


# Land Adjacent to Oldbury Power Station Shepperdine South Gloucestershire



## Archaeological Evaluation Report

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# Land Adjacent to Oldbury Power Station, Shepperdine, South Gloucestershire

## *ARCHAEOLOGICAL EVALUATION REPORT*

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## SUMMARY

*In June 2009 E.ON UK commissioned Oxford Archaeology South to assess and mitigate the impacts of geotechnical investigations on the archaeological resource at land north of Oldbury Power Station in Gloucestershire. The investigation was multi-disciplined and included documentary research, earthwork survey, watching brief and trial pit excavation.*

*The documentary research outlines clearly that Oldbury Power Station and the land adjacent to this lie within an area of known significant archaeological activity dating from the Mesolithic to Roman period. The historic landscape is also very well preserved with extant ridge and furrow remains present across most of the area. Associated field boundaries and historic farms reflect add to this representing a very coherent landscape effectively documenting the development of the area from the late medieval landscape into the post-medieval enclosed pasture farmland as present today.*

*The geotechnical investigations necessitated the construction of a temporary compound area that removed an area of earthworks. These were surveyed and recorded prior to removal. A watching brief undertaken upon the topsoil removal of the compound area established that potential archaeological horizons were not impacted upon by the construction of the compound.*

*The geotechnical seismic survey utilised a 50g explosive charge buried 2 m deep into the underlying sediments. Controlled archaeological excavation and sampling of two discharged survey locations established that this survey method has a very localised impact on the surrounding sediment that is unlikely to significantly affect archaeological remains. This creates a c 0.35 m crater and an additional 50 mm zone of liquefaction and 'compaction' around the crater.*





## 1 INTRODUCTION

### 1.1 Background

1.1.1 In June 2009 Oxford Archaeology South (OAS) was commissioned by E.ON UK to undertake a programme of primary archaeological works in response to investigative (seismic survey) and related developments (compound construction) on land adjacent to Oldbury Nuclear Power Station, South Gloucestershire. The investigative works were carried out under permitted development regulations. David Haigh (DH), the Manager of the Natural and Built Environment Team for South Gloucestershire Council, produced a Brief for a Programme of Archaeological Recording in response to the potential impact of these works. OAS produced a Written Scheme of Investigation (WSI) to detail how they would implement and complete the archaeological evaluation in accordance with the Brief and agreed this with DH prior to undertaking the fieldwork.

### 1.2 Project Scope

1.2.1 The scope of work covered by this report comprises all elements of archaeological investigation required to fulfil the Brief.

1.2.2 The Brief outlined four separate parts to the archaeological investigation. These are;

- a documentary assessment (Desk-based Assessment or DBA);
- an earthwork survey within the boundary of the compound area;
- an archaeological watching brief upon the compound area to be supplemented by archaeological excavation as appropriate;
- excavation of a borehole(s) following preliminary seismic testing.

1.2.3 The DBA study area comprised everything within 1km of the nomination boundary centred upon NGR ST 613 953 (Fig. 1). The earthwork survey and watching brief was limited to the boundaries of the 50 m by 50 m compound area centred upon NGR ST 611 950 (Fig. 2). The excavation of two borehole locations was within the area of seismic testing to the northeast of the compound (Fig. 2).

### 1.3 Location, Topography and Geology

1.3.1 The site lies within the Severn Levels on the eastern shoreline of the estuary and approximately 2.5 km northwest of Oldbury-on-Severn (Fig. 1). The full nomination boundary encloses approximately 150 ha including pond and lagoon areas northeast of the existing power station.

1.3.2 The area is generally flat although well preserved ridge and furrow cultivation earthworks are visible across many of the enclosed fields within the nomination area.

1.3.3 The temporary compound area is located to the immediate west of the chicken barns of Jobs Green Farm and north of a track/path that leads northwest to the estuary shoreline. The compound area is 50 m by 50 m and lies at approximately 6 m aOD.

1.3.4 The regional geology of the site is shown on the 1:50,000, British Geological Survey Sheet of Chepstow (250) as estuarine alluvium over Mercia Mudstone which, in turn, overlies the Old Red Sandstone. The geological map shows the estuarine alluvial materials as tidal flat deposits comprising predominantly clays and silts of Holocene Age. Borehole logs from the nearby power station site show the alluvium to have a minimum thickness 4m and comprising mottled brown and blue/grey slightly sandy clay.

#### 1.4 **Archaeological and Sedimentary Background**

##### *Archaeological background*

1.4.1 The site is located in an area of known significant archaeological activity, much of which dates to the early prehistoric and Roman periods. A detailed discussion of the archaeological background is presented within the results of the documentary research below (see Section 4). The main points are summarised below, updated with information from the recent geotechnical investigations.

1.4.2 Evidence of Mesolithic to Early Bronze Age activity has been recovered from a considerable distance along the inter-tidal zone at Oldbury-on-Severn (Allen 1998b). Excavations into the underlying sequence have identified five stratigraphic peat units, Unit 3 being radiocarbon dated to 5310 + 70 BP (4325 to 3984 cal. BC). This appears to represent a surface, which was trampled by animals, including cattle, deer and possibly humans. Brown (2005, 237) suggests that these are the earliest dated footprints within the Severn Estuary. Flint cores and blades were also recovered from this unit. More detailed discussion of the environmental sequence of peat units can be found in Druce (2001).

1.4.3 Brown (2005, 222) recovered further lithic material at Oldbury, alongside evidence for burning of reedswamp during the Mesolithic period. Between 4000 and 3100 cal. BC the wetland continued to be exploited until peat formation ceased and these wetland surfaces started to become inundated by the rising sea-level.

1.4.4 Three Neolithic axes were also found in this area by Allen in 1988-9 (Allen 1990a), two of which (one of Group VIII and one of Group XXI) were recovered from Oldbury Flats and found within metres of each other in bedrock debris. The other axe (of Group I) was found at Hills Flats in an area at the mouth of Hill Pill from which worked flints including barbed and tanged arrowheads, scrapers, knives and cores have also been recovered (Allen 1997c).

1.4.5 Evidence for occupation in the area comes from the unpublished excavations and monitoring of the Silt lagoon at Oldbury Power Station undertaken by Avon County Council. Unfortunately these excavations were undertaken in adverse conditions and many features were not fully explored (Brown 2005, 238) although they appeared to represent a phase of intense and long-lived activity at the edge of palaeochannel (Hume 1992). The work produced flint and a structural timber dated to 3400 + 45 BP (1748-1675 cal. BC) from a depth of *c* 1.8m. The prehistoric deposits were located at

the base of the archaeological sequence on a clean fluvial sandbank or island and were overlain by in excess of 1m of archaeologically sterile alluvium the surface of which contained the structures and deposits of Roman date.

- 1.4.6 Within the intertidal zone at Oldbury, Allen and Fulford (1987) recovered 2nd to 4th century pottery, along with iron slag, a piece of flue tile and animal bone, from around the southern tip of the reservoir. Similar pottery, animal bone and a bow brooch were also recovered during earth moving operations at The Windbound Inn, Shepperdine.
- 1.4.7 At Oldbury Pill, iron slag, Romano-British pottery and burnt iron ore were recovered from an area to the south west of the Yacht Club. A stone shaft was also recovered from the edge of the saltmarsh at Oldbury and has been interpreted as being of Roman date and part of a high-status building, matching the finds of flue tile and *tegula* from this area (Allen and Rippon 1997). Allen and Fulford (1993) argue that these scatters of occupation debris, coupled with stratigraphic analysis, imply that reclamation may have taken place here in the Roman period.
- 1.4.8 Pottery recovered from an area of ridge and furrow at Home Farm, Oldbury-on-Severn also included Romano-British and medieval material (Allen 1997c). The Romano-British pottery mainly dated from the mid 3rd to mid 4th centuries. Pottery, iron making materials and fire cracked stone were recovered from Dayhouse Farm, Hill. The pottery included Romano-British material of 3rd to 4th century date. Waste materials from iron making were also present here. At Nupdown Farm, Hill, 11<sup>th</sup> to 13th century pottery was recovered and similar dated material was found at Home Farm, Oldbury-on-Severn.
- 1.4.9 Allen (2005) also identified eight fish traps visible on aerial photographs near Oldbury and suggested that a group of features at Horse Pool may be of a kind unique to the Severn. Recent work in the area between Oldbury and Aust has uncovered a new Roman settlement site and part of a minor Roman road close to the foreshore at Cowhill and further evidence of the Roman settlement at Aust first identified by Solley (1966), also close to the estuary foreshore.

### ***Sedimentary setting***

- 1.4.10 The present day topography of the area has undergone significant modification and bears little resemblance to the landscape of the prehistoric past. Evidence of early prehistoric surfaces and sites can be deeply buried underneath later accumulations of alluvium and made-ground.
- 1.4.11 The Holocene sediments consist of complex sequences of estuarine alluvium, organic clay and peat deposits that accumulated in a variety of environments representing, variously, alder carr, fen, reedswamp, intertidal saltmarsh and mudflats. The currently adopted stratigraphic sequence for the Severn is based on work undertaken by Allen (1987; 1990a) and Allen and Rae (1987). The deposits are macrotidal and well mixed sediments, receiving fine sediment from many sources. At least four

discrete lithostratigraphic formations, predominantly of sandy to silty clay, have been identified along the shores of the estuary in the intertidal zone, to depths up to 20 m.

1.4.12 The sediment sequence identified within the area of the Site is termed the Wentlooge Formation and has been broadly divided into three main lithological units. The Lower Wentlooge Formation consists of estuarine and marine sands that would have been deposited during the early Holocene. The Middle Formation is characterised by silty clay alluvium and peat that reflect periods of changing sea-level and river flooding. The Upper Formation consists of pale green estuarine silty clays that began to accumulate 2500-3000 years ago and ceased to form in the Roman and post-Roman period.

