Highsted Park
Land South East of Sittingbourne, Kent

Geoarchaeological Deposit Model

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Summary

Wessex Archaeology was commissioned by Quinn Estates (the Client), to produce a geoarchaeological deposit model to inform the proposed development of land at Highsted Park, Kent, centred on National Grid Reference (NGR) 591420, 161400.

The proposed development will comprise the construction of a new link road connecting the M2 in the south to the A2 to the north of the Site. Approximately 8,000 new houses, commercial areas, public open space, education and sports facilities, a new M2 motorway junction and link road will be constructed as part of the development. Some areas of the Site are to be retained for agriculture and green space, with no development works taking place in these areas.

The Site comprises 568ha located to the south east of Sittingbourne, close to the villages of Rodmersham, Bapchild, Highsted, Bredgar, Rodmersham Green, Tunstall and Bexon. Quaternary deposits previously recorded within and adjacent to the Site comprise Head-Brickearth, deposited through colluvial aeolian and/or alluvial process, and chalky Combe deposits, deposited through solifluction and/or fluvial processes.

Within the Site, Head-Brickearth and Combe deposits have previously produced significant Middle and Late Upper Palaeolithic archaeology (Dines 1929). Head-Brickearth sequences in the area also contain calcareous units which are known to preserve vertebrates and molluscs. Occasional finds of Mesolithic material may originate from Holocene deposits in the upper parts of the Head-Brickearth. Deposits mapped as Clay-with-flints are recorded in the south of Site. Clay-with-flints can result from situ dissolution, decalcification and cryoturbation of the underlying chalk and Paleogene sediments and/or material deposited through colluvial and/or solifluction processes during the Quaternary.

To create the deposit model for the Site, 162 deposit records were reviewed. The different lithologies were entered into Rockworks ™ v17.0 and modelled outputs. The modelled outputs include a four distribution plots of key Quaternary sedimentary units and five transects through the deposits within the Site.

The modelling has demonstrated that Head-Brickearth and Coombe deposits within the Site have significant archaeological and geoarchaeological potential, most notably for Middle and Late Upper Palaeolithic evidence. Review of GI data suggests that the Clay-with-flints in the south of the Site reflects in situ weathering of bedrock material and has generally low archaeological and geoarchaeological potential; solution features may be present in this southern area which could provide isolated capture for Quaternary sediments with greater potential.

The results of the deposit modelling have been used to provide a Geoarchaeological Landscape Characterisation (GLC) that divides the Site into 10 Geoarchaeological Characterisation Zones (GCZs). The archaeological and geoarchaeological potential of deposits in each zone has been assessed.

Deposit modelling has demonstrated that deposits with significant archaeological and geoarchaeological potential are present within the Site. Consequently, archaeological and geoarchaeological field evaluation is likely to be required. Based on the results of the modelling, recommendations for targeted archaeological and geoarchaeological evaluation works in each GCZ are provided.

Acknowledgements

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Highsted Park
Land South and East of Sittingbourne
Kent

Geoarchaeological Deposit Model

1 INTRODUCTION

1.1 Project Background

1.1.1 Wessex Archaeology was commissioned by Quinn Estates (the Client), to produce a geoarchaeological deposit model to inform the proposed development of land at Highsted Park, Kent (hereafter 'the Site', **Figure 1**), centred on National Grid Reference (NGR) 591420, 161400.

1.1.2 The proposed development will comprise the construction of a new link road connecting the M2 in the south to the A2 to the north of the Site. Approximately 8,000 new houses, commercial areas, public open space, education and sports facilities, a new M2 motorway junction and link road will be constructed as part of the development. Some areas of the Site are to be retained for agriculture and green space, with no development taking place in these areas.

1.1.3 This geoarchaeological deposits model forms part of a staged approach to determine the potential development impacts of the proposed development on the archaeological and geoarchaeological resource. The work follows on from an archaeological Desk Based Assessment (WA 2021) and forms part of the baseline for the ES Chapter.

1.2 The Site

1.2.1 The Site comprises an irregular parcel of land of approximately 568ha located to the south east of Sittingbourne, close to the villages of Rodmersham, Bapchild, Highsted, Bredgar, Rodmersham Green, Tunstall and Bexon.

1.2.2 Most of the Site is under arable cultivation however parts of the Site are also used as orchard and woodland. The former Highsted Quarry also lies within the Site, now covered with woodland. The Site is bisected by Broadoak Road, Ruins Barn Road, the M2 Motorway, Bexon Road, Cromer Road, Dully Road and Highsted Road.

1.2.3 The northern part of the Site is bordered by the A2 and the village of Bapchild, with Radfield located at the north eastern corner of the Site. The north western extent of the Site lies on the south eastern outskirts of Sittingbourne and Tunstall. On its southern side the Site is bound by Bexon and the M2. The eastern extent of the Site is bound by Cromer's Wood, Rodmersham Green, Rodmersham and Radfield.

1.2.4 Located 3.5km to the north of the A2 is the Swale, and a series of creeks are present on the northern side of the A2 around Tonge. The topography of the Site is varied, focussed on a steep sided broad dry valley that extends through the southern and central parts of the Site in a north west to south east orientation through Rodmersham. The lowest part of the Site is situated in the north east adjoining the A2 at approximately 12m OD, the land then rises to the south towards an area of elevated ground around Rodmersham Green at about 60-70m OD before the land falls into the valley within which Highsted is situated before rising to a broad area of elevated ground surrounding the Kent Science Park at around 70-

75m OD. The highest part of the Site is within the south of the Site at Bexon at an elevation of 92m OD.

1.2.5 The underlying bedrock geology across the Site (**Figure 2**; British Geological Survey, Geology of Britain Viewer) is mapped as Cretaceous chalk of Seaford Chalk Formation (89.8–86.3 MA) overlain in places by Palaeocene sands, silts and clays of the Thanet Formation (59.2-56.0 MA). Quaternary deposits are recorded intermittently across the Site and consist of Pleistocene Head, which is infilling dry valleys (**Figure 3**; British Geological Survey, Geology of Britain Viewer).

1.3 Scope of Document

1.3.1 This deposit modelling report outlines the sub-surface superficial deposits underlying the Site and provides an initial assessment of their archaeological and geoarchaeological potential. It provides a suitable baseline within which to inform the need for and scope of any subsequent intrusive archaeological and geoarchaeological evaluation works.

1.3.2 In format and content, this methodology conforms to current best practice, as well as to the guidance in *Deposit modelling and archaeology: guidance for mapping buried deposits* (HE 2020).

2 AIMS AND OBJECTIVES

2.1.1 The aims of geoarchaeological deposit modelling were to:

- use available Ground Investigations (GI) data from within the Site and geoarchaeological data obtained during previous investigations adjacent to the Site (ASE 2019) to characterise the principal superficial geological deposits present underlying the Site;
- assess the archaeological and geoarchaeological potential of the superficial deposits underlying the Site;
- identify the extent of superficial deposits with archaeological and/or geoarchaeological potential; and
- make suitable suggestions for further work at the Site, if appropriate.

2.1.2 These aims were addressed by achieving the following objectives:

- collation of relevant geotechnical and geoarchaeological data;
- production of a series of outputs to model the vertical and lateral extent of deposits across the Site;
- interpretation of the sediments in their local and regional geoarchaeological context;
- assessment of the likely archaeological and geoarchaeological potential of the deposits present;
- production of a preliminary characterisation for the Site, dividing it into different Geoarchaeological Characterisation Zones (GCZs) of varying sub-surface archaeological and geoarchaeological potential, and

- provision of recommendations for field evaluation, where appropriate.

3 ARCHAEOLOGICAL AND GEOARCHAEOLOGICAL BACKGROUND

3.1 Introduction

3.1.1 This section provides a background to the geoarchaeology and archaeology within the Site, drawing on relevant sites and studies within the wider landscape. Where age estimates are available these are expressed in millions of years (MA), thousands of years (Ka) and within the Holocene epoch as either years Before Present (BP), Before Christ (BC) and Anno Domini (AD).

3.2 Solid Geology

3.2.1 BGS mapping of the area indicates that the bedrock geology underlying the Site is the Seaford Chalk Formation (89.8–86.3 MA). Palaeogene deposits of the Thanet Formation (59.2-56 MA) are recorded overlying the chalk across parts the Site (**Figure 2**).

3.2.2 Clay-with-flints is mapped in the southern part of the Site (**Figure 2**). *Sensu stricto* clay-with-flints consist of clay, sands and gravel derived from the in situ dissolution, decalcification and cryoturbation of chalk and Paleogene deposits (in this case those of the Thanet Formation). However, deposits mapped as Clay-with-flints can include superficial deposits (Clay-with-flints *sensu lato*).

3.3 Superficial Geology

3.3.1 The only mapped superficial geology underlying the Site is Head; however, it should be noted that deposits mapped as Clay-with-flints can also contain superficial sediments.

3.3.2 The age of these superficial deposits is currently poorly constrained but is likely to include Late (130–11.7 Ka), and possible Late Middle (240–130 Ka), Pleistocene, as well as Holocene (11.7kya to present) sediments. Together the Pleistocene and Holocene epochs form parts of the Quaternary, a period covering the last 2.6 MA, and defined by repeated fluctuations between cold (glacial) and warm (interglacial) climate stages (**Table 1**).

Table 1 British Quaternary chronostratigraphy

Geological Period	Chronostratigraphy		Age (ka)	Marine Isotope Stage (MIS)
Holocene	Holocene interglacial		11.7 – present	1
Late Pleistocene	Devensian Glaciation	Loch Lomond Stadial	11.7 – 12.9	2 – 5d
		Windermere Interstadial	12.9 – 15	
		Dimlington Stadial	15 – 26	
		Upton Warren Interstadial	40 – 43	
		Early Devensian	60 – 110	
	Ipswichian interglacial		115 – 130	5e
	Wolstonian	Unnamed cold stage	130-374	6

Middle Pleistocene	Complex	Avery interglacial		7
		Unnamed cold stage		8
		Purfleet interglacial		9
		Unnamed cold stage		10
	Hoxnian interglacial		374 – 424	11
	Anglian glaciation		424 – 478	12
	Cromerian Complex		478 - 780	13 – 19

3.3.3 Two sets of deposits have been recorded in previous investigations within and adjacent to the Site that potential contain Quaternary units. These comprise Head-Brickearth, potentially dating from the late Middle Pleistocene through to the Holocene, and deposits mapped as Clay-with-flints, which may contain Pleistocene deposits (**Figure 3**). These sediments and their geoarchaeological potential are outlined below.

Head-Brickearth

3.3.4 Deposits mapped as Head have been deposited through different processes and can include aeolian, colluvial, alluvial and soliflucted material. Such sequences can include material deposited during more than one period of the Pleistocene and can include Holocene colluvium. Where fine grained units dominate, such deposits are often collectively referred to as 'Brickearth'. These deposits can contain eroded and redeposited artefacts and seal underlying stratigraphy in the form of buried former land surfaces; these can be associated with minimally disturbed archaeology and palaeoenvironmental remains. Significantly, the Head-Brickearth in the area contains calcareous sediments that within Bunce's Farm brick field, Tonge, located to the north-west of the Site (**WA05**), have produced mammoth and woolly rhino remains. Further to the north-east, at Murston, calcareous mollusc-bearing deposits, with numerous large-mammal fossils, were identified in area of alluvium and Head-Brickearth.

3.3.5 Investigations within the Site have demonstrated that Head-Brickearth can overlie 'Coombe deposits' consisting of clays, sands and chalky gravels (Dines 1929), which may include solifluction and/or fluvial deposits. In addition, the Head-Brickearth itself has been shown to include windblown loessic sediments. These aeolian deposits include *Limons a Doublet* (paired silts) – these reflect periods of primary loess deposition sandwiched between periods of stabilisation without loess being deposited. During the latter, clay translocation forms alternating clay silt horizons. *Limons a Doublet* are geoarchaeologically important as the demonstrate episodic fine grained aeolian deposition, whilst stabilisation horizons (which can be associated with soil formation) within such sequences have the potential to preserve horizons containing minimally disturbed archaeology.

3.3.6 Previous investigations within the Site and adjacent areas have demonstrated that these Head-brickearth deposits preserve Middle Palaeolithic and Upper Palaeolithic archaeology and associated palaeoenvironmental datasets. The latter include mammalian (Dines 1929) and molluscan faunas (Beccy Scott pers. comm., ASE 2019).

3.3.7 In addition to Pleistocene deposits, such sequences can include Holocene colluvium, which can similarly contain reworked material or bury earlier stratigraphy. Establishing the mode of deposition and age of individual deposits is key to establishing their geoarchaeological potential.

*Clay-with-flints (*sensu lato*)*

3.3.8 Clay-with-flints is mapped in the southern part of the Site. This is a complex, frequently polygenetic deposit consisting of clay, sand and gravel. *Sensu stricto* it is a deposit derived from the in situ dissolution, decalcification and cryoturbation of chalk, with the sand and gravel component derived from Palaeogene deposits. However, deposits mapped by the BGS as Clay-with-flints includes not only this parent material immediately overlying the chalk, but thick, clay-rich sediments incorporating exogenous Pleistocene loessic and/or colluvial material (Clay-with-flints *sensu lato*). Lower and Middle Palaeolithic artefacts are frequently found in association with the Clay-with-flints, particularly near the edges of mapped outcrops.

3.3.9 The presence of such artefacts around the margins of the Clay-with-flints has been interpreted as indicative of places where features (dolines and other solution features) within the chalk have been preserved that contain Pleistocene deposits and Lower and Middle Palaeolithic archaeology, but where Holocene erosion processes have exposed these capture points (cf. Blundell 2016).

3.4 Archaeological and geoarchaeological background

3.4.1 The archaeological and geological background to the Site was assessed in a prior desk-based assessment (WA 2021). Information relevant to informing on the archaeological and geoarchaeological potential of the superficial deposits underlying the Site is summarized below, with additional information referenced as appropriate.

*Palaeolithic (970,000–10,700 kya; **Figure 4**)*

3.4.2 Previous quarrying of Pleistocene Head-brickearth deposits has produced large numbers of Palaeolithic artefacts from two separate areas in the northern part of the Site; these are located on opposite sides of a dry valley to the east and west of Haywood and south-east of Bapchild (**WA03** and **W04**). Palaeolithic assemblages of different dates were recovered from three points within Pleistocene sequences at these locales.

3.4.3 The earliest consisted of approximately 400 Palaeolithic artefacts. This was collected from a deep excavation for chalk undertaken on the western side of the valley (**WA03**) in the base of the area from which Head-brickearth had already been removed (Dines 1929). The assemblage includes significant amounts of material produced using the Levallois technique, indicating a Middle Palaeolithic date. This material was restricted to Coombe deposits infilling channels and fissures in the chalk, between 1.2m to 3.0m thick and of variable character, sealed by up to 3.0m of Head-brickearth (Dines 1929). Faunal remains described as mammoth remains were recovered from the solifluction deposits.

