Archaeology South-East

ASE

An Archaeological and Geoarchaeological Evaluation at Woollards Field, Falmer, East Sussex

NGR 533887 108125

Project No. 3352
Site Code: WFF 08

ASE Report No. 2008076

Nick Garland and Dr Matthew Pope

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An Evaluation of the post-glacial geoarchaeology, chronology and palaeoenvironment and archaeological evaluation at Woollards Field, Falmer, East Sussex

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by

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Abstract

A programme of geoarchaeological work and archaeological evaluation was undertaken at the Woollard's Field site, (close to the A27 between Falmer and Brighton), in advance of the construction of the new East Sussex Record Office and Collection Centre. The primary aim of the investigations was to characterise the geoarchaeological / archaeological resource present, (if any), in order to understand the potential impact of the future development.

The evaluation followed a geoarchaeological watching brief of geotechnical test pits and boreholes. These revealed a deep sequence of Holocene colluvium overlying Pleistocene deposits including loess silts, solifluction gravel and fluvial gravel.

To investigate the archaeological potential of the site and to characterise the Pleistocene/Holocene sedimentary sequences two large excavations were undertaken through the complete sedimentary sequence providing a broad east-west section through the valley bottom. In addition, six, 2x10m evaluation trenches sampled the surface archaeology.

The results showed the site to preserve an extensive sedimentary sequence covering phases of Pleistocene melt-water flow, periglacial solifluction and loess deposition. A Holocene buried soil was located at the tope of the Pleistocene gravels and this in turn was covered by further Holocene colluvium. A number of flint flakes were recovered from the Pleistocene gravels indicating the presence of human activity at the site or in its immediate environs during the Pleistocene. Dating samples were taken during the fieldwork which it is now recommended are processed to provide OSL-determined dates of the age of deposition. Assessment of samples taken from palaeoenvironmental remains proved barren with no preservation of pollen, macroscopic plant remains or molluscs. However this may simply be due to local preservational conditions and other areas of the Falmer valley, to be investigate as part of infrastructure works for the community stadium may deliver this palaeoenvironmental material.

The evaluation trenches, which sampled the surface archaeology, revealed six linear features, representing seasonal water flow which ran across the site in a north-east to south-west orientation along the base of the valley. A single naturally occurring feature lay to the south-east of the site. Evidence of truncation of the site due to the construction of the railway line and A270 was found to the south-east and north-west respectively.

The successful completion of these investigations, as part of the structured redevelopment of the site, allows informed decisions to be made regarding the necessity and type of future mitigation strategies in relation to the geoarchaeological / archaeological resource.

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PART 1: INTRODUCTION AND BACKGROUND INFORMATION

1.0 INTRODUCTION

1.1 Site Background

1.1.1 Archaeology South-East (ASE), a division of University College London Centre for Applied Archaeology (UCLCAA), was commissioned by East Sussex County Council (ESCC) to undertake a geo-archaeological and archaeological evaluation of land at Woollards Field, Falmer, East Sussex (NGR 533887 108125) (Fig. 1).

1.2 Geology and Topography

1.2.1 The site is situated in the base of a valley and is bounded by the A270 Lewes Road to the north, residential housing to the west, a railway line to the south and a reservoir/settling pond to the east. The construction of the road and railway in close proximity to the site may have disturbed the underlying deposits.

1.2.2 The British Geological Survey (BGS) Sheet (318) shows the site lies on head deposits overlying upper and middle chalk. Recent monitoring of geotechnical works (detailed in Parts 2 and 3 of this report) has revealed that the underlying upper and middle chalk is overlain by well rounded, probably fluvial/soliflucted, gravels that contain sarsen stones up to 2m in length. The gravels are in turn overlain by a loess brickearth, colluvium and topsoil.

1.3 Planning Background

1.3.1 The site is proposed for development as the future East Sussex Record Office and Collection Centre and has previously been the subject of two Desk Based Assessments (Place 2004, Russell 2008). No known archaeological material was recorded within the boundary of the site, but evidence from the surrounding area suggests this could be a gap in the archaeological record and archaeological features and deposits may well be present. Casper Johnson, County Archaeologist ESCC, therefore advised that that the site be evaluated to determine the presence/potential of archaeological deposits and the impact that the proposed development will have upon them.

1.3.2 The scope of the work was outlined by Casper Johnson, ESCC, and a Written Scheme of Investigation (WSI) was compiled by Archaeology South-East (Sygrave 2008). All work was carried out in accordance with this WSI, the East Sussex Standards (ESCC 2008) and the relevant *Standards and Guidance* of the Institute of Field Archaeologists (IFA).

1.4 Scope of Report and Report Structure

1.4.1 This report details the geoarchaeolgical and archaeological evaluation undertaken by, Dr Matt Pope, Dr Mike Allen and Nick Garland between the 15th and the 28th May 2008. The project was managed by Jon Sygrave (Project Manager) and Jim Stevenson (Project Manager, Post-Excavation).

1.4.2 This report has been structured chronologically, from the earliest (Pleistocene) to the latest (Surface) archaeological remains.

2.0 BACKGROUND

2.1 **Geo-archaeological Background** by Dr Matthew Pope

2.1.1 No record exists of the valley, in which the site is located, having ever been named, despite it being a major topographical feature providing the main access from the coast (Brighton) with Lewes. Despite providing a continuous communication route this is not a single continuous valley but two chalkland valleys, both originating at Falmer and following diametrically opposite routes. The site sits approximately 2km to the south of the Falmer watershed.

2.1.2 The watershed is controlled by the presence of a local syncline in the underlying Cretaceous and Tertiary geology. The syncline is centred on the village of Falmer where Tertiary deposits, including weathered Reading Beds and Sarsens beds, outcrop on the modern landsurface. The precise limits of this outcrop are only broadly mapped by the BGS and it is expected that elements of the Tertiary geology will be encountered, albeit in a secondary context, within the alluvial and Head components of the sedimentary sequence at the site.

2.1.3 The valley itself has its origins in solifluction and fluvial processes associated with the Pleistocene weathering of the Chalk Downlands. The current network of dry valleys were carved out due to the removal, by melt-water, of rock weakened sediments made mobile through solifluction and fluvial over-steepening of the foot of valley slopes. Given the large, dendritic catchment area of the Lewes Road Valley, water volumes during seasonal thaws and glacial/interglacial transitions can be assumed to be vast and it should be expected that down-cutting and melt water associated with the last (Devensian) glaciation incised a major channel beneath the current level of the modern valley ground surface.

2.1.4 From the beginning of the Holocene we should expect to see features within the sedimentary sequence of the valley which relate to seasonal fluvial activity as a Downland Winter Bourne river. This may include poorly sorted and sub-rounded fluvial gravels and alluvial silts and clays. These might be expected to inter-digitate and give way to extensive colluvial sequences relating to the down-slope movements of valley side soils. Within these deposits it may be possible to determine the presence of occupation horizons, particularly relating to changing land use patterns within the valley during the late Bronze Age and Early Iron Age where local farmsteads and enclosures begin to appear in the valley catchment.

2.2 **Archaeological Background** by Caroline Russell

2.2.1 An Archaeological Desk-Based Assessment (DBA) of the site was previously prepared by Place Archaeological Consultants Ltd (2004). This was updated in August 2008 after the current fieldwork had taken place (Russell 2008). The results of this DBA are summarised below.

2.2.2 No archaeological remains are recorded as being located within the site; the closest to the site is the findspot of prehistoric worked flint, fire-cracked flint and prehistoric/Roman pottery recovered during a walkover of a field directly opposite the site, on the other side of the A270. However, a site walkover

revealed at least one definite historic landscape feature and several possible others within the woodland that divides the site. A ditch, aligned northwest to southeast, was found just within the woodland, whilst various relatively low, indeterminate earthworks were located further within the wood. The remains of a pond, dated from cartographic evidence to between 1825 and 1838, were not seen from the ground or from the most recent aerial photographs obtained. The maps and associated documents revealed that the site strides two fields, both pastoral, in the late 18th century. By 1838, however, one field was pastureland. With the construction of the railway in the mid 19th century and that of the A270 later on, the present area of the site was defined. The maps and aerial photographs show that the site has never been built upon to any great extent. At the time of visit, the site was occupied by travellers and had a playground within the southwest end. The foundations of a building are located beside the playground and are the only obvious remains of a building on the site. Other structures observed within it are likely to relate to the nursery of the first half or so of the 19th century, the A27 embankment or the playing fields and tennis courts of the 1960's, 1970's and possibly 1980's.

2.2.3 A wider Study Area, extending for two kilometres from the centre of the site was considered to place the site in a historical and archaeological context. The Study Area encompasses the villages of Falmer and Stanmer, Stanmer House and Park, and the University of Sussex. Stanmer Park is the only Historic Park and Garden recorded within the Study Area. The majority of the Listed Buildings within the Study Area are located within these four areas. All Listed Buildings are post-medieval, except for a medieval church in each village and a medieval barn in Falmer. The nearest to the site is the pair of lodges at the entrance of the avenue leading into Stanmer Park. These two buildings are located around 0.35 km to the northeast of the site, on the other side of the A27.

2.2.4 Eighteen Archaeologically Sensitive Areas (ASAs) are recorded within the Study Area. ASAs cover Falmer and Stanmer, as well as much of Stanmer Park, not surprisingly considering the concentration of Listed Buildings within each. The Early Iron Age hillfort at Hollingbury is also an Archaeologically Sensitive Area. The largest within the Study Area is that closest to the site, being 0.2 km to the south of it on Falmer Hill. It incorporates a number of sites of varying date and type, including a medieval linear earthwork on the edge of the Study Area, which is a Scheduled Ancient Monument. A settlement site and field system are the nearest of these to the site, located around 0.40 km to the southeast. They are as yet unexcavated and so are provisionally dated to the Iron Age or Romano-British period.

2.2.5 Four other Scheduled Ancient monuments are recorded within the Study Area. Except for Hollingbury hillfort, with its three Bronze Age barrows and possible Romano-Celtic shrine, all are located in Stanmer Park, within either Pudding Bag Wood or the adjacent Great Wood. One is an Early Iron Age cross dyke, another is a levelled Bronze Age barrow containing a small hoard and possible Anglo-Saxon internments, whilst the third is a Neolithic/Bronze Age cross dyke with a Bronze Age barrow to its northwest.

2.2.6 Great Wood is an Ancient Woodland (i.e. woodland known to have existed since 1600 and which may, therefore, contain archaeological features relating to historic woodland management). Six other Ancient Woodlands are recorded within the Study Area, all except one of which stand within Stanmer

Park. Highpark/Millbrook Woods is the closest to the Site, standing to its immediate north, on the other side of the A270.

2.2.7 The conclusions of the desk-based assessment indicate that the site has low potential for archaeological remains of every period, from the Palaeolithic through to the post-medieval period.

PART 2: THE PLEISTOCENE ARCHAEOLOGY

1.0 GENERAL GEOARCHAEOLOGICAL METHODOLOGY by Dr Matthew Pope

1.1 The geoarchaeological investigation took place after the excavation of seven trial trenches which were evaluated for surface archaeological remains. This archaeological investigation is detailed in Part 4, below.

1.2 In two of the archaeological evaluation trenches (Trenches 6 and 7) excavation continued further to reveal the geological stratigraphy. These trenches were machine excavated under the supervision of a geoarchaeologist, until further archaeological deposits or the bedrock was encountered (c. 4m below ground level).

1.3 Due to the depth of the underlying bedrock, the excavation exceeded the general safe working depth of 1.20m. The sides of the trench were therefore stepped by a maximum height of 1.20m (less when loose material was encountered) per step to allow safe access to the trench. Due to the unsafe depth the site was HERAS fenced prior to the machining of any trenches.

1.4 Where the excavations revealed significant archaeological material or loess filled features likely to preserve *in-situ* archaeology, they were excavated in plan. This was particularly applicable for lower occupation horizons encountered below the limits of the standard archaeological investigation. Such exposures were hand cleaned by archaeologists, if safety allowed. Adequate time was made available for appropriate archaeological excavation by hand to identify and record the remains as far as possible within the limits of the works in order to extract archaeological and environmental information. In the event that any *in situ* archaeology of a significant nature was encountered, work ceased until an appropriate mitigation strategy was developed.

1.5 If during, the excavation process, depositional contexts likely to preserve either artefactual or macrofaunal material were encountered but were below the possibility of direct in-situ inspection, the arisings were removed and were placed in stratigraphical order to enable description and recording. During excavation dry sieving of such contexts, where possible, took place to look for lithic artefacts. A standard sample of 100l of sediment was sieved for each 0.25m of depth removed. In conjunction with the sieving, the spoil was constantly checked for artefacts as the trench was dug.

2.0 PLEISTOCENE GEOARCHAEOLOGY by Matt Pope

2.1 The Wollards Field site sits at the bottom of a major, north-south trending valley of the Sussex Downs. The valley rises at Falmer, is deeply incised and presents a distinctive and notable flat-bottomed profile along its course towards the Old Steyne on the Brighton coast. While classified as a 'dry' valley without any current fluvial activity, it was suspected that this was a recent and new state brought about by relatively modern changes in drainage. The size and morphology of the valley, combined with off-shore survey showing its continuance under the English Channel, suggested that for much of its life the valley had been subjected to significant, albeit, fluctuating erosion by water flow. The possibility of deep, stratified deposits recording the long history of environmental change during the formation of the Lewes Road valley offered the possibility of determining the processes which led to the formation of the modern landscape of the Brighton area. Further to this the deposits offered the possibility of determining the presence of humans throughout a potentially extensive history of dramatic environmental and climatic change.

2.2 The opportunity to witness geotechnical test pits and boreholes undertaken by Ashdown Investigations allowed us, from the outset of this project, to definitively determine the presence and potential of Pleistocene (ice-age) sedimentary sequences preserved under the Woollards Field site. These investigations revealed, beneath variable depths of topsoil and Holocene valley colluvium (described in Part 3, below), the presence of both decalcified and calcareous solifluction deposits including a beds of distinctive, rounded fluvial gravel, also of a Pleistocene date. Overlying the solifluction deposits in GTP4, a bed of fine-grained, silty sediment was also recorded, it was thought possible that this deposits might contain loess, either in a primary or redeposited condition.

