSSIs and public accessible sites) can be found on the GeoEssex website

Essex Field Club www.essexfieldclub.org.uk
The Essex Field Club, founded in 1880, exists to promote the study of the county's natural history, and geology. The club has a centre for Biodiversity and Geodiversity in Wat Tyler Country Park at Pitsea, near Basildon, with extensive collections. It is open to the public most weekends. Their website provides comprehensive data on a large number of wildlife and geological sites which can be searched in a number of ways. Details of several hundred geological sites across Essex can be found here which includes LoGS and potential LoGS.

British Geological Survey www.bgs.ac.uk
Other geological resources, maps and borehole information are available on the website of the British Geological Survey.

Essex Rock & Mineral Society www.erms.org.
The Essex Rock and Mineral Society, founded in 1967, is the club for Essex geological enthusiasts.

GeoEast
GeoEast is the East of England Geodiversity Partnership. It is a partnership of organisations active in conserving and promoting Earth heritage in this region.

Earth Heritage Magazine www.earthheritage.org.uk
Earth Heritage magazine is produced for the geological and landscape community by Natural England, Scottish Natural Heritage, the Countryside Council for Wales.

Geologists' Association www.geologistsassociation.org.uk
The Geologists' Association, founded in 1858, is Britain's largest society for amateur geologists.

Quaternary Research Association https://www.qra.org.uk
The Quaternary Research Association researches 'Ice Age' geology, palaeobiology and Palaeolithic archaeology and has published several field guides covering many sites in southern and eastern Essex.

Books and articles relating to the district

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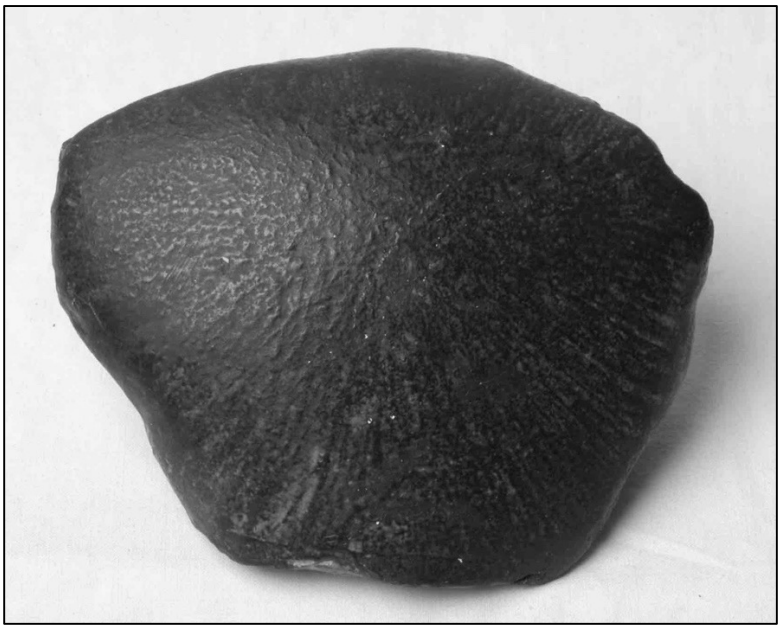

A cast of the Ashdon Meteorite in Saffron Walden Museum

The Ashdon meteorite that fell in 1923 is the only meteorite to have been found in Essex. The fall was witnessed by a farm worker in broad daylight on Ashdon Hall Farm and subsequently dug up from a depth of two feet.

The original is in the Natural History Museum, London.

Photo: Saffron Walden Museum

7. List of Sites

The following is a representative list of geological sites in the district. For completeness it includes a geological SSSI but such sites are statutory sites and do not form part of this report.

The list gives an idea of the range of sites that can qualify as Local Geological Sites (LoGS). It includes those LoGS that have already been approved by the Local Sites Partnership.