3.4.4 Although much of the material collected from the site has been lost, artefacts recovered by Williams, Mount, Jessup and Cook survive in several museums. Study of these artefacts (Beccy Scott pers. comm.) demonstrates that, in contradiction to the description given by Dines of the stratigraphic position of this material, several artefacts collected by Williams (CUMAA collection) are marked as coming from “Coombe deposit resting on Thanet Sand”. These may represent artefacts recovered from other areas of the quarry away from the main concentration in the deep excavation, where the brickearth and gravel could overlie thin veneers of Thanet Sand rather than resting directly over the chalk.

3.4.5 This assemblage from the solifluction deposits comprises Levallois flakes, cores, waste flakes, some flake tools and a handaxe roughout (Beccy Scott pers. comm.). Although fresh material is referred to by Dines (1929), the entire extant assemblage is both heavily abraded and edge damaged, many artefacts bearing “chatter marks” (incipient cones of percussion)

on flaked surfaces, attesting to heavy battering during movement (Beccy Scott pers. comm.). This suggests that the assemblage as a whole is in secondary context, having been reworked from elsewhere within the matrix of the gravels.

3.4.6 This material represents one of the largest undated Middle Palaeolithic Levallois assemblages from Britain. Levallois material is generally equated to the early Middle Palaeolithic (~337–190 kya), however, this conclusion is based largely on evidence from fluvial sequences, primarily in the Thames Valley. Establishing the age and more detailed contextual associations for the historic material from Bapchild may have important implications for understanding the Middle Palaeolithic settlement history of southeast England. Additionally, although the extant material is seemingly reworked, minimally disturbed Middle Palaeolithic material may be present elsewhere within the Site.

3.4.7 The second significant assemblage of Palaeolithic material from within the Site was recovered from the quarry on the eastern side of the same valley (**WA04**), from approximately 0.30m above the base of another, unrelated series of Head-brickearth deposits. The material is technologically Upper Palaeolithic in character, in fresh condition and patinated pale blue in colour, and includes blades, blade cores, endscrapers and burins (Beccy Scott pers. comm.). The industrial attribution of this material is unclear. Two convex-backed blades held in Maidstone Museum (Dines 1929, fig 7a and e) may indicate Federmesser affinities (Jacobi 1982); where dated, such industries generally occur around 10.7 Ka.

3.4.8 An additional third assemblage was collected from a “gravely wash” at the bottom of this sequence (Dines 1929) on the eastern side of the valley, and described by Dines as “Late Levallois” (ibid, 16). This would suggest a Middle Palaeolithic date. However, the material is in fact similar to that from the overlying Head-brickearth and is Upper Palaeolithic in technological character (Beccy Scott pers. comm). Although technologically similar, the artefacts from the gravel are in a different condition to those from the overlying Head-brickearth, being slightly abraded (Beccy Scott pers. comm.).

3.4.9 This Upper Palaeolithic material was collected from a restricted area on the westernmost edge of the quarry only 25 – 30 yards across, which together with the fresh condition of the material from the Head-brickearth might suggest that a particular activity area was encountered during quarrying, rather than material of this date being spread throughout the Head-brickearth at this level. However, given the presence of similar Head-brickearth spreads throughout the Study Area, similar scatters might potentially be present both within the vicinity of **WA04** and within similar contexts elsewhere in the Study Area. Moreover, such deposits are likely to be varied both in terms of mode of deposition and date of emplacement, consequently the Head-brickearth deposits may contain Palaeolithic archaeology of more than one date.

3.4.10 The wider Palaeolithic archaeological potential of Head-brickearth deposits in the area is demonstrated a Middle Palaeolithic Levallois flake recovered from Head-brickearth in recent test pitting evaluation immediately north-west of the Site (ASE 2019; **WA08**).

3.4.11 Additionally, two isolated finds of Palaeolithic handaxes have been recovered from Rodmersham (**WA01** and **WA02**) in areas where Head-brickearth is mapped. Although the specific context of these artefacts is unknown, they indicate the wider potential of areas associated where Head-brickearth is present across the Site.

3.4.12 Also flint long blade debitage was found at West Ridge dating to the final Upper Palaeolithic (**WA06**).

*Mesolithic (8500–4000 BC; **Figure 4**)*

3.4.13 Mesolithic artefacts are known from localities within around the Site (**WA07**, **WA09**–**WA011**). An Early Mesolithic tranchet axe is recorded from Haywood in the northern part of the Site, whilst a Mesolithic pick has been recovered to the south at Rodmersham (Wessex Archaeology and Jacobi 2014). The specific context of these pieces is not known but could have originated from with the Head-Brickearth sequence.

4 METHODOLOGY

4.1 Introduction

4.1.1 The aims of the deposit model have been achieved through deposit modelling and a Geoarchaeological Landscape Characterisation (GLC) of the Site. These techniques are important in providing a framework for more precisely determining the archaeological and geoarchaeological potential of the Site at a scale which can most effectively inform future decision making, management and mitigation of impact to the buried archaeological and geoarchaeological resource.

4.2 Deposit modelling

4.2.1 Deposit modelling is required to map the lateral extent and depth of superficial deposits across the Site, providing data for the subsequent GLC.

4.2.2 To create the deposit model for the Site, 162 deposit records were reviewed (**Figure 5**). These include GI data within the Site (Ecologia 2018; 2020) and geoarchaeological trial pits located immediately north-west of the Site (ASE 2019).

4.2.3 The different lithologies were entered into industry standard software (Rockworks™ v17.0) and assigned to a stratigraphic unit.

4.2.4 The Rockworks data was utilised to map the lateral extent of key stratigraphic units and to produce representative transects mapping the subsurface topography beneath the Site

4.3 Geoarchaeological Landscape Characterisation

4.3.1 The GLC works on the same principles as a Historic Landscape Characterisation (English Heritage 2004) and Landscape Character Assessment (Natural England 2014), but in this case largely considers the shallow buried and outcropping superficial geological elements of the landscape.

4.3.2 The GLC involves breaking down the Site into defined zones called Geoarchaeological Character Zones (GCZs). The GCZ are based primarily on variation in superficial geological characteristics linked to an assessment of the archaeological and geoarchaeological potential of the deposits.

5 RESULTS

5.1 Stratigraphy

5.1.1 The stratigraphy encountered across the deposit modelling area is divided into six main units; modern soil profiles/made ground, Head-Brickearth, ?Head or Thanet Formation, chalk gravel, Clay-with-flints and the solid geology (Thanet Formation and Chalk).

Modern soil profiles/made ground

5.1.2 Relatively shallow modern soil profiles, generally less than 0.50m thick were recorded in most GI interventions.

5.1.3 Made ground was recorded in eighteen interventions, which ranged from 0.20 to 1.00 m in thickness.

*Head-Brickearth (**Figures 6 and 10–14**)*

5.1.4 Head-Brickearth was recorded in interventions across the northern and central parts of the Site. This consisted of silty sands and silty clays, with a generally low clast content. More gravelly units were also noted within the Head-Brickearth. Head-Brickearth sequences ranged from less than 1.00m thick to up to 5.20m. In the northern part of the Site sequences >2.00m are widely distributed, whilst further south the deeper sequences may be more restricted to dry valleys. The deepest Head-Brickearth sequences were recorded within a dry valley in the east of the south-central part of the Site.

*?Head or Thanet Formation (**Figures 7 and 10–14**)*

5.1.5 For interventions where Thanet Formation bedrock was present, lithological descriptions in GI logs do not always enable overlying Head-Brickearth to be clearly distinguished from underlying units of the Thanet Formation. In such instances the deposits have been classed as ?Head or Thanet Formation. These sediments consist of clay sands, whose lithological descriptions are consistent with being bedrock Thanet Formation, or reworked material from the Thanet Formation.

*Chalk gravel (**Figures 8, 10–13**)*

5.1.6 Chalk gravels beneath Head-Brickearth were recorded in eight interventions. These gravels are Combe deposits (see section 3.4). The specific mode of deposition in individual interventions can not be established from lithological descriptions in GI logs; however, they likely include solifluction deposits laid down through seasonal freeze-thaw processes under periglacial conditions and could also include fluvial units.

*Flint gravel (**Figure 8**)*

5.1.7 In dry valleys in the north and south-central parts of the Site, flint gravels, which include a sub-angular – potentially fluvial – component, were recorded at the base of Head-Brickearth sequences. These flint gravel may be indicative of water-flow at the base of the dry valley sequences.

*Clay-with-flints (**Figures 9 and 14**)*

5.1.8 Clay-with-flints, overlying chalk, was recorded in interventions in the south of the Site. The Clay-with-flints consisted of stiff, organising brown slightly sandy gravelly clay containing poorly sorted angular flint clasts, which ranged up to 3.20m in thickness. Although these sediments could include material deposited through colluvial and/or solifluction processes during the Quaternary (Clay-with-flints *sensu lato*), the lithological descriptions suggest that these sediments reflect in situ dissolution, decalcification and cryoturbation of chalk and overlying Palaeoegene sediments (Clay-with-flints *sensu stricto)*

*Solid Geology (**Figures 10–14**)*

5.1.9 Solid geology was recorded in most interventions and consisted of chalk which, in places, was overlain by units of the Thanet Formation. The distribution of the Thanet Formation is broadly in line with the BGS mapping (see **Figure 2**).

5.2 Deposit modelling outputs

5.2.1 The deposit modelling comprised a series of modelled outputs, including; four distribution plots (**Figures 6**–**9**) and five cross-sections through the deposits within the Site (**Figures 10**–**14**).

5.2.2 The distribution plots illustrate where different Quaternary stratigraphic units have been recorded in GI interventions, whilst the thickness of Head-Brickearth has also been plotted (**Figure 6**). These plots are overlain against LiDAR hill-shade data to illustrate the topographic position of different sediment bodies.

5.2.3 The cross-sections are two-dimensional vertical displays of the deposit records along lines drawn across the Site, modelling the possible make-up of the deposits between individual deposit records. This was achieved using Rockworks™ v17.0 to interpolate the upper and lower surface of stratigraphic units, creating a grid model which was sliced along the path of the drawn transect, then overlaying that vertical slice of the model with interventions located along the lines of the transects.

*Distribution of Head-Brickearth (**Figures 6 and 7**)*

5.2.4 Although data coverage is sparse in some areas, distribution plots demonstrate that in northern part of the Site significant Head-Brickearth sequences occur within a dry valley and on the higher ground flanking this valley. The depth range of the Head brickearth within the valley ranges up to 4.00m in thickness, whilst on the higher ground sequences generally greater than 1.00m but less than 3.00m thick are recorded.

5.2.5 GI data is lacking from within quarried areas directly associated with deposits which produced Middle and Upper Palaoelithic archaeology (**WA03** and **WA04**). Consequently, the extent of any Quaternary deposits preserved in these areas is unknown.

5.2.6 Further south, in the central part of the Site, thick sequences of Head-Brickearth, sometimes greater than 4.00m thick, are present within a dry valley. Interventions flanking this valley recorded shallow Head-Brickearth sequences, less than 1m thick.

5.2.7 In the southern part of the site, Head-Brickearth was largely absent from GI interventions, except for those along the eastern boundary of the Site, which were located on the edges of a dry valley.

*Distribution of chalk and flint gravel (**Figure 8**)*

5.2.8 Chalk and flint gravel units were generally recorded within interventions located within the base of, and flanking, dry valleys located in the northern and central part of the Site. These likely include solifluction gravels, but may also have a fluvial component.

*Distribution of Clay-with-flints (**Figure 9**)*

5.2.9 Clay-with-flints was largely restricted to interventions located on high ground in the south of the Site. This Clay-with-flints may include Pleistocene colluvial deposits, especially in interventions located on valley slopes; however, the topographic position on a plateau suggest that this primarily reflects the in situ dissolution and weathered on chalk and Paleogene bedrock.

*Cross-section 1 (**Figure 10**)*

5.2.10 Cross-section 1 is a west to east orientated transect through the deposits along the northern boundary of the Site. It illustrates that significant sequences of Head-Brickearth occur with the dry valley that runs through this area and on the higher ground which flanks this valley.

Chalk gravel is recorded at the base of a sequence on the edges of this valley; this may be the lateral equivalent of the chalk gravel associated with Middle Palaeolithic archaeology at **WA03** (see section 3.4).

*Cross-section 2 (**Figure 11**)*

5.2.11 Cross-section 2 provides a west to east orientated transect through Quaternary deposits within the northern part of the Site. As with Cross-section 1, this demonstrates that notable thicknesses of Head-Brickearth are present within, and on the higher ground above, the dry valley which runs through the eastern part of this area.

5.2.12 Further to the west, the data records Head-Brickearth within a relatively deeply incised valley but suggests that in locations east and west of this valley Head-Brickearth may be sparse, with a ridge of Thanet Formation bedrock running through the Site.

*Cross-section 3 (**Figure 12**)*

5.2.13 Cross-section 3 is a west to east transect through the central part of the Site. It demonstrates in the east Head-Brickearth is present in areas either side of the dry valley which runs through the Site in this location. In contrast, in the west of the Site, extensive Head-Brickearth is found within a deeply incised valley but is less prevalent on the high ground above this valley; the same potential ridge of Thanet Formation bedrock recorded in Cross-section 2 is identified in this area.

*Cross-section 4 (**Figure 13**)*

5.2.14 Cross-section 4 runs west to east along a transect through deposits in the south-central part of the Site. The transect demonstrates that extensive sequences of Head-Brickearth occur within the valley at the western end of this transect and within the southern continuation of the dry valley at the western ends of Transects 2 and 3. In the area between these two valleys, the continuation of the potential ridge of Thanet Formation bedrock is noted.

*Cross-section 5 (**Figure 14**)*

5.2.15 Cross-section 5 provides a west to east transect through deposits in the south of the Site. In this area Clay-with-flints located on high ground, with Head-Brickearth present at the eastern end of the transect, where the edge of a dry valley marks the eastern boundary of the Site.

5.3 Geoarchaeological Landscape Characterisation

5.3.1 The available data allows the Site to be divided into 10 Geoarchaeological Character Zones (**Figure 15**). These zones are summarised in **Table 2** and discussed below.

Table 2 Geoarchaeological Character Zones

Zone	Principal Quaternary deposits
1a	Head-Brickearth
	Combe deposits
1b	Head-Brickearth
	Combe deposits
2	Head-Brickearth
	Combe deposits
3	Head-Brickearth
4	Head-Brickearth

	solifluction deposits
5	Head-Brickearth
6	Head-Brickearth
7	None
8	Head-Brickearth
	Combe deposits
9	?Sediments within solution features
10a	Head-Brickearth
10b	Head-Brickearth

GCZ 1a and 1b

5.3.2 GCZ 1a and 1b comprise areas associated with Brickearth extraction and which have produced significant Middle (**WA03**) and Late Upper Palaeolithic (**WA04**) lithic assemblages. The contexts for this archaeology are the Head-Brickearth and underlying chalky Coombe deposits, located on the eastern and western margins of dry valley which runs through this area (see section 3.4)

5.3.3 GI data is lacking from these areas and the extent of Quaternary deposits preserved is unknown. It should be noted, however, that it is likely some Quaternary deposits are present in this zone as Brickearth extraction is unlikely to have entailed the entire removal of all Quaternary deposits.