2.3 On the basis of these observations a targeted programme of geoarchaeological investigation, aimed at determining both the environmental and archaeological potential of the Pleistocene sediments was implemented. This involved the stepped excavation of the 10m × 10m evaluation Trench GTP6 down to the surface of the solid cretaceous chalk, determined through the geotechnical boreholes to underlie the site at 4m depth. To the east the 10m × 8m Excavation of GTP7 was taken down to the surface of the Pleistocene fluvial sediment beds. These sections were excavated by machine before detailed sedimentary recording and sampling for palaeoenvironmental remains, clast orientation patterns, OSL dating samples and sediment lithology.

2.4 Character of the Pleistocene sedimentary sequence

2.4.1 The excavations revealed sedimentary sequences with in excess of 3m of Pleistocene sedimentation below the more recent hillwash deposits described above. The beds comprised four distinct phases of alternating solifluction and fluvial deposition. The base of the sequences revealed weathered chalk, comprising bedded but disturbed marl-like beds of the Chalk overlain by a primary deposit of solifluction gravel, incised by a narrow, relatively high-energy fluvial deposit. This, in turn, was overlain by further soliflucted

material prior to a later, bedded fluvial channel. The sequence was overlain by further solifluction gravel that was subjected to significant decalcification and reworking in the early Holocene. Fine grained silt beds were identified as part of these upper deposits. It remains to be determined, through sedimentary analysis, whether this sediment contains a loessic component. The sedimentary sequences were recorded as follows.

Depth	Stratigraphy	Lithology	Colour	Sample	Comments
0.7m	Reworked loess	Clay silt		Yes	Discontinuous horizons of silt depositions, filling apparent hollows in the surface of the Decalcified Head Gravels. Associated with Sarsens.
0.8m	Decalcified Head Gravel	Silty Clay	7.5YR 4/6 strong brown	No	70% sub-angular flint gravel 10-200mm. Some intrusive silt (loess?) towards top of gravel bed suggesting reworking through fluvial action. Very loose, sometimes open framework. Occasional Sarsen 300-950mm. Contact with below marked by solution pipes.
1.3m	Upper Solifluction Gravel	Clay Silt	10YR 8/3 very pale brown	Yes	40% sub-angular chalk 10-50mm. Some weak bedding present in the arrangement of the gravel, a degree of coarsening towards the top. Occasional Sarsen 400- 1100mm
1.77m	Upper Fluvial Gravel	Silty medium sand	10YR 7/4 very pale brown	Yes	40% sub-rounded flint 20-120mm. Clasts matrix supported but loose and unconsolidated. Asymmetrical, fluvial channel profile.
2.55m	Middle Solifluction Gravel	Clay Silt	10YR 8/3 very pale brown	Yes	40% sub-angular chalk 10-50mm. Some weak bedding present in the arrangement of the gravel, a degree of coarsening towards the top.
3.12m	Lower Fluvial Gravel	Silty medium sand	10YR 7/4 very pale brown	Yes (OSL-sampled)	70% sub-rounded flint 10-110mm. Clasts matrix supported but loose and unconsolidated. Asymmetrical. Stone-free sandy bed at base of apparent channel incision
3.45m	Lower Solifluction Gravel	Silty clay	10YR 8/4 very pale brown	Yes	60% angular chalk fragments 10-40mm and 5% angular flint gravel 20-80mm. No apparent bedding.
4.05m	Weathered Upper Chalk	Silty clay	10YR 8/4 very pale brown	No	80% sub-angular chalk fragments 10-60mm. bedded but weathered. Proven to 1m below contact.

Table 1: Trench 6 Pleistocene Sediment Sequence

Depth	Stratigraphy	Lithology	Colour	Sample	Comments
0.7m	Decalcified Head Gravel	Silty Clay	7.5YR 4/6 strong brown	No	60% sub-angular flint gravel 15-200mm. Very loose, sometimes open framework. Sarsen 450mm noted. Contact with below marked by solution pipes.
1.3m	Upper Solifluction Gravel	Silty medium sand	10YR 7/4 very pale brown	Yes	50% sub-rounded flint 20-120mm. Clasts matrix supported but loose and unconsolidated.

Table 2: Trench 7 Pleistocene sediment sequence

2.4.2 The sequence provides a thus-far unique record of the dynamic interplay between fluvial and periglacial process in forming the landscape of the South Downs. The depth and level of development of the Moulsecombe Valley system, combined with the extensive off-shore expression of the channel, had indicated that the valley was distinctive in terms of scale and form to other north-south dry valleys between Shoreham and Rottingdean. Sampling of a number of the these valleys was made possible during the programme of archaeological works ahead of the A27 Brighton By-pass works in the late 1980's (Rudling 2002). These allowed for the sampling of six dry valley sequences to the immediate north west of Brighton and Hove.

2.4.3 Where excavation proceeded to the surface of the solid chalk (Toadeshole Bottom East and Eastwick Barn Valley), the recorded Pleistocene sediment sequences were relatively shallow (<2m) and periglacial deposits survived only as remnants beneath hill wash. In no cases were these sequences built of distinctive alternating beds of fluvial and solifluction depositions, nor were they subject to extensive decalcification and resultant solution piping of the Quaternary sediments. While some deeply developed dry valley sequences do exist to the east of Brighton, for example at Black Rock, these have a relatively uniform character resulting from different level of periglacial formation and moderate fluvial resorting. The high-energy fluvial deposits are thus far unique in the Brighton and Hove area although one suspects that the London Road Valley and Steyne confluence areas will contain similar, and perhaps more deeply developed, sequences.

2.4.4 The distinctive character of the Falmer sequence is currently thought to have resulted from its age and focus for melt water drainage during the Pleistocene. There is a real possibility that the periglacial/fluvial cycles represent responses to global climatic cycles, most probably at the intra-glacial (Devensian) scale rather than representing glacial-interglacial cycles. The most comparable sequences in Sussex to the Falmer sections come not from dry valley sequences per see, but from the Solifluction lobes which coverage the Upper Coastal Plain between Arundel and Westbourne Common, along the line of the Boxgrove raised beach. Here, the age of the

solifluction deposits (up to 480,000 years BP) has allowed for deep and extensive decalcification and formation of solution pipes within the Pleistocene gravels (Roberts & Pope, in prep). Alternating regimes of solifluction and fluvial reworking have led to the formation of a series of gravel beds, varying in clast size, degree of sorting and roundedness throughout up to 12m of sedimentation. In some cases, such as the Valdoe and Slindon Valleys, fluvial reworking and dry valley formation have sorted the upper the parts of the Pleistocene sequence in the late- Devensian and early Holocene in a similar manner to that suspected for the Falmer sequence.

2.4.5 It is therefore tentatively suggested that the Falmer sequences represents a major axis of Downland drainage during the Pleistocene and particularly in the Devensian. The possibility therefore exists that the sequence from the valley are far more extensive in age than those recorded for other dry valleys in the area. At least three phases of solifluction deposition are separated by erosive events leading to the formation of fluvial deposits left by high-energy braided melt-water rivers. The history of fluvial activity combined with suggestions of Winterbourne activity in the Holocene places the Falmer Valley as a significant, albeit currently fluvial, system of the South Downs.

2.5 Palaeolithic finds and potential for further remains

2.5.1 During the course of the investigation four lithic artefacts were found within the Pleistocene gravels. These humanly made products of tool manufacture, while not in primary context are nonetheless significant. They represent a clear indication for the presence of archaic Homo sapiens or Neanderthal populations within the catchment of the Falmer Valley system. The tools, although slightly polished from wind-blown sediment, are in a fresh condition and remarkably well-preserved, They were recovered from both the Middle and Lower Solifluction deposits. They confirm the presence of human activity within the valley during the Pleistocene, they also present the first recovered palaeolithic tools from a clear Pleistocene context in the Brighton and Hove area since the 19th century discovery of a biface at Black Rock. It is not diagnostically possible to determine the exact technology industry or human species responsible for these tools. One flake could be interpreted as a biface edge preparation flake and would suggest an Achuelean industry. While this could date as much as 500,000 years ago, a later Mousterian (60,000 years ago) date is perfectly possible. It is hoped that OSL samples taken from the coarse, sandy base of the fluvial channel, may help to date the artefacts found both immediately above and below this sediment.

2.5.2 While important, the artefacts were recovered from sediments which have potentially moved significant distances prior to deposition, even from the immediate valley flanks or as part of mobile solifluction lobes along the profile of the valley. Such process would have rendered the destruction of any co-arrangement of artefacts and would have potentially led to the resorting of size classes of artifices making any behavioural interpretation impossible. Sieving for artefacts from these sediments on a systematic basis was attempted, (with 20 litres per horizon sifted for humanly modified flakes). This failed to produce further material and all four artefacts were spotted during direct excavation. The conclusion reached is that while Palaeolithic archaeology is present it does not constitute a site as such and therefore no direct mitigation or intervention is recommended.

2.5.3 No macro-faunal remains were identified during the investigation but the conditions for preservation exist for such finds to be made within the solifluction gravel. Sieving of solifluction bulk samples failed to produce evidence of small vertebrate remains or molluscs. Vigilance should be maintained in any further archaeological intervention for large mammal remains, these are robust and perfectly capable of being preserved in the sediments. Their apparent absence during the large-scale excavations suggest however that they are not likely to be present in large quantities.

2.6 Pleistocene geoarchaeology summary

2.6.1 The investigation has offered a thus-far unique examination of Pleistocene valley formation in the chalklands of East Sussex. It has confirmed the valley was incised by a combination of high-energy fluvial action and erosion through periglacial processes. It has firmly established the presence of pre-modern human hunting groups within the valley, the context and timing of which can now be further elucidated through a focussed programme of analysis. Recommendations listed below include the processing of all OSL samples and the sedimentological classification of potential loessic beds recorded at GTP4 and Trench 6.

PART 3: THE POST GLACIAL GEOARCHAEOLOGY by Mike J Allen (of AEA: Allen Environmental Archaeology)

1.0 INTRODUCTION

1.1 Investigations at Woollards Field, Falmer (NGR 533887 108125) were undertaken to evaluate the presence and potential of archaeological and geoarchaeological deposits on the site (Sygrave & Pope 2008). This section of the report largely deals with the post-glacial geoarchaeology, the archaeological implication of the occurrence of sarsens, and the potential absolute chronology of the full Holocene (late glacial and post-glacial sediments sequence).

2.0 GEOLOGY, SOILS AND VALLEY MORPHOLOGY

2.1 The nature of the deposits will, in part, be defined by the morphology of the valley which is outlined in summary below. Although much of the area is disturbed by building (North Moulsecoomb Estate) and transport routes (A270 and Lewes-Brighton railway), the basic morphology of the valley on visual inspection is quite clear.

2.2 The chalkland valley originates from a local syncline centred on the village of Falmer, approximately 2km from the site of investigations. At the head of the valley Tertiary deposits comprising weathered Reading Beds and Sarsen beds outcrop on the surface and exist over the chalk The dry valley cuts through Middle and Upper chalk and runs to the coast and is the conduit for the Lewes to Brighton Road (A27-A270). It and its tributaries are mapped as contain Head. The chalkland around generally support brown rendzinas of the Andover 1 Association. Fieldwork in the area showed that the valley floor contained very shallow, recent grey to brown rendzinas over head (decalcified colluvium, gravel or calcareous solifluction material, eg, Combe Deposit), and that the eastern slopes of Moulsecoomb were largely thin grey rendzinas over chalk under arable. In contrast those on the west were shown by augering to be shallow typical brown earths over clay-with-flints or eroded tertiary deposits, supporting woodland. This is significant in examining the products of erosion (colluvium) on the valley floor.

2.3 Valley topography/morphology

2.3.1 The valley from Falmer to the Old Steyne, Brighton is slighted at the location of investigation (Woollards Field on the valley floor) by the embankments for dual carriageway of the A270 on the west, and the railway to the east, and by the construction of North Moulsecombe estate to the south and east. Nevertheless, it is apparent that this typically asymmetrical dry valley contains a clear, albeit modified, flat and level valley floor which is, unusually flanked on both sides by clear terraces. To the west of the A270 there is a terrace at 65m OD, the slopes below which are wooded (west of the A270) and contain loose sarsen boulders. The soils here are thin brown earths over clay-with-flints or eroded tertiary deposits. This is mirrored by a similar terrace on the eastern side and enveloped by the Moulsecoomb Estate and the grounds of Falmer High School. This terrace seems to be slightly lower at *c.* 50m OD; the terrace edge forming clear edge of the valley floor, and the terrace surface sloping gradually toward the steeper Downs at about the 100m contour. The scarp rise generally marks the edge of the North and East Moulsecoombe Estates. Some embayments and scarp dry valleys are

present. One of these is the clear scarp dry valley that drains into the southern part of Woollards Field and its floor today is occupied by Ashurst Road.

3.0 POST-GLACIAL GEOARCHAEOLOGY OF TRENCHES 6 & 7

3.1 Two evaluation trenches (6 & 7) revealed post-glacial deposits. Elsewhere the removal of the topsoil exposed loose calcareous gravel or calcareous solifluction material (Combe Deposits).

3.2 Methods

3.2.1 Trenches 6 and 7 were 15m × 9m and stepped down at 1m intervals leaving a 1m steep to obtain a maximum depth of 4m to 4.5m. Trench 6 obtained this full depth and recorded a deep Pleistocene sequence, while Trench 7 was excavated to a depth of 2m where it exposed the full sequences of undisturbed post-glacial deposits. Machining was undertaken in spits and under geoarchaeological supervision. The sections were vigorously cleaned, examined by geoarchaeologists (Dr Mike Allen and Dr Matt Pope), and drawn at 1:20, with a representative portion of the post-glacial deposits drawn at 1:10. Full sedimentary description was made of the post-glacial deposits following terminology outlined by Hodgson (1976). A 50cm long monolith sampled the main post-glacial deposits, facilitating more detailed descriptions and sub-sampling for environmental assessment. A second smaller (12cm) monolith was taken through the loessic head deposit (/unit 6) to facilitate subsampling for pollen and provide a bulk sample suitable for soil chemistry, and particle size analyses.