Note: *Not all of the sites here described are accessible. Some sites are on private land and can only be viewed from footpaths that pass through or alongside the site. Inclusion of a site on this list does not, therefore, imply any right of access.*

Sites of Special Scientific Interest (SSSIs)

UGLEY. Hall's Quarry SSSI (also known as Ugley Park Quarry) (TL 519 280)
The complex sequence of sands, gravels and boulder clay at this quarry is important for showing that, during the Anglian cold stage (450,000 years ago), the Thames catchment was repeatedly invaded by ice. The evidence from Ugley, in conjunction with that from Westmill Quarry (Hertfordshire), is critical in demonstrating that there were at least four of these ice advances, each one depositing a characteristic boulder clay (glacial till). The quarry is still active but is partly infilled. Two representative sections were intended to be maintained in the northern part of the pit. There are usually several sarsen stones by the road at the entrance to the quarry.

Local Geological Sites (LoGS)

Sites agreed by Local Sites Partnership to date

ARKESDEN. Arkesden War Memorial (TL 4821 3456)
The war memorial in St. Mary's churchyard consists of a very large, single boulder of puddingstone 1.7 x 1.7 x 0.8 metres in size. This boulder was apparently brought here from somewhere on the Wood Hall estate, probably less than a mile to the south, and transported by horse-drawn sledge.

GREAT DUNMOW. Flitch Way Ballast Pit and Tufa Springs (TL 6195 2160)
An old overgrown railway ballast pit adjacent to the railway cutting, which is now the route of the Flitch Way footpath. The adjacent cutting provides limited exposures of Kesgrave Sands and Gravels overlain, or butting up against, boulder clay (glacial till). Also of particular interest are hard-water 'petrifying' springs, which are the source of crystal-clear streams that run in the cutting, depositing calcium carbonate 'tufa' and encrusting all the objects in the steam bed including leaves and twigs. The exposures are considerably overgrown but there is the potential to create a scientifically important visible section with public access.

NEWPORT. The Leper Stone (TL 5199 3496)
A large coarse-grained sarsen stone 1.7 by 1.2 metres in size known as the Leper Stone sits upright on the grass verge on the side of the road at the north entrance to the village. This is the best known erratic boulder in north Essex. Adjacent to this is a wall constructed largely of blocks of clunch, a hard variety of chalk formerly used for building.

SAFFRON WALDEN. The Gibson Boulders (TL 5369 3817)
At the junction of Gibson Gardens and Margaret Way is a mound of grass and trees containing at least 25 glacial erratic boulders of varying sizes. More than 10 different rock types are represented. The largest is a slab of colourful puddingstone 1.2 metres long. The site also has great historic interest. The Gibson

Gardens estate was built on land which was formerly the gardens owned by George Stacey Gibson (1818-1883), naturalist, who had a great interest in geology. An 1877 map shows this mound to be the site of his summer house and it seems certain that he accumulated these boulders in his garden. They were almost certainly gathered from the farmland that he owned in the vicinity.

The Gibson Boulders

On the corner of Gibson Gardens and Margaret Way in Saffron Walden is a remarkable collection of glacial erratic boulders collected by George Stacey Gibson in the 19th Century.

Photo: G. Lucy

SAFFRON WALDEN. Elm Grove Summer House (TL 5398 3828)
Elm Grove is a group of bungalows for elderly persons, which were built on land which was formerly the rear garden of a property called Elm Grove, built in 1828 and demolished in the 1970s. Against the flint boundary wall is a small structure built as a summer house or grotto in the former garden. The summer house is remarkable as it is built almost entirely from erratic boulders. There are at least 20 boulders of different rock types but of particular interest is a giant Hertfordshire puddingstone 2.6 by 1.2 metres in size at the base of the south wall, which may be the largest puddingstone in Essex. The summer house is not the only structure in the garden to survive the subsequent redevelopment. In the centre of the grounds is the prominent ruin of a delightful flint 'folly' which was once used as a tiny museum. Elm Grove is private property and permission for access must be obtained from the Estate Manager.

The summer house at Elm Grove, Saffron Walden.