GCZ 2

5.3.4 Topographically this zone is dominated by a south west to north east trending dry valley. Extensive sequences of Head-Brickearth have been proved in this zone, along with chalk and flint gravels, which are record in the east of the zone. GCZ 2 is located between GCZ 1 and 1b, where significant Middle and Late Upper Palaeolithic archaeology was recovered. The lateral equivalent of units within the Head-Brickearth and chalky Combe deposits associated with this archaeology may continue in this zone. Specially, flint gravels recorded in this zone may be the continuation of the “gravely wash” at the bottom of this Quaternary sequence recorded by Dines (1929), which contained Late Upper Palaeolithic archaeology (see section 3.4)

GCZ 3

5.3.5 The zone overlooks the southward continuation of dry valley in GCZ 2. GI data indicates 1.00-3.00m of Head-Brickearth. The zone is located south of Head-Brickearth deposits which have produced Late Upper Palaeolithic archaeology (**WA04**); the Head-Brickearth in this zone may include units which are the lateral continuation of the artefact bearing sediments.

GCZ 4

5.3.6 GCZ 4 includes the southward continuation of the dry valley which runs through GCZ 2. Although there is limited GI coverage in this zone, the data indicates that deeper Head-Brickearth deposits may be confined to the centre of the valley, whilst only shallow sequences, <1.00m thick, overlying bedrock may be present overlooking the valley. Chalk gravels are present on the margins of this valley; these are likely to be solifluction deposits.

GCZ 5

5.3.7 Located west of GCZ 4, GI data coverage in this zone is sparse. A dry valley runs through the western part of this zone, which contains Head-Brickearth. Similarly to GCZ 4, the available GI data indicates that Quaternary deposits (Head-Brickearth) outside of the valley may be of limited thickness (<1.00m) and overlie bedrock.

GCZ 6

5.3.8 GCZ 6 comprises unquarried ground overlooking the western flank of the dry valley which runs through GCZ 8. Limited GI data from the zone suggests that Head-Brickearth sequences up to 2.00m thick occur.

GCZ 7

5.3.9 GCZ 7 encompasses Highsted Quarry. Although there is no GI coverage of this zone, this was a chalk quarry and quarrying is therefore highly likely to have removed any pre-existing Quaternary deposits from this zone.

GCZ 8

5.3.10 This zone is located east and south of Highsted Quarry. Topographically GCZ 8 is dominated by a dry valley which runs through the west of the zone. GI interventions are concentrated in and along this valley; they illustrate that the valley contains thick Head-Brickearth sequences, frequently greater than 4.00m deep. Chalk and flint gravels are recorded within this valley which may be Coombe deposits.

5.3.11 GI data outside of this valley is limited, but indicates that Quaternary sequences may be shallow, with a potential ridge of Thanet Formation sediments overlying chalk running through the centre and west of the zone (identified as ?Head Brickearth or Thanet Formation in log review).

5.3.12 A more minor dry valley containing up to 3m of Head-Brickearth is recorded in the east of the zone (TP12-2018).

GCZ 9

5.3.13 Topographically GCZ 9 is a plateau of higher ground located in the south of the Site. GI coverage is good in this zone and consistently records Clay-with-flints overlying chalk. The lithological descriptions and topographic position indicate that these Clay-with-flints units derive from the in situ dissolution, decalcification and cryoturbation of chalk and Palaeogene deposits (Clay-with-flints *Sensu stricto*).

GCZ 10a and 10b

5.3.14 GCZ 10 consists of two restricted areas located on the eastern margins of GCZ 8 and 9, which are defined by a dry valley. Limited GI data is available from GCZ 10b, which demonstrates that Head-Brickearth sequences are present within this valley.

6 ASSESSMENT OF PALAEOLITHIC ARCHAEOLOGICAL AND GEOARCHAEOLOGICAL POTENTIAL

6.1 Introduction

6.1.1 Examination of GI logs, BGS mapping and previous published and grey literature has revealed Quaternary deposits across much of the Site with archaeological and geoarchaeological potential. This potential has been assessed for each deposit in each GCZ.

6.1.2 The '*potential*' rating assigned to deposits in each GCZ represents a measure of probability. This has been determined via the application of professional judgement, informed by the evidence from the site itself and equivalent deposits in the surrounding study area. '*Potential'* is expressed on a four-point scale, assigned in accordance with the following criteria:

- **High** Situations where assets are known or strongly suspected to be present within deposits and which are likely to be well preserved.
- **Moderate** Includes cases where there are grounds for believing that assets may be present, but for which conclusive evidence is not currently available. This category is also applied in situations in which assets are likely to be present, but also where their state of preservation may have been compromised.
- **Low** Circumstances where the available information indicates that assets are unlikely to be present, or that their state of preservation is liable to be severely compromised.
- **Unknown** Cases where currently available information does not provide sufficient evidence on which to provide an informed assessment with regard to the potential for assets to be present.

6.1.3 The relative '*Significance'* of known and potential assets has been determined in accordance with the criteria set out in **Table 3**

Table 3 Generic schema for classifying the significance of archaeological/geoarchaeological assets (based on HE 2015)

Significance	Categories
Very High	World Heritage Sites (including nominated sites) Assets of recognised international importance Assets that contribute to international research objectives
High	Scheduled Monuments Non-designated assets of national importance Assets that contribute to national research agendas
Moderate	Assets that contribute to regional research objectives
Low	Assets compromised by poor preservation and/or poor contextual associations Assets with importance to local interest groups
Negligible	Little or no archaeological or geoarchaeological interest
Unknown	The importance of the asset has not been ascertained from available evidence

6.2 Areas of archaeological and geoarchaeological potential

6.2.1 The archaeological and geoarchaeological potential of deposits in each GCZ is summarized in **Table 4**, consideration of the possible significance of any evidence present is also provided.

Table 4 Geoarchaeological Landscape Characterisation framework for the Site

GCZ	Principal Quaternary deposits present	Archaeological and geoarchaeological potential of deposits	Archaeological and geoarchaeological significance

1a	Head-Brickearth and Coombe deposits	High	Moderate-High
1b	Head-Brickearth and Coombe deposits	High	Moderate-High
2	Head-Brickearth and Coombe deposits	High	Moderate-High
3	Head-Brickearth	Moderate	Moderate-High
4	Head-Brickearth and solifluction deposits; ?concentrated with dry valley	Moderate	Moderate-High
5	Head-Brickearth; ?concentrated with dry valley	Unknown	Moderate-High
6	Head-Brickearth	Moderate	Moderate-High
7	None	Low	Low
8	Head-Brickearth and Coombe deposits; ?concentrated with dry valley	Unknown	Moderate-High
9	?Isolated occurrence in solution features	?Low	Moderate-High
10a	Head-Brickearth in dry valley	Unknown	Moderate-High
10b	Head-Brickearth in dry valley	Unknown	Moderate-High

GCZ 1a

6.2.2 Combe deposits in this zone have produced significant Middle Palaeolithic archaeology (see Section 3.4). Although Brickearth extraction has occurred in the zone, which will have impacted on Quaternary deposits, and GI data is lacking, it is unlikely that this previous quarrying will have removed all Quaternary deposits from GCZ 1a. It is particularly likely that the basal Coombe deposits will be present in places. Field investigations are required to establish the extent of remaining Quaternary deposits, and to evaluate their archaeological and geoarchaeological potential.

GCZ 1b

6.2.3 Upper Palaeolithic archaeology has been recovered from two contexts in this zone; Head-Brickearth and “gravelly wash”. At least one late Upper Palaoelithic lithic scatter is known from GCZ 1b (see section 3.4). Brickearth extraction will have impacted on Quaternary deposits in this zone; however sediments with archaeological and geoarchaeological potential are likely to present. GI data is limited for the zone but does demonstrate that Head-Brickearth and chalk gravels are present on the margins; the chalk gravel may be the

lateral equivalent of deposits associated with Middle Palaeolithic archaeology in GCZ 1a. As with GCZ 1a field evaluation is required to assess the extent and potential of surviving Quaternary deposits.

GCZ 2

6.2.4 This zone comprises unquarried deposits in the dry valley flanked by GCZ 1a and 1b. GI data indicates that Head-Brickearth, flint gravels and Coombe deposits, which may be the lateral continuation of deposits associated with Middle and Upper Palaeolithic archaeology in zones 1a and 1b, may be present.

GCZ 3

6.2.5 GI data demonstrates that significant sequences of Head-Brickearth, up to 3.00m thick, are present in this zone. The position of these deposits indicates that they may include the lateral equivalent Head-Brickearth, which in GCZ 2 to the north, contained significant Late Upper Palaeolithic archaeology (see above).

GCZ 4

6.2.6 GCZ 4 includes the southwards continuation of the dry valley which runs through GCZ 2. The available GI for this zone indicates that significant Quaternary deposits may be less widespread than in areas further north, with the more extensive Head-Brickearth sequences concentrated within the dry valley; only thinner outcrops may be present on the higher ground above the valley. Areas with the greatest archaeological and geoarchaeological potential in this zone may, therefore, be focussed within this valley; a handaxe (**WA01**) is recorded from just beyond the southern boundary of GCZ 4.

GCZ 5

6.2.7 Topographically GCZ 5 is dominated by a dry valley that runs parrel to that in GCZ 2 and 4. GI data coverage is relatively sparse for this zone but suggests that significant Quaternary sequences may be focussed within this valley, where Head-Brickearth up to 2.00m thick is recorded. The archaeological and geoarchaeological potential of the Head-Brickearth sequences in this zone is currently poorly defined; a Mesolithic pick (**WA11**) has previously been found on the eastern slopes of the valley; this may be associated with Holocene units within the Head-Brickearth.

GCZ 6

6.2.8 GCZ 6 overlooks the western slopes of the dry valley running through GCZ 8. GI records Head-Brickearth sequences up to 2.00m thick in this zone. Limited information is available about these deposits; however, they are located on the south-wards continuation of the ridge associated with Head-Brickearth deposits further north at Bunce's Farm brick field, Tonge, which produced mammoth and woolly rhino remains (**WA05**).

GCZ 7

6.2.9 GCZ 7 is defined by Highsted Quarry. As Highsted Quarry was a chalk quarry, it is unlikely that any extant Quaternary deposits are present in this zone.

GCZ 8

6.2.10 A dry valley dominates the west of this zone. This valley runs parallel to those valleys further south in GCZs 2, 4 and 5. The GI data illustrates that significant Head sequences, sometime more than 4m thick, and which in places may overlie Coombe deposits, occur within this valley. The archaeological and geoarchaeological potential of these sequences is unknown; however, this extensive stratigraphy may have significant potential.

6.2.11 GI data is concentrated in this valley. Nevertheless, data from beyond its margins indicates that Quaternary deposits are more limited in extent and thickness, principally being recorded in a second, minor valley in the east of the zone. The wider data suggest that the eastern part of this zone is dominated by a ridge of Thanet Formation bedrock.

GCZ 9

6.2.12 This zone is characterised by high ground located in south of the Site. Geologically it is dominated by Clay-with-flints overlying chalk bedrock. Consideration of the lithology of the deposits described in GI data and their topographic context suggests that these Clay-with-Flints derive from the in situ dissolution, decalcification and cryoturbation of chalk and Palaeogene deposits (Clay-with-flints *Sensu stricto*). Such deposits have limited archaeological and geoarchaeological potential. It is possible, however, that deposits with greater potential could be preserved in isolated capture points for Pleistocene sediments, within solution features in this zone.

GCZ 10 and 10b

6.2.13 These zones are situated along the eastern boundaries of GCZ 8 and 9 and are defined by the western edge of a dry valley, within which GI data recorded up to 3.00m of Head-Brickearth. The archaeological and geoarchaeological potential of this Head-Brickearth is currently unknown.

6.3 Research themes and context

6.3.1 The deposits identified in the Site principally have Palaoelithic archaeological and geoarchaeological potential.

6.3.2 Any archaeological and geoarchaeological datasets associated with Quaternary deposits within the Site have the potential to contribute to the following national and regional Palaeolithic research themes:

***Research and Conservation Framework for the British Palaeolithic* (EH 2008)**

1. Hominin Environments and Climate Drivers:

- What effect did Pleistocene climate change have upon British environments and faunal communities?
- How much of Pleistocene time saw the presence of hominins in Britain or on the adjacent continental shelf?
- What were the specific environmental and climatic tolerances of hominins in Britain?
- How did hominin subsistence, technical and social strategies respond to climate change over the long-term?

2. Hominin Demographies: the Palaeoecology of Hominin Colonisation and Settlement Processes:

- How did Pleistocene faunal communities change over time, and what was the pattern of human interaction with and impact on these?
- Did a significant population crash occur over Lower Palaeolithic/Middle Pleistocene time?

- What were the biological relationships between British Pleistocene populations and those of neighbouring regions?

3. How We Became Human: Social, Cultural and Economic Change:

- What technical innovations can be observed within the British Middle Palaeolithic?
- Why were the Neanderthals so successful for so long in British latitudes? What particular challenges and opportunities did they face in dealing with the British landscape and climate?
- How do we compare enclosed (cave and rockshelter) and open-site archaeology in terms of settlement systems?
- How closely were British Magdalenian populations culturally connected to those of the Continent?

South-East Region Research Framework: Early Palaeolithic **(SERF 2019)**

Clay-with-flints (*sensu lato*)

- Can individual artefacts from Clay-with-flints deposits be dated on the basis of condition and/or patination: (a) to the Palaeolithic; (b) to any particular stage of the Palaeolithic?
- Can any infilled dolines with stratigraphically/chronologically constrained beds containing Lower/Middle Palaeolithic material be identified in areas of Clay-with-flints deposits? And if so, how frequently do they occur, and how can they be remotely detected in advance of development?
- How did Lower/Middle Palaeolithic activity at outcrops of Clay-with flints fit in with behaviour across the wider landscape?
- Was there activity of similar nature/intensity at outcrops of Clay-withflints throughout the Lower/Middle Palaeolithic, or is there differential patterning at different stages?

Colluvial/solifluction/aeolian deposits

- Identification of areas of colluvial/solifluction deposits that may contain undisturbed or minimally disturbed concentrations of Palaeolithic remains;
- More attention to ‘Brickearth’, and characterisation as colluvial or aeolian (or fluvial);
- Mapping and dating of loessic sediments, and modelling of likelihood of any contained Palaeolithic remains;

7 RECOMENDATIONS

7.1 Introduction

7.1.1 Deposit modelling has demonstrated that Quaternary deposits with significant archaeological and geoarchaeological potential are present within the Site. Consequently, archaeological and geoarchaeological field evaluation is likely to be required.

7.1.2 Deposit modelling has enabled the Site to be divided into 10 Geoarchaeological Character Zones (GCZs), within which the distribution of Quaternary deposits has been considered, along with their archaeological and geoarchaeological potential.

