LAND AT WHITE OX FARM, PENRITH, CUMBRIA

Archaeological Evaluation

Client: Atkinson Building Contractors Ltd

Planning Application Ref.: 16/1029

NGR: 350892 531511 (centre)

September 2020

The Site	
Site Name	Land at White Ox Farm, Penrith
County	Cumbria
NGR	350892 531511 (centre)

Client	
Client Name	Atkinson Building Contractors Ltd

Planning	
Pre-planning?	No
Planning Application No.	16/1029
Summary of plans	Residential development
Condition number	-
Local Planning Authority	Eden District Council
Planning Archaeologist	Jeremy Parsons, Cumbria County Council

Archaeological work	
Desk-based assessment done as previous phase of work?	Yes
Geophysical survey done as previous phase of work?	Yes
Approximate number and dimensions of trenches proposed	Eight trenches, each 20m long, targeting features in geophysical survey

Archiving	
Relevant Record Office(s)/Archive Centre(s)	Carlisle
Relevant HER	Cumbria
Relevant Museum	Penrith and Eden Museum, Penrith

Staffing	
Site work	Dan Elsworth Tom Mace
Report writing	Dan Elsworth
Report editing	Jo Dawson
Illustrations	Tom Mace
Date(s) site work carried out	11th to 14th August 2020

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Summary

Following the submission of a planning application for the construction of a residential development on land at White Ox Farm, Penrith, Cumbria, Greenlane Archaeology was commissioned to carry out an archaeological evaluation, following on from the completion of an earlier desk-based assessment and geophysical survey. This comprised the excavation of eight trenches targeting features of potential archaeological interest revealed during the previous phase of work.

Documentary evidence demonstrates that the wider area contains archaeological remains from at least the Mesolithic period onwards, but the area around the site is dominated by those of later prehistoric and Roman date and the core of Penrith itself, which is primarily medieval.

The evaluation trenches revealed that the substantial feature shown in crop marks and the geophysical survey comprised a large curving ditch running approximately north/south along the slope of the hill. To the east of this a shallow linear feature and a group of pits/post holes seem to indicate an area of occupation and structural remains. No finds were recovered that would allow these features to be dated, although it is apparent that the large ditch was subject to a period of relatively rapid infilling, which incorporated some dressed stone, suggesting this occurred no earlier than the Roman period, and perhaps much later. Small fragments of burnt bone, glass and some industrial residue were recovered from samples taken from the group of pits/post holes, further indicating that this was an area of occupation. Elsewhere, the samples tended to contain only wood charcoal and no other charred organic material.

The evaluation demonstrated that the features revealed in the crop marks and geophysical survey are of archaeological origin, and although they could not be dated it is likely, on morphological grounds, that the large ditch is late prehistoric or Romano-British in origin. The other features are less easy to date in the same way but are presumably related. The remains potentially therefore represent an enclosure and associated settlement, although the full extent cannot be known at this stage. Further archaeological work examining a wider area would be necessary in order for this to happen, and dating of features through the radiocarbon dating of material recovered from the samples.

Acknowledgements

Greenlane Archaeology would like to thank Atkinson Building Contractors Ltd for commissioning the project and in particular Jonathan Green for his assistance during the project. Thanks are also due to Luscombe Plant Hire for providing the excavator and Peter Kellett for his excellent plant operation. Additional thanks are due to Lynne Gardiner at Wardell Armstrong Archaeology for managing the assessment of the flots from the environmental samples.