This curious derelict structure on the private land of Elm Grove Housing is important as it was built by the Gibson family almost entirely from glacial erratic boulders.

Photo: G. Lucy

SAFFRON WALDEN. Limefields Pit Nature Reserve (TL 541 396)
Disused chalk quarry less than 10 minutes walk from the town centre. The floor of the pit is occupied by housing. A buffer zone between the houses and the chalk face is an Essex Wildlife Trust nature reserve. The 6 metre high face is a fine exposure of Upper Chalk. The access gate is locked and the entry is available by contacting the nature reserve warden. However, the face can be clearly seen from the road.

SAFFRON WALDEN. Radwinter Road Chalk Quarry (TL 553 385)
Fine disused chalk quarry with clean vertical faces on the north side of Radwinter Road just east of Tesco's and currently used as a private depot. According to early 20th century geological survey records this was a very fossiliferous quarry. Fossil sponges, corals, crinoids, echinoids and even a belemnite and shark tooth have all been reported. Access is not possible but the faces are clearly visible from the roadside.

The Radwinter Road Chalk Quarry

Most of the old chalk pits in north Essex have been infilled and those that remain are in need of protection for their geological, landscape and historical value. The photograph was taken from Radwinter Road.

Photo: G. Lucy

UGLEY GREEN. Ugley Green Puddingstone (TL 524 271)
Beside the green, next to the village pump, is a fine, rounded and colourful boulder of Hertfordshire puddingstone 1.2 metres long.

Potential Local Geological Sites in the district.

The following is a list of other sites in the district which are being considered as potential LoGS.

ARKESDEN. Clatterbury Lane Puddingstone (TL 4834 3422)
Almost hidden in vegetation at the side of Clatterbury Lane to the south of the village is a very large and colourful boulder of Hertfordshire puddingstone (2 x 1.3 x 1 metres in size). It is close to the road but access is difficult.

ARKESDEN. Arkesden Chalk Pit. (TL 4914 3368)
Fine disused quarry in the Upper Chalk, cut into the hillside and visible from the road. On private land. The pit is a Local Wildlife Site.

Arkesden Chalk Pit.
Photo: G. Lucy

ARKESDEN. Wicken Water Boulders (TL 4821 3449)
A large concentration of glacial erratic boulders can be seen in the bed of the Wicken Water, which is the stream running through the village. The boulders are on the west side of the road bridge near the village hall. There are at least 12 stones here, one about 1.5 by 1.1 metres in size, and they are of two types - puddingstones and sarsens. The stones are safe to visit provided care is taken when traversing the stream bed. The stream bed is usually dry. They are situated at the apex of a hairpin bend in the river.

ASHDON. Ashdon Meteorite (site of fall) (TL 581 409)
The Ashdon meteorite that fell in 1923 is the only meteorite to have been found in Essex. The fall was witnessed by a farm worker in broad daylight on Ashdon Hall Farm and subsequently dug up from a depth of two feet. The site of the fall is therefore historically important although there is nothing to see.

It is hoped that a plaque commemorating the event could be erected in the future. In England in the last 100 years only three other meteorites were seen to fall and subsequently were recovered. The meteorite is now in the meteorite collection at the Natural History Museum, London and is still available for study. A cast of the meteorite can be seen in Saffron Walden Museum. Ashdon Museum also has a cast with a small display on the fall.

AUDLEY END. Audley End Sarsen Stone (TL 5234 3800)
Fine sarsen stone by the road opposite the entrance to Audley End House (110 x 90 x 50 centimetres in size).

The Audley End sarsen stone

Photo: G. Lucy

CATMERE END. Catmere End Sarsen Stone (TL 497 388)
A very large sarsen stone 2.1 metres long sits in the long grass by the signpost at the crossroads.

DUDDENHOE END. Coopers End Farm Puddingstone (TL 4649 3596)
Large Hertfordshire puddingstone (160 x 140 x 55 centimetres in size) by the entrance to a plant hire company at Coopers End Farm. The boulder is unusual as the base is free of pebbles and therefore takes on the appearance of a sarsen stone.