7.1.3 The GCZs can be divided into four groups according to the distribution of Quaternary deposits, and their archaeological and geoarchaeological potential. These are:

- Zones where significant Head-Brickearth and/or Combe deposits may be widespread (GCZ 1a, 1b, 2, 3 and 6);
- Zones where significant Head-Brickearth and/or Combe deposits may be confined to dry valleys (GCZ 4, 5, 8, 10a and 10b);
- Zones where Clay-with-flints overlie chalk bedrock (GCZ 9)
- Zones where Quaternary deposits are likely to be absent (GCZ 7)

7.1.4 Appropriate methods of evaluation through which to characterise archaeological and geoarchaeological risk of development impacts in each zone is summarized in **Table 5** and summarized below.

Table 5 Recommendations for archaeological and geoarchaeological evaluation

GCZ	Principal Quaternary deposits present	Method of evaluation
1a	Head-Brickearth and Coombe deposits	Test pits distributed at regular intervals across zone
1b	Head-Brickearth and Coombe deposits	Test pits distributed at regular intervals across zone
2	Head-Brickearth and Coombe deposits	Test pits distributed at regular intervals across zone
3	Head-Brickearth	Test pits distributed at regular intervals across zone
4	Head-Brickearth and solifluction deposits; ?concentrated with dry valley	Test pits distributed as transects across dry valleys
5	Head-Brickearth; ?concentrated with dry valley	Test pits distributed as transects across dry valleys
6	Head-Brickearth	Test pits distributed at regular intervals across zone
7	None	None required
8	Head-Brickearth and Coombe deposits; ?concentrated with dry valley	Test pits distributed as transects across dry valleys

9	?Isolated occurrence in solution features	Electrical geophysics followed by targeted test pits, if required
10a	Head-Brickearth in dry valley	Test pits distributed as transect across dry valleys
10b	Head-Brickearth in dry valley	Test pits distributed as transect across dry valleys

7.2 GCZs 1a, 1b, 2, 3 and 6

7.2.1 Deposit modelling indicates that extensive and widespread Quaternary sequences comprised Head-Brickearth and/or Combe deposits with significant archaeological and geoarchaeological potential occur in these zones. The most effective method of evaluating potential and characterising archaeological risk would be a program of targeted test pitting, including on-site sampling and sieving for artefacts and palaeoenvironmental datasets, with test pits distributed at regular intervals across the zones.

7.3 GCZs 4, 5, 8, 10a and 10b

7.3.1 Available data suggests that deeper Quaternary sequences of Head-Brickearth and/or Combe deposits, which may have significant archaeological and geoarchaeological potential, are concentrated within dry valleys in these zones. Outside of these valleys the potential for significant deposits to be present may be reduced. The most effective method of evaluating potential and characterising archaeological risk in these zones would be a program of targeted test pitting evaluation, including on-site sampling and sieving for artefacts and palaeoenvironmental datasets, with test pits distributed in transects across dry valleys. This provides the most targeted method for evaluating deposits which may have the greatest potential.

7.4 GCZ 9

7.4.1 Assessment indicates that this zone is dominated by Clay-with-flints (*sensu stricto*), which overlie chalk bedrock, and that have generally low archaeological potential. Consequently, widespread intrusive ground evaluation is unlikely to be required. There is, however, potential for isolated Quaternary sediments capture points in the form of solution features. Electrical geophysics may be the most suitable method for assessing for the presence of solution features, with subsequent targeted test pitting, if required.

7.5 GCZ 7

7.5.1 No Quaternary deposits are likely to be present in this zone, and no evaluation is likely to be required.

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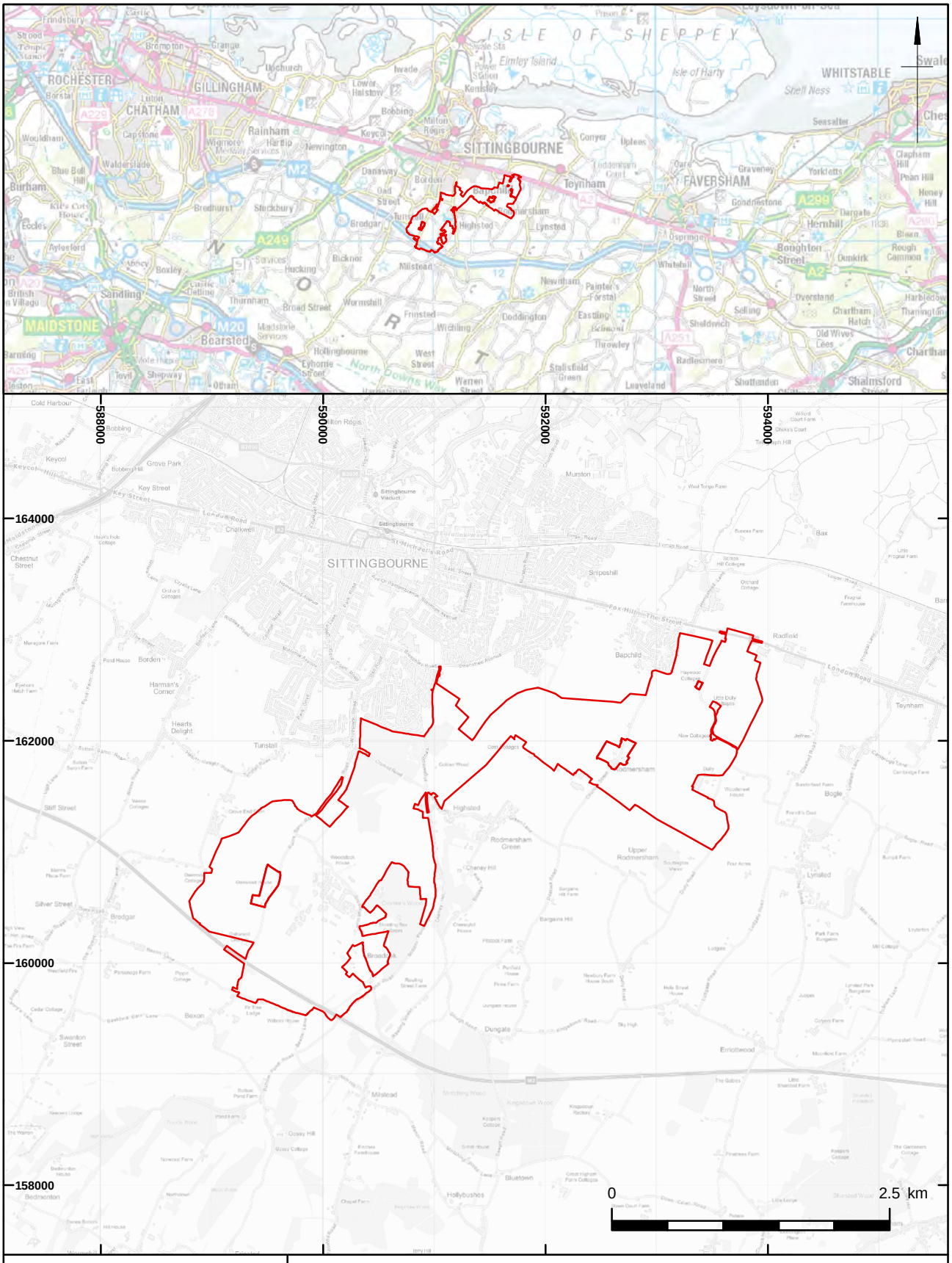
Appendix 1: Palaeolithic and Mesolithic Gazetteer

WA.no	MonUID	Record Type	PrefRef	Name	MonType	Period	Easting	Northing
WA01	MWX20852	FS	TQ 96 SW 225	Rodmersham area, Palaeolithic handaxe find of unknown provenance	FINDSPOT	Lower Palaeolithic to Middle Palaeolithic	592500	161500
WA02	MWX20853	FS	TQ 96 SW 226	Rodmersham Green, Palaeolithic handaxe find near College Wood	FINDSPOT	Lower Palaeolithic to Middle Palaeolithic	591500	161300
WA03	MWX20958	MON	TQ 96 SW 228	Middle Palaoelithic lithics from Coombe deposits under brickearth, pit west of Haywood, Bapchild	FINDSPOT	Middle Palaeolithic	593215	162510
WA04	MWX20952	MON	TQ 96 SW 227	Upper Palaeolithic lithics from brickearth at Bapchild - pit east of Haywood	FINDSPOT	Upper Palaeolithic	593800	162410
WA05	MKE91549	PFS	TQ 96 SW 1249	Bunce's Farm brick field, Tonge, Sittingbourne: mammoth and woolly rhino bones	FINDSPOT	Palaeolithic	592880	163900
WA06	MKE91553	FS	TQ 86 SE 305	Sittingbourne, 6 West Ridge - surface find of flint Long Blade debitage (final Upper Palaeolithic)	FINDSPOT	Upper Palaeolithic	589953	163020
WA07	MKE3615	MON	TQ 96 SW 38	Mesolithic and Neolithic material	SHELL MIDDEN; SHELL MIDDEN	Early Mesolithic to Late Neolithic	593000	163000
WA08	N/A	N/A	N/A	Levallois flake from Head-Brickearth	FINDSPOT	Middle Palaeolithic	592657	163725
WA09	MKE97507	MON	TQ 86 SE 224	Prehistoric features and flints	PIT?	Early Mesolithic to Late Neolithic	589953	161869
WA10	MKE78713	FS	TQ 96 SW 259	Flint core, Vincent Road	FINDSPOT	Early Mesolithic to Late Neolithic	592191	163383
WA11	MKE3643	FS	TQ 96 SW 68	Mesolithic pick	FINDSPOT	Mesolithic	592000	162000



Site boundary

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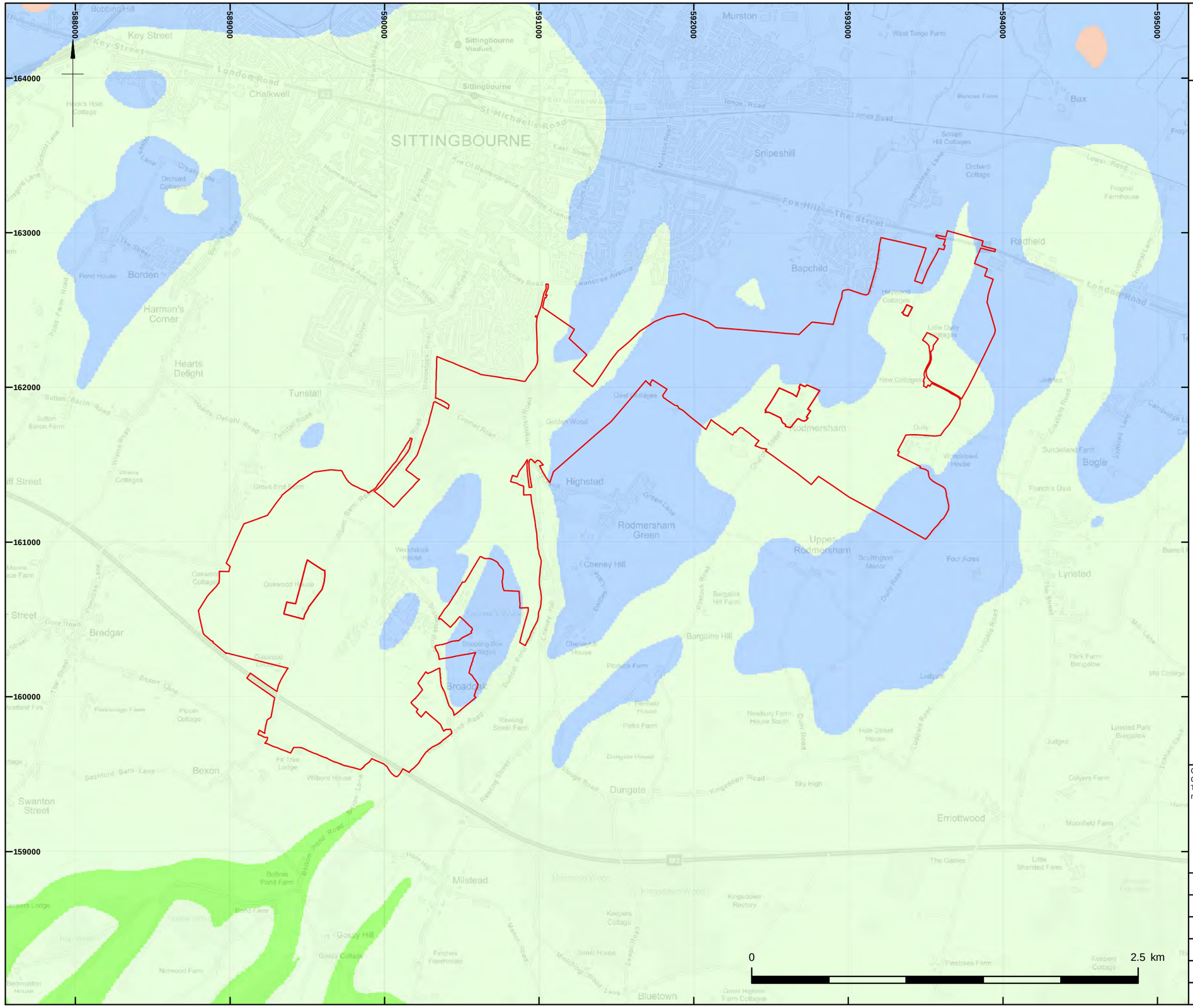
Site location and plan

Figure 1



Site boundary
Lambeth Group
Lewes Nodular Chalk Formation
Seaford Chalk Formation
Thanet Formation

