Bexhill to Hastings Link Road

Geoarchaeological Monitoring and Recording during Geotechnical Investigations

Archaeological Investigation Report

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Bexhill to Hastings Link Road
East Sussex

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GEOARCHAEOLOGICAL MONITORING AND RECORDING DURING GEOTECHNICAL INVESTIGATIONS

FOR

MOTT MACDONALD

ON BEHALF OF EAST SUSSEX COUNTY COUNCIL

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SUMMARY

Oxford Archaeology (OA) was commissioned by Mott MacDonald on behalf of East Sussex County Council to undertake a geoarchaeological watching brief of geotechnical ground investigations for a proposed link road between Bexhill and Hastings, East Sussex (centred on NGR 756 108). The work was undertaken between November 2008 and March 2009, to mitigate the effects of the ground investigations on the archaeological resource and provide the opportunity to further evaluate the archaeological potential of the route.

Previous archaeological work undertaken as part of the Scheme has identified good potential for early prehistoric archaeology to be located along the proposed route. The Scheme has been subject to an ongoing programme of detailed archaeological and geoarchaeological assessment to help determine potential. To date, this work has comprised a desk-based assessment, aerial survey, fieldwalking, geophysical survey, site inspection, a geoarchaeological desk-based assessment and geoarchaeological test pitting.

The geotechnical investigations comprised 86 boreholes, 18 cone penetration tests (CPTs) and 185 test pits along the Scheme. The watching brief has confirmed that extensive prehistoric peat deposits exist within all four of the main valley sequences. The sediment sequences identified are consistent with the tripartite system of two main phases of marine transgression and one phase of regression proposed previously within the deposit model. Within this sequence there are periods of complexity, with some slight variations in the main Combe Haven Peat Sequence. In addition to the four main valley sequences the watching brief identified a further peat deposit associated with a smaller potential wetland sequence located near to Bexhill.

The watching brief identified a total of four potential archaeological features. Two ditches (TP106 and TP126) and two pits (TP237 and TP243). A number of colluvial deposits were also noted. No significant dating material was recovered from these features, although charcoal and small quantities of burnt flint were noted in their fills. The sterile nature of these fills and absence of finds may indicate a prehistoric rather than later date. In addition worked flint of predominantly Mesolithic date was recovered from several test pits. This material included a scraper from TP146 and evidence of blade manufacture within TP118, TP113 and TP246. Numerous pieces of worked flint were also recovered from the topsoil in and around a number of test pits indicating general activity on the higher valley ridges.

Abundant well preserved wood was identified within the peat deposits of the valley bottom sequences. Seven wood samples were recovered from the watching brief and sent to a wood specialist for more detailed examination. Most of the samples proved to be naturally worn and shattered fragments of tree trunks. Two exceptions were noted; a piece of potentially split wood from TP181 and a worked stake from TP265. However, the first sample appears most likely to have been split by natural agencies and the later relates to an undated wetland sequence on the Bexhill ridge. No direct evidence of human activity was therefore identified associated with the main prehistoric valley peat deposits within the watching brief.

The archaeology identified during the watching brief and from the previous phases of work, indicates a patchwork of different phases of activity and evidence along the proposed development. The main weight of this evidence appears to indicate high potential for early prehistoric activity dating from the Mesolithic to early Iron Age to be found associated with the wetland deposits, and its margins, and potentially associated with buried peat deposits. The higher ridge elevations may also have provided clear vantage points for hunting parties during the early Mesolithic. The absence of any pottery or other datable finds from the test pits may indicate a true reduction of activity in the area during the later historical periods.

Bexhill to Hastings Link Road
East Sussex

GEOARCHAEOLOGICAL MONITORING AND RECORDING DURING GEOTECHNICAL INVESTIGATIONS

CENTRED ON NGR TQ 756 108

1 INTRODUCTION

1.1 Scope of the Study

1.1.1 Oxford Archaeology (OA) was commissioned by Mott MacDonald on behalf of East Sussex County Council to undertake a geoarchaeological watching brief of geotechnical ground investigations for a proposed link road between Bexhill and Hastings, East Sussex. The work was undertaken between November 2008 and March 2009, to mitigate the effects of the ground investigations on the archaeological resource and provide the opportunity to further evaluate the archaeological potential of the route.

1.1.2 Previous archaeological work undertaken as part of the Scheme has identified good potential for early prehistoric archaeology to be identified along the proposed route. The Scheme has been subject to an ongoing programme of detailed archaeological and geoarchaeological assessment to help determine the nature and extent of the archaeological and palaeoenvironmental resources that could be affected by the Scheme.

1.2 Location, topography and geology

1.2.1 The Scheme follows a route between Bexhill and Hastings (centred on NGR 756108), crossing near to the village of Crowhurst (Figure 1). It follows the lower slopes of the Battle-Hastings ridge. The route skirts around the main Combe Haven basin crossing an intricate pattern of minor valleys and ridges, the river valleys of the Combe Haven Stream, Watermill Stream, Powdermill Stream and Decoy Pond Stream shown in Figure 2.

1.2.2 The Combe Haven Valley itself is a low-lying, poorly drained, flat wetland, where much of the land lies just above sea level. The Combe Haven River runs through the main valley, towards Bulverhythe, from where it flows into the sea. The majority of the land is unimproved pasture with small farmsteads located on the higher ridges of the valleys. To the west and east are the major coastal urban areas of Bexhill and Hastings.

1.2.3 The British Geological Survey of Great Britain (BGS 320/321 1:50,000) maps the underlying geology of the area as predominantly floodplain valley deposits, surrounded by ridges of predominately Wadhurst Clay overlying Ashdown Sands. These are part of the Hasting Beds formation, that were former Cretaceous seabed deposits, uplifted through tectonic movement into what now forms part of South East England.

2 THE ARCHAEOLOGICAL AND ENVIRONMENTAL BACKGROUND

2.1 Introduction

2.1.1 Previously it has been assumed that the heavy soils of the Weald were less favoured for early prehistoric activity and settlement, compared to areas like the South Downs with its lighter soils (Armstrong 1974). The lack of archaeological evidence discovered along the Scheme has tended to reinforce this view, with only isolated find spots hinting at low-levels of archaeological activity in the area. This is however in contrast to palaeoenvironmental studies (Jennings *and* Smyth 1987a, 1987b, 1988 & 1990; and OA 2008a) that have identified potentially early prehistoric impacts on the vegetation history of the Combe Haven. The absence of significant evidence is very likely therefore to reflect a lack of investigation rather than a true absence of activity and settlement in the area.

2.2 Summary of previous archaeological work

2.2.1 Previous archaeological work in connection with the Scheme has consisted of the following:

- Archaeological Desk Based Assessment (Blandford Associates 2004)
- Archaeological Watching Brief of Geotechnical Test Pitting (Archaeological South East 2006)
- Updated Archaeological Deskbased Assessment (OA 2006a)
- Geophysical Survey of the Proposed Route (Geophysical survey) (OA 2006b)
- Cultural Heritage Walkover Survey (OA 2006c)
- Chapter 14: Cultural Heritage. Bexhill to Hastings Link Road Environmental Impact Assessment (OA 2007a)
- Geoarchaeological Deskbased Assessment (OA 2007b)
- LIDAR Survey Analysis (OA 2007c)
- Surface Collection Survey (Fieldwalking) (OA 2007d)
- Geoarchaeological Field Assessment (OA 2007; Rev 2008a)
- Geoarchaeological Geophysical Survey (OA. 2008b).

2.2.2 The previous geoarchaeology assessment undertaken along the Scheme identified significant archaeological potential associated with the valley bottoms. The assessment identified a deep Holocene sedimentation filling the valley sequences, potentially burying early archaeological deposits. Thick peat deposits (c 1.8 to 5.6m in depth) were identified previously within three of the valleys, which have significant palaeoenvironmental and archaeological potential. The evidence may include deposits relating to the early prehistoric exploitation of the wetland environment and the use of the valleys for mobility or transport (eg wooden structures or track ways), as well as palaeoenvironmental material dating from the Mesolithic period onwards.

2.2.3 An interpretation of the Scheme stratigraphy initially presented within the appendix of the EIA (OA 2007a) was updated following the completion of the geoarchaeological field investigation (OA 2008a). The stratigraphical sequence has been broadly divided into three main stratigraphic units. The lower sequence consists of estuarine and marine sands that were deposited during the early Holocene. The middle part is characterised by organic silty clay alluvium and peat reflecting periods of changing sea-level and freshwater river flooding. The upper deposits consist of a return to estuarine silty clays that began to accumulate between 2500-3000 years ago. The present-day landscape developed following the later reclamation of the area that began during the medieval period.

2.2.4 The Combe Haven Peat Sequence can be broadly divided into three main organic units. A lower peat between -1m aOD and 0m aOD, comprised a compacted blackish brown wood peat with occasional clay lens. An upper peat, between +1m aOD and +2m aOD, consists of wood peat and clayey peats. A third deposit of humic silty clays and peaty clays that separates the two. This sequence represents the main phase of marine regression, which is characterised by phases of peat accumulation and humic silty clays. This sequence of deposition indicates that a mosaic of different freshwater wetland environments would have existed at any one time in the bottom of the valleys.

2.2.5 It has been noted that early prehistoric utilisation of similar wetland environments was dependent upon marine transgression episodes, which allowed the environment to shift from estuarine/saltmarsh to fen and carr vegetation (Jennings *et al*, 2003 and Jennings 2005). Early prehistoric activity (Mesolithic-Bronze Age) associated with the formation of the Combe Haven Peat Sequence could potentially be found buried between, sealed within or just above the peat. Along the route of the proposed Scheme between 1 m to 2 m of later fluvial sediments have been previously recorded overlying the upper peat deposits.

2.3 Environmental background

2.3.1 In order to understand the archaeology in the Sussex Levels and the reasons behind changes in settlement patterns in the past, it is necessary to understand the changing nature of the South Coast environment. Fluctuations in sea-level since the end of the last glaciation has created an exceptionally full and complex sedimentary and palaeoenvironmental sequences. Human activity in the area has had to respond to these changes in environmental conditions and resource availability. Therefore by establishing the environmental history of the area, it may be possible to gain a deeper understanding of the potential archaeology present along the Scheme.

2.3.2 The present day topography of the area has undergone significant modification and bears little resemblance to the landscape of the prehistoric past. Evidence of early prehistoric surfaces and sites can be deeply buried below later accumulations of alluvium and made-ground. Monitoring of the ground investigations provides a valuable source of information on the archaeological potential of these deposits.

2.4 Archaeological and Historical background

2.4.1 The archaeological and historic background to the project has been extensively covered previously (OA 2006c and 2007a), and only a brief summary is presented here to help place this work within a wider archaeological context.

2.4.2 At Upper Wilting Farm several possible hearths and pottery finds dated to the Bronze Age (and possibly the Early Iron Age) have been located on the valley edges and at the interface with the wetland zone. This suggests that there may have been a Bronze Age activity located on the higher ground overlooking the Combe Haven, possibly on land between Monkland Wood and Upper Wilting Farm (to the south of the Scheme).

2.4.3 The remains of a thriving Iron Age economy have been identified in the Combe Haven Valley based on the establishment of an early iron smelting industry. The area contains the essential raw materials that are required for iron smelting, including a plentiful supply of fuel wood. During the Roman period, the iron extraction industry continued to be the main focus of economic activity in the area, and was likely to have expanded.

2.4.4 In the Early Medieval period the lower-lying parts of the Combe Haven Valley were largely reclaimed from the sea, with only certain parts of the valley retaining any maritime links. There is a paucity of archaeological and historical evidence for this period. The Combe Haven Valley appears to have remained relatively stable since the medieval period, although some minor variation in sea-levels has been recorded.

3 AIMS

3.1 Research strategy

3.1.1 The main aim of the borehole/trial pit monitoring was to assess the archaeological potential of the Scheme, and record the depth and presence of potential archaeological horizons and deposits.

3.1.2 The assessment aims to:

- mitigate the effects of the ground investigations through preservation by record;
- identify any archaeological remains (if present) or deposits that may be removed or affected during the construction of the Scheme;
- characterise and record the sequence of sediments and patterns of accumulation across the valley sequences, including the depth and lateral extent of major stratigraphic units, and the character of any basal land surface pre-dating these sediments;
- update and test the preliminary deposit model that has been developed for the Scheme (OA, 2008a);
- Identify the location and extent of any waterlogged organic deposits and address the potential and likely location for the preservation of archaeological and palaeoenvironmental remains;
- assess the archaeological significance of the Scheme and highlight areas with higher potential where further work may be recommended;

4 METHODOLOGY

4.1 Introduction

4.1.1 A program of boreholes, test pits and CPT were undertaken along the proposed route of the Scheme. All test pits were monitored by an on site geoarchaeologist who was there to record and interpret the sequences of deposits and identify evidence of archaeological activity. A selection of boreholes was also monitored in order to add to the existing geoarchaeological dataset. For the other types of investigations like cone penetration testing (CPT) and windowless borehole sampling only the records were requested as it is not possible to record these samples in the field.

4.2 Test pitting

4.2.1 The test pits were dug using a mechanical 5 tonne mini digger fitted with a tooth bucket (Plate 1). The pits were initially taken down in controlled spits and were briefly halted if significant archaeological remains or sediments were encountered. The topsoil of each pit was removed over an area of 0.8m by 3m, down to as deep as possible, or until flooding prevented further progress. Some of the test pits were shored in order to allow safe access to the base of the pit, otherwise recording of the test pit profiles were normally undertaken from the side of the pit.

4.2.2 Test pitting comprised the excavation of 185 pits located across the Scheme. Of the test pits proposed, 166 were monitored in the field. Sixty eight were located within or immediately adjacent to identified wetland areas. These areas were previously mapped (OA 2008b) using a geophysical technique (EM31 Survey) to identify the extent of the deposits and the results are illustrated in Figures 4-7.

4.2.3 Trial pits were monitored and recorded by a qualified OA geoarchaeologist in line with the methodology for excavation and recording as outlined in the East Sussex County Council Guidelines (2008). This included the exposures of the prehistoric peat deposits that have been previously identified with the valley alluvial sequences (OA 2007b and 2008a). These deposits have increased potential for recovery of in-situ archaeology and for the preservation of rare waterlogged remains.

4.3 Boreholes

4.3.1 Eighty six boreholes were undertaken along the proposed Scheme, using a variety of drilling techniques including rotary drilling and Shell and Auger (cable percussion). The cable percussion rigs were selectively monitored as this allowed the deposits to be examined in the field (Plate 2). Thirty two boreholes within the wetland areas were prioritised for monitoring in order to examine the full depth of deposits within the valley bottom sequences. The boreholes provide an opportunity to investigate the underlying alluvial sequences and test the preliminary deposit model (OA 2008a). A number of boreholes were proposed in areas along the proposed Scheme that were not covered within the previous geoarchaeological investigations.