3.2.2 In addition to these two trenches designed to expose long and deep sequences of stratigraphy, the extent and axial profile of the post-glacial colluvium was mapped by the excavation of a number of testpits. A total of 10 testpits were excavated by machine under direct archaeological supervision (Dr Mike Allen), to record the presence, lateral extent and depth of the post-glacial colluvium enabling this deposit to be mapped (see Fig 2).

3.3 Post-glacial sequence

3.3.1 The post-glacial sequence is described below and augmented with more detailed descriptions obtained from the monolith of undisturbed sediments (monolith 1) from the south-west facing section (Fig 3). The basic sequence can be summarised as follows:-

1. present soil	Post-glacial deposits
2. dump/disturbed	
3. channel infills	
4. colluvium	
5. incipient old land surface	
6. loess	Late Glacial Stratigraphy
7. fluvially reworked gravel	
8. calcareous Combe Deposits	

Table 3: Basic representation of Post-Glacial sequence

3.4 Trench 6: Post-glacial sequence

3.4.1 The post-glacial sequence was described at a point 3.8m along the south-west facing section , where the sequence was sampled as undisturbed sediment in monolith 1 (Fig 4). Full depth of deposits were recorded, and where contexts did not appear at this point they were described elsewhere and have been inserted into the descriptions below, and thus contain no depth data. The Pleistocene deposits are listed here and described in detail below.

depth (cm)	***unit/ context***		***samples***	***description***
0-23	1			Dark brown (10YR 3/3) humic silt loam with a clear strong medium crumb, small blocky structure, common medium flints and rare very small and small rounded chalk pieces, many fine fibrous roots, abrupt smooth boundary. A horizon, immature rendzina-form soil
	2			Light yellowish brown (10YR 6/4) – brownish yellow (10YR 6/6) stiff/firm slightly humic calcareous silty loam with few stones. **Recent deposit**
23-34	3			Light yellowish brown (10YR 6/4) calcareous silt marl with common medium and large flints (nodular), many medium chalk pieces, sharp boundary. Infill of palaeochannel; material derived from calcareous solifluction material. Channel back fill
34-46	4a	Monolith 1	34-44	Brown (7.5YR 4/4) firm silty clay loam, no structure observed, with few medium flints, no chalk pieces, rare vertical macropores (0.5mm diameter), some pseudomycelium developing on pore surfaces, abrupt boundary Upper colluvium
@ 46	4b			line of single medium cortical flints Stone string
46-70	4c		49-54	Brown-strong brown (7.5YR 5/4 - 5/6) essentially stonefree weakly/non-calcareous massive silty loam (with very rare medium flints, no chalk pieces), gradual wavy boundary. Lower colluvium
70-86	5		74-79	Brown (7.5YR 4/3-4/4) stonefree massive weakly/non-calcareous silt loam with weak medium blocky/prismatic structure noticeable on some weathered surfaces – a number of small flecks of fine charcoal noted in this horizon throughout the exposed sections, very rare small burnt flints, many very fine macropores, rare vertical medium macropores, some lines with very small stones (earthworm aestivation chambers) abrupt smooth boundary. Incipient buried soil developed in colluvium
	6			Strong brown (7.5 4/6) silt loam with very rare small flints, and clear moderate fine columnar/prismatic structure, rare medium vertical macopores, one lined with very small flint stones (aestivation chamber). Loessic Head
86-	7			Gravel; abundant small and common large cortical and nodular flints within a largely fine flint gravel matrix, with more colluvial material matrix towards the upper portion of this deposit. Abrupt, smooth to wavy boundary Fluvially reworked decalcified head/periglacial gravel

	8			Calcareous chalk marl and flint gravel. Periglacial solifluction material (Combe Deposit)

Table 4: The Pleistocene deposits

3.4.2 The gently undulating surface of the fluvial reworked head gravel (unit 7) gradually slopes eastwards (1:33) toward the centre of the valley (Fig. 3). The incipient buried soil (5) is not detectable on the western 3m of the section, but is recognisable from 3m and attains a maximum thickness of about 20cm. It is clearly developed in colluvium, and its clear boundary with the underlying head gravel suggests little pedogenic activity at this contact and this may suggested the erosion and removal of an earlier post-glacial soil which was replaced by colluvium in which soil development occurred.

3.4.3 The post-glacial hillwash thickens towards the centre of the valley floor, but maximum thickness hardly exceed 0.6m It is divided into upper and lower portions (4a & 4c), by a stone string (4c). The lower colluvium (4c) thins towards the valley centre being essentially a footslope deposit, while the upper colluvium (4a) above the stone string thickens towards the valley centre indicating a valley colluvium and possibly some local fluvial reworking down the valley axis.

3.4.4 Although in cross section the colluvium shows distinct deposition onto the valley floor from the west, and possibly indicating some lateral transport, a loess head (6) 'bar' in the floor of the valley (Fig. 5). This bar occurs over the fluvial reworked decalcified head gravels (7) and seals a large sarsen bolder sitting in the surface of the gravel. The thickness (*c.* 35cm) and height of the bar prevented accumulation of hillwash over much of this deposit s exposed in Trench 6.

3.4.5 The upper colluvium is cut by a series of undulations deliberately infilled /backfilled with calcareous periglacial solifluction deposit. These channels are assumed to be small fluvial channels (see below), and were infilled either during the construction of the railway to the east (*c.* 1844-1846), or for the levelling and construction of the playing fields in *c.* 1950s.

3.4.6 The post-glacial deposits as exposed clearly show truncation of the sequence on the western edge presumable with the deposit being slighted as a result of construction of the A270 embankment, and the creation of the level playing fields.

3.5 Trench 7

3.5.1 The sequence of deposits in Trench 7 was essentially the same as that recovered in Trench 6 above. The main and significant variation was that disturbance occurs to depths of 0.9m. Massive reworking and deposition of the calcareous solifluction material was evident slighting the colluvial deposits. Over 0.5m of re-deposited calcareous solifluction material (made ground) was present at the eastern edge of the trench and is assumed to relate to significant engineering works relating the construction of the Lewes-Brighton railway embankment in the 1840s. The embankment, which lies about 75m beyond Woollards Field, stands an estimated *c.* 5m above the valley floor.

3.5.2 The buried soil is very weakly developed and only recognised over a limited

stretch of *c.* 2.4m (Fig. 6).

4.0 DISTRIBUTION OF POST-GLACIAL COLLUVIUM

4.1 The distribution of the post-glacial colluvium was rapidly mapped by the excavation of ten machine-cut testpits (Fig 2)

Testpit	***Description of deposits encountered***
Testpit 9	Topsoil (0.2m) over calcareous head and flints
Testpit 10	Topsoil (0.25m) over calcareous head and flints
Testpit 11	Base of hillwash @ 0.4m over calcareous head and flints
Testpit 12	Base of hillwash @ 0.7m over calcareous head and flints
Testpit 13	Base of hillwash @ 0.5m over loessic head to 1.7m over calcareous head and flints
Testpit 14	Base of hillwash @ 1.4m over loessic head to 1.8m over calcareous head and flints
Testpit 15	Base of hillwash @ 0.8m over loessic head to 1.75m over calcareous head and flints
Testpit 16	Base of hillwash @ 0.4m over loessic head to 0.7m over calcareous head and flints
Testpit 17	Topsoil (0.2m) over calcareous head and flints
Testpit 18	Topsoil (0.2m) over calcareous head and flints

Table 5: Test Pit Descriptions

4.2 This indicates a broad (80m wide), shallow (1.7m) post-glacial dry valley perpendicular to the main valley axis, which has been slighted and removed by recent development (A270 and playing fields) on its western edge. It also contains Pleistocene loessic head, skirting, or fringing, the western edge, at least, of the valley floor.

5.0 GEOARCHAEOLOGY OF THE POST-GLACIAL DEPOSITS

5.1 A thin (0.7m maximum) veneer of decalcified, largely stone-free, post-glacial colluvium mantled the flat and essentially level post-glacial valley floor, comprised of fluvially reworked flinty head gravel (7) and fluvio-periglacial calcareous chalky marls and gravel (8). The western floor contained ribbons or banks or reworked loessic head (6), a distinctly different loessic facies to that contained within the calcareous periglacial deposits (7), seen in geotechnical pit GTP4.

5.2 Post-glacial colluvium (4) lay unconformably over the fluvially reworked gravel (7) in the valley floor, and over loessic head (6) on the edge of the main valley floor. An incipient buried soil (5) was recognised at the base of the shallow colluvium in the centre of the valley floor developed on the reworked gravel. It comprised a weakly calcareous silt with weak medium ped structure, and despite vigorous cleaning back and carefully examination, very few artefacts were recovered, though a small quantity of charcoal flecking was generally scattered throughout the buried soil. The weakly structured soil is developed in colluvium with limited weathering into the underlying gravel parent material, suggesting the presence and removal of a former soil in post-glacial early prehistoric times.

5.3 The weakly to non-calcareous colluvium examined is largely derived from the shallow slope and terrace of South Coldean Wood to the west which supports shallow brown earths over local clay -with-flints or Reading Beds. The superficial drift geology here gives rise to non-calcareous brown earth and rendzina soils and consequently to the largely stone-free non-calcareous colluvium. The colluvium covered the valley floor and some local fluvial resorting and movement down the valley axis is likely.

5.4 Weak soil formation in colluvium (5) indicates a period of stasis, or the cessation of/reduction in, the rate of colluviation. This may infer either the reduction of activity (clearance or cultivation) on the slopes of Coldean, or the formation of a boundary or lynchet temporarily preventing and restricting colluviation onto the valley floor. The presence and preservation of the old land surface, nevertheless, indicates renewed colluviation burying and largely removing the soil from further pedogenic development and biotic activity. The colluvium both in which the soil was formed, and burying it, is predominantly silty and is derived from loess-rich deposits. It is largely decalcified, stonefree, unsorted and massive containing few internal deposition structures (cf. Allen 1991). One clear (4b), and several less clear and intermittent, bands of medium and large flint were present in the upper portion of the colluvium. These are assumed to relate to colluviation from the Coldean slope and erosion of flinty soils and subsequent sorting by fluvial colluvial processes under arable conditions (cf. Allen 1988; 1991; 1992). The presence of flints may indicate thinning of the soils on Coldean, or more extreme erosion events such as those recorded in both Bronze Age and recent (1984) deposits at Ashcombe Bottom, East Sussex (Allen 2005a). Further stonefree colluvium (4a; ave. *c.* 0.25m thick) provides the final surviving colluvial veneer on the valley floor. The upper colluvium (4a) is cut by a series of shallow linear channels (Trench 6) probably of medieval or post-medieval valley/winerbourne or drainage channels.

Post-glacial events

	Activity	***Product***
	Prehistoric	
1.	Early post-glacial *in situ* soil formation on the fluvially reworked gravel.	None- but lack of deeply weathered soil into gravel.
2.	Erosion and removal of the soil, possibly as a result of woodland clearance locally giving rise to increased run-off and ?fluvial erosion of the soil on the valley floor.	As above.
3.	Small-scale colluviation onto the valley floor; possibly as the final consequence of clearance, or further small-scale soil disturbance (cultivation) on the slope of Coldean.	Initial colluvium on the valley floor (later modified by *in situ* pedogenesis (soil formation – unit 5).
	Probably prehistoric	
4.	Cessation of colluviation and the *in situ* development of grassland soil on the valley floor.	*In situ* soil development in colluvium (5).
5.	Erosion probably as a result of cultivation on the slope of Coldean or on the valley terrace skirting the western edge of Woolllards Field.	Stonefree colluvium (4c).
6.	Thinning of soils (cultivation -)	Flint lenses in colluvial sequence (4b).
7.	Further tillage	Fine-grained colluviation (4c).
	Medieval – post-medieval	
8.	A variety of recent (medieval-post medieval) disturbances and modification.	see below (2 and 3).

Table 6: Post-Glacial Events

6.0 RECENT MODIFICATION OF THE VALLEY FLOOR

6.1 Excavation of the large geoarchaeological trenches (Trenches 6 and 7), machine-cut sondages and the examination of specific deposits (Trenches 2 and 3) by geoarchaeologists has enabled a series of recent modifications to the valley floor to be clearly defined.

6.2 Minor fluvial channels

6.2.1 A series of shallow channels were recorded cut into the calcareous solifluction material in Trench 3 where the solifluction material (Combe Deposit) lay immediately beneath the shallow soil, and into the top of the upper collvium (4a) in Trench 6. The channels were broadly parallel up to 1.4m across though the main channels were only 0.4m wide, and in this trench (Trench 3) attained a maximum depth of 0.25m including the present soil. In Trench 3 the base of the channels was lined with a thin veneer of dark grey (2.5Y 4/1) humic silty sand, described in more detail below).

6.2.3 These features run down the axis of the valley and probably represent shallow seasonal overland water flow or drainage ditches. Machine excavation after full recording of these features, confirmed that they were cut into *in situ* calcareous head deposits, and were not part of any larger fluvial regime. Although there is no dating evidence for these features we assume that they are of later medieval or post-medieval date. The archaeological desk-based assessment (Place 2004) does not indicate whether any channels were present on historical maps (eg, 1575 to 1898), but high water tables are indicated by the presence of a 'small pond (8m dia.)' within Woollards Field.

6.2.4 The channels in Trench 3 were very shallow and are filled with the present soil profile. Those in Trenches 6 and 7 are deliberately back filled with calcareous solifluction material, and we assume that this was done during the construction of the railway (*c.* 1844-1846), the construction of the embankment for the A270, or the levelling and creation of the playing fields.