1.4.13 Reclamation during the Roman period is thought to have isolated the Wentlooge Surface in large areas of tidal wetland in the lower estuary. The soil that developed on this surface is recognised as the Wentlooge palaeosol in those places where post-Roman breaching of the sea defences led to a resumption of tidal sedimentation, thereby sealing and protecting this surface. The overlying thick, largely pink sandy to silty clays, termed the Rumney Formation, began to form at times ranging from the early medieval to the early modern periods. The present landscape developed following the later reclamation of the Levels that began in the medieval period.

## 2 AIMS OF THE INVESTIGATION

### 2.1 General

2.1.1 The Brief specified that it was the purpose of this programme of archaeological investigation to ensure the preservation by record of any surviving archaeological remains revealed within the compound area and to assess the impact of the seismic survey upon the underlying sediments within the nomination area. The following sections detail specific aims to each element of the investigation as outlined within the WSI.

### 2.2 Desk-Based Assessment

2.2.1 It was the aim of the documentary research to;

- compile a brief outline history of the development and land use within the study area,
- locate any previously unrecorded archaeological features, and attempt to identify areas and deposits of greater archaeological potential within the development and study area,
- elucidate all archaeological and historic landscape features and buildings within the study area,
- elucidate all archaeological and bio-archaeological features and deposits, historic landscape features and buildings within the study area.

## 2.3 Earthwork Survey

2.3.1 It was the aim of the earthwork survey to;

- preserve by record the detailed profile of the earthworks,
- relate these to any surrounding historical structures and/or landscape features and earthworks,
- inform the following phase of watching brief recording during the construction of the compound.

## 2.4 Watching Brief and Trial Pit Excavation

2.4.1 It was the aim of the watching brief to;

- identify all archaeological remains revealed during the course of ground disturbance within the affected area,
- determine the existence or absence of archaeological remains and, should archaeological remains be present, to assess their general nature and significance,
- ensure the preservation by record of all archaeological remains revealed during the course of this ground disturbance,
- determine or confirm the approximate date or date range of the remains, by means of artefactual or other evidence,
- determine the condition and state of preservation of the remains,
- assess the associations and implications of any remains encountered with reference to the historic landscape,
- prepare an appropriate archaeological archive of the site including the treatment and preservation of any finds, and their publication,

## 2.5 Trial Pit Excavation

2.5.1 It was the aim of the trial pit excavation to;

- determine the impact that the seismic survey technique has upon the surrounding sediments and stratigraphy,
- identify signs of compaction or distortion within the sediment stack,
- record and interpret the sediment sequence.

## 3 REPORT PRESENTATION

### 3.1 Layout

3.1.1 The three main elements of this investigation (documentary research, the compound area survey and watching brief and the seismic survey trial pit excavation) are presented separately in the following sections. Each section includes an outline of the relevant methodology utilised followed by the presentation of the results and conclusions where appropriate.

## 4 DOCUMENTARY RESEARCH

### 4.1 Consulted Sources

4.1.1 The South Gloucestershire Historic Environment Record (SGHER; held by South Gloucestershire Council) and the National Monuments Record (NMR, held by English Heritage) are the primary repositories of archaeological data for the Sites. They were contacted and supplied printouts of known archaeological sites and events within the Site and for the surrounding 1km Study Area.

4.1.2 Aerial photographs (AP) held in the NMR were examined for this assessment. The NMR AP collection comprises 199 vertical APs taken between 1945 and 1992, and 4 oblique APs taken in 1969 and 2008. The principal features noted were the extensive earthworks of former ridge and furrow cultivation. No significant other archaeological features were observed within the Site on any AP examined for this assessment.

4.1.3 In addition information was obtained from the following sources:

- Gloucestershire County Record Office - historic maps, including Ordnance Survey (OS), estate maps and tithe maps, and secondary sources;
- Sackler, Bodleian and Oxford Archaeology libraries in Oxford - historic OS maps and published sources;
- A walkover survey of the Site undertaken on the 6th July 2009.

4.1.4 A full list of sources consulted is given in Appendix 1.

4.1.5 Appendix 2 is a gazetteer of archaeological sites and finds within the Study Area. Each entry has been allocated an OA number, added to the gazetteer (Appendix 2), referred to in the text and marked on Figure 3.

### 4.2 Results by Period

#### *Prehistoric period (500,000 BP – 43 AD)*

4.2.1 No archaeological sites or finds dating from the prehistoric period have been found within the nomination area.

4.2.2 Neolithic and Bronze Age material has been recovered from the area to the south. Flint implements were found on the site of Oldbury Power Station and the silt lagoon on its southern side, c 500m from the area of proposed development. Some of the artefacts were stray finds and others came from an archaeological investigation in 1992 (OA 4).

4.2.3 During the excavations the level of prehistoric material uncovered suggested Neolithic - Bronze age settlement on the margins of the Severn Estuary, with many of the finds located on the edges of a palaeochannel (Allen 1998). Similar

palaeochannels may survive within the Site. Settlement or intense activity appears to have been interrupted by periods of marine inundation late in the third millennium BC (GCC 2008, 6.6.10).

- 4.2.4 There is no evidence for continuity of settlement, but by the later Iron Age activity was again taking place along the margins of the estuary (Allen and Rippon 1997).
- 4.2.5 The Site has therefore an uncertain but probably moderate to high potential to contain significant prehistoric deposits, including flooded, anaerobic deposits possibly associated with one or more palaeochannels.

#### ***Roman period (43 AD – 410 AD)***

- 4.2.6 No archaeological sites or finds dating from the Roman period have been found within the nomination area, although there was apparently pottery, animal bone and a brooch recovered during earth-moving at the Windbound Inn (**OA 45**), adjacent to the northern corner of the site (GCC 2008). What are described as ‘large amounts’ of Roman finds were recorded to the north-east of the Site (**OA 1**), during engineering works on the sea-wall in 1983 but no further details are known.
- 4.2.7 Finds of Roman material had also been found in the area of the power station and silt lagoon (**OA 4**). An excavation in 1992 uncovered evidence for settlement from the 1st to 4th centuries AD including a metal-working site and an inhumation cemetery.
- 4.2.8 The Site therefore has a high potential to contain significant Roman deposits, possibly including evidence for settlement (also cemeteries), industrial activity and river-exploitation.

#### ***Early medieval period (AD 410 – 1066)***

- 4.2.9 There are no recorded sites or features that have been positively identified as of early medieval origin within the nomination area or the broader Study Area. As this landscape appears to have been reclaimed or at least stabilised in the Roman period, then it is likely to have been utilised as an agricultural or pastoral resource in the early medieval period, if not densely settled or more intensively used. Despite some confusion over the interpretation of the 1086 Domesday Survey (Moore 1987), the settlement of Oldbury on Severn appears to have an early medieval origin, as one of a series of holdings associated with Thornbury (Rudder 1779, 749).
- 4.2.10 The Site has an uncertain but probably low potential to contain significant deposits of early medieval origin.

#### ***Later medieval period (AD1066-1550)***

- 4.2.11 The recorded archaeological resource within the nomination area includes references to possible later medieval origins to the settlements at Manor Farm (**OA 16**), and to the probably later medieval origin of the ridge and furrow earthworks north of Jobsgreen Farm (**OA 20**). Worthy Farm (**OA 18**) is recorded as a farm in the late

15th century and was almost certainly in existence during the later medieval period. The possible fish-pond (**OA 42**) may be of later medieval origin.

4.2.12 The extensive earthworks of former ridge and furrow cultivation recorded within the nomination area (**OA 41**) and broader Study Area and seen on aerial photographs are very likely to have a later medieval origin, even if the last active use of this form of cultivation dates to the post-medieval period. Allen's analysis of the local landscape (1992, 90-91) suggests that the ridge and furrow earthworks can be divided into two forms: 'older' and 'younger' (Fig. 4); and that small areas of 'ancient' grassland can be distinguished in the extant landscape. Allen suggests that the former later medieval open fields (represented by the ridge and furrow earthworks) were gradually converted to pasture during the enclosure process, and that this process was complete by the 17th century (*ibid*, 87). The landscape of the nomination area and broader Study Area was probably dominated by open arable fields in the later medieval period, which were farmed from a series of dispersed, small settlements (*eg* **OA 2, 3, 15, 16, 18, 35**) then enclosed to form a primarily pastoral landscape late in the medieval period or early in the post-medieval period. The ditch noted as **OA 43** appears to be a key feature in the extant historic landscape and may have been in existence in the later medieval period.

4.2.13 There are six features or structures in the broader Study Area which have been recorded as of possible later medieval origin. These comprise:

- **OA 2** - Holt Farmhouse;
- **OA 3** - Chapel House;
- **OA 14** - Water-meadows south of the power station;
- **OA 15** - Knights Farm;
- **OA 35** - Shepperdine settlement;
- **OA 39** - Rabbit warren.

4.2.14 The Site therefore has potential to contain significant deposits of later medieval origin, especially in the environs of the Manor Farm (**OA 16**), and Jobsgreen Farm (**OA 20**) and Worthy Farm (**OA 18**) complexes.

#### ***Post-medieval period (AD1550+)***

4.2.15 As noted above, the landscape in which the nomination area is located appears to have been converted to a primarily pastoral landscape by the 17th century, and this is reflected in the recorded and extant archaeological and historic landscape resource. The complex at Worthy Farm and Jobsgreen Farm (**OA 18, 19, 42**) includes a number of farm buildings of post-medieval date, as do the buildings at Manor Farm (**OA 16**) and at Dairy Farm (**OA 23**). The latter is a good example of a late post-medieval dairy farm complex, the principal structures of which survive in a good, coherent condition. The Thornbury parish tithe map and the OS First Edition map of 1885 (Fig. 4) both depict the area as formed of an intricate pattern of medium and small-size fields defined by mature hedgerows, enclosing former furlongs, a small



proportion of which were kept as orchards and some of which include ponds. All of the ponds noted during the walkover survey are currently or recently used as stock-ponds.