4.3.2 The deposit sequence observed at selected locations was recorded and logged using standard sediment terminology and sedimentary pro-formas. Recording follows English Heritage guidelines for geoarchaeological recording (English Heritage 2004). Samples for further description and palaeoenvironmental remains were retrieved where appropriate. The descriptions were used to confirm correlations of stratigraphic units between the previous geotechnical investigations, the geoarchaeological investigations and the new dataset. This information was then used to refine and update the geoarchaeological deposit model.

5 TEST PIT RESULTS

5.1 Introduction

5.1.1 The results of the watching brief are detailed below with summaries of the specialist finds and environmental assessments. Only the test pits that produced archaeological evidence are described here in detail and a table of all deposits monitored during the watching brief can be found within Appendix 1.

5.2 Archaeological features and deposits

5.2.1 The watching brief identified four potential archaeological features and several colluvial deposits that contained charcoal and burnt flint. These features and sequences are described below and illustrated on Figure 9.

5.2.2 Test Pit 106 (Figure 5)

5.2.3 A possible ditch (10606) was identified within TP106 towards the south of the Combe Haven Stream Valley Sequence. The ditch was over 1.0m in width and 0.5m in depth and filled with a light yellowish brown slightly clayey sand (10607). This deposit was sterile and no finds were recovered. This ditch appeared to have been cut into a light greyish brown colluvial deposit (10602), although the full extent of feature could not be fully defined.

5.2.4 Test Pit 126 (Figure 5)

5.2.5 A ditch (12602) was identified within TP126 on the northern slopes of the Combe Haven Valley Sequence. The ditch was 1.60m in width and 0.30m in depth and filled with dark yellowish brown clayey silt (12603). Charcoal fragments were noted within the ditch fill but no finds were recovered. The ditch was dug into sandy bedrock (12604) and sealed by modern topsoil (12601). A small cluster of burnt flint was also noted within the ploughsoil adjacent to the test pit.

5.2.6 Test Pit 237 (Figure 6)

5.2.7 A possible feature was identified within TP237 at the western edge of the Watermill Stream Valley. At least two possible cuts were identified (23703, 23707) dug into a weathered bedrock deposit (23708). This feature was 0.45m in depth and over 2m in width, and filled with alluvium. The earliest potential cut (23707) was filled with soft light greyish brown silty sand (23706). This deposit produced a flint flake, which may indicate a potential prehistoric date. The later cut was filled with two firm yellowish brown silty clay deposits (23705, 23704). The upper deposits containing frequent black manganese inclusions. These features and the buried land surface into which they were cut were sealed by 0.2m of dark brownish yellow colluvium (23702) and modern topsoil (23701).

5.2.8 Test Pit 243 (Figure 7)

5.2.9 A small pit (24305) was identified within TP243 on the lower slopes of the Decoy Pond Stream Valley. The pit was 1m in width and 0.4m in depth and dug into weathered bedrock deposits (24306). It was filled with a greyish brown clayey sand deposit (24304) and contained (5%) charcoal fragments. Similar inclusions of charcoal and a core-trimming flake were recovered from the overlying colluvial deposits (24302). This sequence of deposits was sealed by 0.3m of sandy silt topsoil (24301).

5.2.10 Test Pits 114, 139, 198, and 229 (Figure 5).

5.2.11 Numerous colluvial and solifluction deposits were identified during the test pitting near the lower valley slopes. Many of these deposits appeared to be quite localised and potentially related to slope stability rather than specifically caused by human agency. However, a series of colluvial deposits were identified within the base of the Combe Haven Stream Valley overlying alluvial deposits that may have been related to woodland clearance. Sandy colluvial deposits were identified within test pits TP114, TP139, TP198 and TP229. Worked flint was also recovered from a colluvial subsoil deposit that was identified within TP229.

5.3 Finds

5.3.1 A total of 54 lithics were recovered from the geotechnical investigations including 13 burnt, unworked items and one natural gravel flint cobble. The vast majority of this assemblage was recovered from the ploughsoils around the test pits. However at least four small flint assemblages were recovered from within the test pitting sequences. More detailed discussion on the worked flint can be found within Appendix 2.

5.3.2 The worked flint assemblage included a scraper from TP146 and evidence of blade manufacture within TP113, TP118 and TP246. Numerous pieces of worked flint were also recovered from the topsoil of a number of test pits indicating general activity on the higher valley ridges. The majority of the assemblages comprised waste flakes from late in the reduction sequence, although some primary flakes might suggest the exploitation of locally occurring flint deposits. The waste is mostly undiagnostic of date, but what dateable material exists is all of Mesolithic origin.

5.3.3 No pottery or other datable material was identified within any of the test pits that would indicate later phases of activity. The absence of even a small amount of pottery may be informative by its absence, when compared with the volume of worked and burnt flint recovered. This might suggest low archaeological potential for Roman through to post-medieval activity along the route.

5.4 Wood Samples

5.4.1 Abundant pieces of preserved tree trunks (mostly alder) and branches were found to be preserved within the upper Combe Haven Peat Sequence at depths between 1.5m and 2.5m. Of the wood encountered, seven pieces were thought to be potentially worked and were sent to a woodworking specialist for examination. Most of the samples proved to be naturally worn and shattered fragments of tree trunks, although two were identified as having further potential. The worked wood report can be found within Appendix 3.

5.4.2 A piece of worked wood was recovered from TP265 (Figure 9, Plate 5) situated in a railway cutting near to Bexhill. The wood was recovered at the interface between a peat deposit (26505) and an overlying alluvial deposit (26504) which contained modern brick pushed into it. The alluvium appeared to be insitu but sealed by chalk dumps and the made ground for the foundations of the railway. There is a possibility that this wood may relate to the construction of the railway and is intrusive into the alluvium and underlying peat deposits. The wood comprised of a chunk of radially cleft oak branch c. 0.12m in length with one probably humanly cut, weathered, flat end and the other charred.

5.4.3 A split log was also recovered from peat deposits within TP181 (Figure 9) and another observed within TP180 (Plate 4). These test pits were located at the margins of the Powdermill Stream. These logs were located at a depth of between 2-2.5m below ground level (+1m aOD) and were associated with organic deposits. The wood recovered from TP181 appeared to have been rolled and broken, and appears not to have been in-situ. People might possibly have split this log section but this could also have occurred by natural agencies such as tree fall or lightening. Large over-turned unworked alder logs from this level at the edges of the alluvium had been previously noted during the geoarchaeological field investigations (OA 2008a).

5.4.4 Although only one piece of wood was definitely worked (and may be of relatively recent origin) the others do indicate the potential for wood to be preserved within the main organic sequence.

5.5 Environmental samples

5.5.1 Four samples were taken from the boreholes and test pits where notable preservation of palaeoenvironmental remains was observed during field logging. Samples <1> and <2> were taken from BH143 from the main peat deposits within the Powdermill Stream sequence (Figure 7). Sample <3> was taken from a buried soil overlying the gravels located 10m below the present ground level on the margins of the Powdermill Stream Sequence within BH144 (Figure 7). Sample <4> was recovered from a peat deposit (26511) from TP265 (Figures 3, 9). This test pit was situated in a railway cutting close to Bexhill.

5.5.2 The highly woody nature of these peat samples is suggestive of the development of an alder carr wetland. Test Pit 265 revealed a peat sequence in an area not previously investigated and this and the samples from the Powdermill Stream Sequence were taken in order to compare with the previous sampled sequences from the valleys recorded during the geoarchaeological field assessment (OA 2008a). More detailed discussion of the samples can be found in the waterlogged plant remains assessment in Appendix 4.

5.5.3 The landscape represented by the upper peat samples <1> and <2> from the Powdermill Stream sequence, characterised by the presence in sample <1> of seeds of alder (*Alnus* sp.) and sedge (*Carex* sp.) together with probable alder wood fragments, suggest the development of alder carr woodland. The accumulation of these deposits has been previously radiocarbon dated to a period of marine regression 4390±60BC to 1790±100BC (late Mesolithic to early Bronze Age) following on from a phase of sea-level rise and deposition of marine silts. The samples confirm and are consistent with the presence of alder carr deposits as previously noted in the valley bottoms of the Watermill and Powdermill Stream valleys.

5.5.4 The narrow range of plant remains recovered from the early Holocene buried soil (sample <3>), help indicate its character. The presence of hazelnuts in what appears to be a rodent cache suggests that hazel vegetation was growing very close by. The two seeds of dogwood (*Cornus* sp.) are also indicative of nearby wood or scrubland. Corylus is known to have been one of the earliest deciduous trees to recolonise Britain after the last glaciation, with ubiquitous high hazel pollen values preceding the first influx of oak and elm (Deacon, 1974). Previous pollen work indicated an environment dominated by arboreal pollen, like Lime. The sample also contained high numbers of pine, with very abundant ferns. The presence of an indeterminate pine cone (*Pinus* sp.) demonstrates that pine formed a component of the local woodland, probably a remnant of an earlier birch-pine forest environment. This horizon was sealed by a silt sandy layer thought to represent an episode of marine inundation.

5.5.5 Sample <4> from TP265 produced a poor plant assemblage which included a single seed of blinks (*Montia fontana*) suggesting a damp environment and abundant indeterminate abraded wood fragments. Three insect fragments were also noted. Due to the lack of evidence in this sample the peat sequence revealed under the railway cutting could not be directly correlated with the main Combe Haven Peat Sequence.

5.5.6 The assessment of the waterlogged material from the route demonstrates that anaerobic preservation was good in the sampled horizons, including the Mesolithic pre-inundation land surface represented by sample <3>. The samples confirm previous indications that there is good potential for the preservation of valuable palaeoenvironmental evidence.

6 DISCUSSION OF THE VALLEY SEQUENCES

6.1 Introduction

6.1.1 The archaeological potential revealed within the test pits can be best examined in the light of the valley and ridge sequences. This work has confirmed that extensive peat deposits exist within all four of the main valley sequences. The sediment sequence is consistent with the tripartite system of two main phases of marine transgression and one phase of regression proposed within the deposit model (OA 2008a). However within this sequence there are periods of great complexity, with variations in the elevations of the main Combe Haven Peat Sequence. In addition to the four main valley sequences the watching brief identified peat deposits associated with a previously unknown wetland sequence located near to Bexhill.

6.1.2 Representative cross-sections of the main valley sequences that are crossed by the Scheme are illustrated in Figures 10 and 11. Comparisons with the previous palaeoenvironmental studies are complicated by differences in elevation of the main peat units with those recorded previously. There may have been a time lag between changes in sea-level represented at the mouth of the river and when these effects extend further up the valleys. Therefore peat deposits may have continued to accumulate in some areas of the valleys while other low-lying areas were experiencing marine sedimentation.

6.2 Bexhill Ridge sequence (Figures 3 and 4)

6.2.1 The ground investigations on the Bexhill ridge indicated a sequence of topsoil and made-ground deposits overlying weathered sandy bedrock. The modern made-ground deposits comprised mixed deposits of silty sand and gravel, with frequent modern inclusions. No significant archaeological deposits were identified in the majority of test pits within this area of the proposed Scheme.

6.2.2 The one notable exception to this sequence of deposits was TP265 that comprised alluvium and peat deposits underlying 0.8m of made-ground deposits within a former railway cutting. The piece of potentially worked wood recovered from the interface between the peat deposits and the overlying alluvial silts, could be of archaeological significance. The dating of this wood is problematic, although it could conceivably be associated with the peat deposits. However, due to the lack of matching environmental evidence and the higher elevation of the peat deposits in this area any direct correlation with the main Combe Haven Peat sequence cannot be simply applied.

6.3 Combe Haven Valley Sequence (Figure 10)

6.3.1 The test pits indicated significant evidence of early prehistoric activity on the lower slopes and wetland margins of the Combe Haven Stream Valley. Small quantities of worked flint were recovered from TP113, TP118 and TP229 from both the topsoil and sealed underneath colluvial deposits. This activity appears to have occurred at the margins of the alluvium deposits, indicating activity in the transitional zone between the wet and dry land.

6.3.2 The sequence of colluvial deposits identified within test pits TP114, TP139 and TP198 near to the valley bottom may represent episodes of clearance or disturbance of the upper valley slopes. These deposits were sealed just underneath the topsoil and comprised brown silty clay containing frequent charcoal, bloom and burnt flint. In places these deposits were found to overlie silty clay alluvium. Previously, 27 fragments of fired clay from a potential kiln were recovered from similar deposits in the geoarchaeological test pit OATP2. The dating of the colluvial deposits is problematic especially without supporting evidence such as pottery or other clearly datable artefacts. However worked and burnt flint, along with evidence of industrial waste type material may indicate a potential late prehistoric or early historic date.

6.3.3 The two possible undated ditches identified on the upper slopes of the valley within TP106 and TP126 support the evidence for clearance of the upper slopes of the valley. Both ditches contained only charcoal and burnt flint. A broken scraper was also recovered from the topsoil within TP164 near to the top of the ridge and scatters of burnt flint may provide further evidence of prehistoric activity on the upper slopes.

6.3.4 The previous geophysical mapping (OA 2008b) of the valley bottom indicated a complex sequence of islands and diverging channels within the base of the valley that would have been very attractive locations from which to exploit the rich resources of the wetlands. The sequence comprises fluvial sandy clays to a depth of 5m (-1m aOD) seen within BH117. Thin bands of organic deposits were identified within BH186 and previously in OATP2. These deposits were recorded at depths between 1.3m and 2m. At present these deposits are undated and are only tentatively linked with the main phases of peat accumulation within the Combe Haven. These organic deposits within the valley were found not to have been as extensive or as thick when compared to the other valley sequences. This sequence appears to have been much more confined and less affected by marine conditions. It is possible that the peat deposits within this area were either unlikely to form in such a confined sequence or have been eroded by later channel activity.

6.4 Watermill Stream Valley Sequence (Figure 10)

6.4.1 The watching brief identified a series of upper silty clay alluvial deposits underlying the topsoil within the Watermill Stream Sequence to a depth of 1.75m to 2.5m. A complex sequence of organic silts and peat deposits were also identified between 1.75m and 8.5m in depth within TP150, TP161, TP162, TP163, TP164, TP201, BH127, BH128, URSBH130, URSBH131, BH132 and BH134. These deposits ranged from organic silty clays to poorly humified wood peats. A series of sandy fluvial deposits were identified underlying these deposits within the geotechnical boreholes on top of sandy gravel and weathered bedrock. No archaeological features or deposits were identified within this alluvial sequence.