6.3 Disturbance relating to the railway construction

6.3.1 Engineering and construction works were associated with the construction of the Lewes-Brighton railway and the building of the large embankment. It is evident that significant disturbance of head and colluvium had occurred along the eastern margin of Woollards Field to depths in excess of *c.* 0.5m over large areas, (Trench 7). These workings involved the excavation and massive re-deposition of large quantities of Head deposits. Only large exposures were able to determine the difference between large-scale deposited head and *in situ* head.

6.3.2 Dumping of thin (0.15 – 0.2m thick) veneers of Head were present in Trench 2. This overlay fine-grained sorted organic deposits (contexts 2/003, 2/005 & 2/006) with clear fluvial/lacustrine structures indicating slow deposition in an aqueous and semi-fluid conditions. The contacts with the overlying re-deposited Head (2/004 and 2/008) and underlying re-deposited Head (2009), showed clear flume structures typical of deposition and buried of a semi-fluid

sediment.

6.3.3 It lay on further re-deposited Head, and clear impressions of a tracked vehicle were present on its surface (Fig 7). A machine-excavated sondage confirmed the re-deposited nature of the overlying Head (2/004) and recovered fragments of clinker from the organic coal/coke deposit (2/006).

6.3.4 Detailed visual examination of a voucher sample of this deposit (2/006) under a ×10-×30 stereo-binocular microscope allowed the following description.

> Black (2.5 gley 1) humic silt loam (coal, coke or soot dust and silt) with rare very small rounded quartz pieces and rare very small fragments of possible clinker.

6.3.5 We can conclude that this deposit represents the accumulation of coal/coke and clinker dust washed from stockpiled mounds of this material during, or subsequent to the construction of the Lewes-Brighton railway embankment in *c.* 1844-6. This coal/coke deposit was that exposed in patches in Trench 2 and lined the base of the channels/drainage ditches in Trench 3. The limit of these deposits in Trench 3 was coincident with the extent of a lusher rank grass and herbaceous vegetation that occurred along the southern and eastern portions of Woollards Field. It seems that this vegetation is co-incident with, and due to, the higher water-retention capacity of the dense coal/coke/soot silt. As the rank presence of the grassland maps the minimum extent of significant disturbance relating to the construction of the railway embankment, and later levelling and creation of the playing fields (Fig 2).

6.4 Slighting due to A270 embankment construction

6.4.1 The western side of Woollards Field is bounded by the A270 dual carriageway that runs on an embankment. It is clear from the western end of Trench 6 and Testpits 16 and 17, that this edge of the site has been truncated (Fig 6) where the following deposits have been slighted or removed

a) colluvium (4)
b) loessic head (6)
c) possible the surface of the fluvially reworked Pleistocene gravel (7)
d) in places slighting of the calcareous solifluction marl (8)

6.5 Creation of the playing fields

6.5.1 Slighting of Woollards Field to the west may in part be due to the construction of the A270 embankment, but may also be a result of levelling the ground for the construction of the playing fields in *c.* 1950s. Similar levelling may be seen by the infilling and slighting of the colluvium on the eastern edge of Woollards Field, and by the deliberate infilling of shallow channels with calcareous Head (Trench 6).

7.0 DATE AND SIGNIFICANCE OF THE HILLWASH

7.1 The colluvium (4) and incipient buried soil (5) contained virtually no artefacts. Assiduous cleaning along the south facing (drawn) section produced no sherds of pottery of any description. One possible struck flint and three small calcined flints were recorded along the whole *c.* 20m of exposed and cleaned section. The lack of artefacts, even from just cleaning of an exposed section, is a good indication of the level of artefacts contained within hillwash. Numerous artefacts, including diagnostic finds have commonly been similar exercises of cleaning exposures or section at, for instance Southerham Grey Pit and Malling near Lewes (Allen 1995 and Cuckoo Bottom (Allen & Fennemore 1984; Allen 2005b), end excavated sequences have produced several hundred to many thousand artefacts (Allen 1988; 1991; 1992; 2007).

7.2 We can, therefore, accept that the low level of artefacts here is a true reflection of the artefact level within the colluvium, and as such we can take this as an indication of very limited settlement and archaeological activity on the valley floor and the immediate vicinity (ie, the western slopes of Coldean) contributing hillwash to the valley floor. The colluvium itself, rare presence of burnt flint pieces, and few flecks of charcoal indicate some human activity. But we can be relatively sure that no significant post-glacial archaeology is present in the valley floor, bearing in mind the extent of mapped colluvium. Similarly, this tends to obviate the potential of the burial and sealing of any significant prehistoric activity or even settlements, ie, Ashcombe Bottom, near Lewes (Allen 2005a; 2005c); Bourne Valley (Allen 2007) and Kiln Combe (Bell 1983), near Eastbourne. Although prehistoric settlement is attested locally, at Downsview (Rudling 2002), there seems to have been little settlement of activity in the Moulsecoomb valley floor at the location examined.

8.0 PALAEO-ENVIRONMENTAL EVIDENCE

8.1 The field descriptions of the post-glacial sequence (above) were augmented by more detailed laboratory descriptions of the colluvial sequence sampled in Monolith 1 of Trench 6 (Fig. 4).

8.2 Soils and sediments

8.2.1 The colluvium and buried soil in Trench 6 were described in the field and augmented by more detailed laboratory description from the sequence sampled in Monolith 1. Three small (*c.* 500g) samples were removed from the monolith to assess preservation of land snails. The buried soil is a very weakly formed incipient horizon. It is poorly dated, due to the lack of artefacts in this deposit, and thus micromorphology and soil chemistry was not considered valuable.

8.2.2 A small suite of small 10g samples were removed for magnetic susceptibility measurement. Following full description of the sediment and removals of samples, the remaining sediment was discarded.

8.2.3 A small monolith/kubiena (sample 2) was removed from stone-free loessic head (unit 6) from the east facing section of Trench 6. The sediments were described (see below) and eight samples removed at 2cm intervals. The sample of undisturbed deposits is retained (kubiena sample 2), but sediment micromorphology is not considered to be significant the studies here, but particle size analysis and chemistry (ie, presence of chlorite; Catt 1978) could be considered.

depth (cm)*	***unit/ context***	***pollen samples***	***description***
0-4.5	6	0cm 2cm ***4cm***	***Brown (10YR 4/3) slight humic massive silt (will take a polish), rare small flints, few very fine macropores, rare vertical medium macropores (earthworm)*** Transition between upper humic loess and lower less humic loess
4.5-14	6	6cm ***8cm*** 10cm ***12cm*** 14cm	Strong brown (7.5 4/6) silt loam with very rare small flints, and clear moderate fine columnar/prismatic structure, rare medium vertical macopores, one lined with very small flint stones (aestivation chamber). Loessic Head

* depth in kubiena/monolith sample 2 (samples for pollen assessment are in bold italic)

Table 7: Results of Pollen analysis

8.3 Land snails

8.3.1 Following detailed description of the post-glacial colluvial sediment sampled in monolith 1, three small spot samples were removed from the monolith to evaluate the presence, preservation and significance of land snails.

8.3.2 The location of the samples are listed above but constituted 1 sample each from units 4a, upper colluvium; 4c, lower colluvium and 5, buried soil. The three small samples (*c.* 0.5kg) were air dried, weighed and processed for the recovery of land snails following standard methods (Evans 1972). Flots and

residues were retained on sieves of 0.5mm mesh aperture. Residues were dried and fractionated into 4mm, 2mm, and 0.5mm fractions. Due to the small nature of the flots and residues, all portions were fully sorted under a ×10 - ×30 stereo-binocular microscope. The weights of the residue fractions are recorded in table A1.

8.3.3 The small flots and residues were almost totally devoid of remains. A few very fine <1mm fragments of charcoal were present. Three shells were recorded (Table 6), indicating the weakly to non-calcareous nature of the deposits. At least one specimen (*Candidula gigaxii*) is an intrusive shell being an 'Introduced Helicellid' (Kerney 1966) of Medieval or later date. We can assume all shells recorded are intrusive through macropores (eg, worm burrows). All species present inhabit open country dry grassland and all inhabit the present playing fields (Allen pers. obs.). The shells are of no palaeo-ecological value.

Unit / Context	5	4c	4a
Sample	1/3	1/2	1/1
Depth (cm)	74-79	49-54	34-44
sample wt (g)	505	520	560
MOLLUSCA			
Pupilla muscorum (Linnaeus)	1	-	-
Helicella itala (Linnaeus)	-	1	-
Candidula gigaxii (L. Pfeiffer)	1	-	-
small charcoal fragments	some	some	rare

Table 8. Land snails from post-glacial soil and colluvium

9.0 POST-GLACIAL POLLEN

9.1 The survival of pollen in colluvium is notoriously bad; generally even worse than calcareous soils. Here it is consider that biotic activity and sediment transport prevents any pollen preservation. As such it was not considered valuable to remove samples for assessment (but assessment of pollen is more suited to other sampled deposits).

10.0 LATE GLACIAL POLLEN ASSESSMENT

(Rob Scaife, Palaeopol and School of Geography, Southampton University)

10.1 Eight sediment sub-samples were taken by Dr. Allen at 2cm intervals (0cm – 14cm) from kubiena sample 2 of the loessic head (6) and three (4cm, 8cm and 12cm) were selected for assessment for their sub-fossil pollen and spore content. The principal aims of this first analysis were:

- To ascertain the presence or absence of pollen
- If present, to provide a preliminary analysis outlining the vegetation and environment during the period represented by the sediments
- If pollen is present to provide a preliminary idea of the age of the material and any evidence for human impact on the environment local to the site
- To propose any future work programme

10.2 Samples of 2ml - 4ml were processed using standard techniques for the extraction of the sub-fossil pollen and spores (Moore & Webb 1978; Moore *et al.* 1992). These procedures were carried out in the Palaeoecology Laboratory of the Department of Geography, University of Southampton.

10.3 The pollen data

10.3.1 The loessic head was predominantly silty (aeolian) with very little humic detritus and unfortunately pollen was absent in these samples despite processing the samples twice. Only two grains of *Taraxacum* (Dandelion type) were present. These have robust exines and are typical of poor and differential preservation. This indicates loss and degradation of pollen in the sampled deposit.

10.4 The vegetation and environment;- the potential

10.4.1 The lack of pollen preservation in this loessic head precludes of any further work on the sampled context. The archive consists of slides held by Dr. Scaife. Extra subsamples not assessed will be discarded.

10.5 Charred plant and charcoal remains

10.5.1 No archaeological features were recovered. Bulk samples were however, removed from the black silty deposit (2005/2006) in Trench 3. However, following both further archaeological indications that this deposit is recent, and microscopic examination of a voucher sample (see fluvial/lacustrine deposits above), it is considered that these samples have little palaeo-

environmental value and are disposed of accordingly.

11.0 CHARCOAL

11.1 A single fragment of hand-picked charcoal from the Pleistocene loessic head (6) was identified by Dr. A.J. Clapham (letter dated 3rd June 2008) who reports as follows:-

The charcoal … "is a piece of trunk wood of *Fraxinus* sp. (ash). The amount of growth between each ring suggests that the climate at the time was warm and wet. As the charcoal was recovered from a loess deposit perhaps dating to *c.* 17-22Kya, this is quite unusual.

… it is a possibility that the identified piece of charcoal could be from the early post-glacial, as isolated pollen grains of *Fraxinus* have been identified from the earlier phases of the Holocene perhaps indicating that there were isolated populations in Britain in the Boreal woodland prior to the full development of the deciduous forest. *Fraxinus* pollen has been identified from the peat of the Dogger Bank (Godwin 1984, 309-312). The only sensible way to resolve the dating of the charcoal is by ^{14}C analysis".

The presence of ash in this late glacial deposit is incongruous, and may indicate reworking and mixing, or that this is interglacial.

12.0 SAMPLES FOR ABSOLUTE CHRONOLOGY

12.1 A series of 4 samples were taken by Dr David Peat of the Oxford Research Laboratory of Archaeology and the History of Art for Optically Stimulated Luminescence (OSL) dating. Each sample was accompanied by spot samples and *in situ* measurement of radiation dose using a portable gamma spectrometer. All samples and data are currently retained at the Oxford Laboratory.

In addition one charcoal fragment (*Fraxinus* sp.) was hand collected from the loessic head.

	Late Glacial Stratigraphy
6. loess	1 × OSL and 1 × *Fraxinus* charcoal (^{14}C)
7. fluvially reworked gravel	
8. calcareous Combe Deposits	2 × OSL calcareous loess in solifluction
	1 × OSL silt lens low in solifluction deposits

Stratigraphically the samples can be listed as follows

5) ^{14}C	*Fraxinus* (ash) charcoal in loessic head (6)	Trench 6	0.7m
4) OSL	loessic head (6)	Trench 6	0.7m
3) OSL	top of calcareous loessic deposit in solifluction deposit	GTP4	
2) OSL	base of calcareous loessic deposit in solifluction deposit	GTP4	
1) OSL	silt lens with chalky solifluction deposit	Trench 6	2.8m

The significance of this suite of samples is that: -

- Three distinct sedimentary units are stratified enabling the results, potentially, to be constrained by Bayesian modelling
- Two samples from the calcareous loess enable rate of deposition to be examined and a greater precision of date of deposition of this unit to be gained
- A radiocarbon assay from the loessic head provide both a control for the OSL result from the same deposit, and aids in the precision of the upper contrasting date

13.0 THE ARCHAEOLOGICAL POTENTIAL OF SARSEN STONES

13.1 Sarsens (a tertiary quartz-cemented sandstone) are well known in Wessex occurring across landscapes around Avebury (Lockeridge and Piggledene etc) where they are know locally as 'grey whethers' (Bowen & Smith 1977), as well as in prehistoric monuments such as Stonehenge and Avebury. They are, however, are present in low quantities in both East and West Sussex, occurring in outcrops of weathered Reading Beds. Despite their occurrence, there is surprisingly little known of their use in prehistory, which seems remarkable in the otherwise stoneless landscape of the chalk downs. Perhaps this is even more anomalous considering the presence of prehistoric sarsen monuments, standing stones and stone circles in Wessex to the west and Kent (Medway valley) to the east.