- 4.2.16 Features **OA 21** and **OA 24** mark the location of small structures shown on the Ordnance Survey First Edition map of 1881. At the recorded location of **OA 21** is a short section of surviving stone walling and earthworks of uncertain form. Nothing was seen at the location of **OA 24** during the walkover survey. The boundary stones noted as **OA 26, 27, 28, 29** and **30** on the OS map of 1903 are no longer extant.
- 4.2.17 The recorded resource outside of the nomination area includes a high proportion of buildings or structures of post-medieval origin (*eg OA 2, 5* or **13**) or activities associated with these buildings (*eg OA 40, 45*). Unsurprisingly, the recorded resource for the river and river-banks is dominated by evidence for former exploitation (*eg Fish traps OA 8 to 12*).
- 4.2.18 The nomination area has been demonstrated to include significant structures and deposits of post-medieval origin, and has a high potential to include hitherto unknown archaeological deposits related to the primary use of the landscape as pastoral farmland since the 17th century. This includes an intricate network of historic landscape features including the extant ridge and furrow earthworks, the hedgerows within and bounding the nomination area, the drainage/ditch system, and the complexes of dispersed, small farms.

### 4.3 Concluding Summary

- 4.3.1 No archaeological sites or finds dating from the prehistoric, Roman or early medieval periods have been positively identified within the nomination boundary. However, the potential for these to exist has been established through the identification of similar sites within the immediate surroundings where it has previously been possible to investigate the archaeological horizons of preservation buried within the sediment sequence.
- 4.3.2 The settlements at Manor Farm and Worthy Farm are very likely to have later medieval origin, as do the ridge and furrow earthworks that extend over much of the area. A ditch aligned across the centre of the nomination area may have been in existence in the later medieval period. The farm complexes at Worthy Farm, Jobsgreen Farm, Dairy Farm and Manor Farm include a number of farm buildings of post-medieval date in various states of preservation.
- 4.3.3 It should be noted that in addition to the known and potential archaeological resource discussed above, the nomination area includes within its boundary significant elements of the historic built environment (both Listed and non-Listed) which form part of a historic landscape with a high degree of coherency and articulation, and a significant time-depth. The individual elements of the historic landscape within the nomination boundary include the fields and lanes defined by the hedgerows, the ridge and furrow earthworks, and the small, dispersed farming settlements.

## 5 EARTHWORK SURVEY AND WATCHING BRIEF (COMPOUND)

### 5.1 Methodology

#### *Earthwork survey*

- 5.1.1 The earthwork survey was targeted upon the specified 50 m by 50 m boundary of the compound area. In the event this was enlarged to 70 m by 80 m to allow for a buffer zone of potential disturbance that may occur during the construction and subsequent use period.
- 5.1.2 The survey was conducted using GPS equipment (Leica 1230 GPS). The survey was conducted by using corrections from a base station network via GPRS providing a real-time positional location of between 10mm + 1ppm and 50mm +2ppm and a post-processed accuracy of between 1mm +1ppm to 30mm +2ppm on the positional (XY) plane, and no more than double this on the height (Z) plane.
- 5.1.3 Following initial survey of the major breaks of slope the features were plotted as hachures to indicate slope extent and steepness, with detail of salient features added as appropriate. Profiles were taken across the ridge and furrow and heights were recorded at all points adding detail to the site record. All survey points were recorded relative to the National Grid, and levelled relative to Ordnance Datum.

#### *Watching brief*

- 5.1.4 Following the completion of the earthwork survey, the compound area was stripped of topsoil overburden using a mechanical excavator fitted with a toothless bucket to the specification of the groundwork contractors. All machine clearance was completed under the direct supervision of an experienced archaeologist. No tracking of machinery was authorised across the resultant surface until the attending archaeologist had established that, either archaeological deposits were not present, or that they were not impacted upon by the final level of the excavation. A geotextile membrane was laid over the resultant surface prior to the compaction of a aggregate surface to create the temporary compound.
- 5.1.5 A digital, written, drawn and photographic record was made of the fieldwork investigation (also applicable to the trial pit excavation section presented below) in accordance with the requirements of the Brief and to the standards of OA's Field Manual and the Institute of Field Archaeologist's *Standard and Guidance for Archaeological Watching Briefs* and *Standard and Guidance for Archaeological Excavations*.
- 5.1.6 The limits of the machine excavated areas and heights were recorded in relation to OS data. The stripped watching brief compound area was planned at a scale of 1:250 due to the absence of significant archaeological remains. Ridge and furrow profiles were drawn at a scale of 1:25 whilst the sections of the trial pit sediment sequences were recorded at a scale of 1:20.

- 5.1.7 A full black and white, colour (35 mm transparency) and digital photographic record illustrating both the archaeological findings of the project and the general undertakings and methods of the fieldwork was maintained.

***Finds and palaeoenvironmental samples***

- 5.1.8 No archaeological finds were encountered during the course of the fieldwork. No environmental samples were recovered during the course of the investigation.

**5.2 Results**

- 5.2.1 The earthwork survey detailed the presence of well preserved ridge and furrow cultivation (Fig. 5). These were aligned NE-SW and spaced between 9.5 m and 10.5 m from ridge to ridge evenly across the surveyed area. Limited post cultivation disturbance is evident at the modern gated entrance to the field likely to have resulted from vehicle access and animals gathering at the field entrance and causing localised erosion. An area of post cultivation disturbance was recorded 10 m to the north of the compound area beyond the limit of impact. This was a shallow bowl *c* 11 m across although it was too shallow to be a stock pond and it did not hold water.

- 5.2.2 The watching brief did not significantly add to the results of the survey. The construction design limited the removal of topsoil/overburden deposits to a maximum depth of 0.30 m across the compound area (Plate 1). However, this was not a uniform layer across the site and was largely limited to the removal of the topsoil and turf (1) and underlying buried ploughsoil (2) along the tops of the ridges to level the area with the base of the furrows. Localised patches of underlying alluvial clay (3) were revealed under the high points of the ridges with topsoil and scrapped turf remaining in the furrows. No archaeological deposits, features or finds were encountered during the removal of the topsoil and subsoil across the compound area.

## 6 TRIAL PIT EXCAVATION AND TESTING

### 6.1 Methodology

#### *Geotechnical seismic testing and trial pit excavation*

- 6.1.1 A series of seismic tests were staged using buried explosive charges to investigate the sediments and underlying geology (see IMC Geophysical Seismic Survey Report forthcoming for the layout of the test locations). The seismic survey was undertaken using 50g charges inserted into the ground at the bottom of a 50 mm diameter and 2 m deep spiral augerhole. These were then backfilled with 10 mm pea gravel before each explosive was discharged.
- 6.1.2 Subsequently, two trial pits (Fig. 2, Trial Pits 1 and 2) were excavated under archaeological conditions positioned upon two seismic survey boreholes and detonations (IMC Geophysics locations 237 and 243). The surface dimension of the trial pits were *c* 1.5 m by 3.5 m and up to 2.5 m deep to reveal the charge detonation impact crater (at 2 m below ground level). The trial pits were excavated in controlled spits using a mechanical excavator fitted with a toothless bucket under the direct supervision of an experienced archaeologist maintaining the auger hole to the side of the trench. The profiles of the auger holes and explosion craters were revealed by carefully hand excavating the sections until these became clearly visible. The trial pits were secured with shoring at a suitable depth prior to continuing machine excavation to the full depth. The shoring ensured that the profiles of the auger holes and charge detonations was accessible and visible for detailed inspection. The second trial pit was excavated due to the first section partially collapsing before adequate samples and records could be recovered.
- 6.1.3 The profile (section) of each trial pit was cleaned by hand to reveal in detail the sediment sequence and any impacts upon it. Detailed recording of the sediments was undertaken by a geoarchaeological specialist. A site meeting was arranged at this point to include the Manager of the Natural and Built Environment Team (the English Heritage Regional Scientific Advisor was invited but unable to attend).

#### *Recording*

- 6.1.4 The trial pits were photographed and recorded using standard sediment terminology according to Jones *et al* 1999. This included information on colour, composition, texture, structure, compaction, erosional contacts, artefactual and ecofactual inclusions. Recording of the sequence was undertaken according to English Heritage guidelines for geoarchaeology recording (EH 2004) and environmental sampling (EH 2002).

#### *Geoarchaeological samples*

- 6.1.5 Two monoliths samples were recovered vertically and horizontal from Trial Pit 2 at the edge of the blast crater to compliment the recording of the wider section and to

examine the more localised affects of the explosion. The monoliths were subsequently examined under laboratory conditions to identify the presence or absence of compaction or stress. The monoliths were cleaned, recorded and photographed in accordance with English Heritage guidelines for geoarchaeological sediment recording (2004). A pocket penetrometer was used to test the samples for signs of compaction or stress caused by the explosive. The penetrometer is designed to measure sediment resistance to an equally applied pressure. Measurements were take at 10 mm intervals from the edge of the blast crater up to 100 mm and then every 50 mm after that until 0.50 m. An error up to 1/2 division on the scale equivalent to 0.125 TSF is possible with the instrument used.

## 6.2 Results

### *Description of deposits*

6.2.1 The trial pits revealed a sequence of laterally equivalent deposits that appear to be consistent between trial pits (Fig. 6). No evidence of archaeological activity or finds were encountered. Two possible alluvial surfaces were identified at depths of 0.60 m (5.80 m aOD) and 1.22 m (5.18 m aOD) below ground level (BGL) (6.40 m aOD). The Roman archaeology identified previously at the power station was approximately 1m below the ground surface at elevations between 4-5 m aOD.