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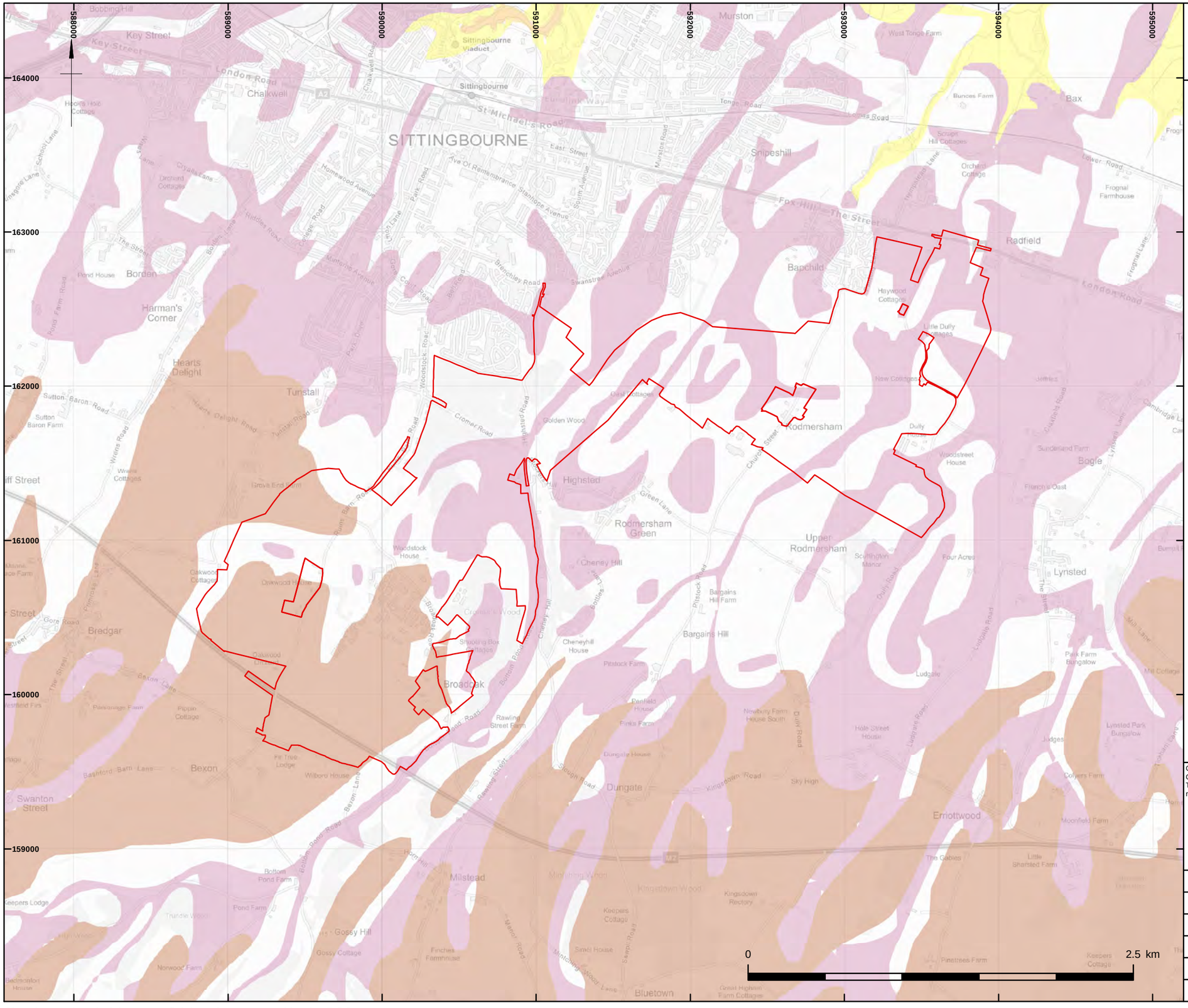
Site plan and underlying solid geology mapped by the BGS

Figure 2



Site boundary
Alluvium
Beach and Tidal Flat Deposits (Undifferentiated)
Clay-with-Flints Formation
Head

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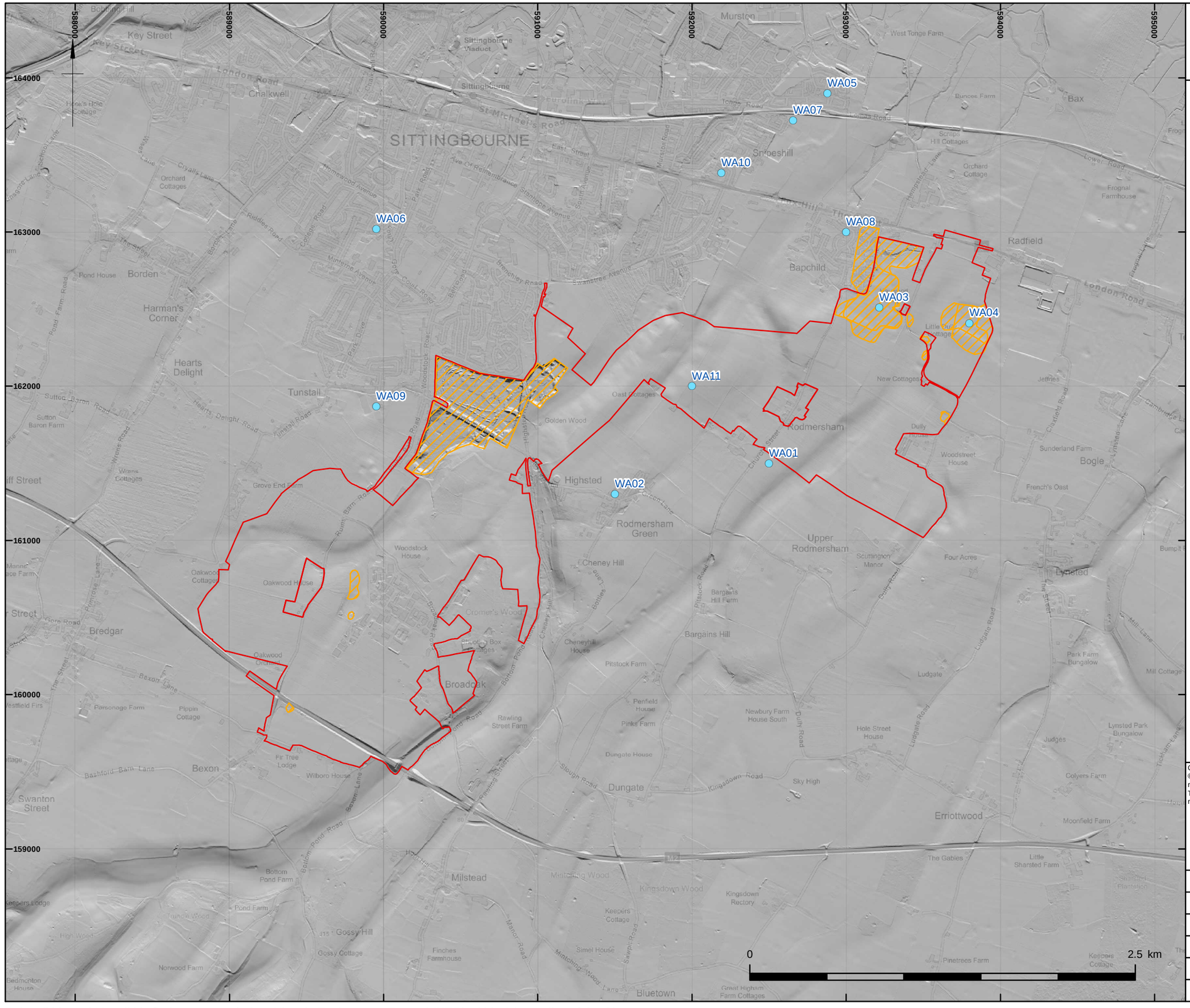
Site plan and underlying superficial geology mapped by the BGS

Figure 3



Site boundary

Palaeolithic and Mesolithic findspots

Area of quarrying

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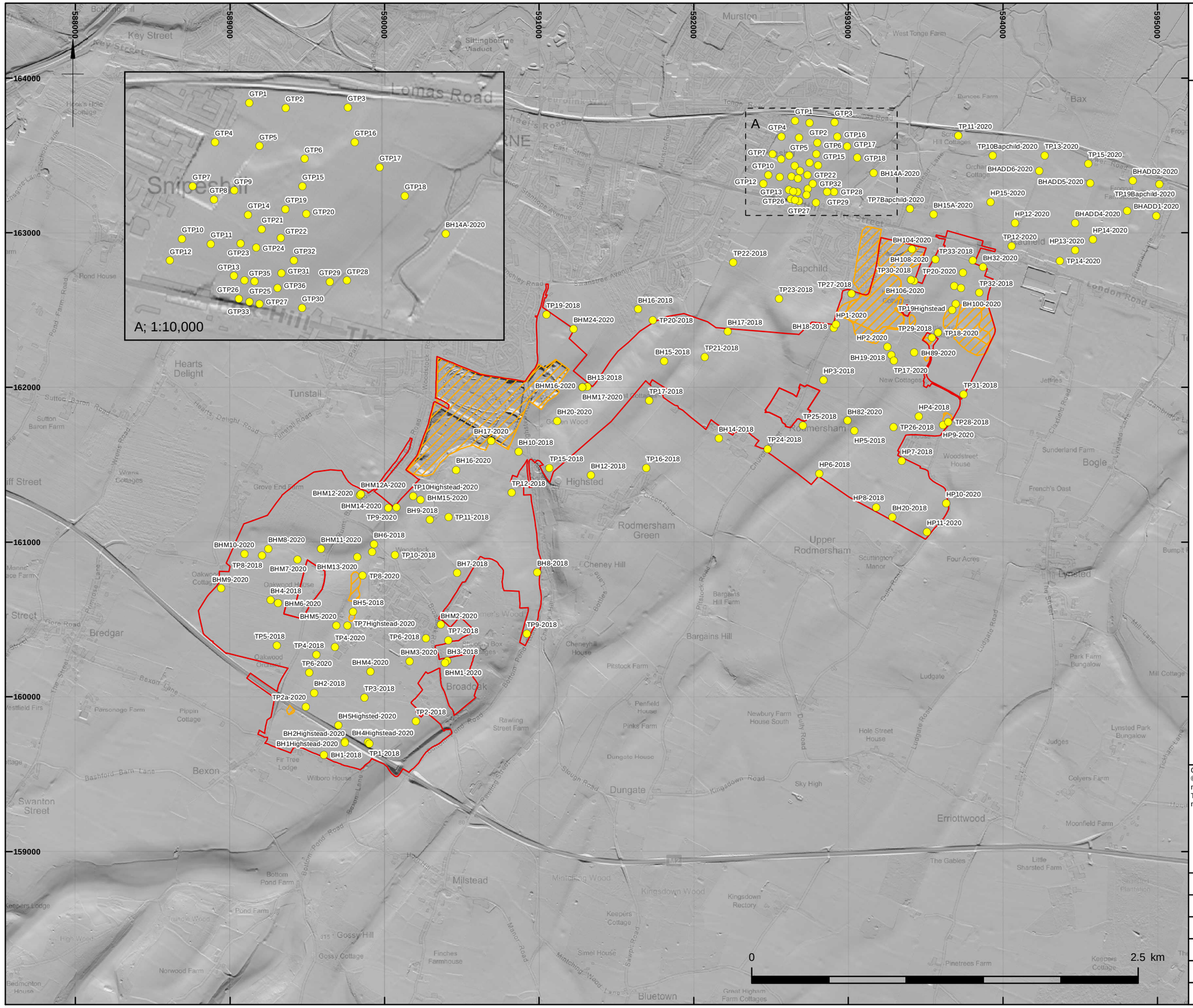
Palaeolithic and Mesolithic findspots recorded on Historic Environment Record (HER) within 1 km radius of the Site

Figure 4



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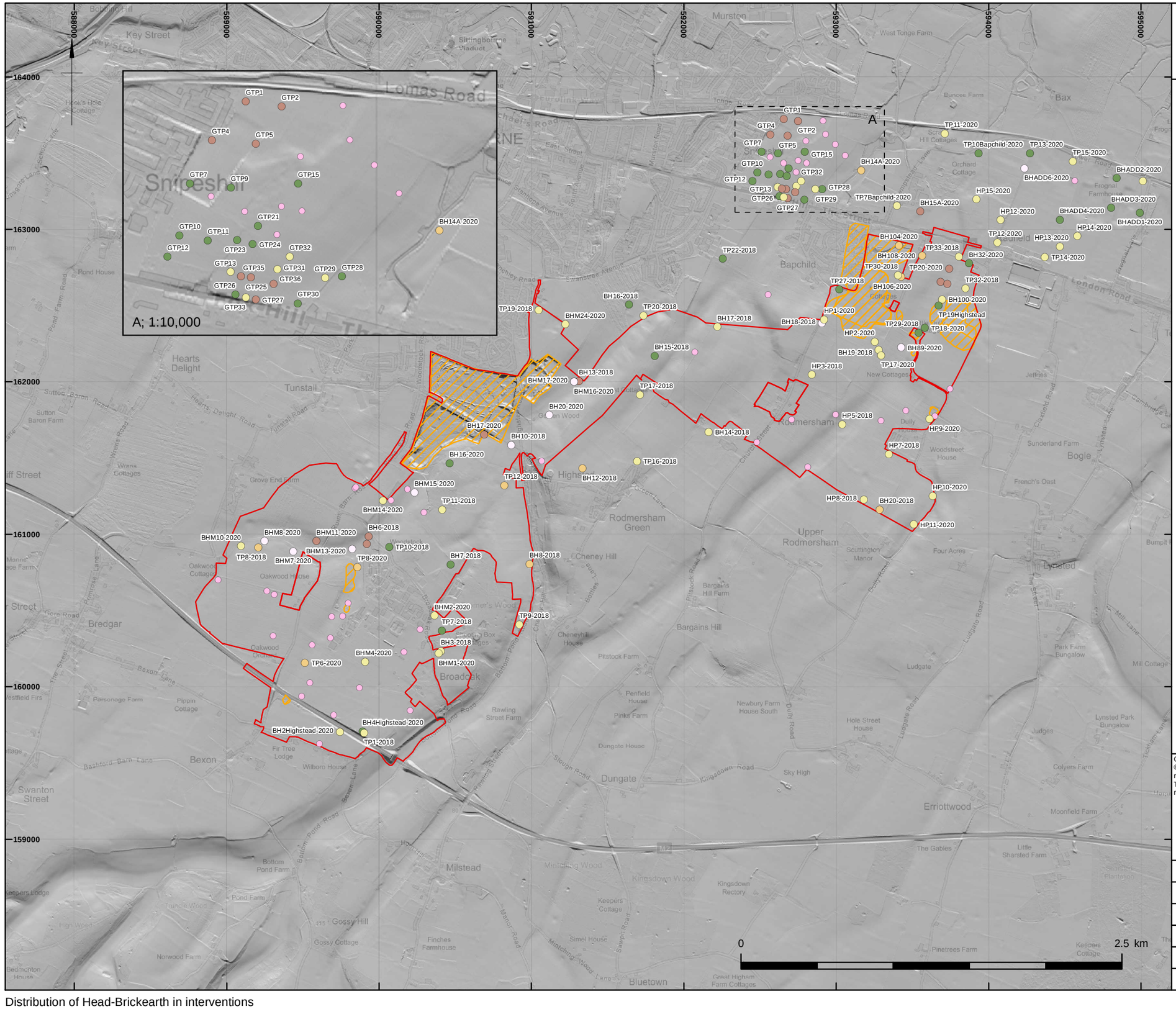
Site plan and data points used in deposit model