13.2 Sarsens are known as isolated outcrops and boulders, in particular in the Falmer area; in Falmer village, Stanmer Park, Rocky Clump and The Goldstone for instance (Table 9). Excavations in Woollards Field produced a number of rounded and well-rounded boulders of small (0.2 × 0.2 × 0.3m) to large (*c.* 0.8m across) size from within the flinty and fluvial facies of the calcareous solifluction deposits. More significantly surface sarsens are present in the immediate vicinity both within the woods at the north of Woollards Field, and in the wooded slopes of Coldean immediately next to the A270. In the latter, rounded sarsens of medium size 0.3 to 0.4m across were noted, and in wooded area of Woollards Field similar but considerably larger rounded sarsen boulders were present. Also of significance was one surface sarsen in the wooded area that was not rounded but subrectangular and was *c.* 1.55 ×1.05 × 0.6m. The shape contrasts with other sarsens seen in the area and is more reminiscent of shaped monolith and may have been a standing stone.

13.3 The lack of prehistoric mortuary structures, stone circles or even standing stones is surprising, especially as sarsen stones are present as surface outcrops. Indeed the lack of known prehistoric stone monuments may be a true reflection of the lack of their use in prehistory, but it may, in part, be a lack of recognition of this potential by antiquarian and archaeological scholars. What few utilised standing stones that may have existed may have been re-utilised in churchyards (eg, St. Nicholas Church, Brighton) or removed to clear farmland and discarded in field boundaries, hedges or adjacent woodlands.

Location	*comment*
Sarsens associated with archaeological sites	
Crowlink, near Eastbourne	Many small sarsen fragments/stones associated with Bronze Age barrow (Greatorex 2001)
Mileoak, Coldean	Sarsen stone in posthole associated with Bronze Age roundhouse and putative henge (Russell, 2002, 14)
Sarsens reputedly from stone monuments	
The Goldstone (TQ287060)	A very large block of stone (4.1m long, 2.7m high, 1.7m wide and estimated to weigh about 20 tons) called 'The Goldstone'. It is surrounded by a circle of much smaller stones, but neither the Goldstone or the circle are in their original positions (Toms 1932, 725).
Southwick and Thunders Barrow (TQ239070)	Block of sarsen 0.9m square and 0.6m high, apparently moved to current location from Southwick Church
St. Nicholas Church, Brighton	Horsfield (1835, 106) records three stones in the churchyard and was local legend told that there had been many more, as well as a tumulus known as 'Mound' (Horsfield 1835 p.106). By the late 19th century these last stones were gone (Clarke 1882, 34)
Sarsens collected from natural outcrops	
The Old Steyne, Brighton	The Old Steyne fountain is surrounded by sarsen stones, some of which are believed to have been removed from St Nicholas Church and Goldstone. A number of sarsen boulders existed in an old steam that flowed through the Old Styene (Evans 1933).
St Leonards Church, Aldrington, Hove	Five blocks of sarsen stone are in the north west corner of the churchyard (Barr-Hamilton 1970, 15).
Stanmer	A number of sarsen stones exist in the village (Toms 1927), from which it derives its name. Some are believed to have been 'dug up' from nearby field near woodland know as 'Granny's Belt', and were reputed the remains of a stone circle
Rocky Clump	Copse of trees west of Stanmer contains a group of half buried sarsens. Some have recently (2000) been found in excavation to contain tool marks (Funnell pers. comm.), and some were incorporated into a Romano-British building (Gilkes 1997, 124)
Standean (TQ315115)	Standean (stony valley) situated north west of Stanmer contains a number of sarsen stones, and many are around the pond to the north of Standean.
Falmer (TQ354087)	The village pump is surrounded by sarsens, and the village pond is lined with them. They are believed to have been removed from fields locally (where there is a natural outcrop of sarasen in the weathered Reading Beds)
Ditchling	Numerous sarsen blocks around the village, the churchyard and line the edge of the village green. Modern sarsen stone circle.
Alfriston	As Ditchling, a number of blocks of sarsen around the village, in the churchyard
Lullington	Excavations revealed sarsen and built into the fabric of the church (Barr-Hamilton 1970, 15)

Table 9. List of sarsen stones located in Sussex

PART 4: THE SURFACE ARCHAEOLOGY by Nick Garland

1.0 METHODOLOGY

1.1 Archaeological Methodology

1.1.1 Six trial trenches measuring 20m by 2m and two trial trenches measuring 15m by 9m were machine excavated under archaeological supervision (Fig 2). The trenches were accurately located, using a Digital Global Positioning System (DGPS) and DGPS Total Station (Leica 1205 R100 Total Station, Leica System 1200 GPS).

1.1.2 The trial trenches were scanned prior to excavation using a Cable Avoidance Tool (CAT). All of the trenches were excavated under constant archaeological supervision, using a 13 ton 360° tracked excavator, fitted with a toothless ditching bucket. Revealed surfaces were manually cleaned in an attempt to identify any archaeological deposits or features. The sections of the trenches were selectively cleaned to observe and record their stratigraphy. All spoil removed from the trenches was scanned visually and with a metal detector for the presence of any unstratified artefacts.

1.1.3 All encountered archaeological deposits, features and finds were recorded according to accepted professional standards in accordance with the approved ASE Written Scheme of Investigation using pro-forma context record sheets. Archaeological features and deposits were planned at a scale of 1:20 and sections generally drawn at a scale of 1:10. Deposit colours were verified by visual inspection.

1.1.4 A full photographic record of the trenches and associated deposits and features was kept (including monochrome prints, colour slides and digital), and will form part of the site archive. The archive is presently held at the Archaeology South-East offices at Portslade, East Sussex, and will in due course be offered to a suitable local museum.

1.1.5 Only undifferentiated topsoil, subsoil and overburden of recent origin was removed by machine and kept separately. The excavation was taken, in spits of no more than 0.1m for the top and sub soil, down to the top of the first significant archaeological horizon or the top of the underlying ‘natural’.

1.1.6 Spoil was divided into topsoil, subsoil and made ground, as appropriate, and was backfilled sequentially. Spoil heaps and trench bases were scanned using a metal detector as was the spoil derived from excavated features.

2.0 Aims and Objectives

2.1 The aims and objectives of this archaeological and geoarchaeological evaluation were outlined in the preceding WSI (Sygrave 2008) and are reproduced below.

2.2 The main purpose of the archaeological investigation (evaluation) of the site was to ascertain the character, quality and degree of survival of any archaeological remains present to provide information as to how future development would impact upon the existing remains on the site.

2.3 Research Aims

- To investigate the geological formation processes at work on the site.
- To understand the historic development of the settlement and land use of this area of East Sussex
- To understand the use and development of the access from the coast (Brighton) to the near interior (Lewes)

2.4 Specific Research Objectives of the evaluation:

- To investigate evidence of the changing geological processes/topography of the area and ascertain the potential for preserving archaeological artefacts/eco-facts.
- To investigate evidence of the changing geological processes/topography that may have covered earlier periods of archaeological activity through processes such as the formation of colluvium.
- To investigate and record any prehistoric flint and/or any other artefact scatters present in the top soil.
- To investigate the extent of remains relating to the Iron Age/Romano British settlement and field systems to the south east.
- To investigate and compare prehistoric activity on the site in relation to local findspots and monuments.
- To investigate evidence relating to the later development of the area during the Anglo-Saxon, medieval and post-medieval periods.
- To investigate the effect of the 19th century railway embankment to the east and the 20th century embankment of the A270 to the west upon the site.

Number of Contexts	47 contexts
No. of files/paper record	1 folder
Plan and sections sheets	5 drawing sheets
Bulk Samples	2 samples
Photographs	Digital c/s and b/w

Table 10: Quantification of site archive

3.0 RESULTS

The following detail the results of the archaeological investigation for eight trial trenches, 150m in total length.

3.1 Trench 1

3.1.1 Trench 1 was orientated in a north-east to south-west direction and was located to the south-west of the area of investigation. It measured 20m in length and 2m in width (Figs 2 and 3).

List of recorded contexts

Number	Type	Description	Max. Length	Max. Width	Deposit Depth	Height m.AOD
1/001	Layer	Topsoil	Tr.	Tr.	0.19m	48.978m
1/002	Layer	Subsoil	Tr.	Tr.	0.07m	48.788m
1/003	Layer	Natural	Tr.	Tr.	N/A	48.718m

3.1.2 Summary

The natural [1/003], a mid greyish orange silty sand with frequent inclusions of sub-angular coarse pebbles and small to medium stones, was observed between 48.653 m OD to the west of the trench and 48.783 m OD to the east of the trench. Overlying this was a 0.07m thick layer of subsoil, [1/002], a mid greyish brown silty clay. Overlying this was the topsoil, a dark brown sand clay [1/001].

No archaeological features, deposits or artefacts were discovered within this trench.

3.2 Trench 2

3.2.1 Trench 2 was orientated in a north-east to south-west direction and was located to the south-west of the area of investigation. It measured 20m in length and 2m in width (Figs 2 and 4). A sondage was excavated in this trench to clarify the stratigraphic sequence.

List of recorded contexts

Number	Type	Description	Max. Length	Max. Width	Deposit Depth	Height m.AOD
2/001	Layer	Topsoil	Tr.	Tr.	0.17m	48.238 m
2/002	Layer	Subsoil	Tr.	Tr.	0.10m	48.068 m
2/003	Layer	Organic deposit	Tr.	Tr.	0.05m	47.818 m
2/004	Deposit	Redeposit	Tr.	Tr.	0.16m	47.768 m
2/005	Deposit	Organic deposit	Tr.	Tr.	0.26m	47.438 m
2/006	Deposit	Organic deposit	Tr.	Tr.	0.27m	47.178 m
2/007	Deposit	Organic deposit	Tr.	Tr.	0.15m	47.968 m
2/008	Deposit	Organic deposit	Tr.	Tr.	0.17m	47.608 m
2/009	Deposit	Redeposit	Tr.	Tr.	0.28m	46.908 m
2/010	Deposit	Redeposit	Tr.	Tr.	0.30m	46.628 m
2/011	Deposit	Organic deposit	Tr.	Tr.	0.27m	46.328 m
2/012	Deposit	Natural	Tr.	Tr.	N/A	46.058 m

3.2.2 Summary

The natural [2/012], a mid brown clayey silt with occasional inclusions of small chalk and flint nodules, was observed at 46.058m OD at the base of the trench. The depth of the natural at this location, in comparison to the level in other trenches, indicates that this horizon has been truncated, probably by up to as much as 2m. Overlying the natural was a sequence of made ground deposits. The first was a light to mid grey clay, [2/011], with patches of redeposited natural and a high organic content. Overlying this was a mid orange brown clayey sand. [2/010] which was overlain by a light orange brown silty sand with occasional chalk and flint inclusions, [2/009], both contexts seemed to comprise of redeposited natural. Overlying this were two thick layers of organic material, a dark grey silt [2/006] and a light grey silt [2/005]. Overlying this was a layer of organic material, a dark greyish black silt with occasional inclusions of coarse pebbles, [2/008]. Overlying this was a layer of redeposited natural, a light orange brown silty sand with occasional inclusions of flint and chalk [2/004]. Above this was a thinner organic deposit, a mid greyish black silt with frequent inclusions of coarse pebbles and flint, [2/003]. Above this was a thick deposit of organic material, a light bluish grey silt with occasional inclusions of coarse pebble [2/007]. Overlying this was the subsoil, a light orange brown clayey silt [2/002], which lay underneath the a dark brown silt clay topsoil [2/001].

No archaeological features, deposits or artefacts were discovered within this trench.

3.3 Trench 3

3.3.1 Trench 3 was orientated in a north-west to south-east direction and was located to the centre of the area of investigation. It was 20m long and 2m wide.

List of recorded contexts

Number	Type	Description	Max. Length	Max. Width	Deposit Depth	Height m.AOD
3/001	Layer	Topsoil	Tr.	Tr.	0.23m	48.873m
3/002	Layer	Subsoil	Tr.	Tr.	0.07m	48.643m
3/003	Layer	Natural	Tr.	Tr.	N/A	48.573m
3/004	Fill	Fill of Linear	Tr.	0.48 m	0.04m	48.645m
3/005	Cut	Cut of Linear	Tr.	0.48 m	0.04m	48.605m
3/006	Fill	Fill of Linear	Tr.	0.4 m	0.05m	48.473m
3/007	Cut	Cut of Linear	Tr.	0.4 m	0.05m	48.423m
3/008	Fill	Fill of Linear	Tr.	0.44 m	0.05m	48.474m
3/009	Cut	Cut of Linear	Tr.	0.44 m	0.05m	48.424m
3/010	Fill	Fill of Linear	Tr.	0.31 m	0.02m	48.380m
3/011	Cut	Cut of Linear	Tr.	0.31 m	0.02m	48.360m
3/012	Fill	Fill of Linear	Tr.	0.41 m	0.07m	48.380m
3/013	Cut	Cut of Linear	Tr.	0.41 m	0.07m	48.310m

3.3.2 Summary

The natural, a light grey sand with moderate amounts of small and medium

stone and gravel inclusions [3/003], was observed between 48.383 m OD to the south of the trench and 48.763 m OD to the north of the trench. A layer of subsoil, a light orangish brown silty sand [3/002], lay over the natural. Overlying this was the dark brown silt clay topsoil [3/001].

Five linear features were uncovered across the trench, cut into the natural substrate, [3/003] and sealed by the subsoil, [3/002]. The features were: [3/005], [3/007], [3/009], [3/011] and [3/013] (Fig 6). All of the features were orientated in an east to west direction and were parallel to one another (Fig 7). The features were unevenly spaced, ranging from 0.2 to 5.1 metres in distance.