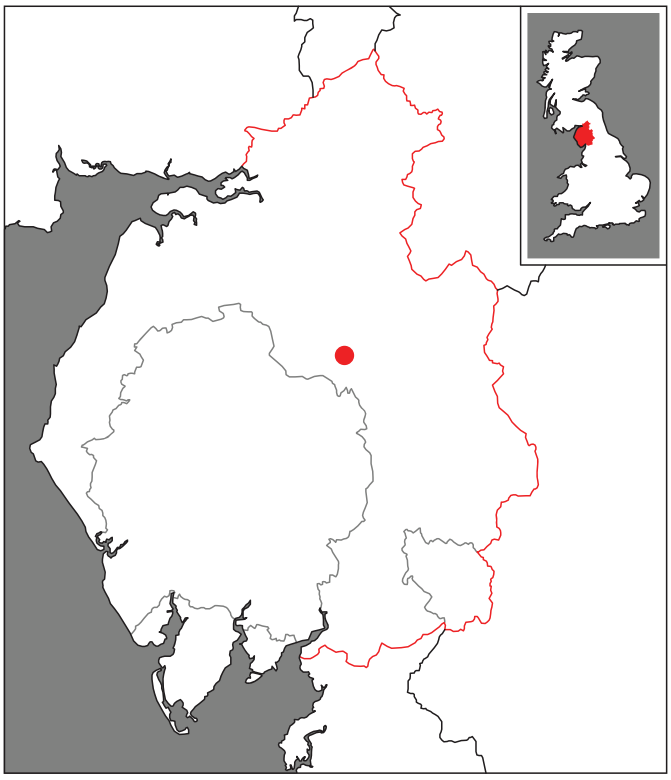
1. Introduction

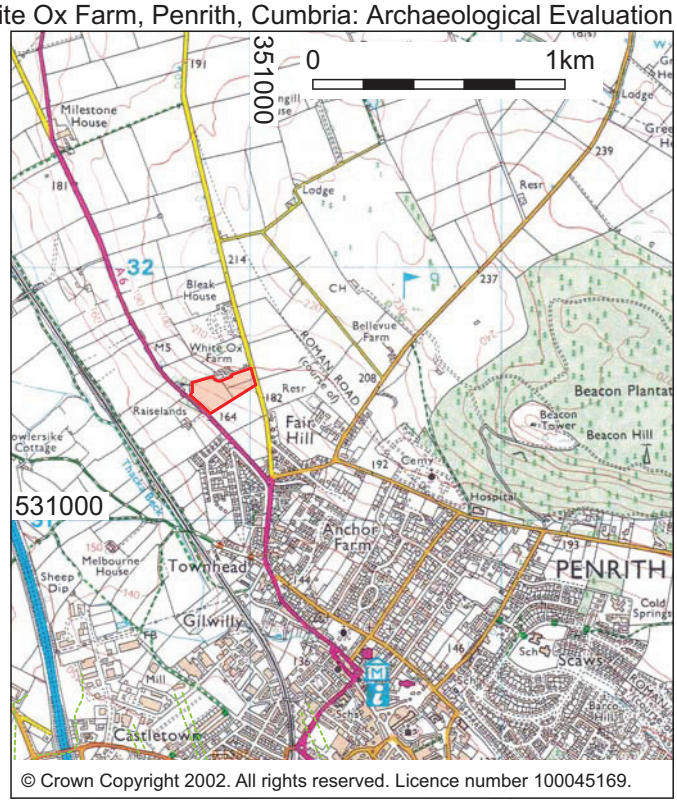
1.1 Circumstances of the Project

1.1.1 The circumstances of the project are set out in the tables on the inside cover of this report.

1.2.1 The *c*2.4 hectare site is to the north side of Penrith and comprises two fields to the south of White Ox Farm, situated between the A6 to the west and Inglewood Road to the east (Figure 1). The Penrith to Carlisle branch of the West Coast Main Line railway runs north-west/south-east approximately 300m to the west (Ordnance Survey 2002). The solid geology comprises red Permian sandstone of the Penrith group (Moseley 1978, plate 1), with overlying glacial deposits concealing much of the bedrock (Countryside Commission 1998, 40).

1.2.2 The landscape is situated within the Eden Valley, which is primarily dominated by '*improved pasture bounded by mature hedgerows and dry stone walls*' with areas of arable cultivation (Countryside Commission 1998, 41).