6.4.2 The watching brief may have identified further prehistoric activity at the edges of the Watermill Stream Valley with the identification of a pit within TP237 which contained worked flint. A thin deposit of colluvium helped to seal and protect this feature. This activity was located on a buried land surface approximately 0.4m below the present ground level (+1.84m aOD), at a similar depth below ground level to a previously identified flint scatter in the sequence identified during the geoarchaeological field investigation (OA 2008a). It may also be worth noting that this valley bottom sequence was less intensively covered by test pitting when compared to the other sequences and therefore its archaeological potential may be slightly under-represented in the current phase of work.

6.4.3 The edges of the wetland zone have previously produced a small assemblage of worked and burnt flints at the interface between peat and underlying sand deposits within OATP4 (OA 2008a). That flint assemblage consisted of four fresh flint flakes, a shallow minimally retouched flake and a simple edge-retouched flake. One flake was burnt and another was broken. The flints were all in exceptionally fresh condition possibly forming part of an in-situ scatter dating potentially to the Neolithic period. This small group includes both retouched artefacts and utilised flakes indicating that the assemblage probably results from the performance of various activities rather than representing a knapping scatter.

6.4.4 This valleys environmental sequence (OA 2008a) also provided the earliest evidence of direct human impact within the valley sequences at 3.12m in depth (-0.8m aOD) associated with the accumulation of the lower Combe Haven wood peat. A decline in alder at the expense of elm may indicate episodes of clearance within the valley bottoms. Peaks in plantain/ribwort plantain and *Polypodium* (fern) spores also recorded at this level may also indicate some disturbance/opening up of the woodland in the immediate location. These changes within the environmental sequence were found to coincide with increased charcoal levels. This episode of disturbance was radiocarbon dated to c 3430±90BC, a late Neolithic date.

6.5 Powdermill Stream Valley Sequence (Figure 11)

6.5.1 The test pits within the Powdermill Stream Valley identified a similar sequence of upper silt clay deposits at depths between 1.5m and 2.2m. The peat deposits were located between 2-2.5m below the current ground level and extended to a depth of 9.70m (-7.66m aOD). Again these deposits were underlain by fluvial sands and gravel to a depth of 10.6m from ground level. Colluvial deposits were also identified in TP152 at the western edge of the valley towards Hillcroft Farm.

6.5.2 One potentially split piece of alder wood was recovered from TP181 and others were observed within TP180 and OATP6. There is a chance that these split logs may have been cleft by people, however their abundance may indicate a natural process as a more likely cause. One possibility is suggested by the overlying upper silts, that may indicate a rapid marine inundation of a freshwater alder carr environment. This could have caused the rapid dying of the alder woodland, making the dead trees more susceptible to naturally splitting. This is partly supported by the well-worn nature of the wood and its general poor condition.

6.6 Decoy Pond Valley Sequence (Figure 11)

6.6.1 The Decoy Pond Valley comprised a moderately steep sloping valley sequence with a flat wetland valley base. The upper silty clay deposits were identified between 1.3m and 3.65m in depth. Organic deposits were identified between 1.3m and 6m below ground level. Varying levels of the organic deposits may indicate that later channel activity could have removed some parts of the sequence. These deposits were underlain by fluvial sands to a depth of 7.3m (-1.94m aOD).

6.6.2 An archaeological feature was identified within TP243 on the east facing slope of the Decoy Pond Valley. This activity was identified at a depth of 1.1m (+7.92m aOD) and sealed by colluvium. This feature is undated and can only indicate activity of some kind on the slopes of the valley overlooking the wetland environment. No other evidence of archaeological activity was detected within this sequence.

6.7 Hastings Ridge (Figure 8)

6.7.1 The ground investigations identified a sequence of thin topsoil deposits overlying weathered bedrock. No evidence of archaeological activity was identified during the ground investigations from this area of the Scheme.

7 DISCUSSION

7.1 Archaeological potential

7.1.1 The watching brief was able to successfully mitigate the impacts of the ground investigations on the archaeological resource. The work was able to identify the depth of archaeological horizons and the nature of associated deposits along the proposed Scheme route. The work has confirmed that there is potential for early prehistoric archaeology to be encountered along the route. This includes the wetland margins and the prehistoric peat deposits that have been found to extend across all four valley sequences that are crossed by the Scheme. Archaeological deposits could be located at depths of less than 0.4m to 1.1m at the edges of the wetland zone and between 1.5m to 2.5m (+1m and 0m aOD) within the main valley bottom sequences.

7.1.2 The results also showed that there appeared little correlation between the geophysical anomalies and the potential archaeological features. Where strong geophysical readings were identified these were found to coincide with changes in the bedrock rather than the location of archaeological features. Outcrops of ironstone within the bedrock were particularly noted to have produced some of the linear and other magnetic anomalies identified within the geophysical survey illustrated on Figure 6.

7.1.3 The Combe Haven sequence is one of many low-lying former coastal inlets on the south coast of England which are prone to flooding at times of wet weather (Plates 6 and 7). Other important inlets include the Pevensey Levels, Whillingdon Levels, and the Cuckmere Valley. The Combe Haven is one of the least disturbed sequences in the area.. Changes in sea-level have helped to shape the sedimentary and archaeological record and therefore it has considerable regional value in studying sea-level change and human settlement patterns.

7.2 Biostratigraphic sequence

7.2.1 Glacial outwash rivers would have helped to form the deeply incised river valleys of the area when most of the water was trapped in glacial ice and sea-level was much lower than the present day. The basal gravel deposits identified within valley bottoms and edges would have accumulated during the last cold stage that occurred between 85,000 to 14,000 BP. During the summer months the valley edges would have been subjected to periglacial processes, leading to the accumulation of solifluction deposits near to the bases of slopes.

7.2.2 With the retreat of the glacier and the onset of warming, soils would have started to form within the natural basin of the Combe Haven and its surrounding valleys. A remnant of this earlier Holocene land surface was identified within borehole BH144. The valley bottoms would have supported a dry forest bed of pine and birch dissected by small freshwater streams. The sea would have been further south than present and the Combe Haven would have been a predominantly wooded environment, rich in food resources and supporting abundant animal populations. This would have provided an attractive environment for early Mesolithic hunter gather communities to exploit.

7.2.3 This early Mesolithic surface was inundated by the rising sea-level during the early/mid Holocene. The accumulation of clayey sands between -7m aOD and -3m aOD represents the inundation of the valley bottoms through tidal incursions. Areas of former forest bed would have gradually given way to salt marshes as the marine influence extended further up the valleys. Previous analysis of fossil remains and diatoms confirm that these deposits were lain down under estuarine conditions, radiocarbon dated to between 8000 and 5000 BP (Jennings *et al*, 2003). Mesolithic communities would have needed to adapt to changes in the environment and activity may have been pushed further up the valley slopes.

7.2.4 The recovery of Mesolithic blades and evidence of blade manufacture flint cultures from the watching brief and during the previous fieldwalking indicate activity on the higher valley ridges especially to the south west of the Scheme. These ridges would have constituted a significant landscape feature, overlooking the Combe Haven basin that was experiencing marine flooding during this time. Areas of former forest would have been gradually replaced by saltmarsh taxa, creating a shift in the environment from one which would have favoured hunting game to one favouring fishing and other foraging. Higher elevations may have been favoured at this time to provide good vantage points to monitor the movement of animals.

7.2.5 The onset of peat formation was radiocarbon dated to *c* 4390±60 cal BC, at a depth of 5.51m (-3m aOD). This represented a major slow down in sea-level rise and the rate of sedimentation. This organic deposition reflects the period when estuarine conditions were confined to the present valley mouth and alder and willow carr deposits appear to have become established on the valley bottoms. There is a brief return to estuarine conditions at 4.81 m in depth (-2.4m aOD) with the replacement of carr deposits with salt marsh and mudflats. However, peat was re-established at a depth of 3.3m (-0.8m aOD), representing a major withdrawal of the sea from the valleys and a period when the shoreline extended out much further than the present day. Areas that were previously salt marsh were replaced by reed swamp initially and then carr deposits. This period represented a major regression and saw the main accumulation phase of the Combe Haven Peat Sequence. The upper peat accumulated from 1.8m (0m aOD) to 0.7m in depth (+1.2m aOD) and has previously been radiocarbon dated to c 1790±100 cal BC. This deposit consists of a wood peat that represents a return to alder carr woodland within the valley bottoms.

7.2.6 Evidence of early prehistoric activity in the form of worked flints was identified within the watching brief at the edges of the Combe Haven, Watermill Stream and Decoy Pond valley sequences. These phases of activity are likely to be associated with the accumulation of the main Combe Haven Peat Sequence and could be associated with the lower peat horizon that produced the environmental evidence of small clearings within the valley floor.

7.2.7 Floodplain islands or promontories at the edges of the wetlands would have been very attractive locations for Neolithic and Bronze Age communities to exploit the rich wetland and river resources present. The sequence of valley ridges and wetland must have helped restrict movement within this landscape, and therefore we can assume that these prehistoric communities developed ways to facilitate movement across this landscape. People are known to have constructed wooden trackways and platforms to enable activities at the edge of wetlands and to move across and exploit them.

7.2.8 At Shinewater on the Willingdon Levels a substantial wooden platform and associated trackways dated to the Late Bronze Age were found buried by marine silts associated with peat deposits (Stevens, 1997). The elevation of the peat (+1m aOD) and topographical setting are very similar to the upper peat in the area of the Scheme and were clearly a focus for early prehistoric activity. The palaeoenvironmental evidence of small-scale clearances within the Watermill Valley Sequence may be contemporary, if not slightly earlier, than the main phase of archaeology identified on the wooden platform at Shinewater.

7.2.9 The potential features identified within the Combe Haven, Watermill and Decoy Pond Valleys were found in association with colluvial deposits that may have resulted from episodes of localised clearances. The upper peat has been dated to the early Middle Bronze Age which is characterised at many sites across England as a period of extensive woodland clearance principally to make way for enclosed agricultural fields. No such evidence for extensive woodland clearance has been identified within the previous palaeoenvironmental assessments undertaken as part of the Scheme. It would appear that this area was not extensively cleared for agriculture until the later prehistoric period. It is possible that this area was subject to more transitory (perhaps seasonal) activity associated with the exploitation of the coastal and marsh environments rather than for large-scale settlement activity.

7.2.10 The accumulation of the upper silts within the sequence marks a shift away from the deposition of organic sediments to minerogenic silty clays, representing a second phase of marine incursion. These deposits consist of soft light-grey/greyish-brown, sandy clays and silty clays, occasionally with an organic peat lens near to the base. They range in thickness from 0.17m to 2.5m, and accumulated between 0m aOD to +4m aOD. Previous studies of pollen and diatoms indicate the establishment of salt marsh conditions on what had been previously alder carr woodland, including the seaward forest bed. Similar major incursions by the sea at this time are recorded in the Lower Thames Valley and a number of other locations around the south coast of England. It is widely believed that large-scale deforestation played a significant role in increased flooding and rising water levels of floodplain environments during this period.

7.2.11 Increased human activity has been noted in the uppermost levels, represented by possible cereal cultivation and a very slight decline in woodland pollen taxa (OA 2008a). However no evidence of Roman or Iron Age activity has been currently been identified along the Scheme, and no pottery was recovered during the watching brief. The wider area is known to have developed in the Iron Age and Roman period due to the development of an iron industry. In fact, the return of marine conditions to the valley is thought to have contributed to the development of this industry within the area. During the late prehistoric and early medieval periods, the river valleys could have provided important trade and transport links.

7.2.12 By the 11th century the river inlets started to slowly silt up with the last maritime connections being recorded at Bulverhythe in the 17th century. Pollen analysis from the upper deposits in the Combe Haven Valley has shown a decline in salt marsh plants and their replacement with grasses, sedges and cereals consistent with the growth of modern agricultural activity. Secondary woodland regeneration has also been recorded in more recent times most likely due to the decline of the iron industry in the region.

8 CONCLUSIONS

- The monitoring of the geotechnical ground investigations only identified four undated archaeological features. However, the absence of later finds may argue for a possible prehistoric rather than later date for these features.

- The identification of colluvial deposits within three of the valley sequences may indicate the presence of localised woodland clearance during the later prehistoric/early historical periods. Within the Combe Haven Stream Valley this might have been associated with more large-scale woodland clearance associated with industrial activity.

- Although the flint assemblage recovered was not large, taken in conjunction with similar evidence found previously in the area and given the nature of the geotechnical ground investigation (which provides only limited scope for archaeological retrieval) the watching brief has confirmed the potential for early prehistoric archaeological activity to be located on the valley slopes and wetland edge environments.

- The retrieval of well preserved wood from the peat deposits, although mostly unworked does confirm that there is potential for rare waterlogged and organic remains to survive within the valley bottoms along the proposed Scheme. Evidence relating to the exploitation of the wetland environment and the use of the valleys for transport (eg wooden structures, track ways or boats), as well as palaeoenvironmental material dating from the Mesolithic period onwards could be preserved.

8.1.1 The valley bottoms and in particular the Combe Haven Peat Sequence may contain deposits of archaeological significance. Any impacts beyond 0.4m in depth at the margins of the wetlands or 1.5-2m within the valley bottoms have the potential to impact upon archaeological deposits.