All five linear features had gently sloping smooth sides and flat bases and were in general quite shallow in depth. Each linear was filled by a sterile light orangish brown silty clay [3/004], [3/006] [3/008], [3/010] and [3/012]. No archaeological material was recovered from the fills of any of these features. These features are likely to be of natural origin, caused by water erosion (see Discussion and Appendix 1)

3.4 Trench 4

3.4.1 Trench 4 was orientated in a north-east to south-west direction and was located to the centre of the area of investigation. It was 20m long and 2m wide (Fig 8).

List of recorded contexts

Number	Type	Description	Max. Length	Max. Width	Deposit Depth	Height m.AOD
4/001	Layer	Topsoil	Tr.	Tr.	0.17m	49.521m
4/002	Layer	Subsoil	Tr.	Tr.	0.09m	49.351m
4/003	Layer	Natural	Tr.	Tr.	N/A	49.261m

4.4.2 Summary

The natural, a light grey silty sand with frequent inclusions of sub-angular small and medium stones, [4/003], was observed between 49.168m OD to the west of the trench and 49.353m OD to the east of the trench. Overlying this was a light brown sandy clay subsoil, [4/002] 0.09m thick. Above this was the a dark brown silt clay topsoil, [4/002].

No archaeological features or deposits were discovered within this trench.

3.5 Trench 5

3.5.1 Trench 5 was orientated in a north-east to south-west direction and was located to the centre of the area of investigation. It was 20m long and 2m wide (Fig 8).

List of recorded contexts

Number	Type	Description	Max. Length	Max. Width	Deposit Depth	Height m.AOD
5/001	Layer	Topsoil	Tr.	Tr.	0.14m	48.698m

5/002	Layer	Subsoil	Tr.	Tr.	0.08m	48.558m
5/003	Layer	Natural	Tr.	Tr.	N/A	48.478m
5/004	Fill	Fill of Linear	Tr.	0.50 m	0.08m	48.591m
5/005	Cut	Cut of Linear	Tr.	0.50 m	0.08m	48.511m
5/006	Fill	Fill of Pit	0.57 m	0.57 m	0.04m	48.514m
5/007	Cut	Cut of Pit	0.57 m	0.57 m	0.04m	48.474m

3.5.2 Summary

The natural, a mid orange clayey silt with occasional inclusions of small pebbles and flint nodules, [5/003], was observed at 48.383m OD to the east of the trench and 48.573m OD to the west of the trench. A layer of subsoil ,[5/002], a mid brown silty clay, lay over the natural and underneath the dark brown silt clay topsoil [5/001].

A linear feature [5/005] was uncovered along the length of the trench, in an east to west orientation (Fig 10). Approximately 6.5m of the length of the linear was observed . It had gently sloping sides and was concave in profile with an uneven base. The single fill was a mid orangish brown silty sand with occasional small stone inclusions [5/005]. The feature cut the natural, [5/003] and was sealed bu the subsoil, [5/002].

A small pit, [5/007] was uncovered in the centre of the trench. It was circular in shape and had gently sloping sides and an uneven base. The single fill was a mid orangish brown silty sand with frequent coarse pebble and flint inclusions [5/006]. No finds were recovered from this feature. The feature cut the natural, [5/003] and was sealed bu the subsoil, [5/002].

3.6 Trench 6

3.6.1 Trench 6 was orientated in a north-west to south-east direction and was located to the north-east of the area of investigation. It measured 15m in length and 9m in width. After this trench had been investigated for archaeological remains it was further excavated to explore the geological stratigraphy (Appendix 1).

List of recorded contexts

Number	Type	Description	Max. Length	Max. Width	Deposit Depth	Height m.AOD
6/001	Layer	Topsoil	Tr.	Tr.	0.13m	50.197m
6/002	Layer	Subsoil	Tr.	Tr.	0.11m	50.067m
6/003	Layer	Natural	Tr.	Tr.	N/A	49.957m

3.6.2 Summary

The natural, a light greyish orange sand with frequent inclusions of gravel, sub-angular coarse pebbles and small and medium stones, [6/003], was observed between 49.298m OD to the south of the trench and 49.808m OD to the north of the trench. Overlying this was 0.11m of light greyish brown silt with frequent gravel, subsoil [6/002], which lay underneath the dark brown silt clay topsoil [6/001].

No archaeological features or deposits were discovered within this trench

3.7 Trench 7

3.7.1 Trench 7 was orientated in a north-west to south-east direction and was located to the north-east of the area of investigation. It measured 15m in length and 9m in width. After this trench had been investigated for archaeological remains it was further excavated to explore the geological stratigraphy (Appendix 1).

List of recorded contexts

Number	Type	Description	Max. Length	Max. Width	Deposit Depth	Height m.AOD
7/001	Layer	Topsoil	Tr.	Tr.	0.14m	49.577m
7/002	Layer	Subsoil	Tr.	Tr.	0.12m	49.437m
7/003	Layer	Natural	Tr.	Tr.	N/A	49.317m

3.7.2 Summary

The natural, a light orange sand with frequent gravel and occasional inclusions of sub-angular coarse pebbles and small stones [7/003], was observed at 49.317m OD at the base of the trench. Overlying this was 0.12m of light greyish brown silt with frequent gravel, subsoil [7/002]. Above this was the dark brown silt clay topsoil, [7/001].

When this trench was extended for the geo-archaeological investigation, modern disturbance was noted at the north-east to a depth of 0.90m. This sequence is highlighted in the geo-archaeological report, Appendix 1.

No archaeological features or deposits were discovered within this trench

3.8 Trench 8

3.8.1 Trench 8 was orientated in a north-west to south-east direction and was located to the far east of the area of investigation. It measured 20m in length and 2m in width (Fig 11).

List of recorded contexts

Number	Type	Description	Max. Length	Max. Width	Deposit Depth	Height m.AOD
8/001	Layer	Topsoil	Tr.	Tr.	0.14m	49.793m
8/002	Layer	Subsoil	Tr.	Tr.	0.10m	49.653m
8/003	Layer	Natural	Tr.	Tr.	N/A	49.553m

3.8.2 Summary

The natural, a light orangish grey sand with frequent gravel and moderate inclusions of sub-angular coarse pebbles and small stones [8/003], was observed at 49.553m OD at the base of the trench. Overlying this was 0.10m of light greyish brown silt with frequent gravel, subsoil [8/002] Above this was

the a dark brown silt clay topsoil, [8/001].

No archaeological features or deposits were discovered within this trench.

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4.0 DISCUSSION

4.1 Geology and Stratigraphic Sequence

4.1.1 The natural substrate, generally a light grey sand or silty sand with frequent gravel inclusions occurred at a heights of between approximately 48.30m AOD and 49.90m AOD, generally dropping to the southeast. The exception to this is Trench 2, where the substrate occurred at a much lower 46.05m AOD (see 5.2). Apart from Trench 2, the trenches revealed a fairly consistent stratigraphic sequence of around 0.10m grey brown silt / silty clay subsoil underlying 0.10-0.20m of dark brown silt sand clay (loam) topsoil.

4.2 Degree of Truncation

4.2.1 The natural horizon appears broadly intact across the site with a couple of exceptions. In Trench 2, the natural [2/012], occurred at over 2m lower than in the other trenches. This is inconsistent with the local topography and indicates that the substrate has been extensively truncated in this vicinity. The six organic and three redeposited natural deposits overlying the natural clayey silt represent made ground. Further analysis of these organic deposits by Dr Mike Allen suggests that some of this material contains coal/coke inclusions as well as clinker, suggesting a fairly recent origin (Appendix 1). Given the proximity of this trench to the railway line to the south it is reasonable to assume that the 19th century construction of the railway track and its associated embankment contributed to the deposition of these layers.

4.2.2 The eastern end of Trench 7, extended for the geo-archaeological investigation, also revealed potentially 0.90m of made ground and the possible truncation of the natural horizon.

4.2.3 Clearly in the vicinity of Trench 2 and the east of Trench 7, any potential archaeological remains will have been removed. However, it is reasonable to assume that across the rest of the site potential archaeological remains would have survived.

4.2.4 It is noted in the geo-archaeological sections of this report that an area of lush overgrowth along the south-eastern boundary of the site (adjacent to the railway) may be resultant from the water retention properties of coal/coke deposits noted in Trench 2 and partly infilling the linear features in Trench 3. This may be circumstantial evidence of the extent of disturbance by modern / post medieval activity. However, the seemingly intact archaeological horizon in Trenches 3 and 5 suggests this is not a reliable measure.

4.3 Archaeological Remains

4.3.1 There were no archaeological features or deposits identified during the evaluation. Similarly, no ancient artefacts were recovered from the topsoil or subsoil in any of the trenches. This suggests that there was not a dense or extensive pattern of ancient occupation within the evaluation area.

4.4 Features of natural origin

4.4.1 The five linear features observed within Trench 3 were all very shallow in

nature with a maximum depth of only 0.07m. The ephemeral nature of the features as well as the lack of archaeological material within their fills suggests that these features are natural in origin. Allen suggests that these features represent 'shallow seasonal overland water flow' down the river valley (Part 3 of this report). This is supported by the fact that all of theses features were orientated in the same direction, north-east to south-west.

4.4.2 The geo-archaeological report states that these channels were present within the section of Trenches 6 and 7, seen during geoarchaeological investigation, and continue along the base of the valley affirming Allen's theory that these features represent naturally occurring features.

4.4.3 The linear feature [5/005] was similar in shape and structure to the five features described above. It was also orientated in a north-east to south-west direction and measured only 0.08 metres in depth. This feature probably also relates to seasonal water flow along the valley, as stated above.

4.4.4 The small pit [5/007] observed with Trench 5 was irregular in shape and shallow in depth. The fill within the feature appeared to be organic in nature and it is likely that this feature is the result of root action rather than being deliberately cut.

PART 5: CONCLUSIONS AND RECOMMENDATIONS

1.0 CONCLUSIONS

1.1 Research Aims

1.1.1 Regarding the broad research aims of understanding the historic development of the settlement and land use of this area of East Sussex and understanding the use and development of the access from the coast (Brighton) to the near interior (Lewes), the negative results of the evaluation suggest that the area was not a major focus of detectable ancient occupation.

1.1.2 Research aims geared to wards understanding the geological framework of the Lewes Road valley were more comprehensively addressed. A full sequence through the Pleistocene and Holocene fills of the valley was recorded during the evaluation providing the first benchmark framework for understanding the history of landscape development within the valley and its surrounding watershed. The detailed excavation and recording of this sequence now places us in a strong position to address the specific research objectives of the project as set out in the original WSI (Sygrave and Pope 2008).

1.2 Research Objectives

1.2.1 The specific objectives relating to the changing geological processes/topography of the area, including those that may have covered earlier periods of archaeological activity through processes such as the formation of colluvium, have been assessed during the geo-archaeological works on this site.

1.2.2 The Pleistocene sequence as recorded through the evaluation has provided a detailed framework through which to understand environmental/climate change and its effects of the evolution of the valley system. While ecofacts and environmental evidence in the form of pollen or land molluscs were not preserved as part of this sequence the sedimentology alone allows us to outline successive phases of high energy melt water flow and solifluction processes acting respectively on the valley floor and valley sides to effect down cutting and valley formation during the Pleistocene. While this process has undoubtedly been occurring in this manner during at least the past two million years, the sediments preserved at the site almost certainly relate to more recent glacial/interglacial cycles. Determining the exact timescale is now reliant on the results of OSL dating.

1.2.3 Human activity during the Pleistocene was indicated by small numbers of flint artefacts recovered from the site. These comprised four, wind-polished and patinated but unrolled flint artefacts, one of which was diagnostic of biface manufacture and of soft hammer origin. OSL dating of the sediments will help to determine further if this technology relate to Middle or Late Pleistocene human occupation.

1.2.4 While there was no specific archaeological evidence relating to the objectives for the prehistoric through to post-medieval periods the isolation of Holocene colluvium as part of the upper sequence now implicates human activity as possibly responsible for changes in the

landscape character and environmental in the valley during the prehistoric period. Decalcification was shown to be highly variable across the site in the underlying periglacial deposits and such variation may extend to allowing the preservation of molluscs and pollen remains elsewhere in the valley offering future research opportunities.

1.2.5 From these investigations it has been demonstrated that the site has been slightly disturbed by both the Railway embankment to the south of the site and the A270 to the north. The absence of colluvium within Testpits 17 and 18 (see Appendix 1) to the north of the site indicate possible excavation of material in this area, possibly to form the embankment for the road to the north. The redeposited natural and organic deposits to the south, within Trench 2, indicate the excavation and infilling of this area from the construction of the railway to the south. Both of these modern constructions severely limit the surviving of any archaeological remains.

2.0 RECOMMENDATIONS

1. Limited excavation around the sub-rectangular sarsen to examine for the possibility of stonehole (5 × 5m or 7.5 × 7.5m)
2. Measure and record the magnetic susceptibility profile (cf. Allen & Macphail 1987; Allen 1988) to aid in the interpretation of the suggested activity-related depositional history
3. Write up the findings for publication for *QRA Newsletter* or *SAC*.
4. To construct valley cross section showing main Holocene and Pleistocene deposits and events. Incorporating geotechnical logs from adjacent A27 bypass and Falmer school.
5. Three OSL dates (a grant will be sought for the 4th), and one ^{14}C determination.
6. Analysis of particle size and heavy mineral (chlorite) content from the loessic head.
7. Consideration of watching brief on deep excavations carried out as part of the proposed developments which impact significantly on the Pleistocene sediments. The would mitigate against the potential destruction of discrete artefact concentrations, isolated landsurfaces/loess pockets and preserved mammalian remains.