6.2.2 The trial pits were excavated to a depth of 2.50 m BGL on to soft light brownish yellow structureless silty clays, with no coarse inclusions (25 and 33). A second deposit of similar soft yellow silty clays (24 and 32) was identified at a depth of 1.90 m. The first potential alluvial surface was identified at 1.22m, where the upper alluvial surface exhibited signs of oxidation and weathering. This surface was overlain by a thin 0.10 m deposit of soft light bluish grey silty clay that included very thin and localised organic lenses (31 and 36). Deposits of light brownish yellow silty clay then continued to accumulate to 0.60 m in depth (23 and 30). The distinct upper surface of these deposits potentially forming the second buried surface. Again this deposit was sealed by approximately 0.10 m of soft light bluish grey silty clay deposits (22 and 29). A soft light yellowish brown alluvial subsoil (21 and 28) gradually developed over these deposits. This sequence of deposits was finally sealed by between 0.20 m and 0.30m of friable mid brown silty clay loam topsoil and turf with frequent modern rootlets (20 and 27).

### *Archaeological impact of the seismic testing*

6.2.3 The discharge of the explosive created a roughly circular blast crater with a diameter of 0.30-0.35 m (Fig. 6 and Plates 2 and 3). The crater was partly filled with the pea gravel backfill that had fallen into the cavity after the explosive had been discharged. The soft clay surrounding the explosive appeared to have been 'compressed' around the blast although no visible signs of sediment distortion or compaction were identified within the surrounding clay or wider trench sequence. The soft and cohesive qualities of the clay appears to have been effective at limiting and containing the impact of the blasts.

6.2.4 Detailed laboratory examination of the sediment samples taken immediately surrounding the blast confirmed that only limited signs of disturbance were present. The results of the penetrometer test indicated an area of greater resistance in both the vertical and horizontal stratigraphy (within the same sediment unit) at 50-70 mm from the edge of the blast crater (Figs. 7 and 8). A maximum reading of 1.5 kg/cm was recorded at 50 mm in Test Pit 2. This was preceded by some of the lowest resistance readings in the first 50 mm zone surrounding the blast crater, indicating damage to the clay structure where this had been 'compressed' around the blast zone. Contrary as to what might be expected by this displacement, the 'compression' of the clay in this zone appears to have destroyed the structure of the clay making it softer and less resistant to penetration. This is most likely to have occurred through the liquefaction of the sediment caused by the pressure of the explosion. The peak from 50 mm to 70 mm seems most likely to represent the compression of the clay beyond the zone of liquefaction where the clay retained its cohesive structure but was compressed by the blast. Other variations within the samples occurred within the vertical section although these are associated with the different sedimentary boundaries.

### 6.3 Conclusions

#### *Potential impact*

6.3.1 The propagation of seismic waves through sediments at a very low strain level (less than 10<sup>-3</sup> percent) is very unlikely to have any significant affect upon the buried stratigraphy or buried structures. The waves will dissipate with distance and depth from the source, and the level of strain placed on a rigid structure buried at depth is not likely to be significant. The water and clay mineral content of the deposits will also determine how the seismic wave travels through the sediments. Archaeological features and deposits are unlikely to be affected by the seismic testing unless they are located within the impact area of the explosive blast and resultant crater. The excavation demonstrates that the impacts of the seismic testing are likely to be very localised to within a maximum of 0.15-0.25 m radius of the blast.

## 7 OVERALL CONCLUSIONS

### 7.1 Concluding Remarks

7.1.1 The combined survey has established a baseline of data for the historic and prehistoric background both within the nomination boundary and the immediate surroundings. Whilst this clearly identifies significant potential for the site to contain remains from several periods, the knowledge and ability to effectively measure the extent and presence of these remains in a non intrusive manner is limited by the preserved pasture landscape currently in existence. The lack of ploughed fields has negated the most common form of ground disturbance removing much of the potential for occasional find spots that would otherwise help identify sites. The combined effect of the pasture, ridge and furrow and underlying sediments is also not conducive to the display of crop marks unless under exceptional and localised circumstances. However, these factors, combined with the historic (Listed and non Listed) buildings within the nomination boundary and surrounding landscape also serve to demonstrate that a more recent historic landscape with all its component parts is very well preserved. This is a quantifiable element with the majority of the relevant remains visible in the current landscape. The majority of the data to define this can either be gleaned from historical maps and supplemented by additional survey. However, the documentary research has also identified the likely existence of associated late medieval remains that form a significant part early in the establishment of this landscape and focused upon the location of succeeding farm structures within the current landscape.

7.1.2 The limited investigation of the sediment sequence at this stage also served to apparently confirm the potential for earlier remains to be present based upon the evidence of surrounding investigations. Possible land surfaces were identified that have previously provided evidence for prehistoric and Roman settlement within the broader landscape. Detailed examination of the seismic survey impact suggests that the full survey will have an extremely localised effect on any buried remains dependent entirely upon if these are present within the blast zone and, to a lesser degree, within a maximum 0.1 m zone around the crater where the sediment structure is destroyed and compressed.

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## APPENDICES

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### APPENDIX 1 DOCUMENTARY RESEARCH BIBLIOGRAPHY AND CONSULTED SOURCES

#### *Published sources*

Allen, J R L, 1998 'A Prehistoric (Neolithic-Bronze Age) Complex on the Severn Estuary Levels, Oldbury-on-Severn, South Gloucestershire', *Trans. Bristol and Gloucestershire Archaeological Society*, **116**, 95-155.

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Rudder, J S, 1779 (rp 1977) *A New History of Gloucestershire*

#### *Other sources*

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Enclosure Map and Award of the Parish of Thornbury 1836 (Gloucs Record Office ref. Q/RI/142)

Tithe Map and Apportionment of the Parish of Thornbury 1846 (Gloucs Record Office ref. P330 SD 2/1 and TRS 224/180 )

Ordnance Survey First Edition Map 6" to 1 mile, 1881 (Gloucs LV NW and SW)

Ordnance Survey Second Edition Map 6" to 1 mile, 1903 (Gloucs LV NW and SW)

Ordnance Survey 1923 Edition Map 6" to 1 mile (Gloucs LV NW and SW)

Ordnance Survey 1:10,560 Map of 1955 (ST 69 SW and NW)

Ordnance Survey 1:10,000 Map of 1976, SP 69 NW

Ordnance Survey 1:10,000 Map of 1977, SP 69 SW



**APPENDIX 2 GAZETTEER OF KNOWN ARCHAEOLOGY WITHIN THE STUDY AREA****Abbreviations used**

OA = Oxford Archaeology

SGHER = South Gloucestershire Historic Environment Record

NMR = National Monuments Record

WS = Walkover Survey

HS = Historic Sources

<i>OA Ref. No</i>	<i>Feature Type</i>	<i>Description</i>	<i>Source</i>
1	Artefact scatter	Large amounts of Roman material were found when the sea bank was renewed in 1983.	SGHER 4949; NMR 654872
2	Listed Building	Holt Farmhouse, Listed Grade II. Probably 16th century in date. Settlement may have originated in the medieval period.	SGHER 5556, 12390.
3	Locally Listed Building	Chapel House, Locally Listed. House dates from c 1660. Excavations in 2000 for a garage found 18th - 19th century foundations. A cistern was found below the house. A chapel existed before 1350.	SGHER 6627, 18011, 13949, 14110; NMR ST 69 NW 16, NMR Ev 1367207
4	Archaeological Excavation	Iron Age/Roman pottery and features from area of Silt Lagoons, excavated in 1992. Neolithic and Bronze Age flint was also found. Stray artefacts had been recovered in the past, prompting the investigation	SGHER 8021-31, 8332, 9695, 11103; NMR ST 69 SW 35, Ev 1049227
5	Locally Listed Building	Church of St Mary the Virgin, Locally Listed. Corrugated iron chapel, dating to late 19th or early 20th century.	SGHER 15508; NMR ST 69 NW 19
6	River Feature	Chapel House fishery, pre 1860s in date. Remains visible on aerial photographs. Some marks may represent a slipway.	SGHER 6724; NMR ST 69 NW 27
7	River Feature	Post-medieval fishery, visible on aerial photographs	NMR 1385148; 28 SGHER 18294
8	River Feature	A possible fish trap, of unknown date, is visible on aerial photographs. It is not clear from the photographs what the construction of the feature is but it appears to comprises piles of stones arranged in two arms, measuring 67m and 53m which form a "V".	NMR 1385149 and 1385151
9	River Feature	Fish Trap (OF5) Oldbury Flats Oldbury on Severn.	SGHER 18291
10	River Feature	Fish Trap (OF6) Oldbury Flats Oldbury on Severn.	SGHER 18292
11	River Feature	Lower Shon Fish Trap, Shepperdine Oldbury on Severn	SGHER 7058; NMR 1385160
12	River Feature	Fish Trap (OF4) Oldbury Flats Oldbury on Severn	SGHER 18290; NMR 1385234
13	Locally Listed Building	Oldbury nuclear power station, locally listed. Commissioned in 1967.	SGHER 9630