ELMDON. Freewood Lane Boulder. (TL 4638 3912)
At the entrance to Freewood Lane is an erratic boulder (80 x 60 x 50 centimetres in size). It is unusual as it consists of Spilsby Sandstone and originates in Lincolnshire.

FARNHAM. Farnham Sarsen Stone. (TL 4806 2432)
At the side of the Hazel End Road near the road junction is a large sarsen stone 1.30 x 1.1 x 0.5 metres in size with a thick band of pebbles running through the centre.

GREAT DUNMOW. Beaumont Hill Sarsen Stone. (TL 6267 2278)
A large sarsen stone 1.6 metres long sits in the grass on Beaumont Hill almost opposite the junction with Lime Tree Hill.

GREAT HALLINGBURY. Tilekiln Green Brick Pit (site of) (TL 5240 2128)
Stansted Distribution Centre Business Park at Start Hill is mostly located on the site of the former Tilekiln Green Brick Pit, which dates back to the nineteenth century. In 1945 the walls of the pit were recorded as exposing Kesgrave (Thames) Sands and Gravels, overlain by boulder clay (glacial till), with London Clay at the base. A high, vertical section still exists at the rear of the Mercedes Benz Truck Centre car park with chalky boulder clay visible and the possibility of Thames gravel and London Clay under the talus. With the permission of the land owner, vegetation and talus clearance could be undertaken. Access would be available either from the Flitch Way or from the adjacent Scania car park (with the permission of the landowner).

HATFIELD FOREST. Hatfield Forest Boulders (TL 541 198)
On the southern edge of the lake were three partially submerged and largely inaccessible boulders, two of Hertfordshire puddingstone (the largest 135 x 90 x 70 centimetres in size) and one of sandstone (140 x 110 x 70 centimetres in size). They were discovered when the lake was created in about 1750. Adjacent to the Shell House a boulder of limestone(?) (80 x 45 centimetres) protrudes from the ground. The National Trust has now moved several of the lakeside boulders to near the Shell House so they are more accessible.

MAGGOTS END. Maggots End Puddingstone. (TL 486 276)
One kilometre north of Manuden, at the junction of the road to Pinchpools, is a fine boulder of Hertfordshire puddingstone one metre square and 60 centimetres thick.

MALLOWS GREEN. Mallows Green Chalk Pit. (TL 4753 2641)
At Mallows Green, south-west of Manuden, is a disused and overgrown chalk pit cut into the hillside adjacent to a public footpath. It provided exposures of Upper Chalk overlain by an outlier of the Lambeth Group (Thanet Sand or Reading Beds) with a layer of green-coated flints (the 'Bullhead Bed') at the junction. The pit was first recorded by Whitaker in 1878, who said that this pit showed the junction of the Chalk with the 'Reading Beds'. The exposure of the Lambeth Group, however degraded it might be, makes this pit an important site.

MANUDEN. Yew Tree Inn Puddingstone. (TL 491 267)
Next to the Yew Tree Inn is a colourful boulder of Hertfordshire puddingstone (120 x 100 x 30 centimetres in size) that has been whitewashed in the past.

NEWPORT. Chalk Farm Lane Chalk Pit (TQ 5234 3352)
Small disused chalk pit just beyond Newport Station on the former access road to Newport Limeworks.

NEWPORT. Debden Road Chalk Pit. (TL 5244 3384)
Very small roadside pit with minor exposure of Upper Chalk overlain by boulder clay (glacial till) consisting of brown clay with chalk pebbles and other erratics. The till is material dumped by a glacier as it ground its way across the landscape 450,000 years ago. This is one of the few exposures of till in north Essex. The site is adjacent to a lay-by on the Debden Road.

NEWPORT. Debden Water Gravel Pit. (TL 5358 3399)
A small disused gravel pit in the valley of the Debden Water east of Newport. A low cliff of glacial gravel can be seen here which was laid down by torrents of meltwater from the Anglian Ice Sheet 450,000 years ago - in marked contrast to the sedate nature of the valley today. Piles of gravel with large nodular flints can be seen on the floor of the pit.