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SMR Summary Form

Site Code	WFF 08					
Identification Name and Address	Woollards Field, Falmer, East Sussex					
County, District &/or Borough	East Sussex					
OS Grid Refs.	533887, 108125					
Geology	British Geological Survey Sheet (318) - Head deposits overlying upper and middle chalk					
Arch. South-East Project Number	3352					
Type of Fieldwork	Eval. ✓	Excav.	Watching Brief	Standing Structure	Survey	Other
Type of Site	Green Field ✓	Shallow Urban	Deep Urban	Other		
Dates of Fieldwork	Eval. 15th to 28th May	Excav.	WB.	Other		
Sponsor/Client	East Sussex County Council					
Project Manager	Jon Sygrave					
Project Supervisor	Nick Garland					
Period Summary	Palaeo.	Meso.	Neo.	BA	IA	RB
	AS	MED	PM ✓	Other Modern		

A programme of geoarchaeological work and archaeological evaluation was undertaken at the Woollard's Field site, (close to the A27 between Falmer and Brighton), in advance of the construction of the new East Sussex Record Office and Collection Centre. The primary aim of the investigations was to characterise the geoarchaeological / archaeological resource present, (if any), in order to understand the potential impact of the future development.

The evaluation followed a geoarchaeological watching brief of geotechnical test pits and boreholes. These revealed a deep sequence of Holocene colluvium overlying Pleistocene deposits including loess silts, solifluction gravel and fluvial gravel.

To investigate the archaeological potential of the site and to characterise the Pleistocene/Holocene sedimentary sequences two large excavations were undertaken through the complete sedimentary sequence providing a broad east-west section through the valley bottom. In addition, six, 2x10m evaluation trenches sampled the surface archaeology.

The results showed the site to preserve an extensive sedimentary sequence covering phases of Pleistocene melt-water flow, periglacial solifluction and loess deposition. A Holocene buried soil was located at the tope of the Pleistocene gravels and this in turn was covered by further Holocene colluvium. A number of flint flakes were recovered from the Pleistocene gravels indicating the presence of human activity at the site or in its immediate environs during the Pleistocene. Dating samples were taken during the fieldwork which it is now recommended are processed to provide OSL-determined dates of the age of deposition. Assessment of samples taken from palaeoenvironmental remains proved barren with no preservation of pollen, macroscopic plant remains or molluscs. However this may simply be due to local preservational conditions and other areas of the Falmer valley, to be investigate as part of infrastructure works for the community stadium may deliver this palaeoenvironmental material.

The evaluation trenches, which sampled the surface archaeology, revealed six linear features, representing seasonal water flow which ran across the site in a north-east to south-west orientation along the base of the valley. A single naturally occurring feature lay to the south-east of the site. Evidence of truncation of the site due to the construction of the railway line and A270 was found to the south-east and north-west respectively.

The successful completion of these investigations, as part of the structured redevelopment of the site, allows informed decisions to be made regarding the necessity and type of future mitigation strategies in relation to the geoarchaeological / archaeological resource.

OASIS ID: archaeol6-46433

Project details

Project name: Woollards Field, Falmer, East Sussex

Short description of the project:

A programme of geoarchaeological work and archaeological evaluation was undertaken at the Woollard's Field site, (close to the A27 between Falmer and Brighton), in advance of the construction of the new East Sussex Record Office and Collection Centre. The primary aim of the investigations was to characterise the geoarchaeological / archaeological resource present, (if any), in order to understand the potential impact of the future development.

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The successful completion of these investigations, as part of the structured redevelopment of the site, allows informed decisions to be made regarding the necessity and type of future mitigation strategies in relation to the geoarchaeological / archaeological resource.

Project dates: Start: 15-05-2008 End: 28-05-2008

Type of project	Field evaluation
Current Land use	Cultivated Land 1 - Minimal cultivation

Project location

Country	England
Site location	EAST SUSSEX BRIGHTON AND HOVE BRIGHTON Wollards Field Falmer
Site coordinates	TQ 533887 108125 50.8758439619 0.180475489205 50 52 33 N 000 10 49 E Point

Project creators

Name of Organisation	Archaeology South East
Project brief originator	East Sussex County Council
Project design originator	East Sussex County Council
Project director/manager	JON SYGRAVE
Project supervisor	Nick Garland
Type of sponsor/funding body	East Sussex County Council

Entered by	Jim Stevenson (jim.stevenson@ucl.ac.uk)
Entered on	1 August 2008

Appendix: Residue fractions

Samples of the colluvium (4a & 4c) and the buried soil (5) were processed for land snails. Residue fractions are recorded below. Residues were fractionated (2mm, 1mm and 0.5mm) and each fraction sorted under a stereo-binocular microscope. The sorted fractions weighed (Table A1), and discarded

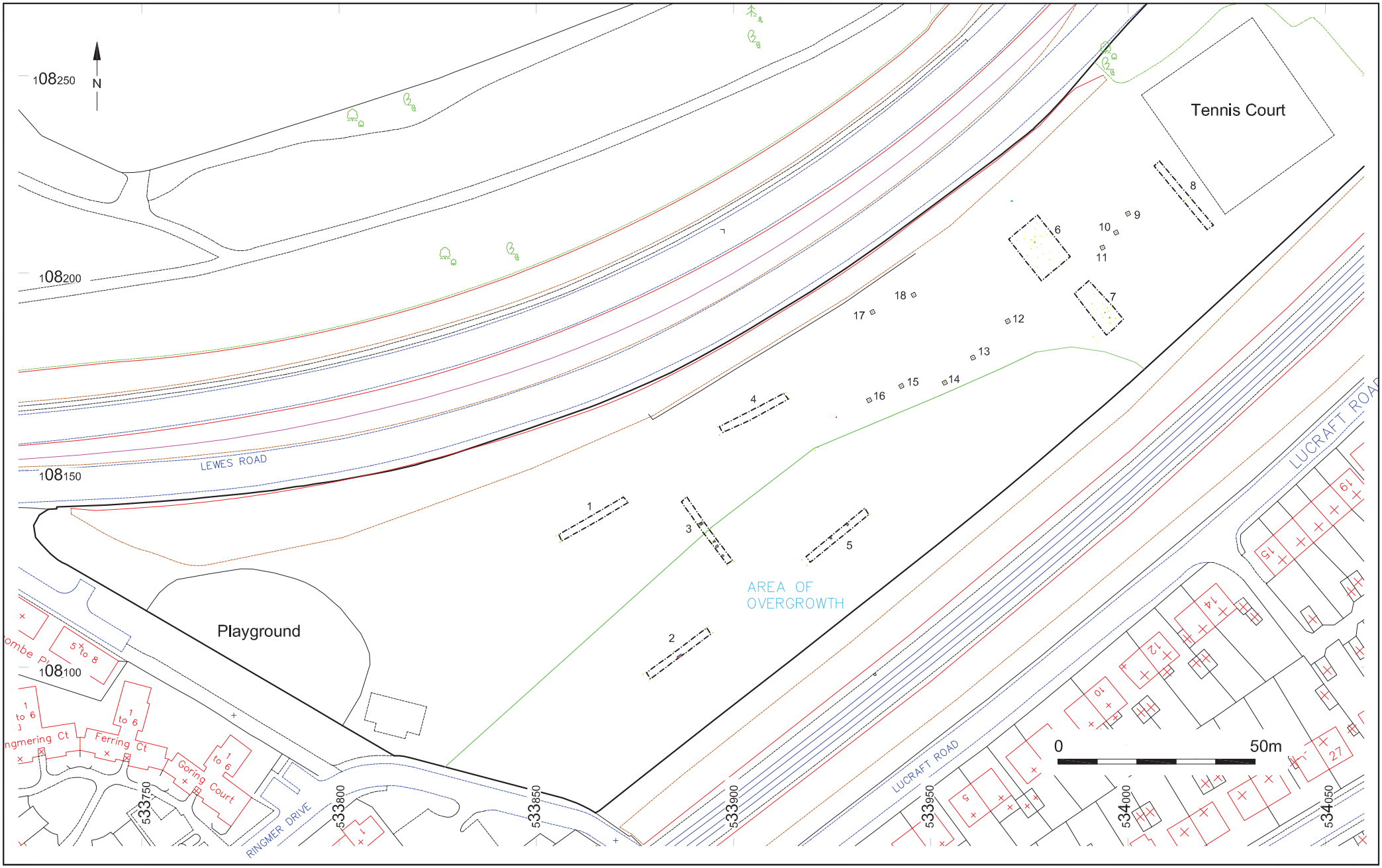
Sample	Depth	Context	Total wt	4mm	2mm	>0.5mm
mono 1 / 1	34-44cm	4a	560	14	7	4
mono 1 / 2	49-54cm	4c	520	14	7	5
mono 1 / 3	74-79cm	5	505	14	4	4

Table A1. Weights (in grams) of the sorted residue fractions

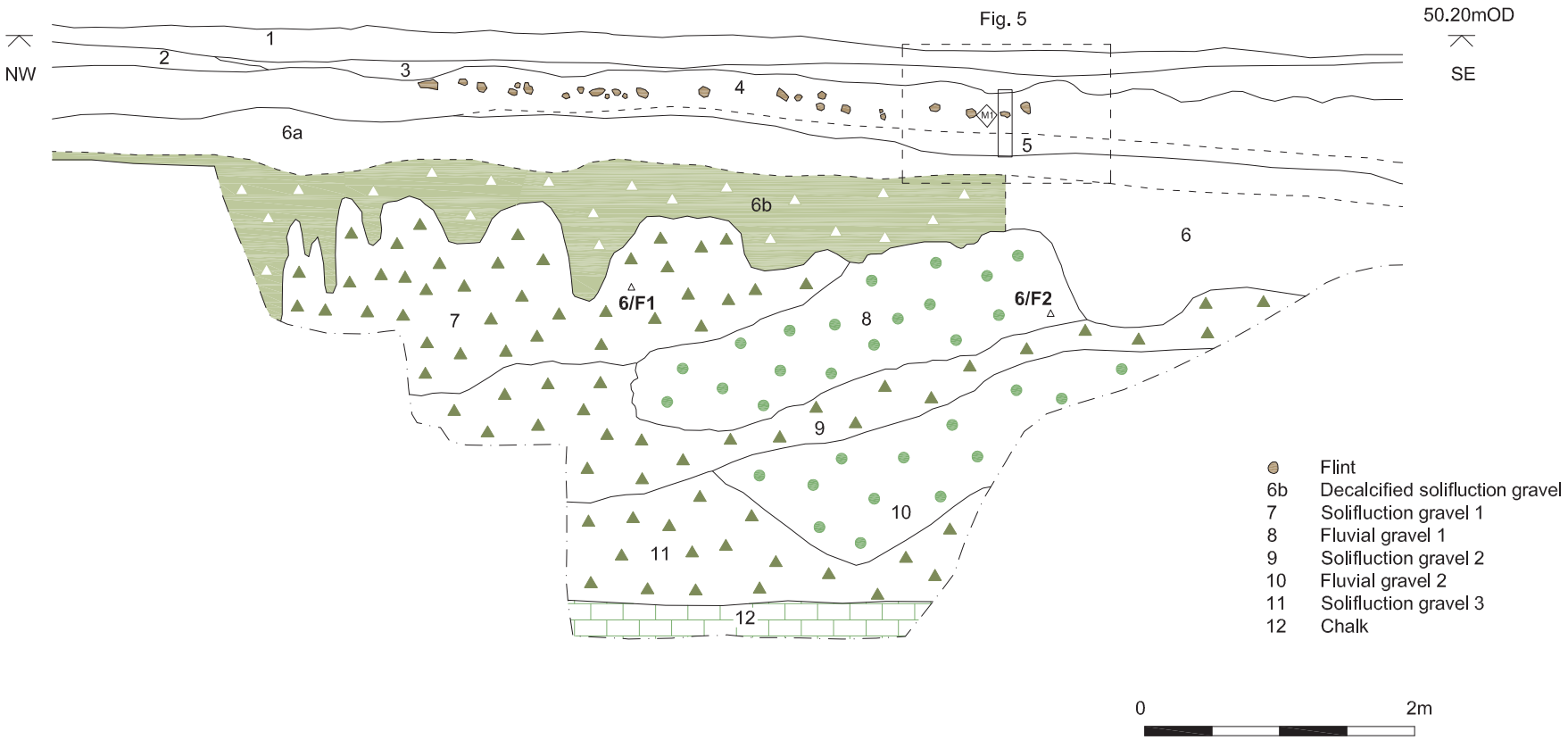
Sample	Depth	Context	4mm	2mm	>0.5mm	<0.5mm
mono 1 / 1	34-44cm	4a	2.5	1.3	0.7	95.5
mono 1 / 2	49-54cm	4c	2.7	1.3	1.0	95.0
mono 1 / 3	74-79cm	5	2.8	0.8	0.8	05.6

Table A2. Percentage residue fractions

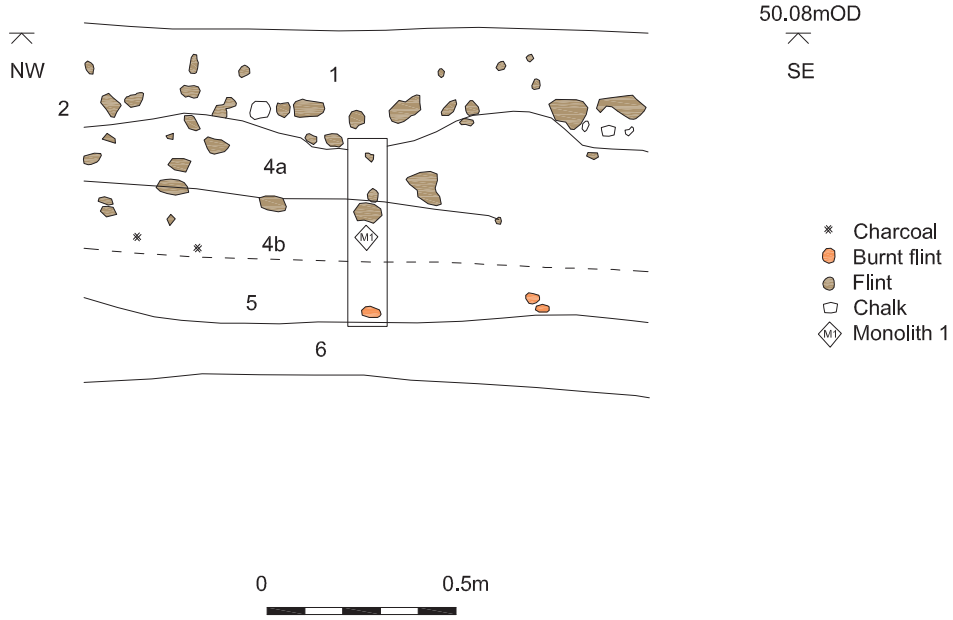
© **Archaeology South-East**		The Keep, Woollards Field, Falmer	Fig. 1
Project Ref: 3352	Sept 2008	Site Location	
Report Ref: 2008076	Drawn by: FEG		