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APPENDIX 1 TABLE OF TEST PIT AND BOREHOLE STRATIGRAPHY

Test Pit/Borehole	Easting	Northing	Elevation	Topsoil	Subsoil	Colluvium	Alluvium	Peat	Fluvial	Sandy gravels	Bedrock
WBTP100	574,641.80	109,516.70	20.35	20.35	20.05						19.55
WBTP101	574,593.40	109,551.50	23.66	23.66	23.34						19.87
WBTP102	574,626.60	109,582.10	23.11	23.11	22.76						20.69
WBTP103	574,652.90	109,564.30	22.32	22.32	22.02						21.62
WBTP104	574,661.00	109,622.10	21.34	21.34	21.09						20.84
WBTP105	574,701.40	109,665.20	18.82	18.82	18.52						18.27
WBTP106	574,682.80	109,734.40	15.61	15.61	7.71						2.29
WBTP107	574,718.40	109,735.20	15.5	15.5	15.25						14.9
WBTP108	574,651.30	109,791.40	15.14	15.14							14.84
WBTP109	574,716.90	109,805.30	12.49	12.49		12.29	11.64				9.89
WBTP110	574,683.20	109,826.60	12.6	12.6							5.33
WBTP111	574,750.80	109,827.60	11.05	11.05	10.75						9.65
WBTP112	574,617.60	109,891.00	10.25	10.25							9.73
WBTP113	574,716.20	109,869.60	10	10			9.75				1.64
WBTP114	574,763.40	109,894.10	8.01	8.01		12.3	7.21				5.01
WBTP115	574,667.60	109,908.20	9.43	9.43	9.13						8.34
WBTP116	574,703.60	109,907.70	8.84	8.84			8.44				8.14
WBTP117	574,674.70	109,948.70	7.05	10.25	6.75						6.55
WBTP118	574,734.90	109,974.70	6.89	6.89	6.59						6.45
WBTP119	574,648.30	110,005.30	5.63	5.63			11.71				
WBTP120	574,620.50	110,019.30	5.94	5.94		5.69	5.04				
WBTP121	574,716.00	110,034.10	5.19	5.19		7.04	7.71				
WBTP122	574,657.30	110,055.20	7.34	7.34							6.65
WBTP123	574,612.10	110,065.80	7.85	7.85			9.08				
WBTP124	574,749.50	110,076.20	8.01	8.01			7.71				7.01
WBTP125	574,694.30	110,087.00	9.63	9.63			9.33				7.23
WBTP126	574,630.60	110,099.30	10.66	10.66			10.05				10.38

WBTP127	574,604.30	110,117.30	10.3	10.3			5.77				8.2
WBTP128	574,714.30	110,120.40	13.58	13.58					12.88		
WBTP129	574,795.80	110,108.70	10.26	10.26	9.96						9.06
WBTP130	574,745.00	109,571.10	17.29	17.29	17.25						16.49
WBTP131	574,761.20	109,612.40	17.9	17.9	17.65						17.2
WBTP132	574,807.50	109,671.70	17.5	17.5	17.27						16.42
WBTP133	574,792.20	109,722.50	16.85	16.85	16.55						16.25
WBTP134	574,823.90	109,751.40	14.97	14.97	14.67						14.22
WBTP135	574,821.90	109,808.00	11.96	11.96	11.66						11.46
WBTP137	574,895.40	109,872.10	8.52	8.52	8.22						10.06
WBTP138	574,853.60	109,939.30	5.16	5.16		4.86	5.03				
WBTP139	574,913.40	110,034.50	6.53	6.53		6.28	5.78				1.49
WBTP140	574,895.40	110,074.00	9.56	9.56	9.23						27.12
WBTP141	574,527.00	109,375.40	27.62	27.62	27.32						5.07
WBTP142	574,795.30	109,943.70	5.55	5.55			5.25				
WBTP143	574,886.10	110,159.40	16.04	16.04							9.33
WBTP144	574,924.30	110,294.00	13.62	13.62		13.22					12.62
WBTP145	574,970.80	110,272.80	14.5	14.5	14.25						21.08
WBTP146	574,935.30	110,406.50	21.98	21.98	21.73						21.48
WBTP147	575,024.80	110,354.60	14.21	14.21	13.96						17.27
WBTP148	575,053.40	110,417.10	17.77	17.77	17.52						11.42
WBTP149	575,008.40	110,505.90	12.22	12.22	11.97						3.65
WBTP150	575,083.80	110,567.40	4.25	4.25			3.95	2.05			
WBTP151	575,784.00	110,672.20	12.73	12.73	12.43						5.12
WBTP152	575,854.80	110,610.30	5.82	5.82		5.52					4.72
WBTP153	575,888.50	110,682.30	4.12								
WBTP154	576,543.90	110,798.80	10.7	10.7		10.47					4.2
WBTP155	576,643.10	110,850.10	5.3	5.3		5.1	4.4	20.5			
WBTP156	576,884.10	110,918.10	21.8	21.8		21.55					42.37
WBTP157	577,116.50	110,981.20	42.98	42.98		42.88					44.01
WBTP158	577,458.50	111,055.50	44.66	44.66	44.51						36.49
WBTP159	577,492.20	111,105.10	36.89	36.89		36.74					50.05

WBTP160	577,549.30	111,111.50	52.35	52.35	51.75						1.37
WBTP161	575,425.20	110,697.00	2.17	2.17			1.92	1.36			
WBTP162	575,474.00	110,524.30	2.06	2.06			1.86	0.83			
WBTP163	575,611.20	110,469.00	1.53	1.53			1.33	0.68			
WBTP164	575,657.00	110,438.20	1.38	1.38			1.13	0.99			
WBTP165	575,779.60	110,429.00	1.49	1.49			1.29	0.99			-0.89
WBTP166	575,849.90	110,453.60	1.51	1.51			1.17	0.81			
WBTP167	575,993.40	110,788.20	2.22	2.22			1.83	0.72			
WBTP168	575,935.70	110,828.50	2.06	2.06			1.86	0.06	-0.25		
WBTP169	575,922.10	110,906.80	2.75	2.75			2.55	0.75	-1.15		
WBTP170	575,898.80	111,002.90	3.17	3.17			3.02	0.13			
WBTP171	576,030.80	110,868.80	2.23	2.23			1.98	1.41			
WBTP172	575,984.50	110,936.20	2.81	2.81			2.51	0.59			
WBTP173	575,955.80	110,980.50	2.99	2.99			2.71	-0.13			
WBTP174	576,101.70	110,872.60	2.47	2.47			2.27	0.96			
WBTP175	576,002.20	111,018.80	3.26	2.99			3.01	2.29			
WBTP176	575,964.40	111,067.10	3.49	3.49			3.21	1.99			
WBTP177	576,048.80	110,974.60	2.91	2.91			2.61	0.98			
WBTP178	576,052.30	111,028.30	3.48	3.48			3.08	1.38			
WBTP179	576,128.20	110,837.60	2.42	2.42			2.32	0.92			
WBTP180	576,119.00	110,937.30	3	3			2.72	1			
WBTP181	575,907.10	111,048.30	3.23	3.23			2.98	-0.15			
WBTP182	575,945.50	110,770.90	1.95	1.95			18.63				
WBTP183	575,685.50	110,702.90	18.8	18.8			18.5	17.3			
WBTP184	575,685.50	110,702.90	18.8	18.8	18.25	18.55	13.54				9.59
WBTP185	576,224.60	110,954.80	11.99	11.99		11.69					7.11
WBTP186	573,857.50	108,104.50	8.31	8.31	7.81						6.61
WBTP187	573,885.90	108,190.20	8.74	8.74	7.94						
WBTP188	576,250.80	110,903.60	15.34	15.34	15.29						15.48
WBTP189	573,957.60	108,585.40	13.69	13.69							15.23
WBTP191	574,067.50	108,803.80	17.28	17.28							17.13
WBTP194	574,282.40	109,016.50	19.1	19.1			19				

WBTP198	574,842.80	109,976.40	4	4		3.7					3.4
WBTP199	574,966.40	110,347.50	14.93	14.93			14.68				2.22
WBTP201	575,304.40	110,634.20	2.77	2.77	2.47						14.53
WBTP202	574,842.80	109,976.40	4								
WBTP203	574,966.40	110,347.50	14.93								
WBTP204	575,829.00	110,640.60	9.02	9.02	8.75						8.42
WBTP205	576,017.50	110,718.20	2.06	2.06			1.76	1.16			
WBTP206	576,119.30	110,634.50	1.91	1.91			1.71	1.01			
WBTP207	576,128.20	110,709.20	2.32	2.32		2.22	1.82	12.42			
WBTP208	576,254.30	110,647.90	13.27	13.27	12.95						12.38
WBTP209	576,436.40	110,709.70	19.5	19.5	19.3						13.49
WBTP210	576,507.50	110,742.60	14.09	14.09	13.89						38.3
WBTP211	577,169.10	111,037.70	39.1	39.1	38.83						38.6
WBTP212	577,248.80	111,077.90	39.99	39.99			39.79				27.21
WBTP213	577,346.70	111,091.90	28.01	28.01	27.76						39.69
WBTP214	577,552.40	111,076.90	52.73	52.73	52.43						23.33
WBTP216	574,569.70	109,414.60	25.33	25.33	25.03						24.03
WBTP217	574,555.80	109,481.10	23.09	23.09	22.89						22.05
WBTP218	574,566.80	109,578.60	23.74	23.74							
WBTP219	574,650.00	109,707.70	17.29	17.29	17.01						12.4
WBTP220	574,647.10	109,746.90	16.11	16.11	15.81						16.59
WBTP221	574,631.00	109,842.60	13.1	13.1			12.86				
WBTP222	574,609.50	109,940.10	7.6	7.6	7.3						15.46
WBTP223	574,591.20	110,037.20	6.53								
WBTP224	574,692.50	110,151.20	17.56								
WBTP225	574,789.70	110,167.40	16.74								
WBTP226	574,753.70	109,489.40	21.3								
WBTP227	574,788.10	109,601.30	15.09	15.09	14.79						7.19
WBTP229	574,984.70	110,052.60	7.99	7.99		7.69					6.89
WBTP230	574,985.10	110,148.70	11.69	11.69	11.33						10.59
WBTP231	574,957.50	110,205.70	14.54	14.54	14.25						13.94
WBTP232	574,996.00	110,256.60	15.66	15.66	15.36						13.98

WBTP233	575,202.40	110,311.60	14.61	14.61	14.41						13.41
WBTP234	575,202.40	110,311.60	14.61	14.61	14.51						10.93
WBTP235	575,273.10	110,346.10	12.13	12.13	12.03						7.29
WBTP236	575,369.20	110,386.40	7.89	7.89			7.64				1.34
WBTP237	575,713.10	110,518.50	2.24	2.24		2.04					3.56
WBTP238	575,799.40	110,549.90	4.96	4.96		4.56					3.86
WBTP239	576,233.80	110,598.20	8.55	8.55	8.3						10.75
WBTP240	576,304.90	110,604.80	12	12		11.7					23.15
WBTP241	576,372.90	110,641.40	23.75	23.75		23.52					15.41
WBTP242	576,403.00	110,625.30	16.11	16.11	15.81						15.41
WBTP243	576,572.60	110,676.00	7.57	7.57		7.18					7.92
WBTP244	576,791.50	110,809.10	9.02	9.02		8.77					11.56
WBTP245	576,812.10	110,715.10	12.21	40.19		11.96					11.41
WBTP246	576,835.70	110,623.50	13.23	13.23		12.96					37.19
WBTP247	576,996.30	110,873.50	37.54	37.54	37.24						36.77
WBTP248	576,887.60	110,690.40	24.06	24.06	23.77						25.95
WBTP249	576,875.10	110,728.40	27.05	27.05	26.73						27.76
WBTP250	577,064.80	110,990.80	40.01	40.01	39.86						36.44
WBTP251	577,000.10	110,936.90	36.84	36.84	36.57						39.31
WBTP252	576,904.00	110,815.80	28.96	28.96			12.06				
WBTP253	576,815.20	110,831.10	12.36	12.36	12.01						28.41
WBTP254	576,862.90	110,843.80	22.18	22.18	21.98						26.31
WBTP255	576,904.40	110,874.80	27.81	27.81	27.66						31.06
WBTP256	576,937.20	110,859.00	32.36	32.36	32.21						36.54
WBTP257	576,996.30	110,873.50	37.54	37.54	37.27						41.42
WBTP258	577,104.60	110,922.80	42.72	42.72							36.55
WBTP259	577,342.70	110,977.80	37.05	37.05							36.05
WBTP260	577,333.40	110,931.60	42.03	42.03	36.64						37.88
WBTP261A	577,407.90	110,889.50	39.38	39.38	41.66						38.88
WBTP261B	577,407.90	110,889.50	39.38	39.38	38.98						11.92
WBTP265	573,930.00	108,510.50	12.42	12.42	38.98			11.6			10.29
WBTP266	573,958.50	108,620.80	13.39	13.39							11.49

WBTP268	574,052.40	108,774.60	17.09	2.51							16.74
WBTP271	574,157.00	108,927.20	17.59	17.09							17.34
WBTP272	576,377.30	110,660.20	24.19	24.19	23.89						16.69
WBTP273	576,377.40	110,724.70	24.98	24.98							21.89
WBTP274A	577,228.00	111,048.90	40.91	40.91			40.74				24.58
WBTP274B	577,228.00	111,048.90	40.91	40.91			40.68				8.2
WBTP274C	577,228.00	111,048.90	40.91	40.91							39.44
WBTP275	577,254.90	111,053.50	40.19	40.19	40.55						21.79
WBTP280	576,912.10	110,964.50	22.23	22.23	39.89		30.85				
WBTP281A	576,953.40	110,932.80	31.05	31.05							30.5
WBTP281B	576,953.40	110,932.80	31.05	31.05	30.85						4.46
URSBH112	574,745.80	109,930.00	7.33	7.33	30.8		7.13				25.59
URSBH113	574,642.80	109,967.50	5.94	5.94			15.01				1.94
URSBH117	574,836.50	110,035.30	4.47	4.47			3.97				-0.51
URSBH118	574,764.80	110,048.80	4.49	4.49			4.09		0.79		5.44
URSBH119	574,892.60	110,136.80	14.44	14.44							13.94
URSBH127	575,122.60	110,599.70	3.22	3.22			2.92	2.22	-2.12		
URSBH128	575,145.10	110,570.10	3.38	3.38			3.23	1.88	-1.16	-0.12	
URSBH129	575,332.00	110,565.70	2.83				2.83	1.33			
URSBH130	575,304.80	110,645.40	3.34	3.34							2.59
URSBH131	575,327.70	110,647.40	3.09		3.04		3.09	1.34	-5.42	-7.41	
URSBH132	575,352.50	110,614.00	3.08	3.08			2.58	1.58	-5.62		-15.88
URSBH134	575,479.30	110,643.10	2.12	2.12			1.82	-0.38	-2.38	-7.18	
URSBH135	575,643.70	110,645.60	10.56	10.56							-0.98
URSBH143	576,067.50	110,666.80	2.08	2.08	10.26		1.78	0.58	-3.32		
URSBH144	576,183.10	110,672.80	4.47	4.47			4.22	-1.53	-1.53	-5.43	-6.63
URSBH147	576,183.10	110,672.80	4.47	4.47							4.06
URSBH148	576,199.10	110,677.00	5.56	5.56	3.67						6.71
URSBH159	576,791.60	110,853.90	8.71	16.74	4.56						
URSBH160	576,802.70	110,876.80	9.32	9.32							7.32
URSBH179	575,046.60	110,389.30	16.74	16.74	8.82						8.92
URSBH184	574,611.20	109,979.70	5.98	5.98	16.54		5.48				11.54

URSBH185	574,604.40	110,002.10	5.8	5.8			5.3				-1.22
URSBH186	574,973.20	109,925.40	3.78	3.78			3.48	2.48	1.38		-3.81
URSBH187	574,928.00	109,972.00	3.19	3.19			2.89		1.49		
URSBH188	575,454.50	110,439.50	2.89	2.89			2.49				-0.41
URSBH189	575,467.70	110,472.20	3.16	3.16			2.96	1.16	-2.11		
URSBH191	576,065.20	110,579.30	2.04	2.04			1.74	0.54	-7.66		-6.04
URSBH192	576,151.30	110,978.70	4.56	4.56			4.26				-3.36
URSBH193	576,176.50	110,995.20	7.19	7.19	3.06		6.69				1.16
URSBH194	576,181.90	110,607.20	3.68	3.68							6.19
URSBH195	576,746.30	110,810.20	5.62	5.62			5.42				1.18
URSBH196	576,778.00	110,819.10	8.38	8.38							7.38

APPENDIX 2 ASSESSMENT OF WORKED FLINT

By David Mullin (Oxford Archaeology South)

Introduction

A total of 54 lithics were recovered from a watching brief of geotechnical investigations between Bexhill to Hastings. This included 13 burnt, unworked items and one natural gravel flint cobble.