NEWPORT. Newport Chalk Quarry (TL 525 331)
Newport Chalk Quarry (also known as Chalk Farm Quarry or Newport Limeworks) is the only working chalk quarry in Essex, supplying chalk for agricultural lime. There are currently fine exposures of Upper Chalk and excellent sections through numerous gravel-filled solution pipes. It is hoped that some geological sections can be retained in any future restoration scheme.

Newport Chalk Quarry.

Remarkable solution pipes in the chalk face at Newport Chalk Quarry in 2011.

Photo: G. Lucy

NEWPORT. Newport Puddingstone (TL 521 335)
A large boulder of Hertfordshire puddingstone 1.5 metres long can be seen by the village hall in Station Road. It was brought here from the outskirts of the town in the 1950s when the village hall was built. It stood outside the village hall until 2008 when it was moved a few metres onto the grass verge.

SAFFRON WALDEN. Newport Road cutting. (TL 5327 3721)
Publicly accessible road cutting on the Newport Road (B1052) between Saffron Walden and Newport. The eastern side of the cutting is a vertical cliff in Upper Chalk about 4 metres high. The cliff was cut back and cleaned in 2019 to prevent cliff falls which had led to road closures. Road cuttings like this are rare in Essex.

SAFFRON WALDEN. Westley Lane Chalk Pit. (TL 5363 4016)
Small chalk pit on the side of Westley Lane, a track leading to Westley Farm. Very fine exposures of clean, white chalk. The track is a public footpath but the pit is private land.

SAFFRON WALDEN. Whitehill Wood Chalk Pits. (TL 5578 3915)
In Whitehill Wood next to the Ashdon Road are two adjacent chalk pits, a large eastern pit and a smaller western pit. They are much overgrown with minor exposures of Chalk and the overlying boulder clay (glacial till). The report of an Essex Field Club visit to this pit in 1914 states that the actual junction of the Chalk and overlying till was then visible. Despite the encroachment of vegetation and accumulation of talus, it is still possible to see chalk and till, although much would be gained by removal of talus and cleaning of the sections. The Chalk in these pits contains fossils, such as stout pieces of the bivalve shell Inoceramus which occur in profusion. Whitehill Wood is a Local Wildlife Site.

STANSTED MOUNTFITCHET. Bentfield End Sarsen Stone. (TL 5056 2538)
A large sarsen stone 1.2 metres long sits outside a cottage at the junction of Wetherfield and Bentfield End Causeway.

TAKELEY. Priors Green Sarsen Stone (TL 5752 2128)
A sarsen stone about 100 x 80 x 35 centimetres in size can be seen on the grass at the entrance to the new Priors Green housing development. It was found close by in 2007 by archaeologists while carrying out a survey in advance of housing construction.

TAKELEY. Stansted Airport Stone (TL 561 212)
A sarsen stone about one metre square is situated on the grass by the crossroads. It was found by archaeologists in a Bronze Age pit at Stansted Airport and had clearly been placed in the pit some 3,500 years ago, suggesting that it had ceremonial significance. The stone was moved here in 2003 and provided with a plaque by the Takeley Local History Society.

THAXTED. Buckingham's Farm Sarsen Stone (TL 606 295)
A sarsen stone 90 x 60 centimetres in size sits by the roadside outside the entrance to Buckingham's Farm.

UGLEY. Alsa Lodge Gravel Pit. (TL 515 264)
Alsa Lodge Pit is a disused sand and gravel pit with the potential to provide exposures of glacial gravel left behind by a glacier that filled this valley during the coldest period of the Ice Age about 450,000 years ago. The floor of pit is now occupied by a shooting range and an auction house. This pit was a geological Site of Special Scientific Interest (SSSI) until it was denotified under Natural England's Geological Conservation Review in the late 1980s. Since then the walls of the pit have become overgrown and very little gravel can now be seen. The original gravel face was very high and is still very steep in places and it would not be difficult to expose a section through the gravel with the permission of the landowner.