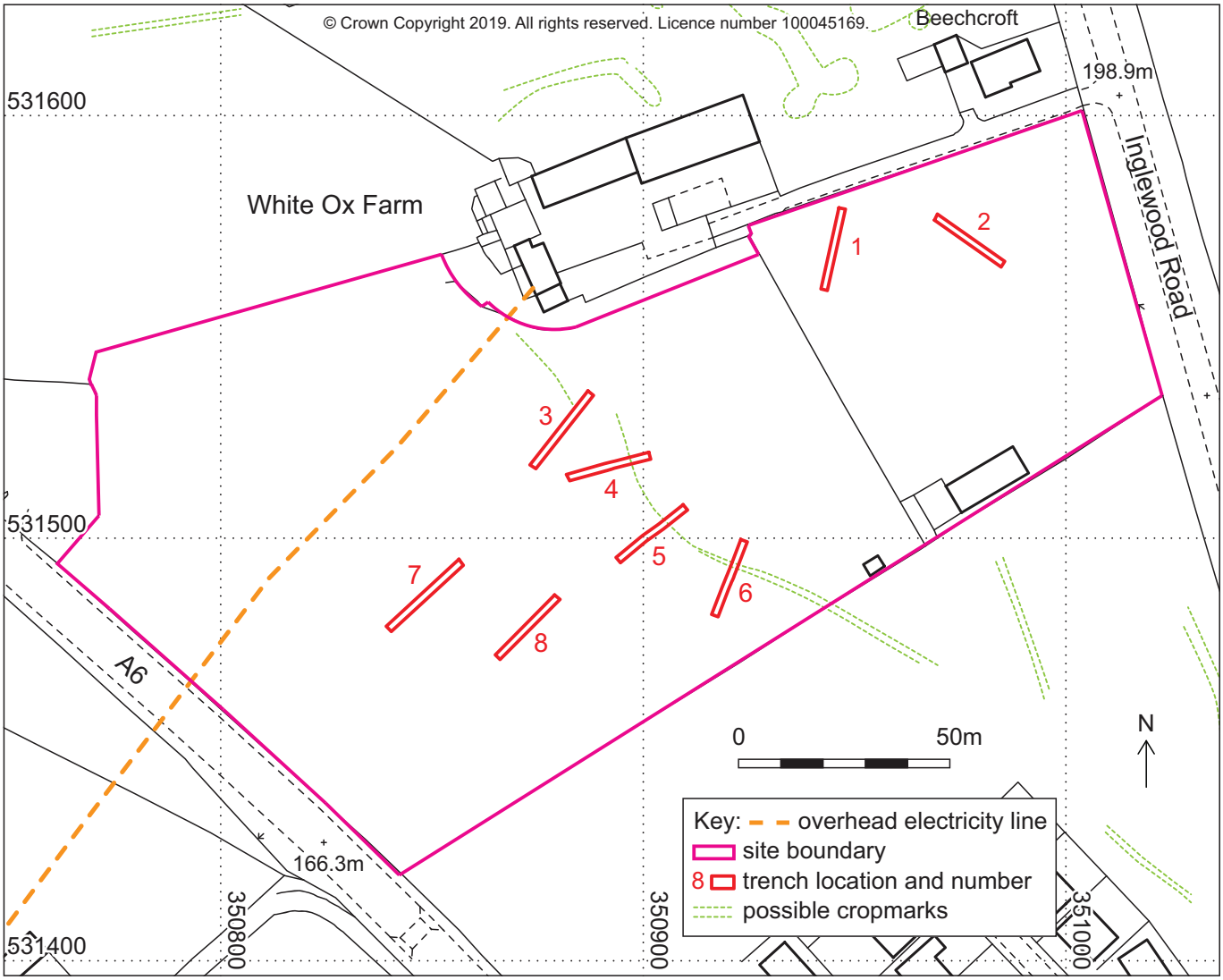


Figure 1: Site location

Client: Atkinson Building Contractors Ltd

2. Methodology

2.1 Archaeological Evaluation

2.1.1 The evaluation was carried out according to the standards and guidance of the Chartered Institute for Archaeologists (CIfA 2020) and comprised the excavation of eight evaluation trenches, numbered from 1 to 8 approximately from north to south (Figure 2). Each trench was typically 20m long and 1.7m wide, with the area of trenching totalling *c*281.35m^2. Excavation was discontinued once the natural geology was reached, which was typically around 0.3m below the ground surface at a height of between 174.1m and 195.7m above sea level.