Results

Context	Description	Raw Material	Date
10001	Burnt flint x10		
10001	Tertiary flake	Grey flint	
10001	Long end scraper	Grey flint	Mesolithic
10001	Blade shatter	Grey flint	
10001	Tertiary flake	Grey flint	
10001	Secondary flake, narrow blade scars	Grey flint	
10001	Secondary flake	Grey flint	
10001	Primary flake	Grey flint	
10001	Miscellaneous retouched flake	Grey flint	
10001	Core trimming flake, blade core	Grey flint	Mesolithic
10001	Primary flake	Grey flint	
10001	Tertiary flake	Grey flint	
10001	Blade shatter	Grey flint	
10001	Tertiary flake	Grey flint	
10001	Tertiary flake	Grey flint	
10001	Tertiary flake	Grey flint	
10001	Tertiary flake	Brown flint	
10001	?broken scraper	Grey flint	
10001	Secondary flake	Brown flint	
10001	Secondary flake	Brown flint	
10001	Tertiary flake	Grey flint	
10001	Core rejuvenation flake, blade core	Dark grey flint	
10001	Blade shatter	Grey flint	
10001	Retouched blade	Dark grey flint	
10001	Core trimming flake	Grey flint	
11303	Core trimming flake, blade core	Grey flint	
11303	Chip	Dark grey flint	
11303	Burnt flint		
11801	Burnt flint		
11801	Tertiary flake	Grey flint	
13101	Core trimming flake	Grey flint	
14601	Burnt flint		
14601	Broken scraper	Grey flint	?Mesolithic
15402	Battered core, re-used as hammerstone	Grey flint	
17301	Tertiary flake	Grey flint	
18401	Unmodified gravel flint		
18401	Primary flake	Grey flint	
18402	Primary flake	Grey flint	
21201	Tertiary flake	Dark grey flint	
21301	Primary flake	Grey flint	
22902	Blade shatter	Grey flint	
21401	Chip	Grey flint	
23201	Secondary flake	Grey flint	

23706	Blade shatter	Dark grey flint	
24302	Core trimming flake	Grey flint	

Conclusion

The majority of the material comprised waste flakes from late in the reduction sequence, although some primary flakes might suggest the exploitation of locally occurring flint deposits. The waste is undiagnostic of date, but the dateable material is all of Mesolithic date and includes at least one scraper and evidence of blade production.

APPENDIX 3 ASSESSMENT OF WATERLOGGED AND WORKED WOOD

By Damian Goodburn (University College London)

Introduction
Seven possible waterlogged worked wood samples were recovered from archaeological monitoring of geotechnical ground investigations. These samples were recovered from prehistoric alluvial silts and peat deposits. The samples were examined for signs of working.

Methodology
These samples were debagged and rapidly washed to see if any traces of tool marks or other signs of working existed. Once cleaned, a set of brief notes and sketches with some dimensions were made, in good outdoor light. A summary list of the material is made below:

Context /Wood sample number	Deposit description	Comment
[20504] Sample <6>		Shattered fibrous fragments of oak , no sign of working.
[19107] Sample <5>		Tiny fragment of water-worn elm, no clear signs of working.
[1431] Sample <1>		Rolled abraded fragment of small log, probably alder? No clear signs of working.
[18105] Sample <4>		Rolled and broken, radially faced log section, from moderately large log, probably alder, no clear cut marks but might be cleft by people???
[15007] Sample <3>		Shattered fragment of an eroded oak pole no clear signs of working.
[1413] Sample <2>		Very odd pudding basin shaped log section c. 100mm in diameter, probably alder ?? Either!- section of log cut out by modern coring machine or ? possibly a rough-out for a carved or turned cup?? Surfaces very eroded but no clear signs of centre marks or gouge marks etc
[26510] Sample <7>		A chunk of radially cleft oak with one probably humanly cut, weathered, flat end and the other charred c. 120mm long. Slow grown oak might just tree-ring date. Appears to be evidence of the use of off-cuts from large-scale oak

		woodworking used for fuel. Reminds me of collection of IA oak off-cuts collected for firewood found dumped in a water channel at the Stratford Box site the R Lea .

Conclusion
Apart from the last burnt fragment none of the pieces had clear evidence of working such as cut marks. People might possibly have split the log sections or this could have occurred by natural agencies such as tree fall, or lightening etc it is uncertain. In summary, the material as a whole is not a strong indicator of marked human activity near by, although the burnt section indicates human activity fairly near where it was found. The material can of course be used for C14 dating etc and will be stored until a decisions made as to its future.

APPENDIX 4 ASSESSMENT OF WATERLOGGED PLANT REMAINS

By Julia Meen (Oxford Archaeology South)

Introduction
A geoarchaeological watching brief was carried out by Oxford Archaeology (OA) between late 2008 and early 2009 across the location of the proposed Bexhill to Hastings Link Road Scheme in East Sussex (NGR 756 108). This took the form of 9 boreholes and 8 test pits excavated for the purpose of sediment description and palaeoenvironmental sampling across the four valley sequences affected by the scheme.

The four samples assessed in this report were taken from boreholes where notable preservation of palaeoenvironmental remains was observed during field logging. Sample <3> is believed to be the oldest in date, representing an early Holocene land surface overlying the Pleistocene gravels. This horizon was sealed by a silt layer thought to represent an episode of marine inundation, linked to postglacial sea level rise. Samples <1> <2> and <4> are from younger deposits in the sequence; field evaluation of the highly woody nature of these samples was suggestive of the development of an alder carr wetland landscape dating to a period of marine regression.

Methodology
All the bulk (WPR) samples were processed by hand flotation, with both the flot and the residue collected on a 250µm mesh. All flots and heavy residues were stored in tap water and kept in cold storage. The flots were scanned for charred plant remains using a binocular microscope at approximately x15 magnification. Identifications were made with guidance from Dr. Wendy Smith but without reference to Oxford Archaeology's reference collection and therefore, should all be seen as provisional. Nomenclature for the plant remains follows Stace (1997).

Results

Sediment sequence
Sample <1> was taken from borehole 143 at a depth of 5.0m; it was a very dark greyish brown silty clay with inclusion of up to 80% wood, noted as being up to 10cm in length. 1L was processed for waterlogged plant remains and residue.

Sample <2> was taken from borehole 143 at a depth of 5.5m; it was a very dark greyish brown silty clay with inclusion of 5% light brownish grey clay and up to 80% wood, noted as being up to 4cm in length. 0.25L was processed for waterlogged plant remains and no residue was produced.

Sample <3> was taken from borehole 144 at a depth of 10.0m; it was a greyish brown clayey silt with up to 70% of the sample composed of organic inclusion - whole hazelnuts, wood and a pine cone were observed during field sampling and processing, with 10% subangular flat stone pebble inclusions. 2L was processed for waterlogged plant remains and residue.

Sample <4> was taken from an organic clayey silt TP265, light yellowish brown (80%) with strong brown mottles (20%). Lenses of black peat (15%) were noted during processing. Subangular stone gravel made up 10% of the sediment. 1L was processed for waterlogged plant remains and residue.

Waterlogged Plant Remains
The results of assessment for waterlogged plant remains (WPR) from the four samples are summarised in **Table 1**.

Sample <1> was poor in terms of identifiable WPR, with identifiable species limited to the presence of two whole and two partial fragments of alder (*Alnus* sp.) seed and two sedge (*Carex* sp.) seeds. Waterlogged wood fragments, including large pieces up to 10cm in length, were however abundant in the flot; although no positive identification was made on these fragments the presence of alder seeds suggests that the wood is likely also to be of alder. No charred material or insect remains were observed.

Sample <2> contained no identifiable WPR, although was abundant in indeterminate wood fragments and rootlet material.

Sample <3> produced a large and rich flot, dominated by abundant hazelnuts (*Corylus avellana*) and hazelnut shell fragments. Scanning of c.25% of the flot produced an estimated count of 22 whole nuts, 22 half nutshell pieces, and fragments approximating to 4 whole nuts**.** Measurement along the longest axis of the smallest and largest whole nuts showed that a range of sizes from 13mm to 21mm in length was present, i.e., representative of immature through to fully mature specimens (see **Figure 1**).

Scanning of the >10mm fraction of the entire flot showed no evidence of charring or roasting of the nuts; however 7 examples of whole nuts with definite evidence of gnawing (characterised by a hole in the base of the nut surrounded by teeth impressions, see **Figure 2**) were identified, as well as one with a possible beak mark. In addition the flot contained one indeterminate pine cone (*Pinus* sp.) and a single seed of dogwood (*Cornus cf. sanguinea)*, together with abundant woody and grassy material. The residue of this sample was also assessed in light of the highly organic nature of the flot. This confirmed that the vast majority of the WPR had been collected in the flot, the somewhat narrow seed assemblage of the sample being supplemented only by one additional dogwood seed. No insects or charred material was observed in either the flot or the residue.

Sample <4> comprised a poor WPR assemblage which included a single seed of Blinks (*Montia fontana*) and abundant indeterminate abraded wood fragments. Three insect fragments were noted.

Discussions

Environment change at Bexhill to Hastings

The narrow range of plant remains from the oldest of the samples, <3>, limits the interpretation of the environment represented by this phase, which, at 10.0m below ground surface, probably dates to the early Mesolithic. The presence of hazelnuts in what appears to be a rodent cache suggests that hazel vegetation was growing very close by, as Kollmann and Schill (1996) observe that mice tend to store their food no more than 30m from the point of collection. The two seeds of dogwood (*Cornus* sp.) are also indicative of nearby wood or scrubland. Corylus is known to have been one of the earliest deciduous trees to recolonise Britain after the last glaciation, with ubiquitous high hazel pollen values preceding the first influx of oak and elm (Deacon, 1974). Pollen and macrofossil studies of the nearby Pannel Valley (Waller, 1993) show that by 9500BP *Corylus* had become dominant both on the floodplain and on the surrounding valley slopes, on the latter probably forming a closed canopy hazel woodland (*ibid*). The absence of acorns (*Quercus* sp.) in the rodent cache may be symptomatic of a lack of oak woodland in the area at a time before *Quercus* was well established in south-eastern England, as it is known that mice will preferentially forage acorns over hazelnuts where the resource is available (Kollmann and Schill, 1996). The presence of an indeterminate pine cone (*Pinus* sp.) demonstrates that pine formed a component of the local woodland, probably a remnant of an earlier birch-pine forest environment.

The landscape represented by the three younger samples, characterised by the presence in sample <1> of seeds of alder (*Alnus* sp.) and sedge (*Carex* sp.) together with probable alder wood fragments, suggest the development of alder carr. A damp environment is further suggested by the observation of blink (*Montia fontana*) in sample <4>. The accumulation of these deposits has been radiocarbon dated to a period of marine regression 4390±60BC to 1790±100BC (late Mesolithic to early Bronze Age) following on from a phase of sea level rise and deposition of marine silts. This sequence again parallels that of the Pannel Valley, where a stable alder carr community became established on the floodplain throughout 6000-4000BP (Waller 1993). As at Bexhill to Hastings, the vegetation at Pannel Valley was shaped by periodic marine transgression, with an estimated rise in sea level of 17m over the course of the Mesolithic (*ibid*); Waller argues that the rising of the water table under these conditions would have encouraged the development of alder carr at the site.

Taphonomy of hazelnuts from sample <3>

Assessment of sample <3> suggests three potential scenarios for the accumulation of such a large number of hazelnuts: firstly, that they were the product of human collection and/or processing of hazelnuts as part of the Mesolithic diet; secondly, that they represented a food cache built up by birds or rodents; and thirdly, that they represented the dropping of nuts from hazel vegetation killed by inundation of the landscape by salt water as sea levels rose during the early Holocene. The stratigraphy of the sample, closely overlying Pleistocene gravels and being sealed by a layer of probable marine silt, initially favoured the last interpretation.

Several studies have stressed the potential role of hazelnuts as a staple of the Mesolithic diet; a highly nutritious food with many minerals and vitamins not available in meats (Zvelibil 1994) and with an energy content of 617 calories per 100g (Scaife 1992), it has been suggested that this food source alone could have supplied groupings of four families with 25% of its diet over the autumn and winter months (Jacobi, 1987). Recovery of hazelnuts from archaeological contexts shows that the remains of nuts inferred to have been used for this purpose survive as charred shell fragments. Experimental work by Score and Mithen (2000) has demonstrated that this is likely to be the result of roasting of hazelnuts in specialised roasting ovens to aid digestion and storability – they found that even in the most efficient of ovens around 25% of the hazelnuts processed became charred and therefore inedible, with the preserved ancient deposits thus being formed of this discarded fraction.

The absence of charring of any of the hazelnuts from sample <3> seems to rule out the possibility of them having been processed by Mesolithic populations; similarly, the high relative proportion of whole to fragmented nuts, and the neat splitting into halves where fragmentation has occurred, argue against their having been opened by humans for eating raw. Scaife (1992) argues that although the lithic technology for prising shells open in this “sophisticated” way would have been available during the Mesolithic, the archaeological abundance of shells smashed into many irregular pieces suggests a crushing action was commonly used to retrieve the nut. This is backed by experimental work by Score and Mithen (2000) which showed that roasted hazelnuts can be shelled most efficiently with the use of elongated pebbles, and is further supported by the discovery of such artefacts associated with hazelnut processing debris at Staosnaig on the Isle of Colonsay. Human action as the source of the deposit might also be expected to result in the preferential collection of larger nuts (as suggested by Scaife for hazelnut deposits at Thatcham, 1992), particularly as *Corylus* would have been an abundant resource in the early Holocene - the broad size range present in the sample, of immature to fully mature nuts, again argues against human agency.