Figure 5



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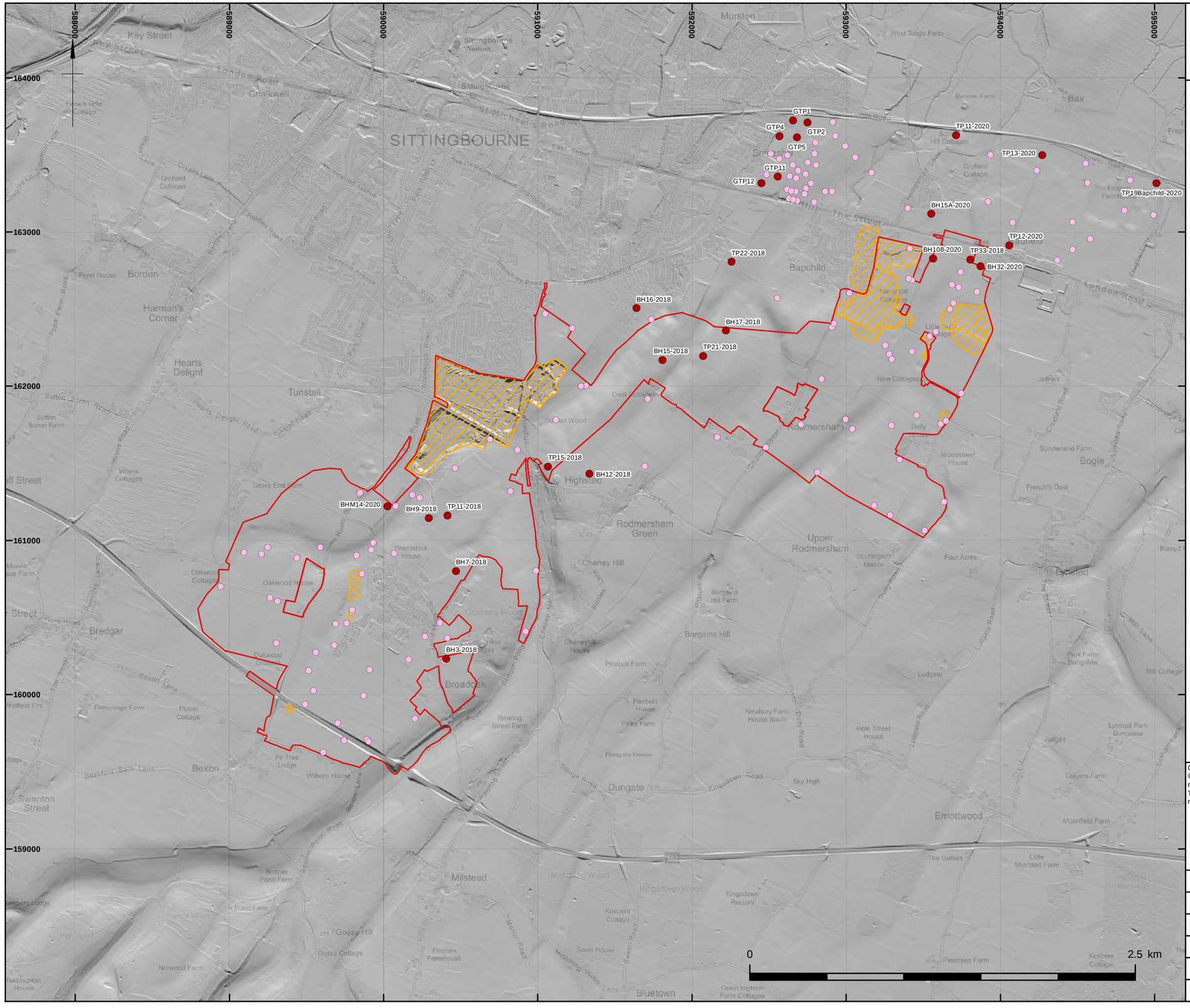
Distribution of Head-Brickearth in interventions

Figure 6



Site boundary

Head-Brickearth or Thanet Formation in interventions

Other intervention

Area of quarrying

Date:	30/04/2021
Revision Number:	0
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Illustrator:	RM
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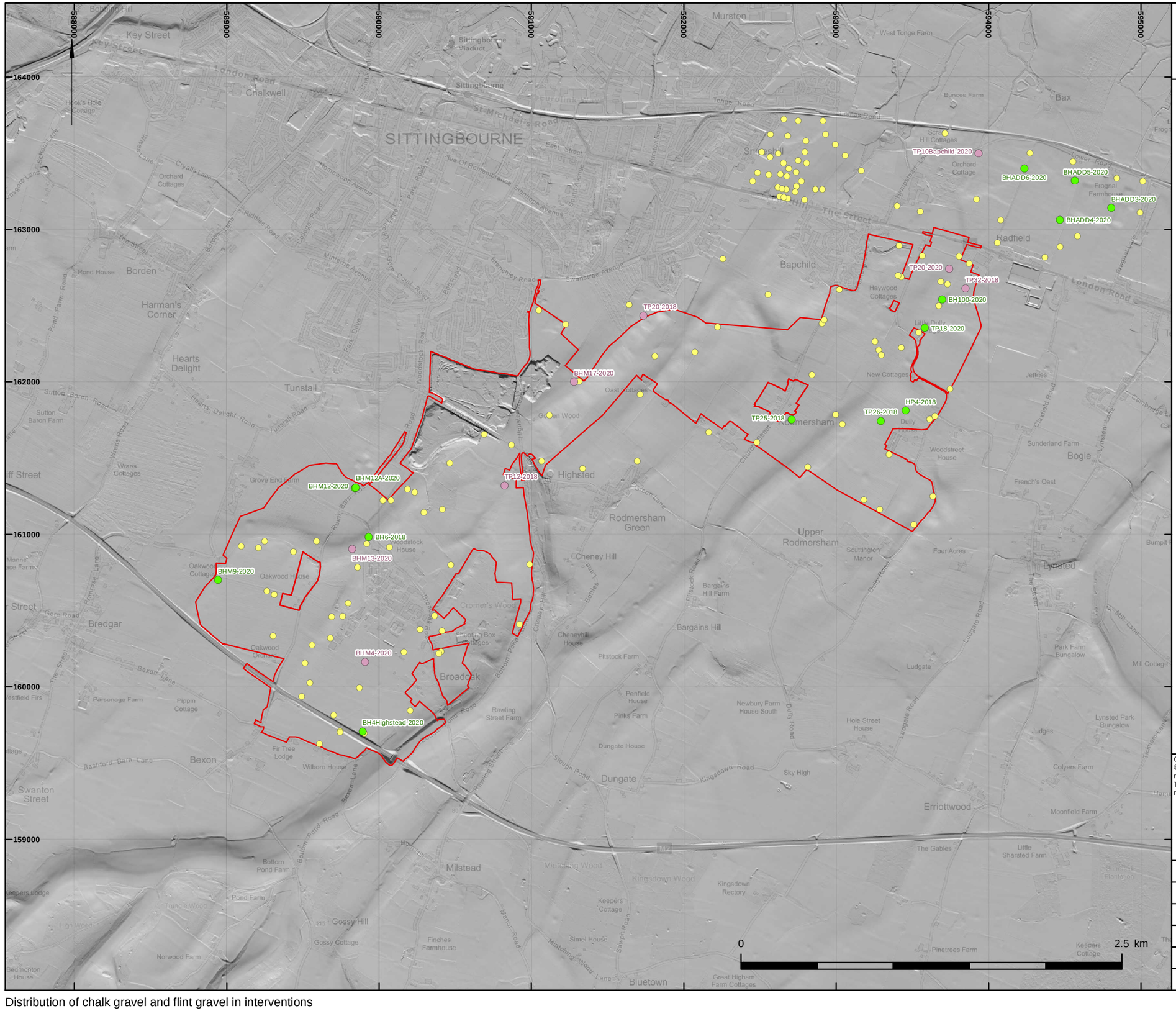
	FigsMXD\2021_04_21

Distribution of ?Head-Brickearth or Thanet Formation in interventions

Figure 7



Site boundary
Chalk gravel in interventions
Flint gravel in interventions
Other intervention

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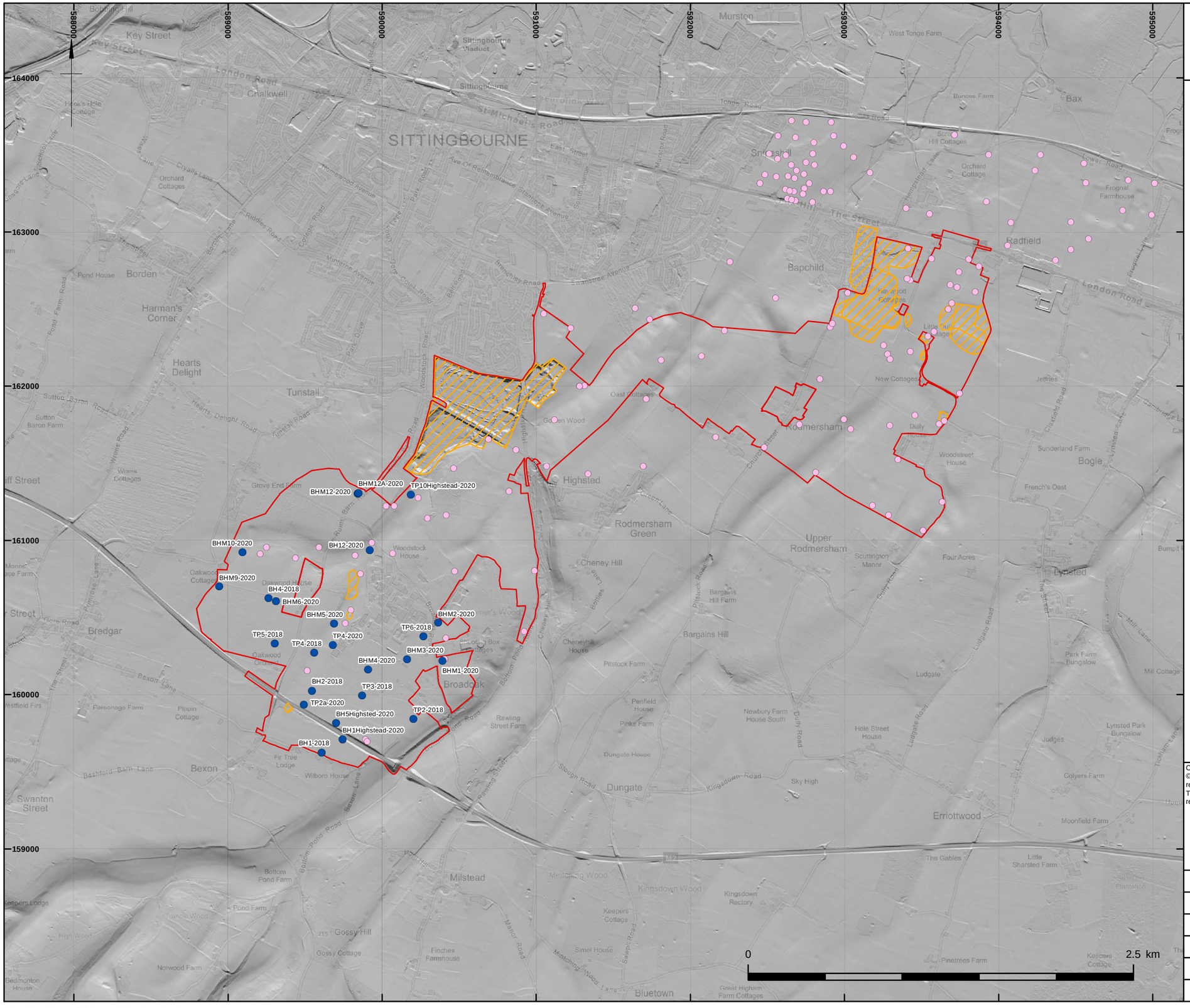
Distribution of chalk gravel and flint gravel in interventions

Figure 8



Site boundary

Clay with flints in interventions

Other intervention

Area of quarrying

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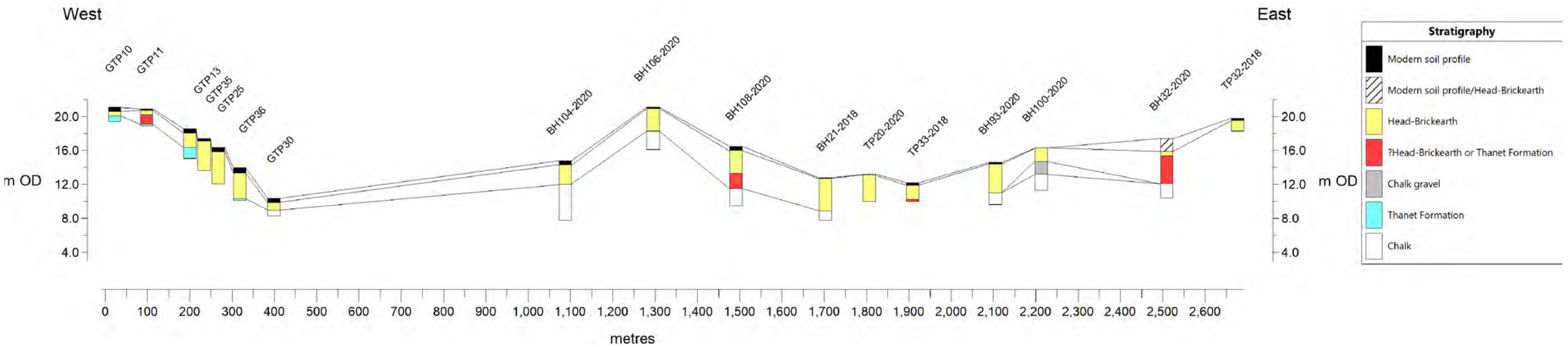
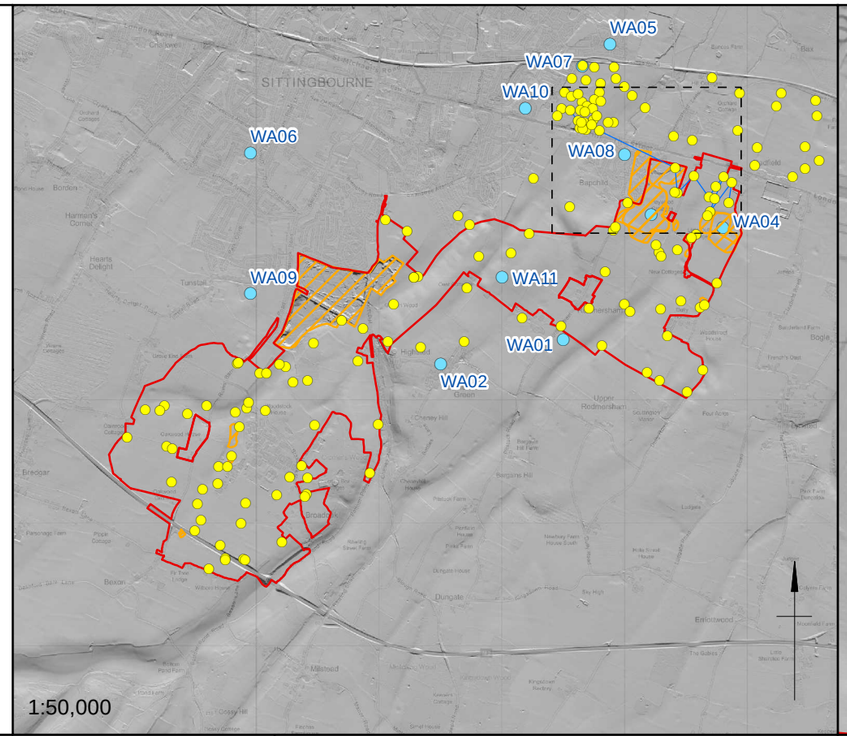
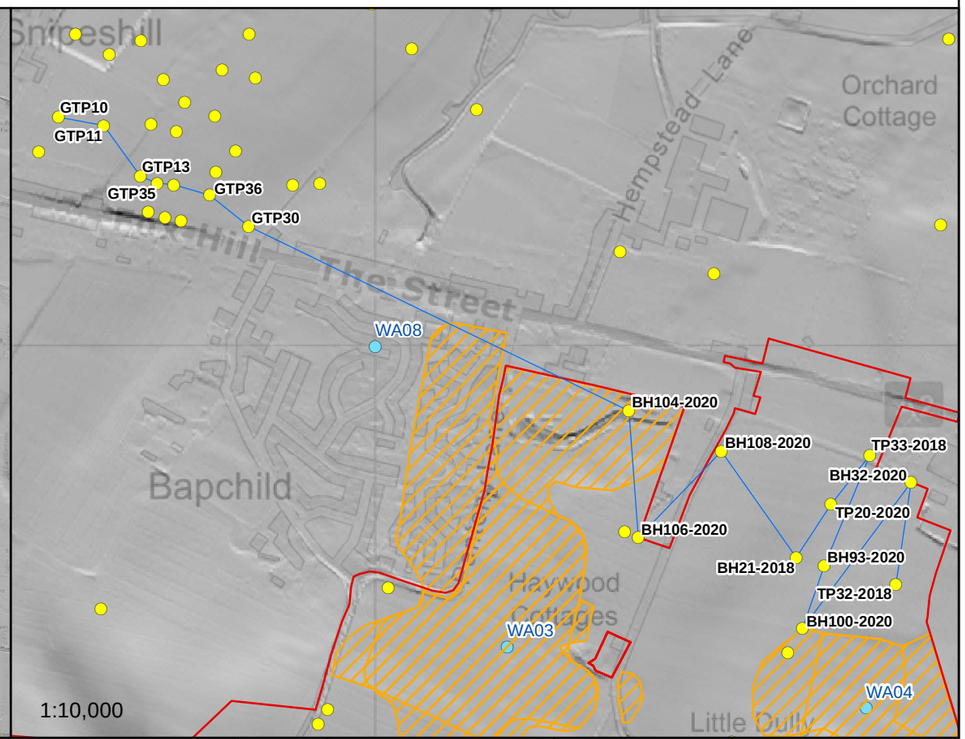
Distribution of Clay with flints in interventions