2.1.2 The topsoil was removed using a mechanical excavator with a toothless bucket and underlying deposits were cleaned and further investigated by hand. All finds were collected from all deposits, as far as was practical. The following recording techniques were used during the evaluation:

- ***Written record***: descriptive records of all deposits and features (see *Appendix 2*) were made using Greenlane Archaeology *pro forma* record sheets, specifically trench record sheets;
- ***Photographs***: photographs in colour digital format (both 12 meg JPEG and RAW file format) were taken of the site during the evaluation, including general views of the site, the surrounding landscape, and working shots. A selection of the colour digital photographs is included in this report and the remainder are included in the archive. A written record of all of the photographs was also made using Greenlane Archaeology *pro forma* record sheets (Greenlane Archaeology 2007);
- ***Instrument survey***: the trench locations were recorded using a Leica TS06 Plus total station which captures the survey data as a digital .dwg file directly in AutoCAD on a Microsoft Surface Pro computer. This enabled the location of each trench to be positioned relative to the local topography and allowed levels above Ordnance Datum to be provided through reference to a nearby spot height;
- ***Drawings***: plans and sections of features were hand-drawn at a scale of 1:10 or 1:20 as appropriate.

2.2 Finds

2.2.1 ***Collection***: all of the finds were recovered by hand and stored in self-seal bags with white write-on panels on site before being removed for processing and assessment. The spoil was also checked with a metal detector and any non-iron finds retained.

2.2.2 ***Processing***: all of the artefacts recovered from the evaluation were washed, with the exception of metal objects, which were dry-brushed. They were then naturally air-dried and packaged appropriately in self-seal bags with white write-on panels.

2.2.3 ***Assessment and recording***: the finds were assessed and identified in the first instance by Jo Dawson. The finds were recorded directly into the catalogue produced as part of this report (*Appendix 3*).

2.3 Environmental Samples

2.3.1 ***Strategy***: a total of 123 litres of samples were taken from 12 different contexts from nine different features. From each of these a single bucket of up to 10 litres (depending on the size of the feature) was processed. A summary of all of the samples taken and the material recovered from them is presented in *Appendix 4* and *Appendix 5*.

2.3.2 ***Processing***: the samples were wet sieved by hand; the light fragments were floated off and collected in 250µm and 500µm sieves with the coarse component (retent) collected on a 1mm mesh. The flot and retent were then dried in a drying oven. The flot was sent for specialist assessment (see *Appendix 5*). The retent was also examined by eye and all ecofacts and artefacts extracted.

2.3.3 The flots were scanned using a stereo microscope (up to x45 magnification). Any non-palaeobotanical finds would be noted on the flot pro forma (Table 1). All suitable sized fragments of charcoal (>2mm of transverse section) were selected for identification. This accounted for approximately half of the assemblages. The charcoal was identified to species as far as possible, using Hather (2000), Schweingruber (1982) and the author's reference collection. Nomenclature for plant taxa followed Stace (2010). The environmental assemblage has been assessed for its local, regional and national potential and for its potential to contribute to the relevant research frameworks.

2.4 Archive

2.4.1 The archive of the project will be deposited with the relevant Record Office or Archive Centre, as detailed on the cover sheet of this report, together with a copy of the report. The archive has been compiled according to the standards and guidelines of the CIfA guidelines (CIfA 2014). In addition, details will be submitted to the *Online Access to the Index of Archaeological Investigations* (OASIS) scheme. This is an internet-based project intended to improve the flow of information between contractors, local authority heritage managers and the general public. A copy of the report will be provided to the client and a digital copy of the report will be provided for the relevant Historic Environment Record, as detailed on the cover sheet of this report.