<i>OA Ref. No</i>	<i>Feature Type</i>	<i>Description</i>	<i>Source</i>
14	Map Feature	Former water-meadows near Power Station at Oldbury on Severn	SGHER 7457
15	Historic Settlement	Post-medieval settlement at Knights Farm, possibly of medieval origin	SGHER 14187
16	Historic Settlement	Post-medieval settlement at Manor Farm, possibly of medieval origin.	SGHER 14186
17	Map Feature	Location of barn shown on the 1st Edition OS map of 1885.	SGHER 16212
18	Historic Settlement	Worthy Farm. Settlement recorded in 1497. May have stood around a green. It appears to have formed, with Jobsgreen Farm, a large farming complex by the mid 19th century as shown on the Thornbury Parish tithe map of 1846 and the OS 1st Edition OS map of 1885. There are several extant ruinous buildings at this location. It is possible that the core of the farm was shifted to what is now known as Jobsgreen Farm in the 17th century. The possible pond to the south (OA 42) may have been a part of this extensive farm complex.	SGHER 9062, WS
19	Listed Building	Jobsgreen Farmhouse and attached barn, Listed Grade II. The house is 17th century in origin, the barn early 19th century. In a ruinous condition.	SGHER 13685, 12389, WS
20	Archaeological Site	Desk-based assessment and archaeological evaluation of premises at Jobsgreen Farm in 2000. Ridge and furrow earthworks noted.	SGHER 14105; NMR 1379519 and 1376261 WS
21	Map Feature	Location of barn shown on the 1st Edition OS map, extant 1903, removed in 20th century. Section of stone walling survives, c 1m high and c 8m long. Observed during walkover survey. Over-grown earthworks of uncertain form and origin also survive here.	SGHER 16211 WS, HS
22	Map Feature	Saltings, shown on the 2nd edition OS map of 1903.	SGHER 18756
23	Locally Listed Building	Dairy Farmhouse Shepperdine Road Shepperdine Oldbury on Severn	SGHER 12387
24	Map Feature	Small building shown on the Thornbury Parish tithe map of 1846, not shown on OS 1st Edition OS map of 1885. Nothing seen at this location during the walkover survey.	HS, WS
25	Map Feature	Small building shown on the Thornbury Parish tithe map of 1846, not shown on OS 1st Edition map of 1885. Nothing seen at this location during the walkover survey although a mature tree stands in approximately the location of the building	HS, WS
26	Map Feature	Location of boundary stone shown on the 2nd edition OS map of 1903. Nothing seen at this location during the walkover survey.	HS, WS
27	Map Feature	Location of a group of boundary stones shown on the 2nd edition OS map of 1903. Nothing seen at this location during the walkover survey.	HS, WS
28	Map Feature	Location of a group of boundary stones shown on the 2nd edition OS map of 1903. Nothing seen at this location during the walkover survey.	HS, WS
29	Map Feature	Location of boundary stone shown on the 2nd edition OS map of 1903. Nothing seen at this location during the walkover survey.	HS, WS
30	Map Feature	Location of boundary stone shown on the 2nd edition OS map of 1903	HS, WS

<i>OA Ref. No</i>	<i>Feature Type</i>	<i>Description</i>	<i>Source</i>
31	Listed Building	Shepperdine House and Cottage, Listed Grade II. Former farmhouse has cottage attached. The front is early 18th century, remodelling an earlier building.	SGHER 12388
32	Earthworks	Earthworks of former ditches suggesting a water course.	SGHER 6726
33	Map Feature	Location of barn shown on the 1st Edition OS map of 1885.	SGHER 16228
34	Listed Building	Shepperdine Farmhouse, Listed Grade II. Early 19th century remodelling of earlier building.	SGHER 12386
35	Historic Settlement	Shepperdine settlement, recorded in 1215. It now consists of two farms and houses along the road.	SGHER 9058
36	Listed Building	Corner Farmhouse, Listed Grade II. Early 19th century remodelling of earlier building.	SGHER 12385
37	Listed Building	Manor Farmhouse, Listed Grade II. 18th and early 19th century rebuilding of earlier house	SGHER 12384
38	Listed Building	Granary at Manor Farmhouse, Listed Grade II. Late 18th - early 19th century in date.	SGHER 12383
39	Earthworks	Rabbit warren. The chapel-house ( <b>OA 3</b> ) was sold with a rabbit warren in 1590 and again in 1646.	SGHER 3955
40	Archaeological Site	Archaeological watching-brief during works on land near Chapel House, Sheppardine.	NMR 1367207
41	Earthworks	Extensive remains of medieval and post-medieval ridge and furrow earthworks surviving in generally very good condition. Visible on AP and on the ground as a pattern of earthworks which contain subtle variations in form, orientation and survival. Some appear to have been most recently used as drainage features and have been enhanced by digging deeper furrows, whilst others appear to survive unchanged since their last cultivation.	NMR 1385212, 1385215, HS, WS
42	Earthworks	Angular earthworks possibly defining the northern and eastern edges of a former fishpond to the south of Jobsgreen Farm. Western edge may be overlain by access road from south. Possibly part of the extensive Worthy Farm/ Jobsgreen Farm complex.	WS, HS
43	Earthworks	Substantial ditch running west and north-west through the Site. Appears to be a key feature in the structure and drainage of the local historic landscape, with both the enclosure field system and the ridge and furrow earthworks respecting this feature.	WS, HS
44	Historic Settlement	The Windbound Public House, Shepperdine Road, Oldbury on Severn. Shown as a public house on the OS 1st Edition OS map of 1885. Currently used as a care home.	NMR 16189, 14185 WS
45	Archaeological Site	Finds recovered during earth-moving at the Windbound Inn comprised pottery, animal bone and a brooch of 2nd to 4th century date.	GCC 2008, 6.6.10



## APPENDIX 3 ARCHAEOLOGICAL CONTEXT INVENTORY

<i>Area / Ctxt No.</i>	<i>Type</i>	<i>Width (m)</i>	<i>Thick. (m)</i>	<i>Comment</i>
Compound				
1	Layer		0.30	Topsoil and turf
2	Layer		0.25	Subsoil
3	Layer			Alluvial clay
Trial Pit 1 (seismic location 237 )				
20	Layer		0.25	Topsoil and turf
21	Layer		0.35	Alluvial clay
22	Layer		0.15	Alluvial clay
23	Layer		0.50	Alluvial clay
24	Layer		0.75	Alluvial clay
25	Layer		0.60+	Alluvial clay
26	'Cut'	0.35 (diam.)		Blast zone/crater
36	Layer		0.12	Alluvial clay
37	Fill			Pea Gravel
Trial Pit 2 (seismic location 243)				
27	Layer		0.28	Topsoil and turf
28	Layer		0.30	Alluvial clay
29	Layer		0.14	Alluvial clay
30	Layer		0.55	Alluvial clay
31	Layer		0.14	Alluvial clay
32	Layer		0.62	Alluvial clay
33	Layer		0.70+	Alluvial clay
34	Fill			Pea Gravel
35	'Cut'	0.35 (diam.)		Blast zone/crater

**APPENDIX 4 BIBLIOGRAPHY AND REFERENCES**

**N.B: Repeating the relevant publications consulted as part of the documentary research and listed in Appendix 1**

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**APPENDIX 5 GLOSSARY OF ACRONYMS**

<b>aOD</b>	Above Ordnance Datum
<b>AP</b>	Aerial Photographs
<b>BGL</b>	Below Ground Level
<b>DBA</b>	Desk-Based Assessment (including documentary research)
<b>DH</b>	David Haigh (Manager of the Natural and Built Environment Team for South Gloucestershire Council)
<b>EH</b>	English Heritage
<b>GPS</b>	Global Positioning System
<b>HMS</b>	Heritage Management Service
<b>NMR</b>	National Monuments Record
<b>OA</b>	Oxford Archaeology
<b>OAS</b>	Oxford Archaeology South
<b>OS</b>	Ordnance Survey
<b>SGHER</b>	South Gloucestershire Historic Environment Record
<b>WSI</b>	Written Scheme of Investigation

## APPENDIX 6 SUMMARY OF SITE DETAILS

**Site name:** Land Adjacent to Oldbury Power Station, Shepperdine, South Gloucestershire

**Site code:** BRSMG:2009/34

**Grid reference:** The nomination area is centred upon ST 613 953. The compound area was centred upon ST 611 950. The trial pit excavations were located at ST 60968 95432 and ST 60964 65428.

**Type of archaeological investigation:** Documentary research, earthwork survey (limited to a 50 m by 50 m compound area), watching brief during the topsoil removal within the compound area, and trial pit excavation (two locations) of the discharged seismic survey 'craters'.

**Date and duration of project:** The earthwork survey was undertaken on 15th June 2009. The watching brief was undertaken on 22nd and 23rd June 2009 and the trial pits were excavated on 25th and 26th June 2009.

**Area of site:** The nomination area covers approximately 150 hectares. The compound was a 50 m by 50 m area within the nomination boundary.

### Summary of results:

In June 2009 E.ON UK commissioned Oxford Archaeology South to assess and mitigate the impacts of geotechnical investigations on the archaeological resource at land north of Oldbury Power Station in Gloucestershire. The investigation was multi-disciplined and included documentary research, earthwork survey, watching brief and trial pit excavation.

The documentary research outlines clearly that Oldbury Power Station and the land adjacent to this lie within an area of known significant archaeological activity dating from the Mesolithic to Roman period. The historic landscape is also very well preserved with extant ridge and furrow remains present across most of the area. Associated field boundaries and historic farms reflect add to this representing a very coherent landscape effectively documenting the development of the area from the late medieval landscape into the post-medieval enclosed pasture farmland as present today.