This range of sizes is more like that which would be expected following the drowning of the parent vegetation, with nuts falling without discrimination. However, the observation of definite gnawing on seven of the whole hazelnuts from sample <3> suggest that a food cache of a small mammal is the most likely origin of the deposit. This is further supported by the presence of abundant grassy material (**Figure 3**), and by the very limited wild seed assemblage and lack of insect remains – suggesting a rodent nest rather than a deposit formed in an open landscape. Tallantire (2002) lists voles, mice, dormice and red squirrels as the main predators of hazelnuts and are, along with the nuthatch, the nutcracker and the jay all known to hoard them in underground stores. Controlled observation of seed predation by Kollmann and Schill (1996) has shown that in grassland, mice are the principle agents for the collection and dispersal of hazelnuts, with 77% of hazel seedlings in the study area shown to have germinated from mouse-made deposits. Examination of the tooth marks on the gnawed nuts shows that they are parallel to the hole and limited to its inner rim. This method of feeding is distinctive to bank voles (*Microtus arvalis*) (Tonkin, 2006), and it is likely therefore that the deposit represents a cache belonging to this species; *Microtus arvalis* would certainly have been present in England at this time, being known from an early postglacial context at Dog Hole Fissure, Derbyshire (Yalden 1999).

Conclusions and Recommendations

The assessment of the waterlogged material from this site demonstrates that anaerobic preservation was good in the sampled horizons, including the Mesolithic pre-inundation land surface represented by sample <3>. Although the range of plant species was limited in this assemblage, this is likely to be a result of the sample originating as a rodent nest rather than forming in the open landscape; there is the potential for significant material from this horizon yet to be investigated which may give a fuller picture of the environment during this period.

If further excavations are carried out, a sampling strategy should be formulated for the recovery of organic remains (waterlogged plant remains, charred plant remains, insects, pollen and molluscs) from a range of potentially datable features across the site. This should be devised by a qualified environmental archaeologist and should be in accordance with the most recent sampling guidelines (eg. Oxford Archaeology, 2005 and English Heritage, 2002).

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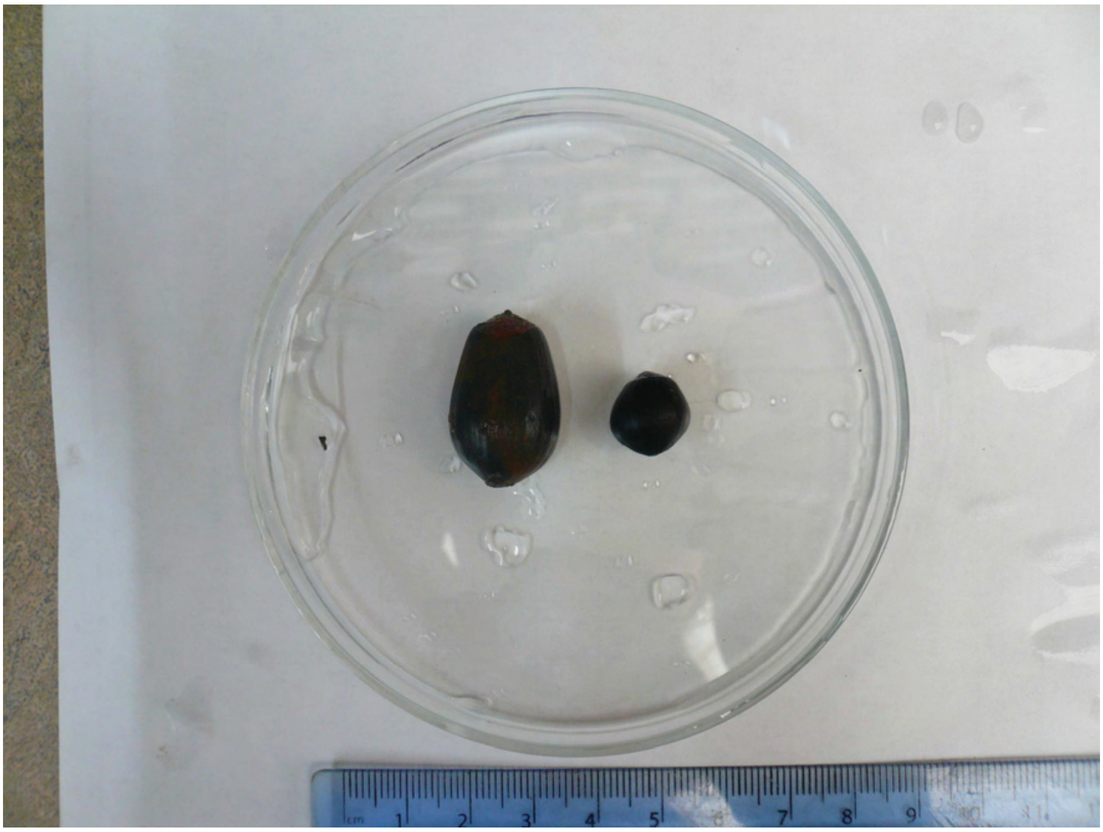
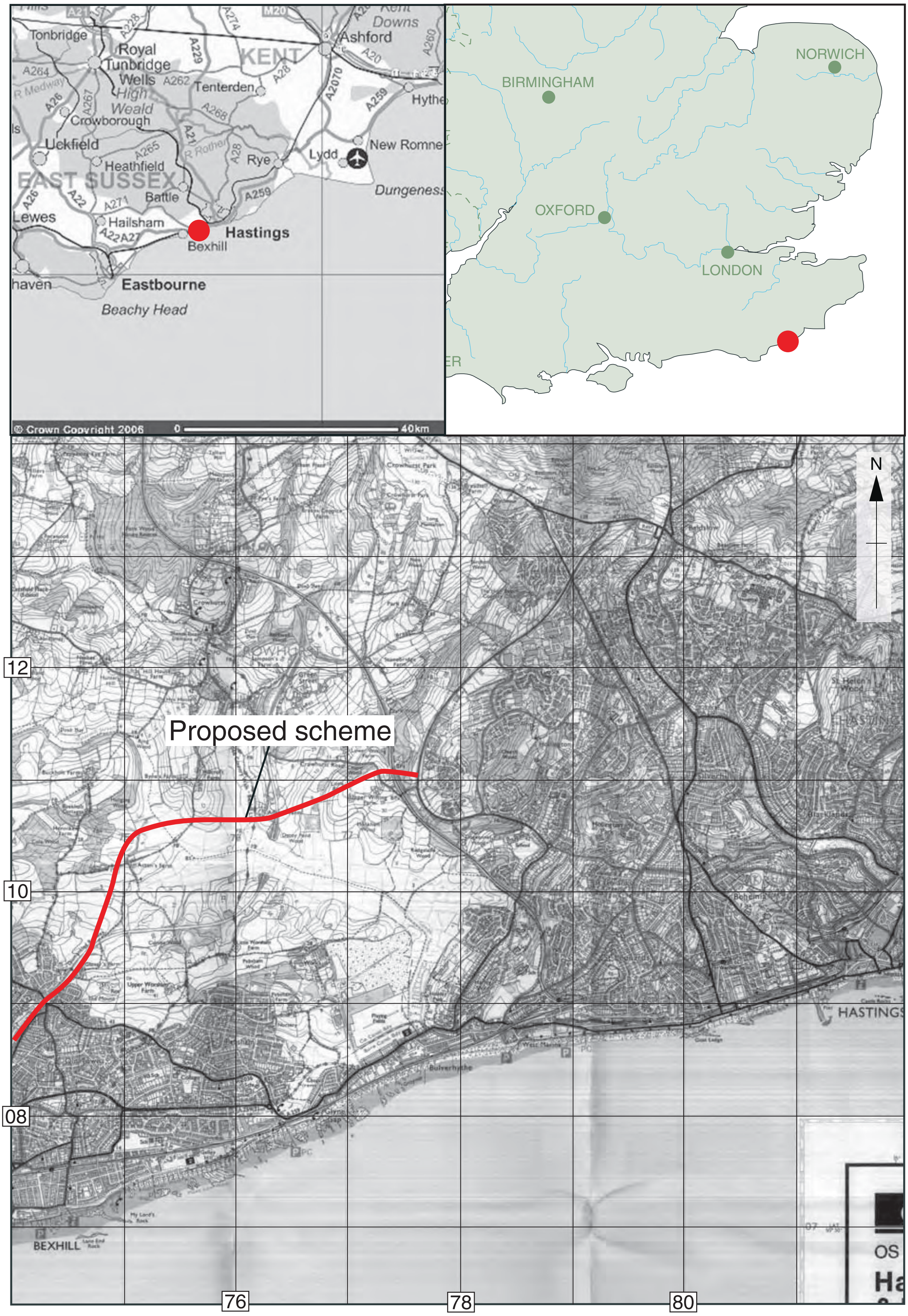


Figure 1. Two examples of hazelnuts from sample <3>, showing the size range from immature (right) to mature.

Figure 2: Tooth marks surrounding hole gnawed in one of the hazelnuts from sample <3>

Figure 3: Abundant woody and grassy material from sample <3>, indicative of rodent nest



Scale 1:50,000

Figure 1: Site location

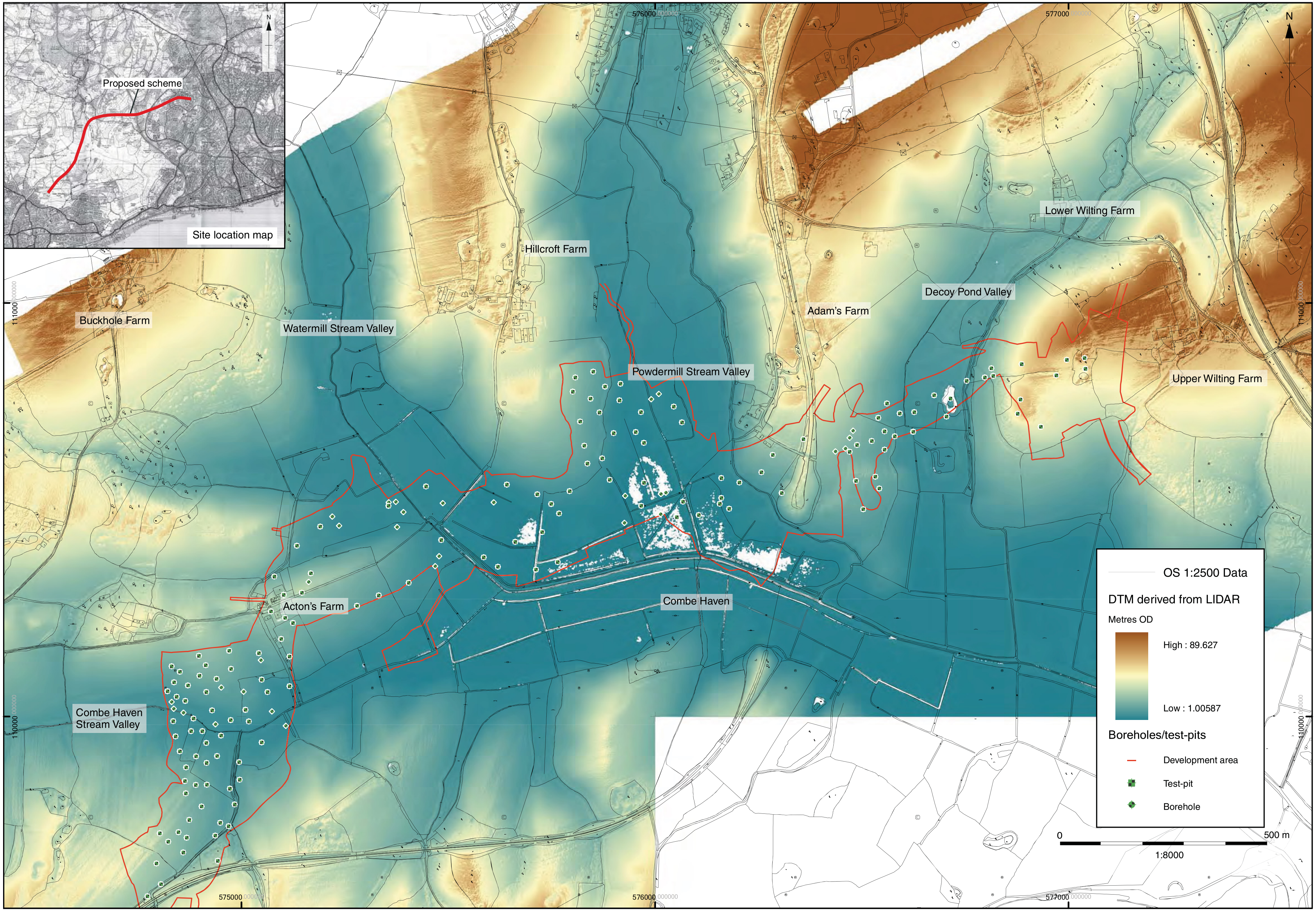


Figure 2: Proposed scheme with geotechnical investigations

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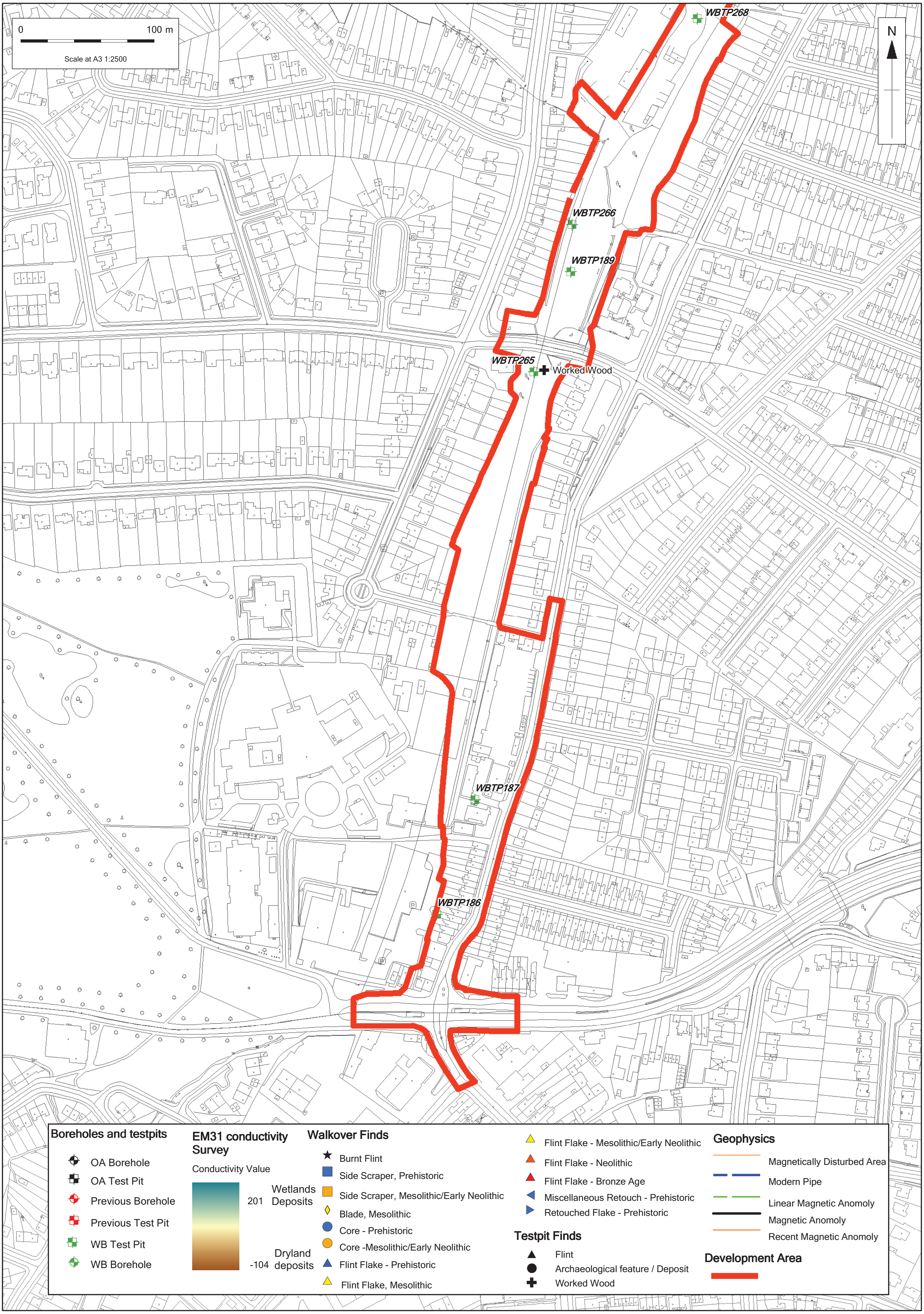