3. Site History

3.1 Introduction

3.1.1 The site history is intended to place the results of the evaluation in their local historical and archaeological context and primarily involved the examination of early maps and consultation of published histories of the area. The site history section is taken from the previous desk-based assessment carried out by Greenlane Archaeology (2019).

3.2 Map Regression

3.2.1 ***Tithe map for Penrith (CAC(C) DRC/8/150 1849)***: this is the earliest detailed map of the area and shows the site comprises parts of two fields labelled 615 and 616 (Plate 1). The accompanying apportionment provides details of the owners and occupiers as well as the names of the fields and descriptions of their state of agriculture (CAC(C) DRC/8/150 1843; see Table 1). The corners of the main field (615) are apparently shown as containing small enclosures.

Plot No.	Owner	Occupier	Name	Description
615	Joseph Salkeld Johnson and Anthony Harrison	William Bird	Hare Gill	Arable
616	Joseph Salkeld Johnson and Anthony Harrison	William Bird	Planting	Arable

Table 1: Details of the plots within the site as given in the tithe apportionment (CAC(C) DRC/8/150 1843)

3.2.2 ***Ordnance Survey c1864***: this map shows that the strip of land along the north edge comprised a wooded area and the west corner of the large field was a quarry (Plate 2).

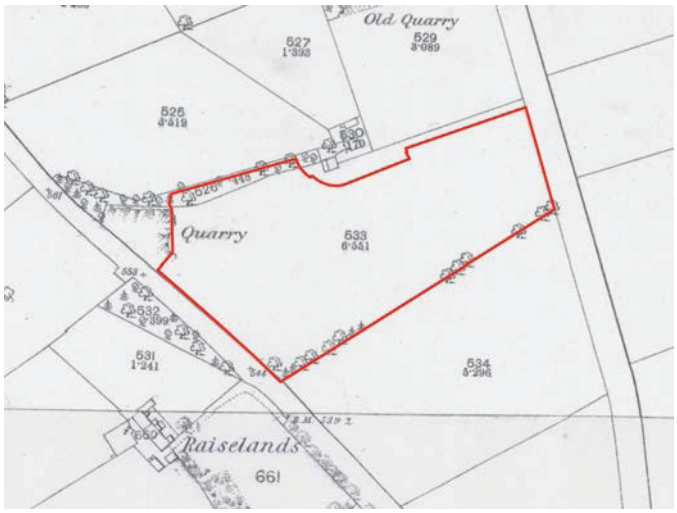


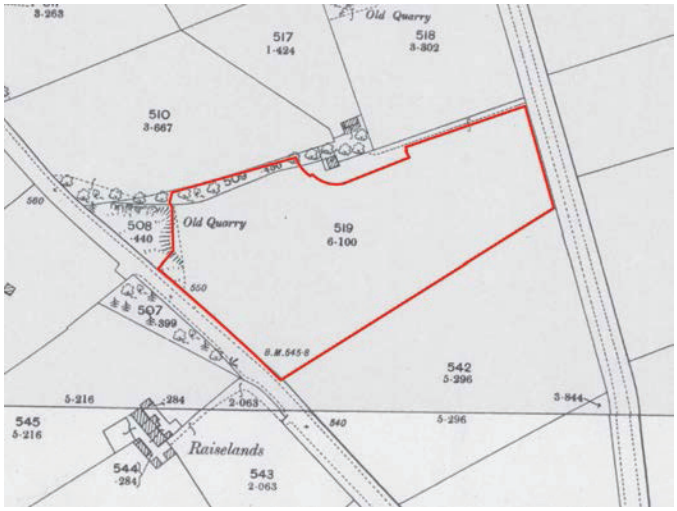
Plate 1: Extract from the tithe map of 1849

Plate 2: Extract from the 1:2,500 Ordnance Survey map of *c*1864

3.2.3 ***Tracing of the Road from the White Ox Northwards***: this map is a tracing of the 1864 Ordnance Survey map and does not show any additional detail about the site (CAC(C) ST/3/63 early 19th century; Plate 3; cf. Plate 2).