WENDENS AMBO. Royston Road Gravel Pit. (TL 4947 3633)
Pit on private land cut into the hillside exposing glacial gravel made up almost entirely of chalk pebbles. In In the 1990s the faces showed solution 'pipes' and ice disturbance structures. The pit is small with only 2.5 metres high faces. The 'pipes' were infilled with darker gravel and are due to localised solution of the chalk pebbles. The pipes are analogous to the solution pipes found in the Chalk and are a very unusual feature.

WENDENS AMBO. Wenden Place Boundary Wall (TL 512 363)
On the bend of the main road opposite the church is a high, ancient wall, which is remarkable for the variety of local rocks used in its construction, including many large boulders. The largest is a puddingstone 1.4 metres long. The wall is a Grade 2 listed building.

The boundary wall at Wenden Place, Wendens Ambo.

Photo: M. Ralph

WIDDINGTON. Widdington Puddingstone (TL 533 322)
At the road junction north of the village is a puddingstone 1.4 metres x 1 metre in size standing upright on the corner of a large wooded traffic island. As a result of recent road widening the boulder is now at risk from lorries turning this tight corner.

Other sites of geological interest in the district.

For completeness, the following sites also contribute to the geodiversity of the district.

ASHDON. Ashdon Parish Church
Erratic cobbles can be seen in the fabric of the church. Geologist Sir John Smith Flett (1869-1947) is buried in the churchyard. His grey granite tombstone is in the shadow of All Saints' church tower with the following epitaph "He richly enlarged man's knowledge of the earth".

ASHDON. Ashdon Sarsen Stone. (TL 5868 4212)
Buried in the ground on the side of the road near the road junction (by the Rose and Crown public house) is a sarsen stone at least 80 centimetres long. The stone is between the road and the steps leading down to the stream and is almost completely buried beneath the turf. It was clearly placed at this spot at a very early date, perhaps as long ago as the junction has existed. Cutting away the turf to fully expose this stone would be an interesting and worthwhile project.

AUDLEY END. Audley End House Septarian Nodule (TL 5217 3831)
On display in the Stable Block is a fine, large septarian nodule (165 x 115 x 30 centimetres in size) cut in half to display the internal calcite-lined cracks or 'septa'. This nodule was no doubt collected locally and was part of the natural history collection acquired by the fourth Lord Braybrooke in the 19th century. It was moved from its previous position on the Tea House Bridge in 2003 to deter vandalism.

AYTHORPE RODING. Lucas Farm Boulders. (TL 5766 1375)
Outside Lucas Farm are two sarsen stones (the largest 90 x 90 x 40 centimetres in size) and two lichen-covered limestone boulders (the largest 110 x 70 x 70 centimetres in size).

BARTLOW. Bartlow Gravel Pit. (TL 5795 4478)
Bartlow Gravel Pit was a geological Site of Special Scientific Interest (SSSI) until it was denotified under Natural England's Geological Conservation Review in the late 1980s. Since then the site has deteoriorated and very little gravel can now be seen. The original gravel face was in excess of 6 metres in depth but is now a steep, wooded slope. The glacial gravel contains numerous fossils of Jurassic age derived from the boulder clay (glacial till). It is potentially still an interesting geological site.

CLAVERING. Clavering Swallow Hole (TL 4764 3175)
A swallow hole is a depression in the ground in a limestone or chalk area into which a stream disappears underground. This example originally took the form of a two metre wide solution hole in the chalk bedrock of the river although it has now been completely obscured by debris and vegetation. It is the route by which water flows into the chalk aquifer. Discovered by the Environment Agency. Access to the stream bed is hazardous. View from the road only.