Figure 3: Location of geotechnical investigations with areas of archaeological potential

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Figure 4: Location of geotechnical investigations with areas of archaeological potential

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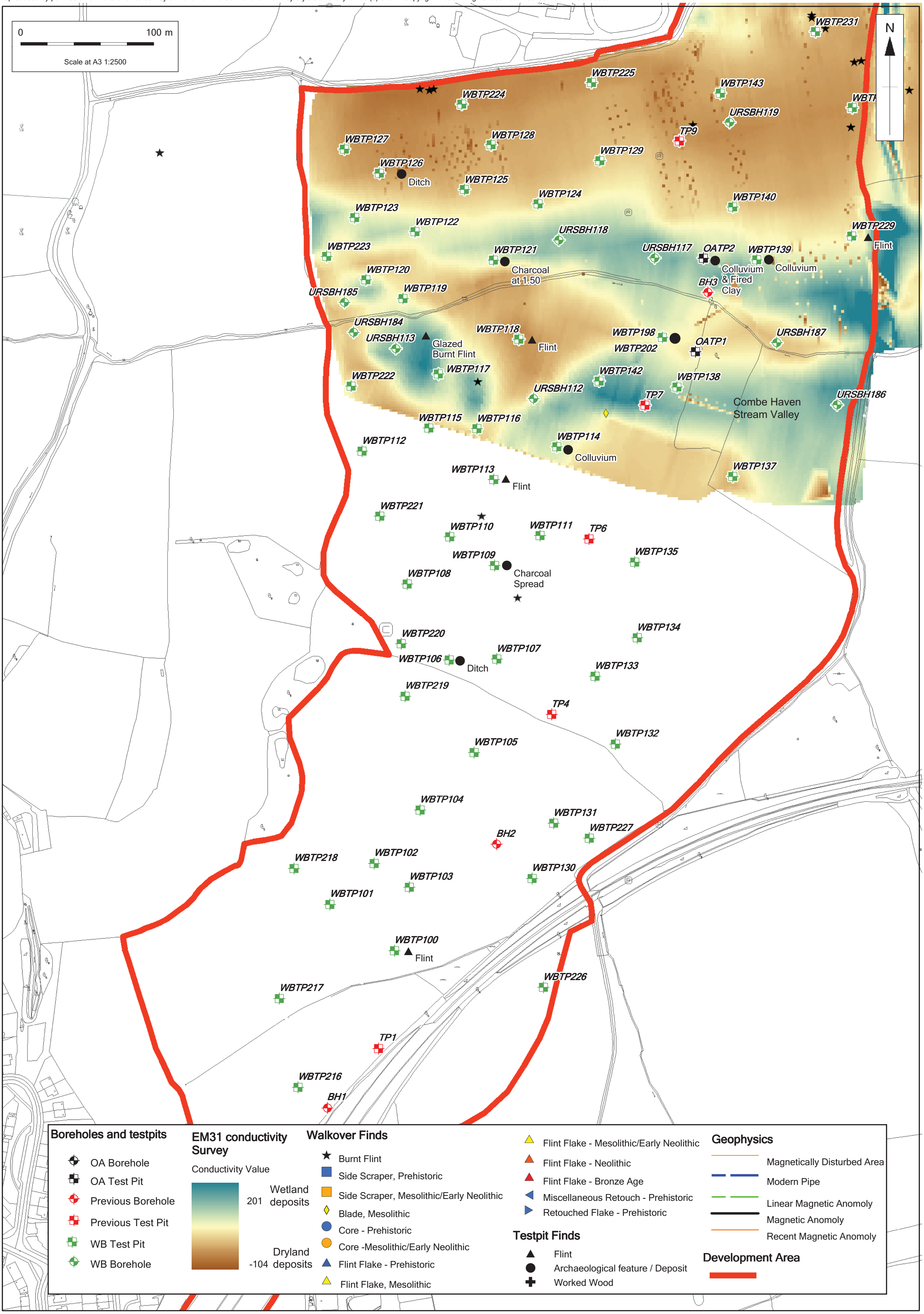

Figure 5: Location of geotechnical investigations with areas of archaeological potential

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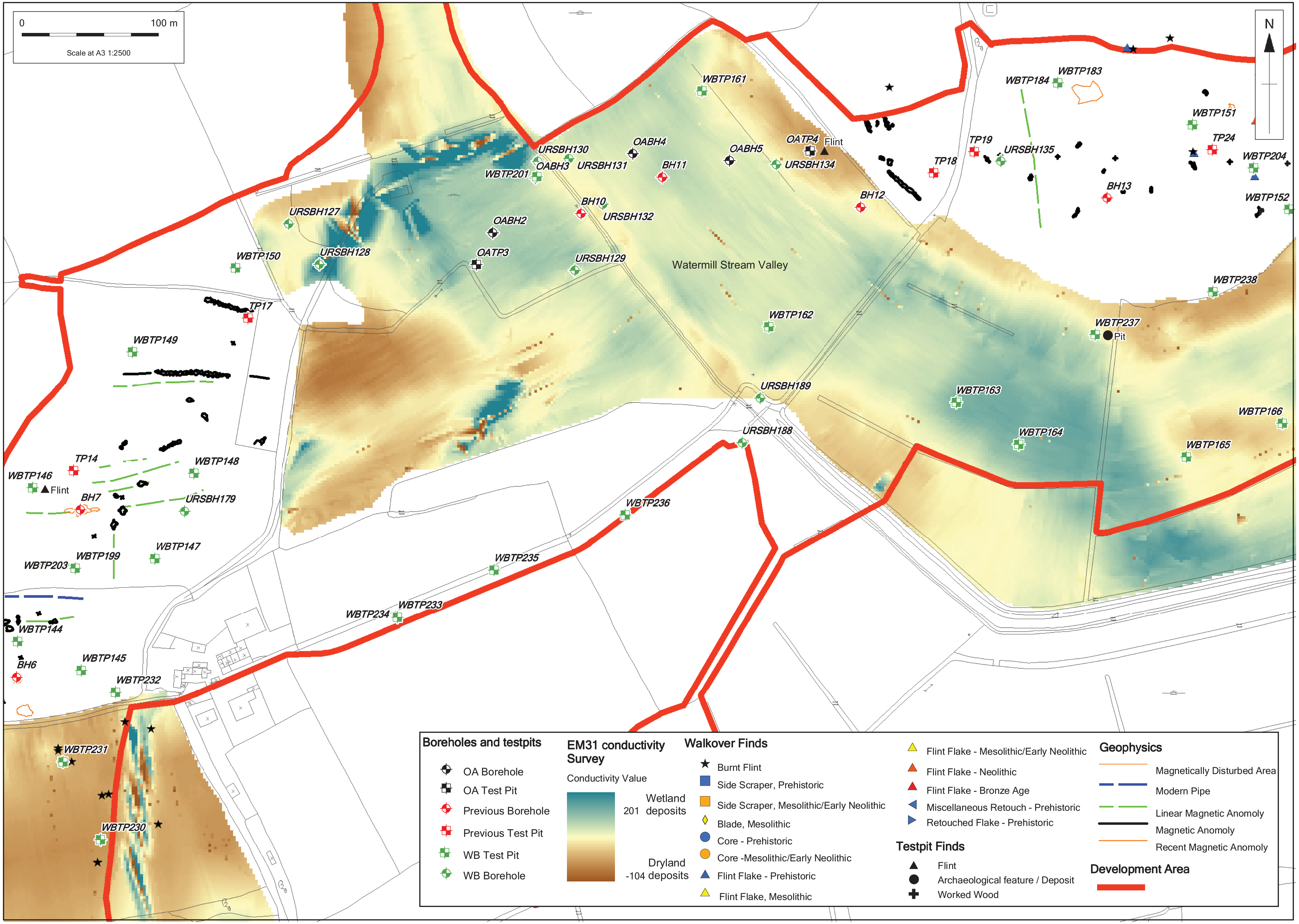

Figure 6: Location of geotechnical investigations with areas of archaeological potential

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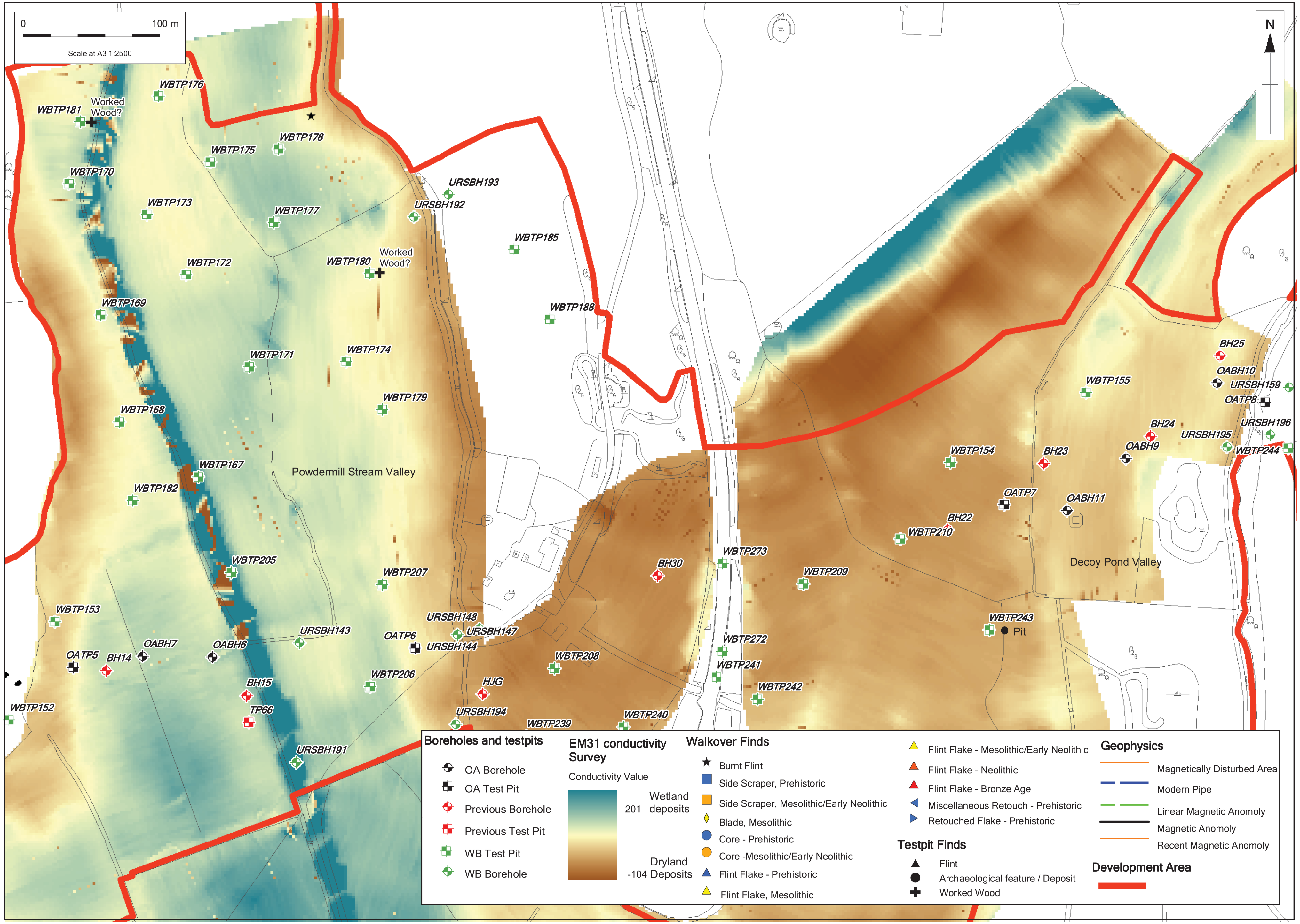

Figure 7: Location of geotechnical investigations with areas of archaeological potential