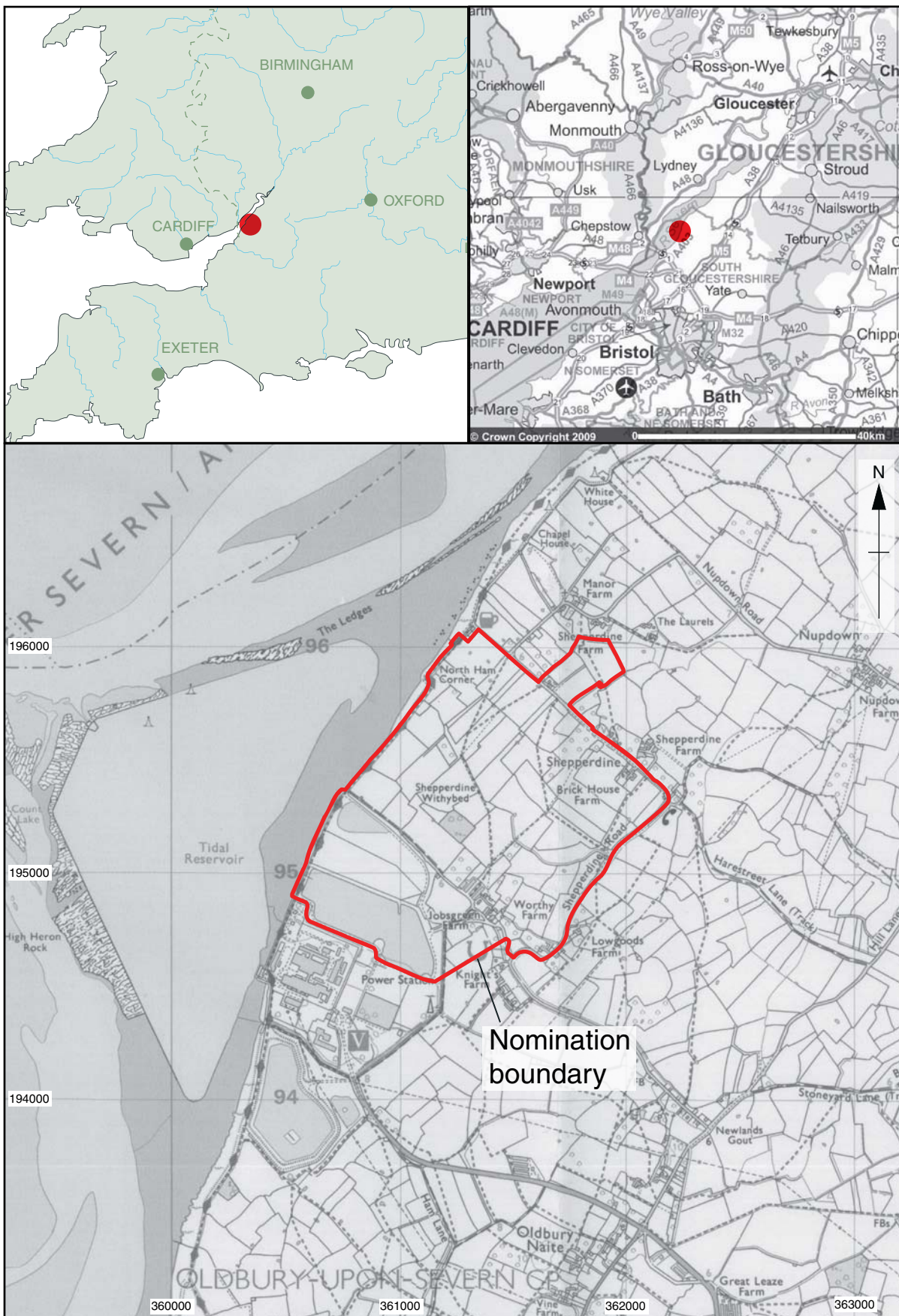
The geotechnical investigations necessitated the construction of a temporary compound area that removed an area of earthworks. These were surveyed and recorded prior to removal. A watching brief undertaken upon the topsoil removal of the compound area established that potential archaeological horizons were not impacted upon by the construction of the compound.

The geotechnical seismic survey utilised a 50g explosive charge buried 2 m deep into the underlying sediments. Controlled archaeological excavation and sampling of two discharged survey locations established that this survey method has a very localised impact on the surrounding sediment that is unlikely to significantly affect archaeological remains. This creates a c 0.35 m crater and an additional 50 mm zone of liquefaction and 'compaction' around the crater.

### Location of archive:

The archive is currently held at OAS, Janus House, Osney Mead, Oxford, OX2 0ES, and will be deposited with Bristol City Museum and Art Gallery in due course, under the accession number BRSMG: 2009/34.