ELSENHAM. Elsenham Gravel Quarry (TL 553 268)
London Clay is sometimes exposed at the base of this working gravel quarry overlain by Red Crag, Chillesford Sand, Kesgrave Sands and Gravels (mostly sands), and chalky boulder clay (glacial till). This is the only inland exposure of Red Crag (including the basal nodule bed). The Red Crag here does not contain fossils as they have been dissolved by percolating ground water. The excellent geological exposures at Elsenham Quarry are the result of continued excavation. It is hoped that some geological sections can be retained in any future restoration scheme.

GREAT CHESTERFORD. Crave Hall Farm Chalk Pit. (TL 5360 4444)
Disused chalk pit excavated into the hillside at the junction of two tracks half a kilometre east of Crave Hall Farm. The pit has a 2 metre high cliff of white chalk with about 1 metre of vertical chalk visible above the talus. At the very top of the face appears to be a layer of boulder clay (glacial till) consisting of white chalk pebbles in a light brown clay. The pit can be seen from the track which is a public footpath but the pit is on private land.

GREAT CHESTERFORD. Great Chesterford C of E Primary School (TL 5072 4282)
The main school building, built in 1849, consists of knapped flints, with limestone dressings on a Gault brick plinth. A very fine example of flint architecture. A Grade 2 listed building.

GREAT EASTON. Highwood Gravel Quarry. (TL 597 226)
Highwood Quarry is a working gravel quarry with exposures of Kesgrave (Thames) Sands and Gravels overlain by a thickness of boulder clay (glacial till). London Clay is exposed on the floor of the quarry. It is hoped that some geological sections can be retained in any future restoration scheme.

GREAT SAMPFORD. Howe Lane Sand Pit. (TL 6410 3608)
Disused pit to the north of the village. The pit once exposed Kesgrave Sands and Gravels, glacial sand and gravel, soil horizons and chalky boulder clay (glacial till). The sediments are contorted probably due to the pressure of ice from the north. Below the floor of the pit up to 5 metres of Red Crag is present.
The 5 metre high section at the north end of the pit was cleared by the British Geological survey in 1980. A description of the pit, together with a sketch of the north face is given in the Great Dunmow Geological Survey Memoir. The pit is a Local Wildlife Site.

HIGH EASTER. High Easter Sarsen Stone. (TL 6242 1486)
At the road junction on the grass verge outside Cottons Cottage is a 1.1 metre long sarsen stone almost completely buried.

LITTLEBURY GREEN. Elmdon Lee Chalk Pit. (TL 4796 3802)
On the side of the road south-west of Elmdon Lee is a small chalk pit. The pit has a clean face with flint nodules. The pit can be seen from the road but is on private land.

LITTLE CANFIELD. Crumps Farm Quarry (TL 582 210)
Crumps Farm Quarry is a working quarry and landfill site. The Kesgrave (Thames) Sands and Gravels are exposed, and at the base of this gravel, and lying directly on the underlying London Clay, the basal pebble bed of the Red Crag was once visible (see also Elsenham Quarry).

LITTLE CHESTERFORD. Bordeaux Pit. (TL 513 413)
The former Bordeaux Pit, just south of Little Chesterford, is now a fishing lake but when it was working in the 1920s it yielded flint tools in association with the bones of mammoth and woolly rhinoceros. Any further excavations on this site could yield further fossils and artefacts. The tools are attributed to Neanderthals.

MANUDEN. Pinchpools Chalk Pit. (TL 4920 2758)
At Pinchpools is a medium size disused chalk pit. It exposed 4 metres of soft to firm white chalk with nodular flint horizons and a tabular flint band at the base. The chalk showed intense vertical fracturing. The faces are now very overgrown with chalk talus largely obscuring the sections. The floor of the pit is used as a private garden.

SAFFRON WALDEN. Ashdon Road Swallow Hole (TL 561 391)
A swallow hole is a depression in the ground in a limestone or chalk area into which a stream disappears underground. Some swallow holes are not obvious on the surface and are merely a point where a stream appears to dry up as it percolates through its gravel bed to continue its journey underground. An example of the latter is in the valley of The Slade where, during most times of the year, the stream disappears underground as it flows from the boulder clay plateau onto the Chalk at a point adjacent to the public footpath midway between Martins Wood and the Ashdon Road.