Figure 9

Cross-Section 1







- Site boundary
- Transect
- Data points
- Palaeolithic and Mesolithic findspots
- Area of quarrying

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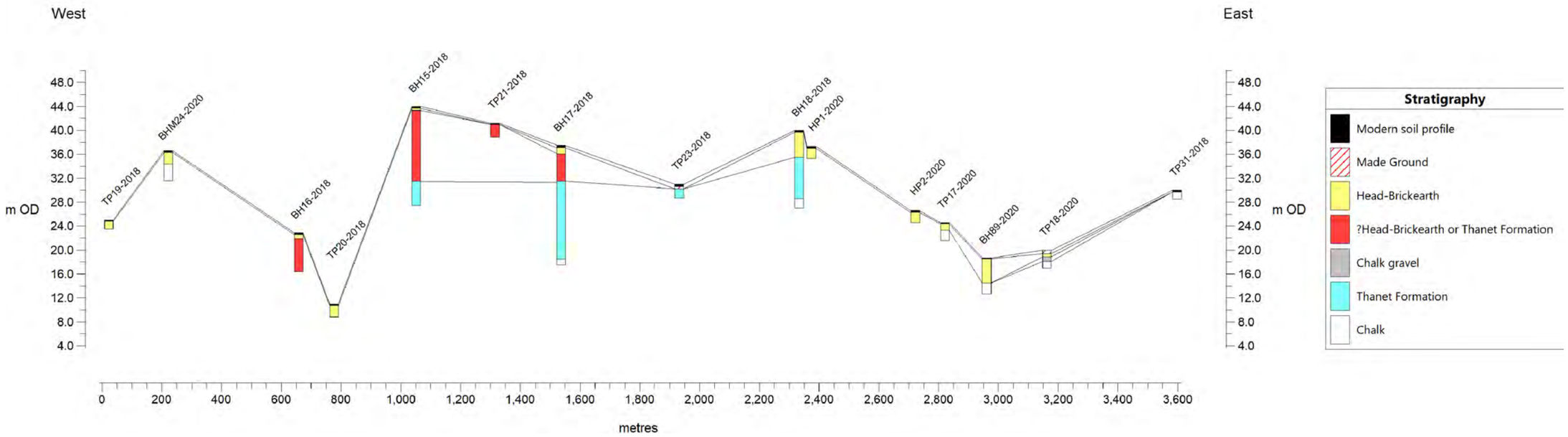
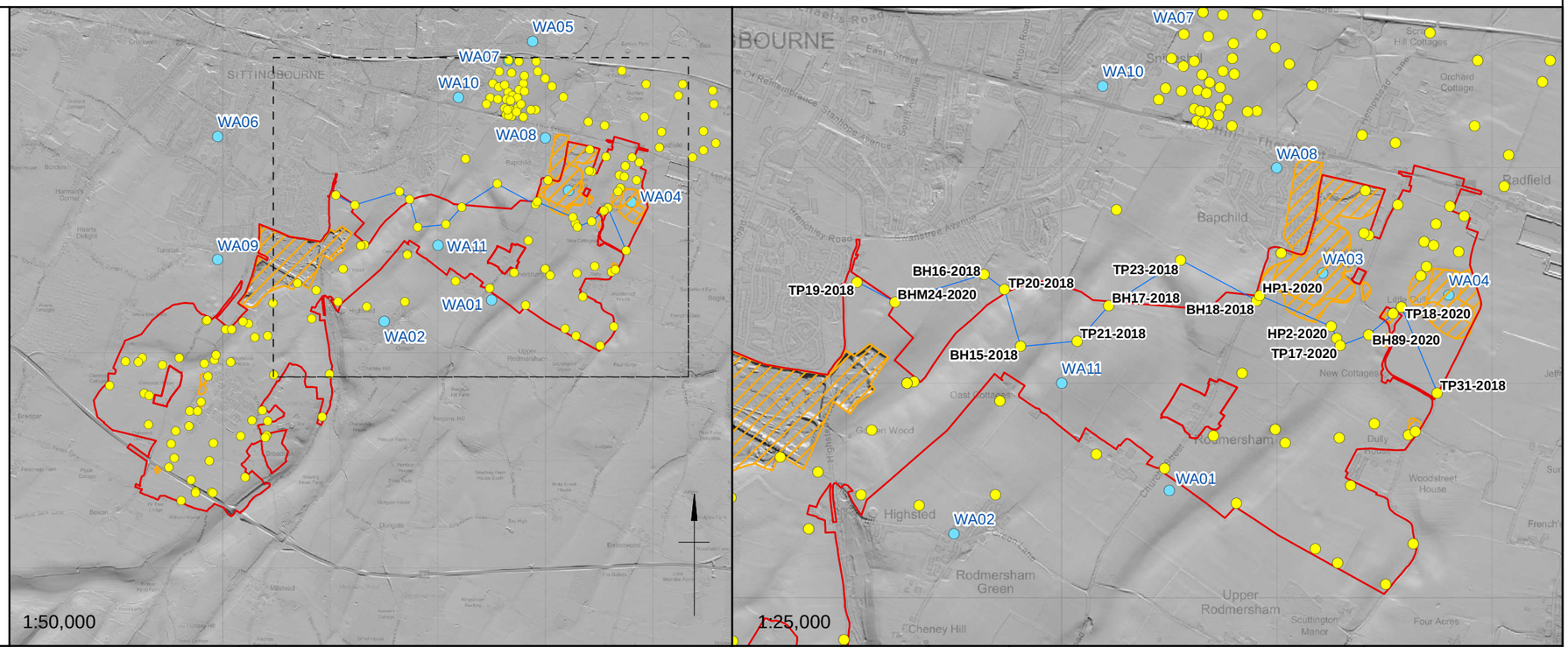
Cross-Section 2





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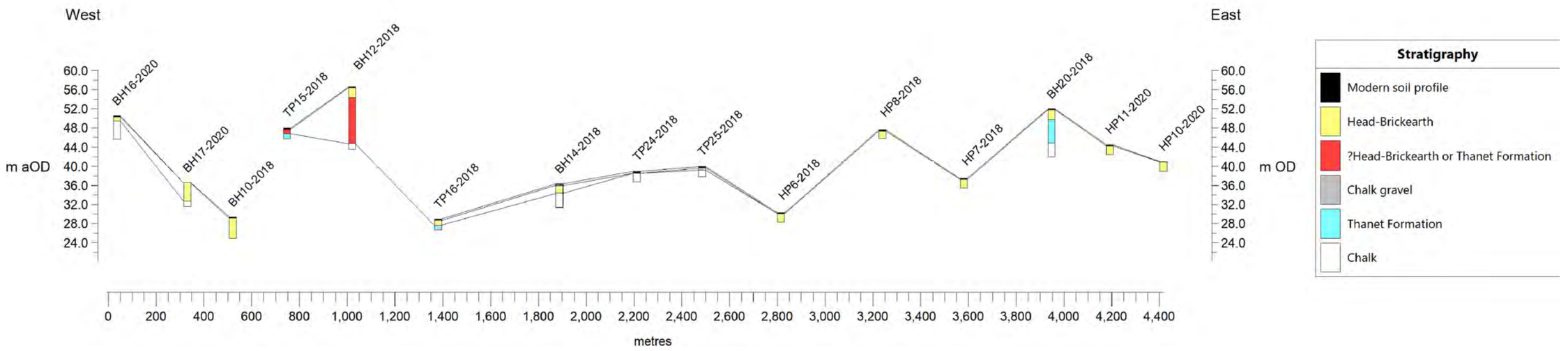
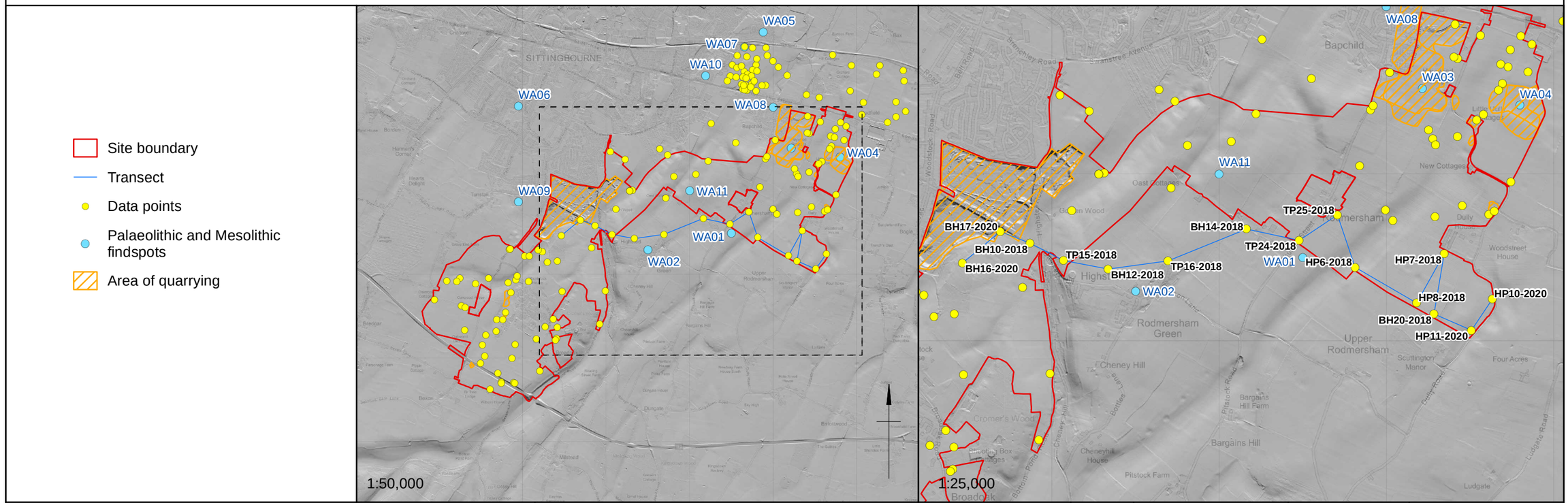
Cross-Section 3