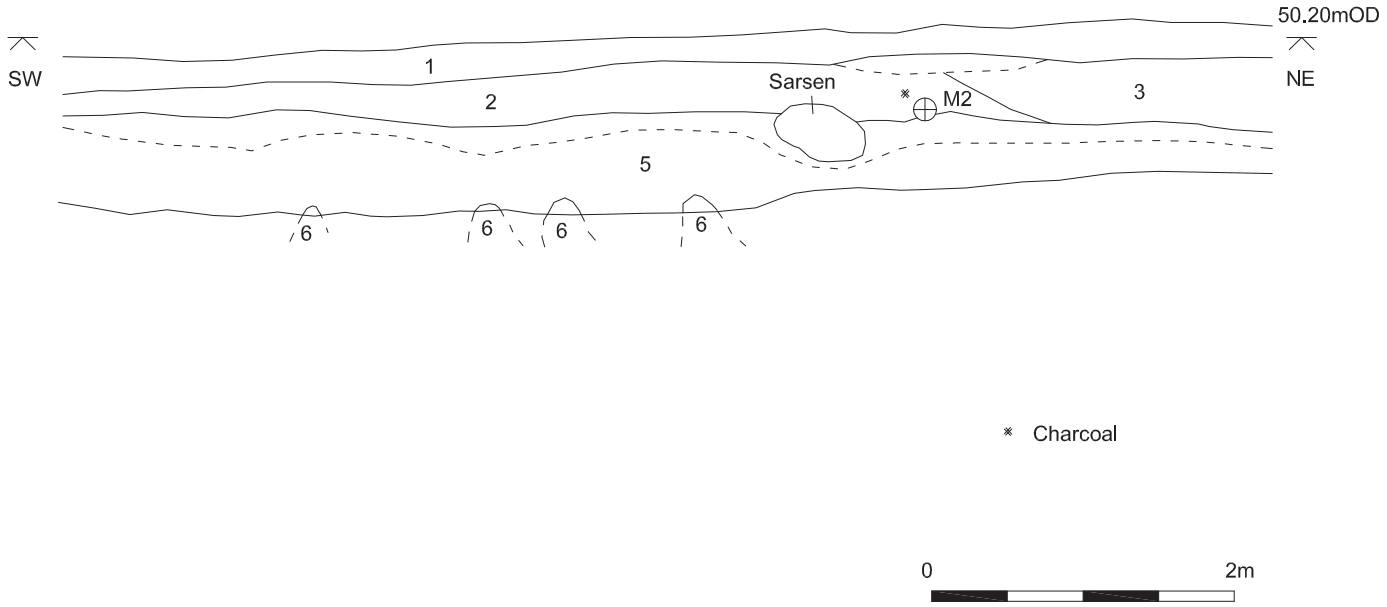
© Archaeology South-East		The Keep, Woollards Field, Falmer	Fig. 2
Project Ref: 3352	July 2008	Trench Location Plan	
Report Ref: 2008076	Drawn by: LD		



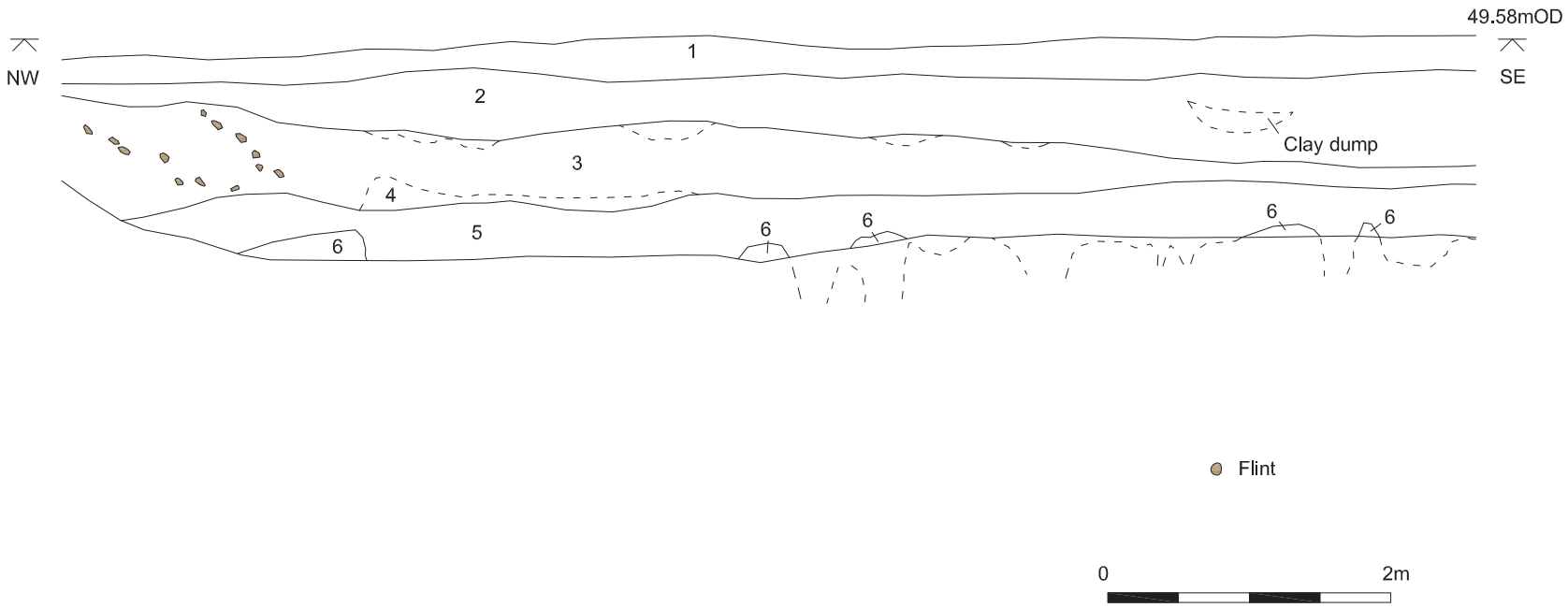
© Archaeology South-East		The Keep, Woollards Field, Falmer	Fig. 3
Project Ref: 3352	Sept 2008	South-west facing section Trench 6	
Report Ref: 2008076	Drawn by: HF		



© Archaeology South-East		The Keep, Woollards Field, Falmer	Fig. 4
Project Ref: 3352	July 2008	South-west facing section of Trench 6 (close up of colluvium)	
Report Ref: 2008076	Drawn by: HF		



© Archaeology South-East		The Keep, Woollards Field, Falmer	Fig. 5
Project Ref: 3352	July 2008	South-east facing section of Trench 6	
Report Ref: 2008076	Drawn by: HF		



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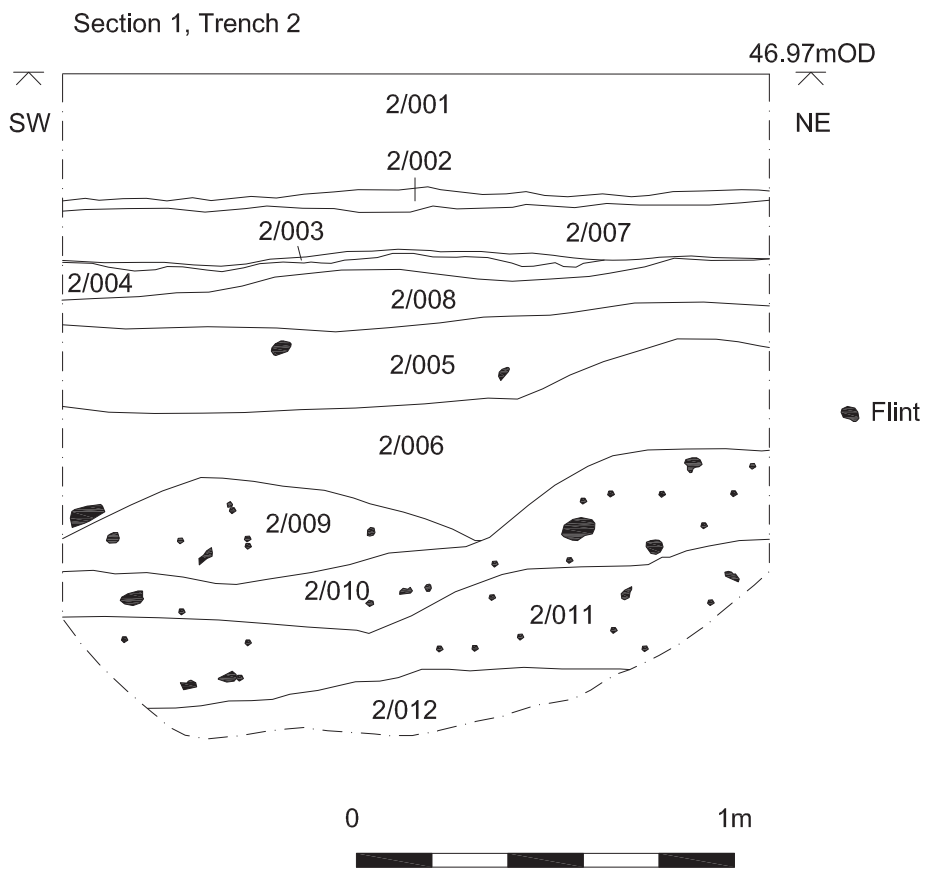
Project Ref: 3352	July 2008	South-west facing section of Trench 7	
Report Ref: 2008076	Drawn by: HF		

Fig. 7: Photo highlighting potential mechanical excavator tracks within trench 2

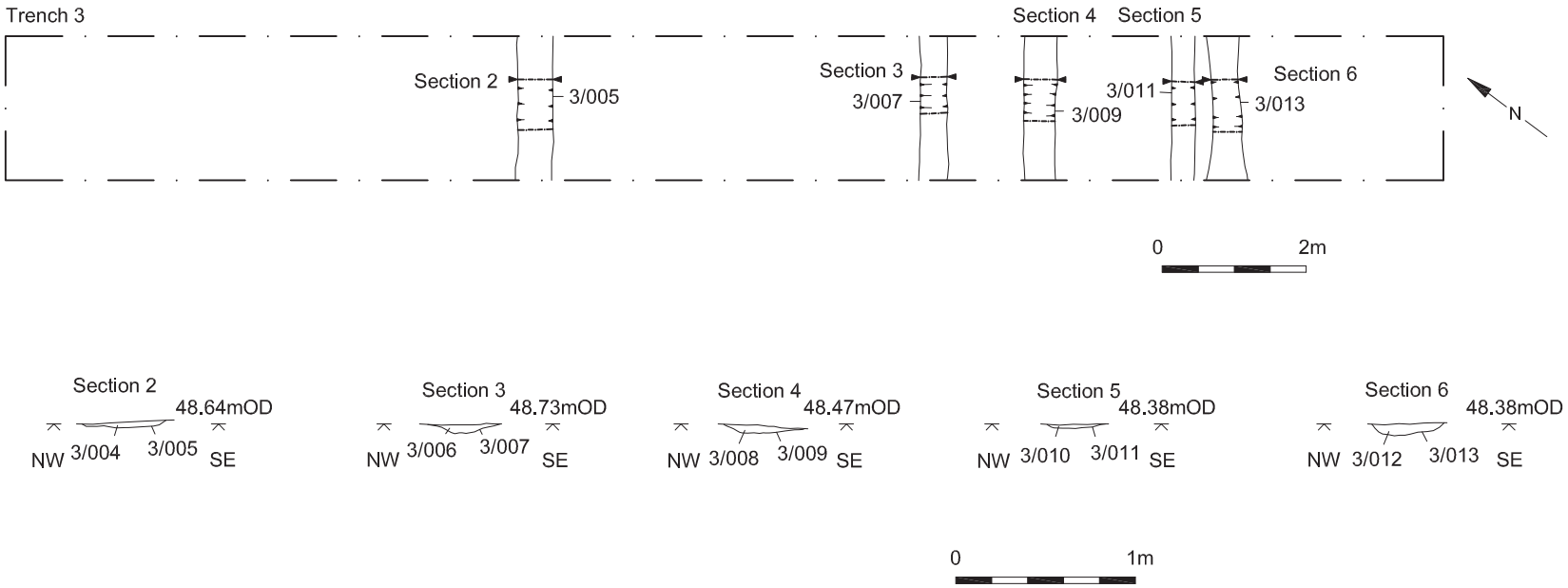
Fig. 8: Post-ex photo of Trench 1, facing south-west

Fig. 9: Post-ex photo of Trench 2, facing south-west



© Archaeology South-East		The Keep, Woollards Field, Falmer	Fig. 10
Project Ref: 3352	Sept 2008	South-east Facing section of Trench 2	
Report Ref: 2008076	Drawn by: HF		

Fig. 11: Post-ex photo of [3005], Trench 3, facing north-east



© Archaeology South-East		The Keep, Woollards Field, Falmer	Fig. 12
Project Ref: 3352	Sept 2008	Post- ex plan and sections Trench 3	
Report Ref: 2008076	Drawn by: HF		