SAFFRON WALDEN. Beeches Close Railway Cutting. (TL 5325 3750)
Disused railway cutting between Beeches Close and the County High School playing fields. It exposes vertical faces of chalk, much overgrown. At the west end of the cutting are almost vertical faces of chalk. The faces are considerably overgrown but could be cleaned. The cutting was part of the Saffron Walden branch railway which closed in 1964. Most of the cuttings on this line were filled in after the line closed, but this 300 metre long section remained. It is accessible only by a padlocked gate onto the playing field.

SAFFRON WALDEN. Grave of Edward Charlesworth (TL 5469 3847)
In the town cemetery is the grave of Edward Charlesworth (1813-1893), an eminent but controversial Victorian geologist who coined the term Red Crag. It has a very fine gravestone with an excellent epitaph.

SAFFRON WALDEN. Saffron Walden Museum Boulders (TL 5384 3872)
An interesting collection of erratic boulders in the grounds of the Museum, the most prominent being a very large and complete septarian nodule over two metres in diameter that was found when digging the foundations of the former Acrow factory (now Ridgeons) on the Ashdon Road. There is also a fine basalt boulder (rare in Essex) by the museum entrance.

The giant Jurassic septarian nodule in the grounds of Saffron Walden Museum.

Photo: G. Lucy

STEEPLE BUMPSTEAD. St. Mary's Church. (TL 6789 4105)
An early nineteenth century tomb-chest in the south isle of St. Mary's Church exhibits cut and polished panels made from a local septarian nodule. It is thought that the original nodule was found locally in the boulder clay. Similar panels can be seen surrounding a fireplace in Saffron Walden Museum which was built in 1834. The tomb was erected in 1834 by George William Gent in memory of his father, George Gent. The archives of Saffron Walden Natural History Society, which founded the Museum, lists a G.W. Gent as a member in 1845. The main material used to face the monument is a grey, streaked marble, which is probably Italian.

THAXTED. Armigers Farm Boulder (TL 5948 2903)
At Armigers, south-west of Thaxted, a giant boulder sits on the grass not far from the roadside. It is approximately 2.5 x 1.5 metres in size and 1.2 meters tall. It consists of a yellow Jurassic sandstone containing numerous fossils such as bivalves and ammonites, and it may originate from Lincolnshire. The boulder is very weathered and has been here for some considerable time. It is claimed that it was found in the gravel pit north of Armigers, and if so, it would make it one of the largest glacial erratics in south-east England. Further research and investigation is required to establish its origin and history.

THAXTED. Stoney Lane (TL 611 309)
Stoney Lane, adjacent to the famous Guildhall, is a good example of a street paved with local erratics. The majority of the cobbles are flint but there are also a large number of other rock types.

UGLEY. Wades Hall Gravel Pit. (TL 5131 2797)
Disused gravel pit in glacial sand and gravel on private farmland near Wades Hall. Some good vertical sections are remaining (just visible from main road).

WICKEN BONHUNT. St. Helen's Chapel (TL 5114 3349)
This small, thatched, 11th century chapel is one of the oldest buildings in Essex. Apart from the front wall, which is brick, the walls consist almost entirely of glacial erratic cobbles and boulders gathered from the local fields 1,000 years ago. A large variety of rock types are present (inside and out) including at least 16 pieces of Hertfordshire puddingstone. The north-eastern corner is supported by a large sarsen stone. It is a Grade 2 listed building.

WIDDINGTON. Hollow Lane Gravel Pit. (TL 530 310)
The Hollow Lane pit is a working gravel pit. The pit has previously exposed Upper Chalk, Lambeth Group (Woolwich and Reading Beds), Kesgrave (Thames) Sands and Gravels and chalky boulder clay (glacial till). In some areas the boulder clay contains so much chalk it resembles chalk bedrock in appearance. It has also been claimed that Red Crag and Norwich Crag (Chillesford Sand) are present.