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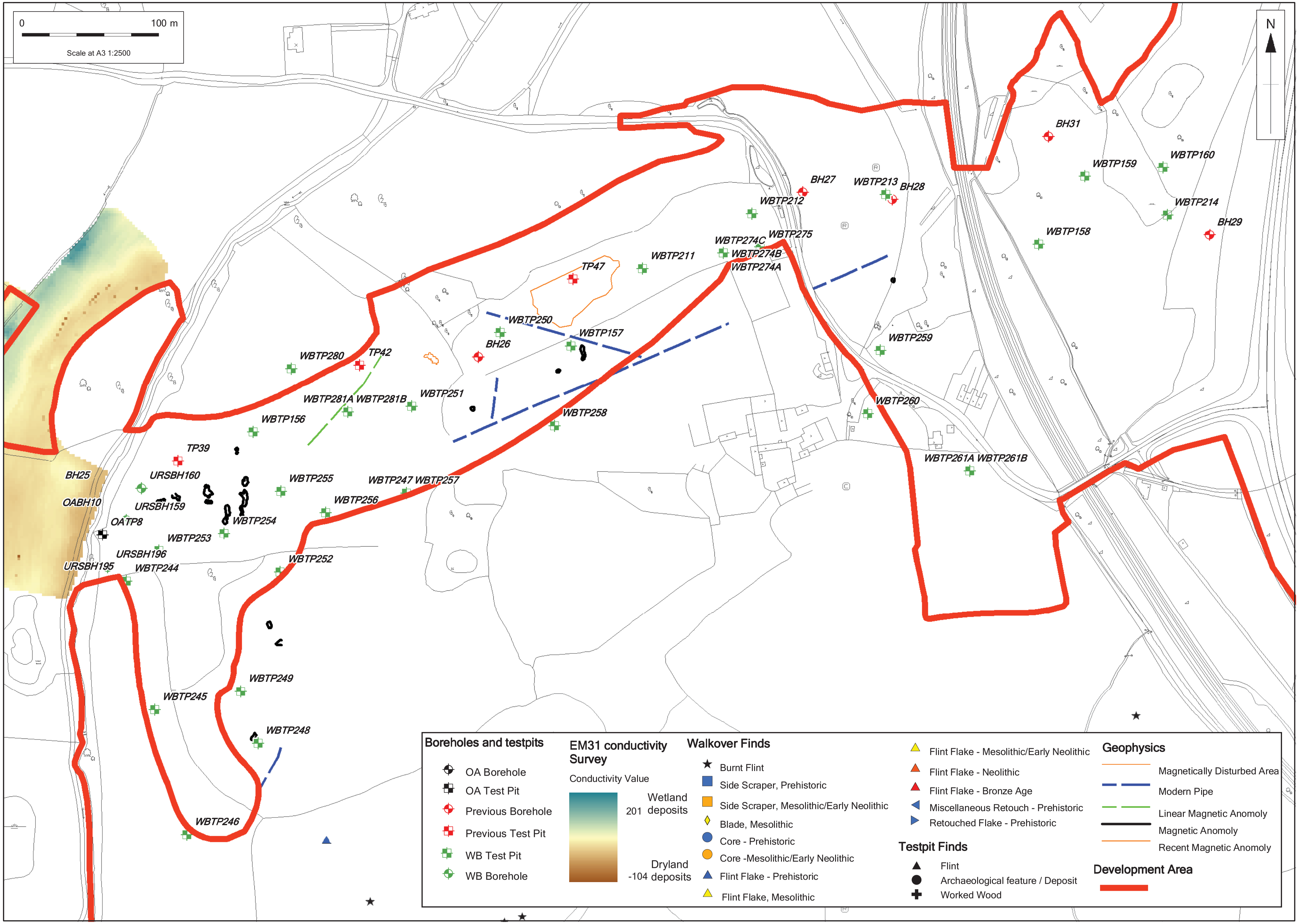

Figure 8: Location of geotechnical investigations with areas of archaeological potential

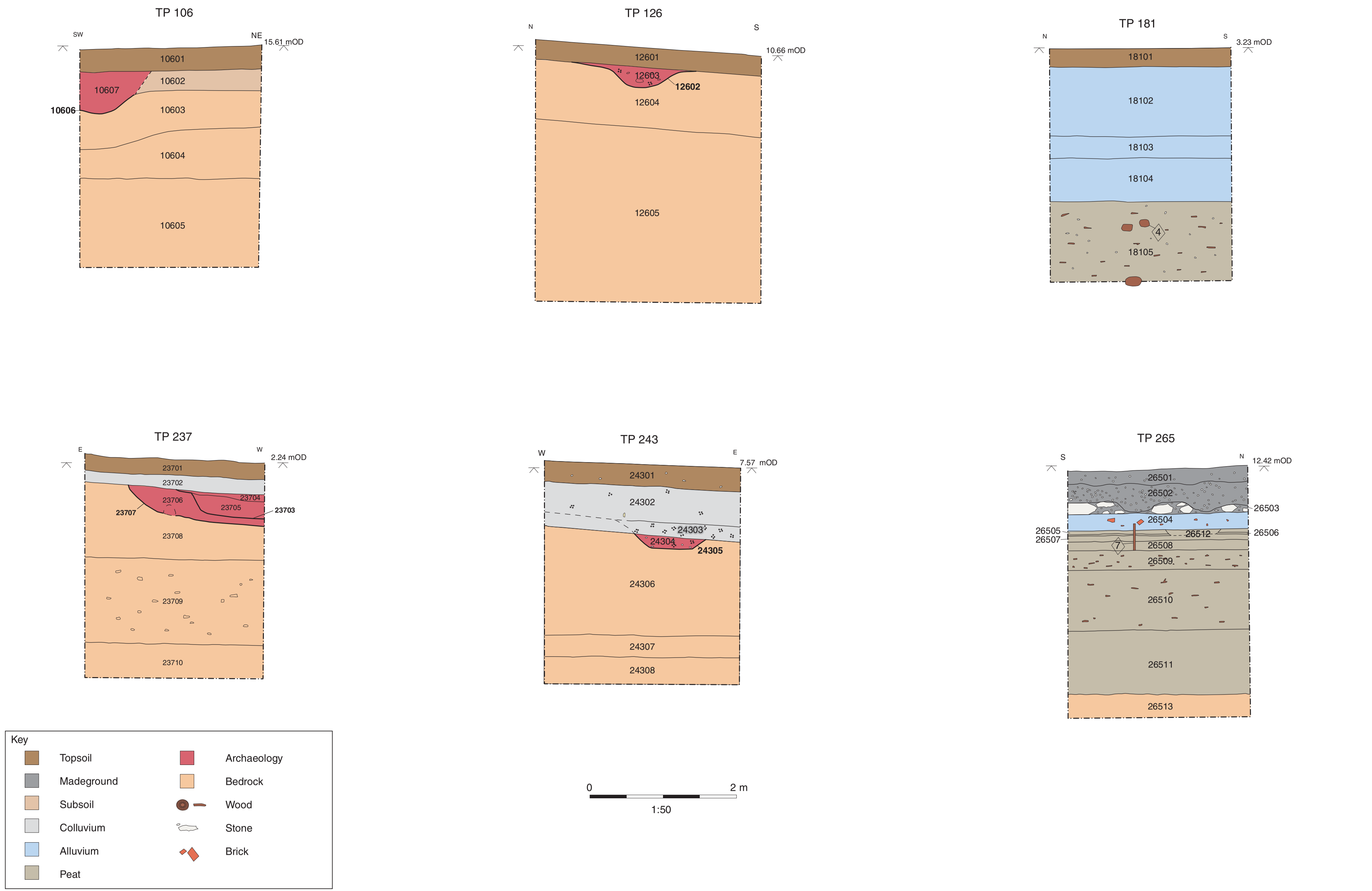

Figure 9: Test pit sections with archaeology

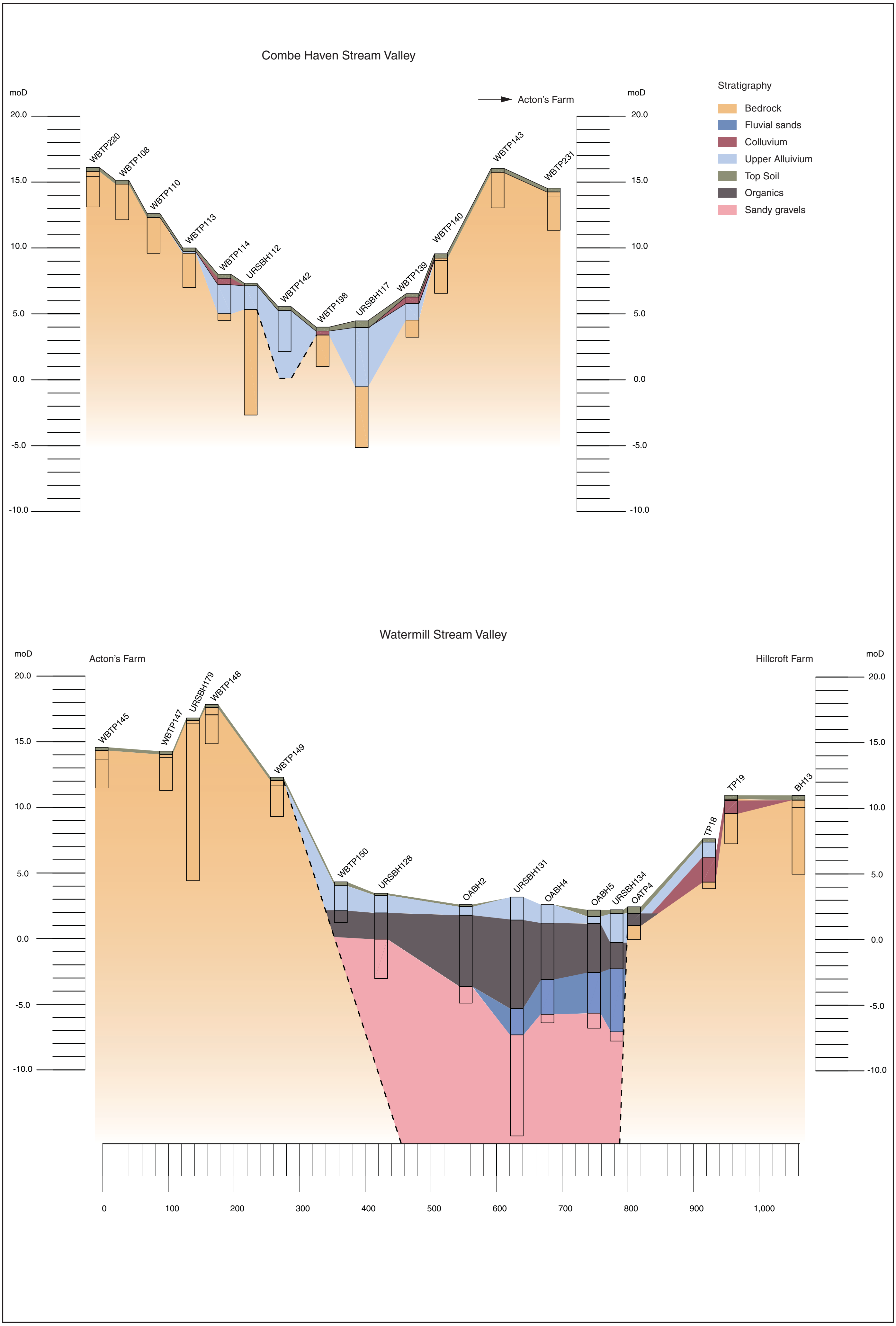

Figure 10: Cross-sections of the Combe Haven and Watermill Stream Valley Sequences

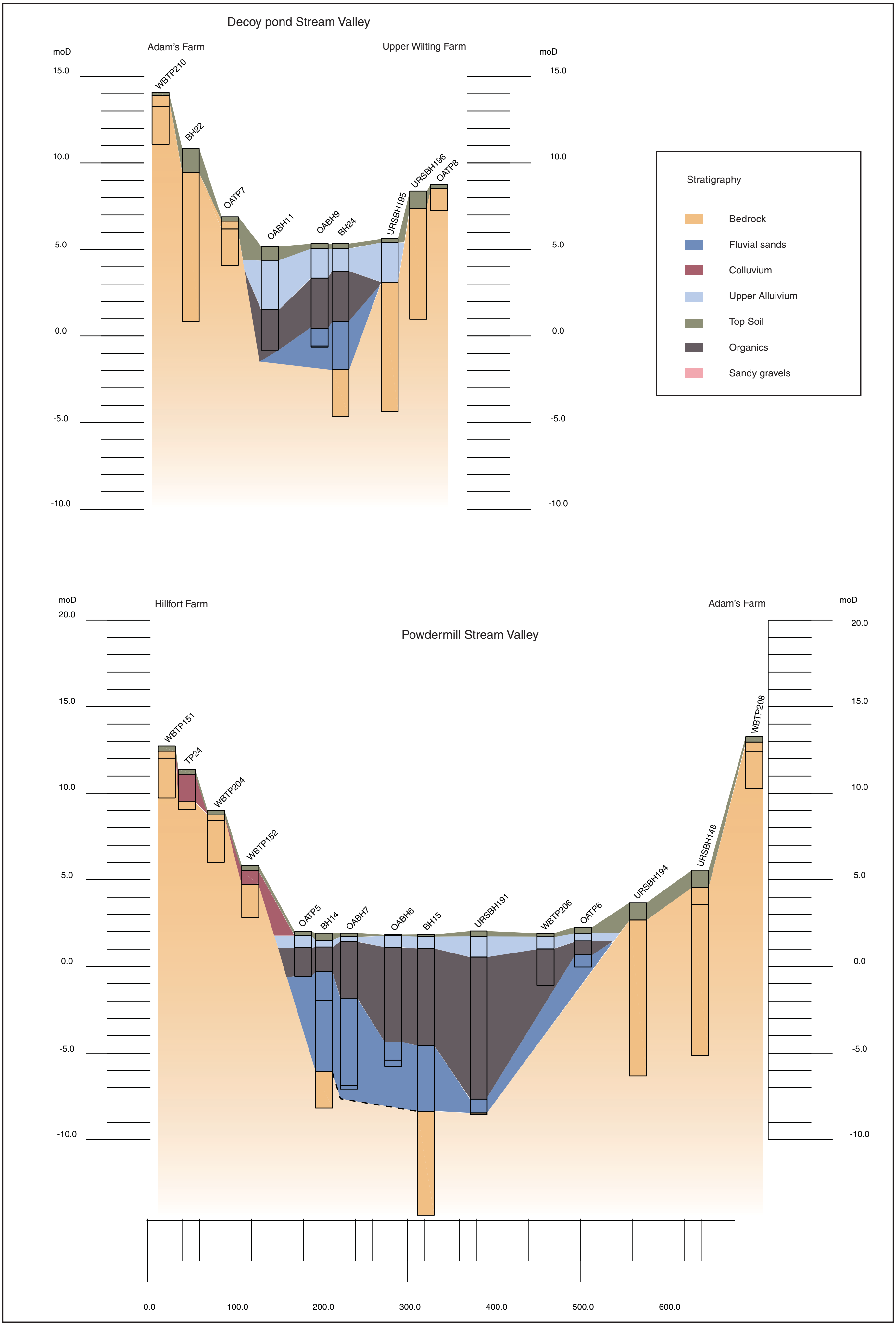

Figure 11: Cross-sections of the Powdermill and Decoy pond Stream Valley Sequences

Plate 1: Photo of Test Pit 171 being excavated with a mini Digger

Plate 2: Photo of Borehole drilling using a cable percussion rig

Plate 3: Photo of Test Pit 114 within the Combe Haven Valley

Plate 4: Photo of a split piece of alder wood identified within the upper peat deposits within Test Pit 181

Plate 5: Photo of Test Pit 265 section that produced a piece of worked wood

Plate 6: Photo of the flooded Combe Haven and surrounding river valleys over winter


Plate 7: Photo of the Watermill Stream Valley over winter

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