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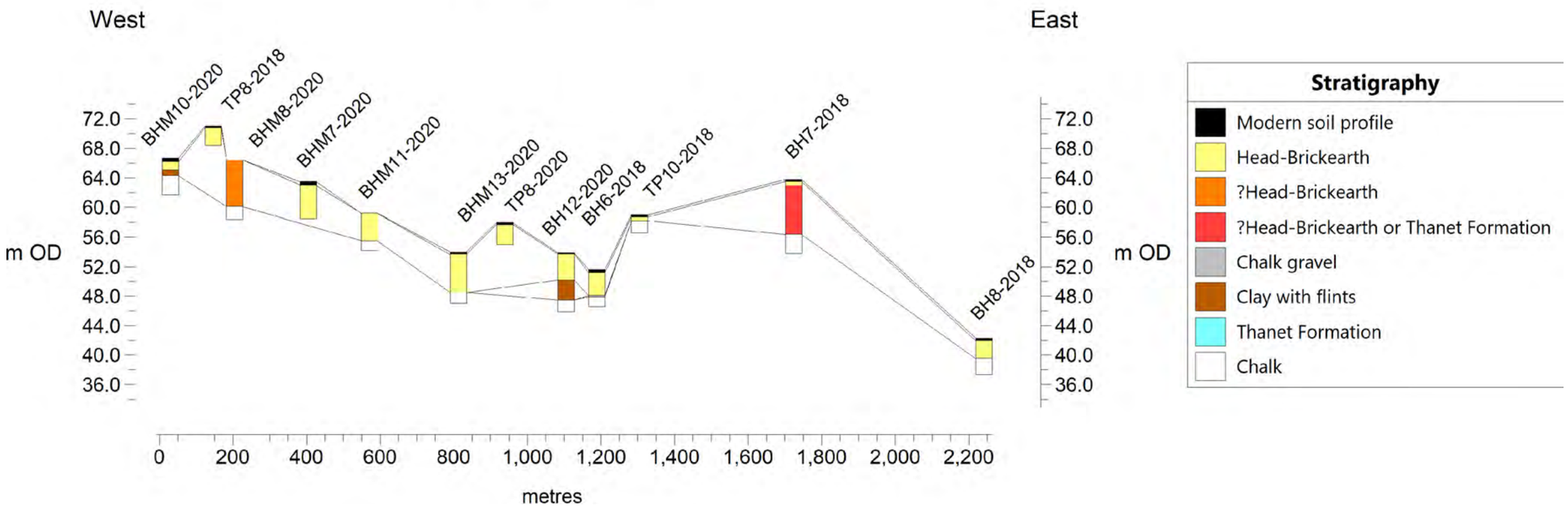
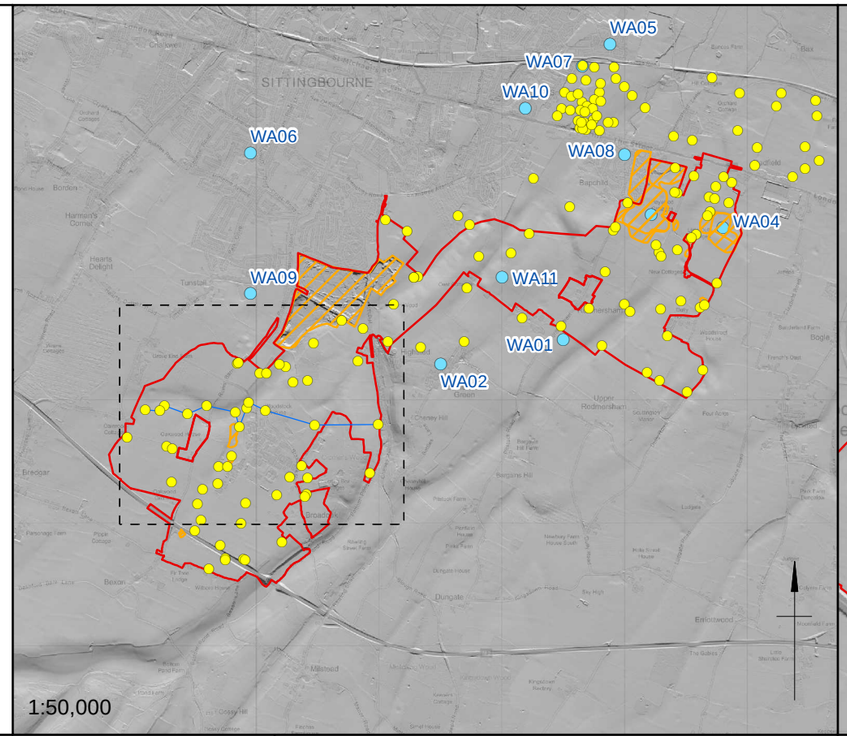
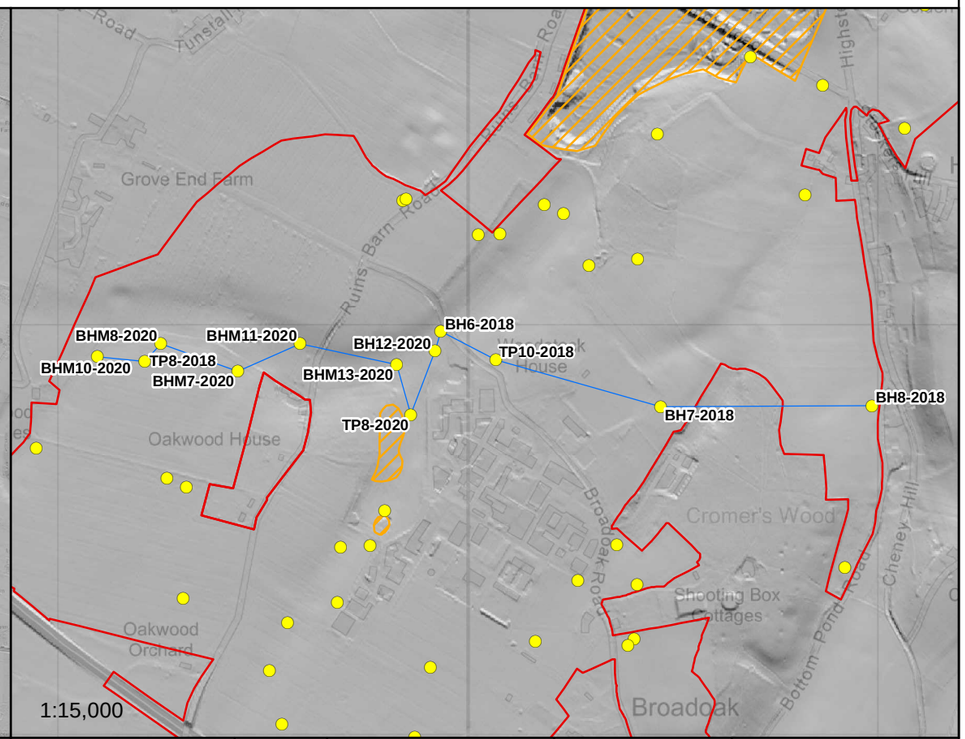
Cross-Section 4







- Site boundary
- Transect
- Data points
- Palaeolithic and Mesolithic findspots
- Area of quarrying

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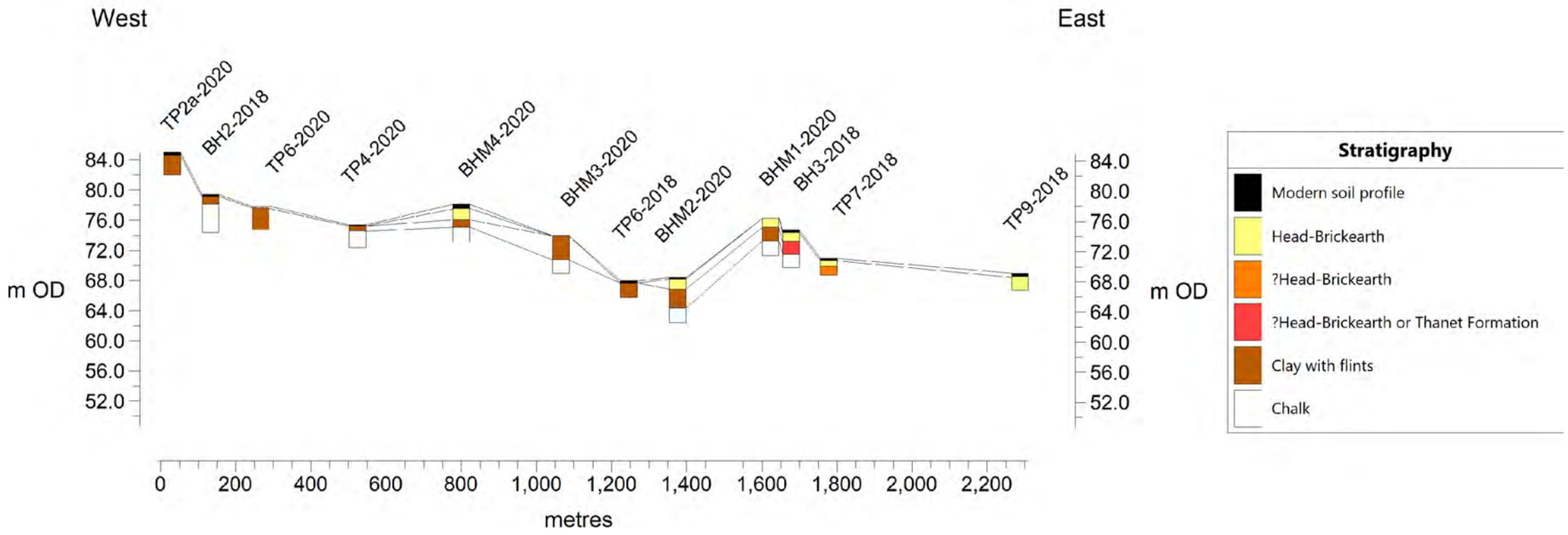
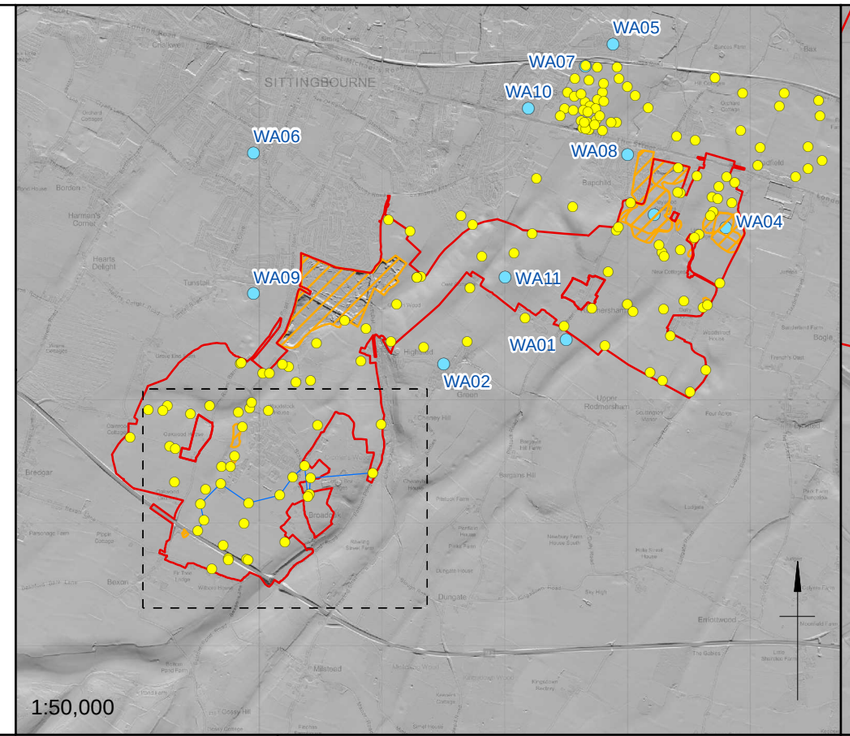
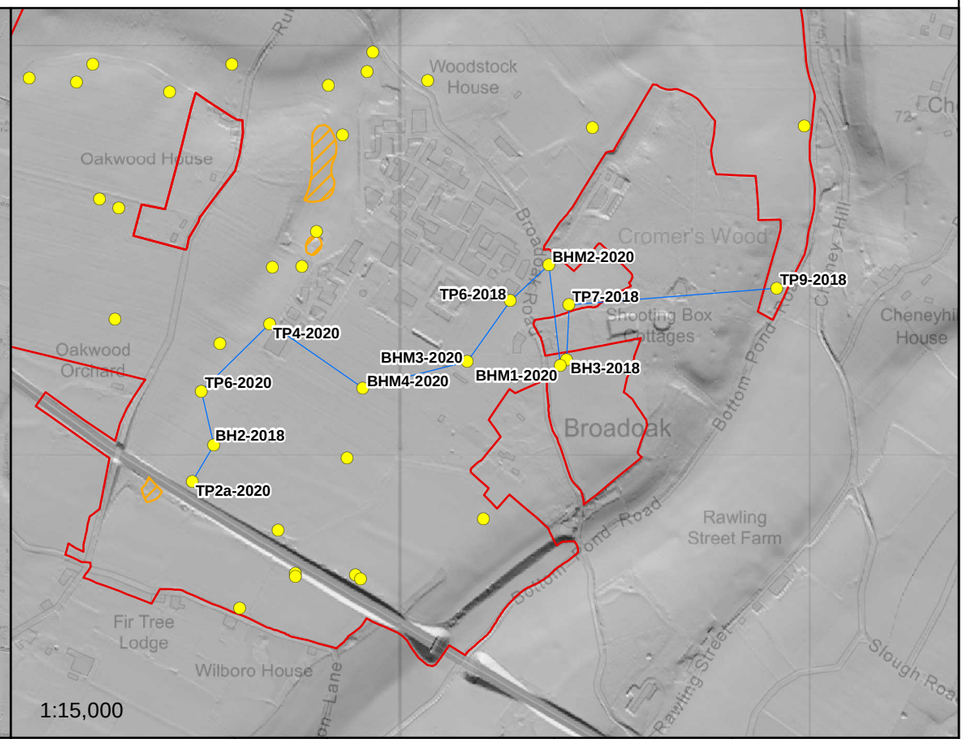
Cross-Section 5







Site boundary

Transect

Data points

Palaeolithic and Mesolithic findspots

Area of quarrying

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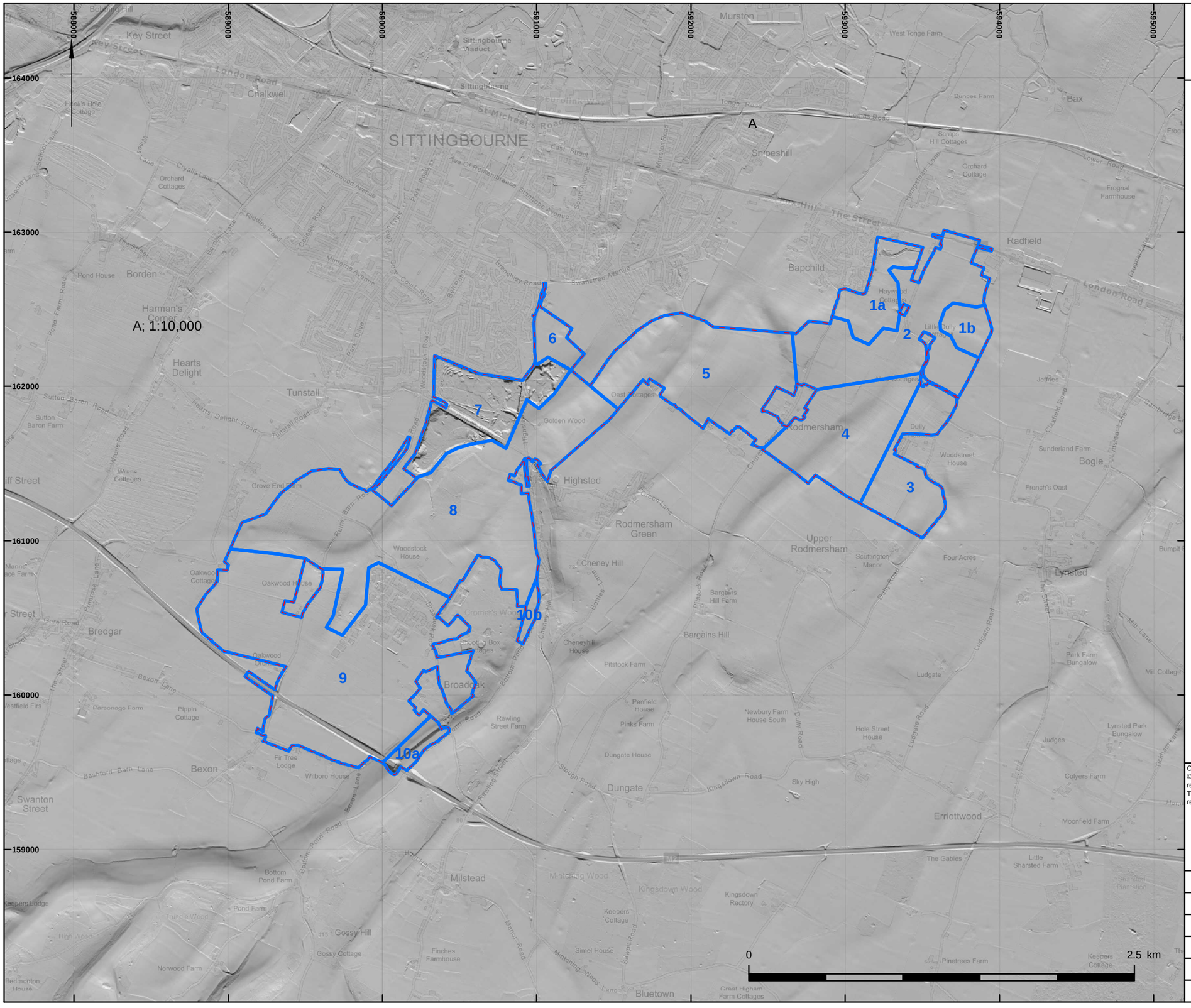

Site boundary

GCZ

Date:	29/04/2021
Revision Number:	0
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Plan of Geoarchaeological Characterisation Zones (GCZs)

Figure 15