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Figure 1: Site location



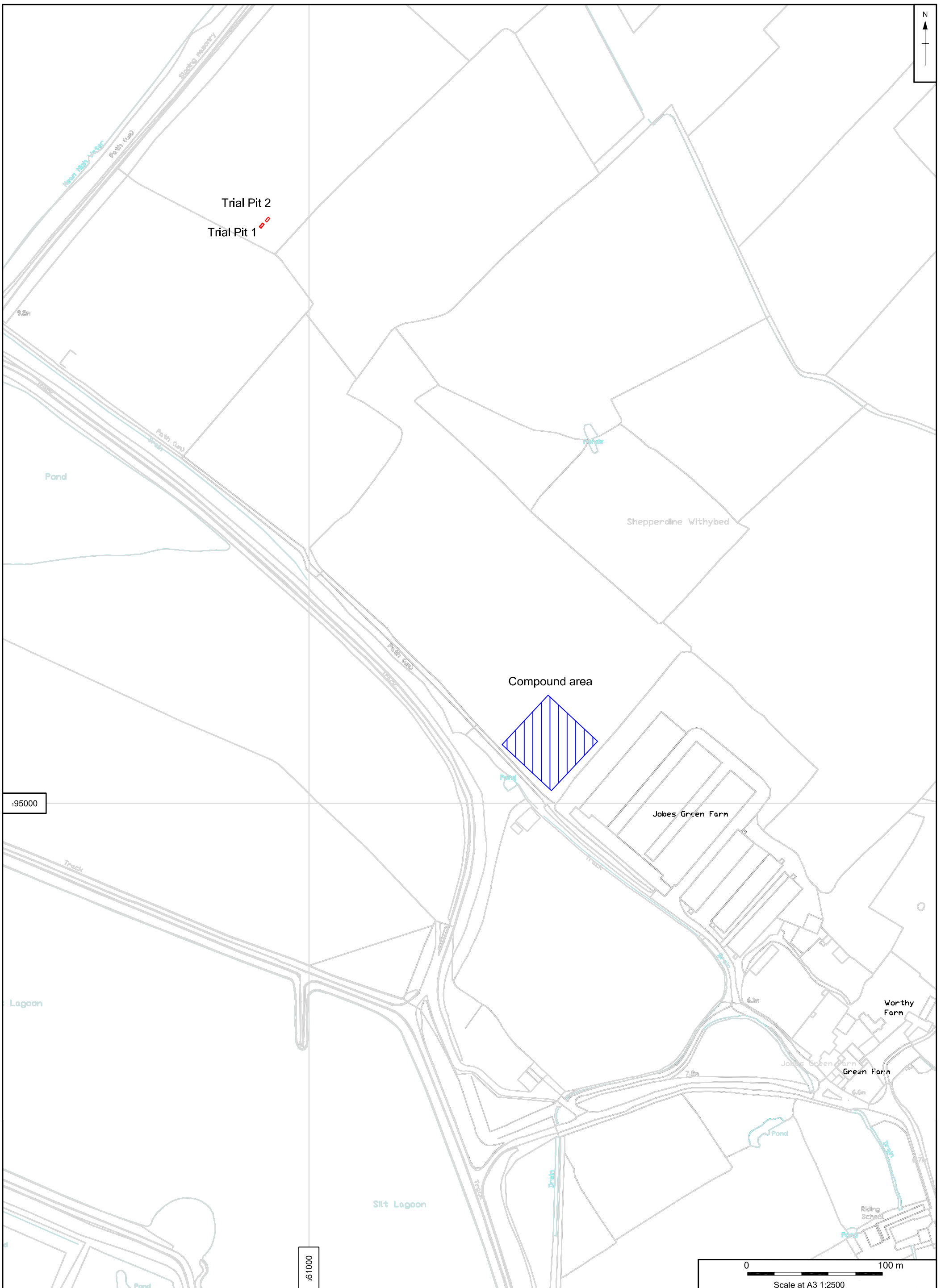


Figure 2: Watching brief and trial pit locations



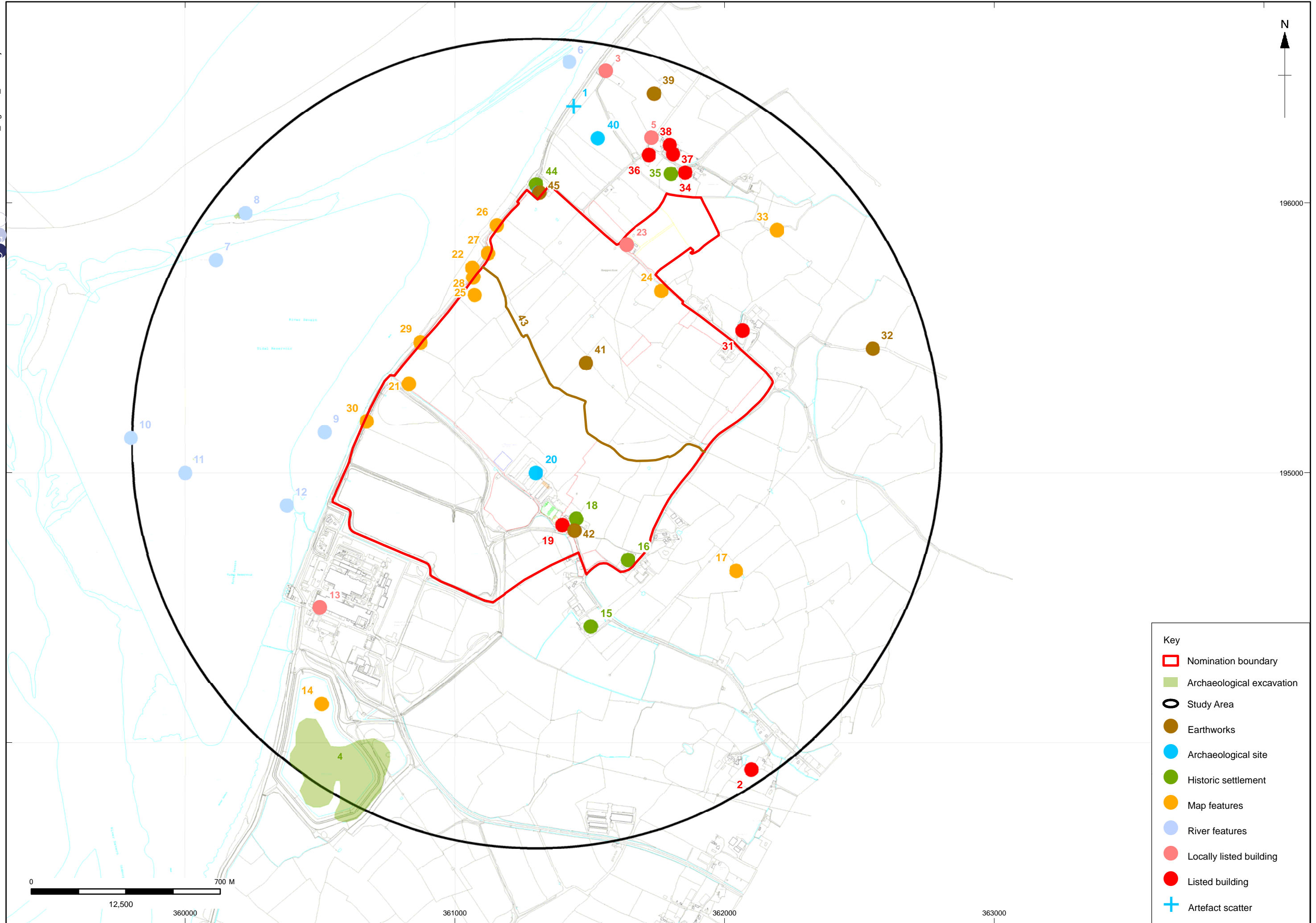


Figure 3: Documentary research feature mapping



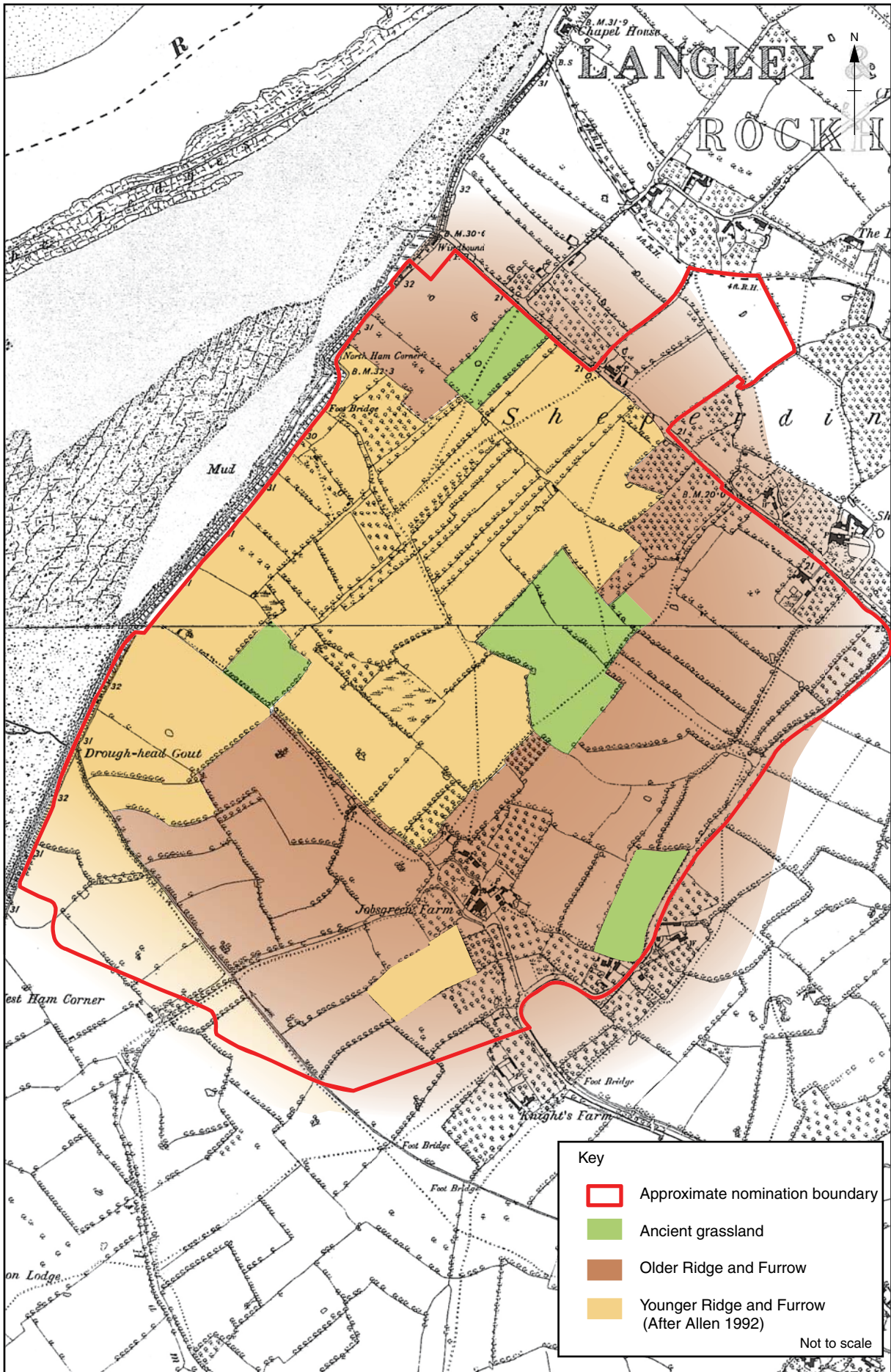


Figure 4: Ordnance Survey 1st Edition 6" map of 1885





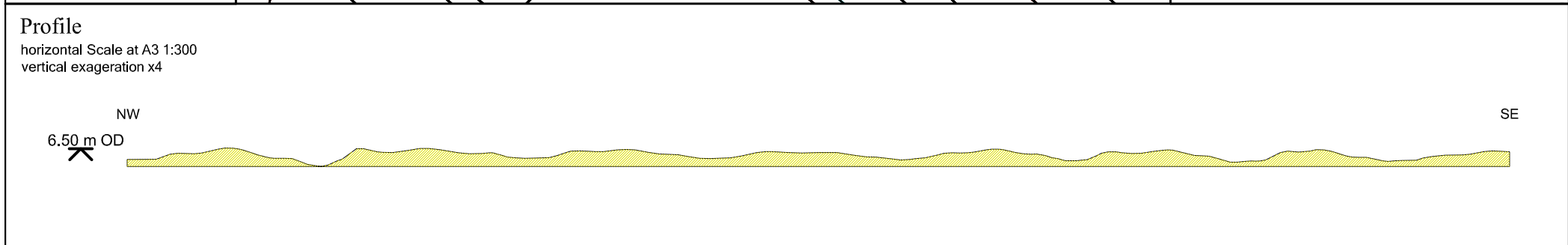
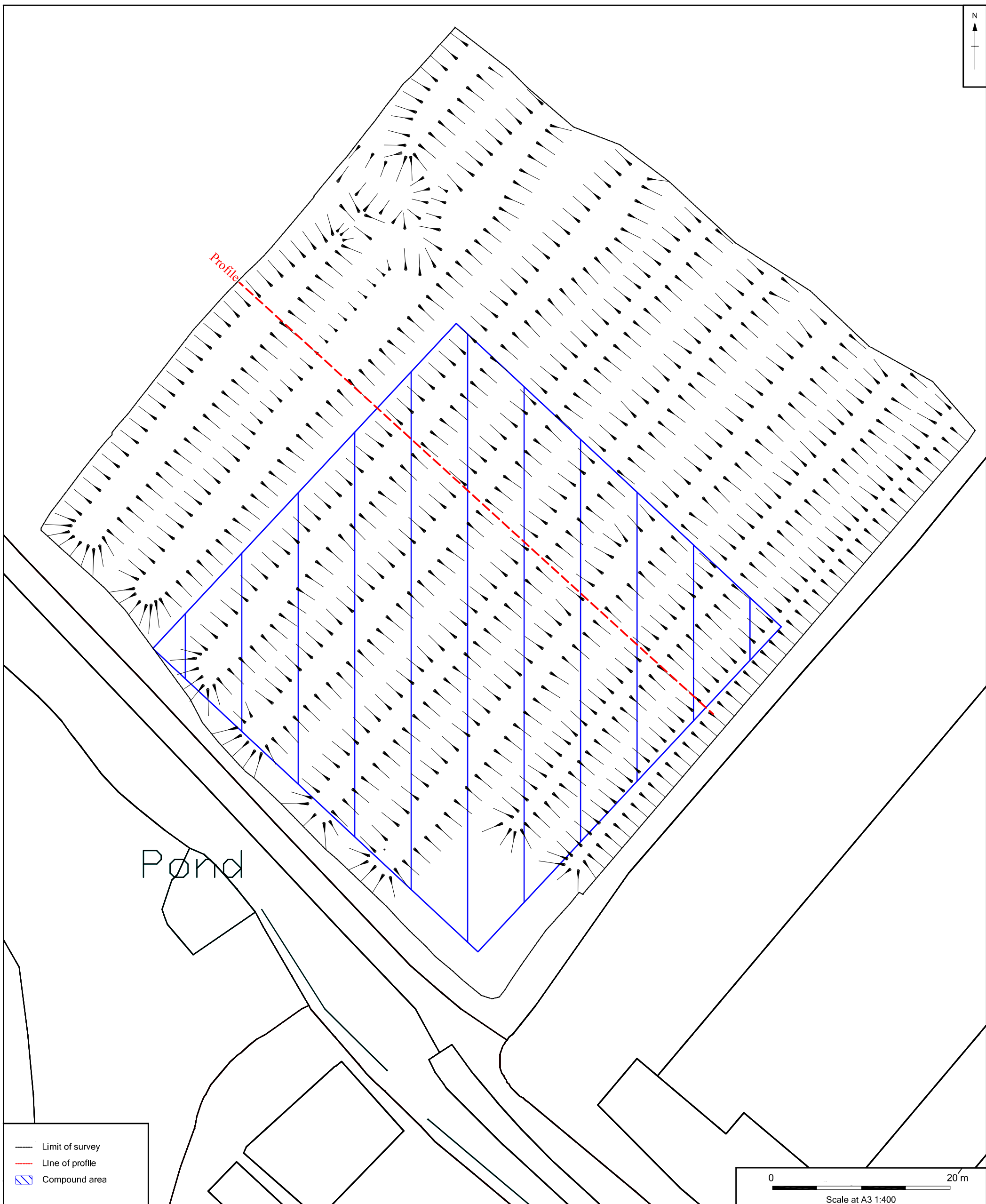


Figure 5: Earthwork ridge and furrow



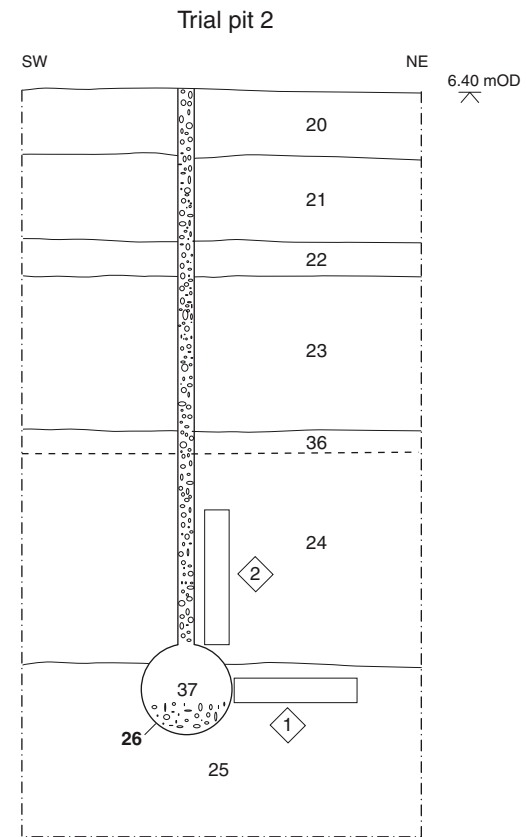
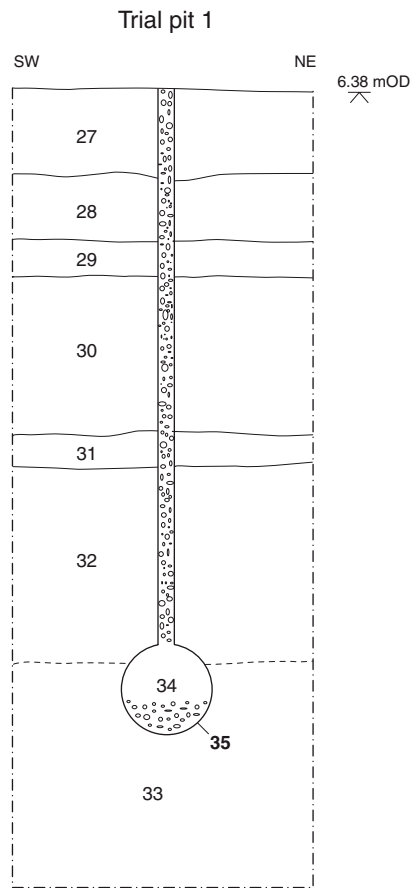


Figure 6: Trial pit sections



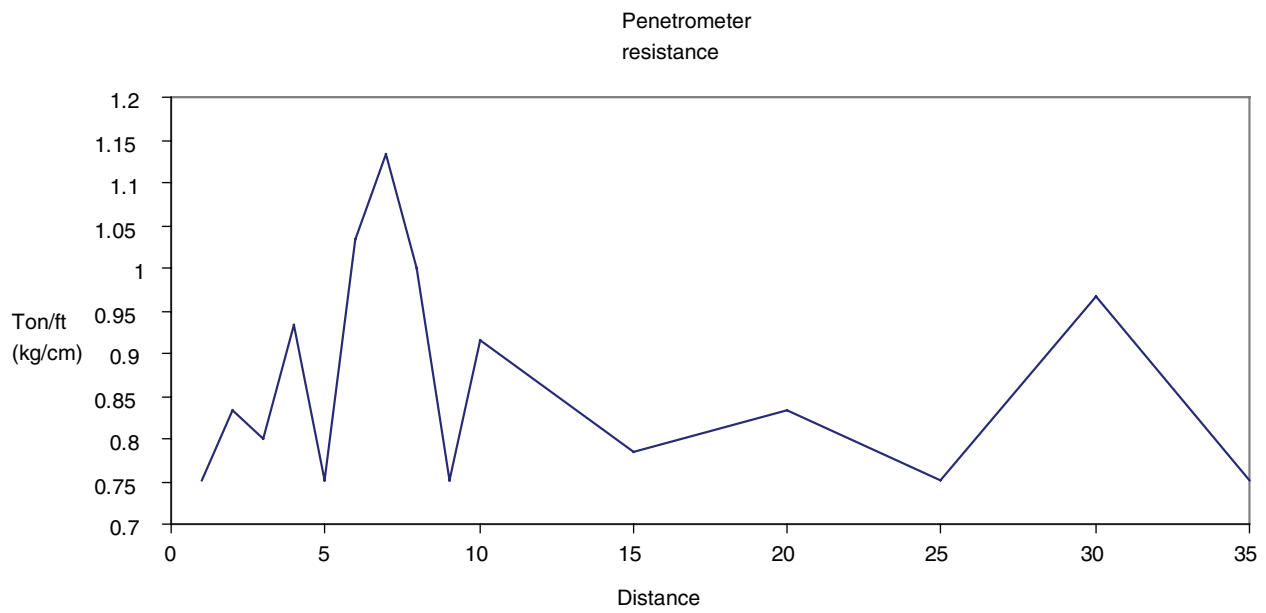


Figure 7: Measuring levels of horizontal compaction (monolith sample 1)



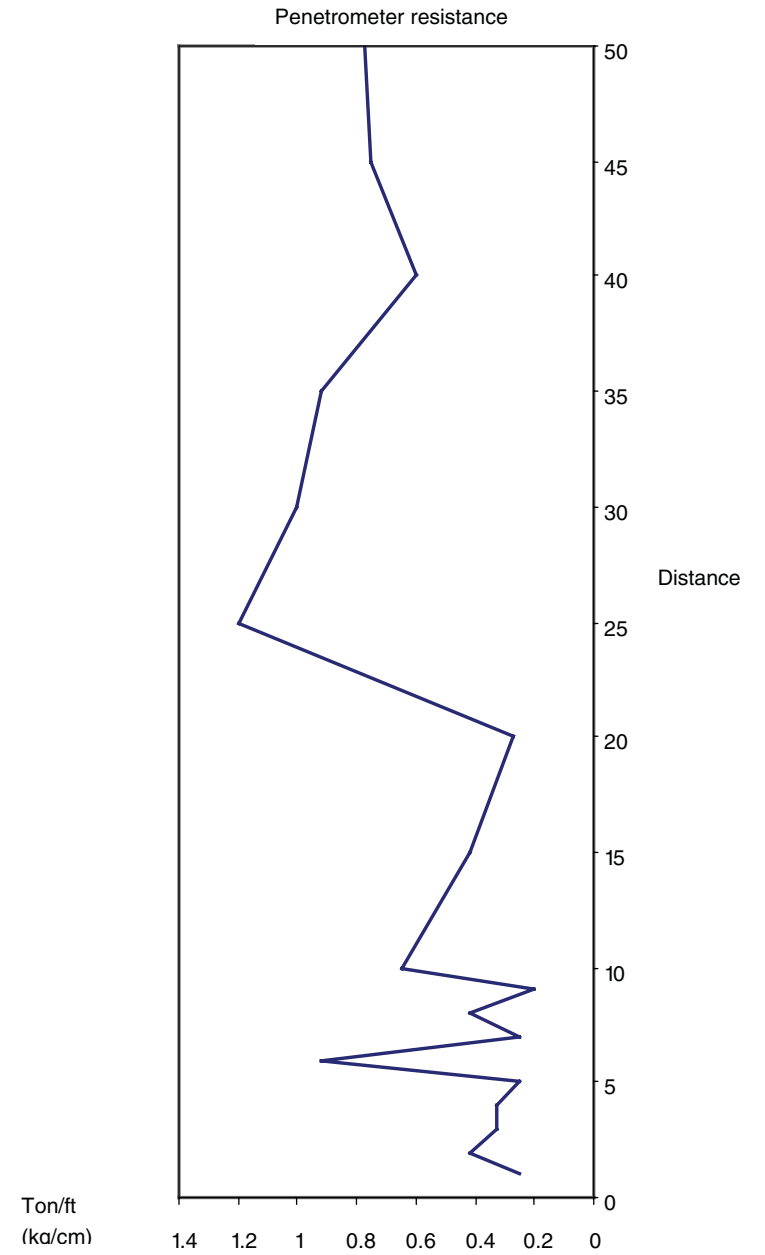


Figure 8: Measuring levels of vertical compaction (monolith sample 2)







Plate 1: Compound area after stripping





Plate 2: Trial Pit 2



Plate 3: Trial Pit 2. Detail of the crater





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