Plate 3: Extract from an early 19th century tracing of the road from the White Ox northwards (CAC(C) ST/3/63 early 19th century)

3.2.4 ***Ordnance Survey 1900***: the Ordnance Survey map of 1900 (Plate 4) shows that there have been some minor changes to the field boundaries around the 'old quarry' to the west and an east/west track is now marked along the north edge of the site to the farm buildings on the north side of the area.



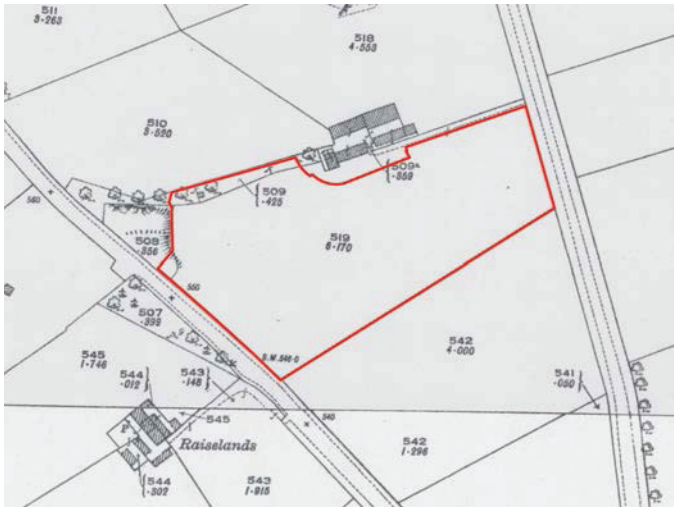


Plate 4: Extract from the 1:2,500 Ordnance Survey map of 1900

Plate 5: Extract from the 1:2,500 Ordnance Survey map of 1925

3.2.5 ***Ordnance Survey 1925***: the site is remains undeveloped. The only obvious differences in the wider area are that the old quarry is no longer marked as such and the farm to the north of the site has been extensively added to (Plate 5; cf.Plate 4).

3.2.6 ***Satellite imagery, 2019***: various possible cropmarks are visible in neighbouring fields from satellite imagery (Google 2019; Plate 7) and earlier oblique aerial photographs of the site, some of which potentially extend within the site boundary (as shown in Plate 6 and Plate 7). These have not been mapped in any detail before and apparently cover a wide area, but are probably part of what has been described as an enclosure (**Site 9**).

Plate 6: Satellite imagery, 2019

Plate 7: Satellite imagery, 2019, with possible cropmarks highlighted

3.3 Site History

3.3.1. ***Prehistoric Period (c11,000 BC – 1st century AD)***: while there is limited evidence for human activity in the county in the period immediately following the last Ice Age, this is typically found in the southernmost part on the north side of Morecambe Bay. Excavations of a small number of cave sites have found the remains of animal species common at the time but now extinct in this country and artefacts of Late Upper Palaeolithic type (Young 2002). Human remains from one of these have also recently been dated to approximately 7,100 BC (Smith *et al* 2013). No remains of this date are known from the immediate area of the site, although a pair of barbed spear heads made from antler were found at Crosby-on-Eden (Hodgson 1895), which, although undated, may belong to the end of the Palaeolithic or early Mesolithic. The county was clearly more densely inhabited during the following period, the Mesolithic (*c*8,000 – 4,000 BC), as large numbers of artefacts of this date have been discovered during field-walking and eroding from sand dunes along the coast, but these are typically concentrated in the west coast area and on the uplands around the Eden Valley (Cherry and Cherry 2002). More recently a particularly large assemblage has been recovered during excavations, directly on the edge of the River Eden, outside Carlisle (Clark 2010) and field-walking has found additional scatters of some significance also in the Eden valley near Penrith (Clarke *et al* 2008), perhaps demonstrating the importance of the Eden and its tributaries. Coastal areas and river valleys are notably places where such material is frequently found in the wider region (Middleton *et al* 1995, 202; Hodgkinson *et al* 2000, 151-152; Hodgson and Brennand 2006, 26).

3.3.2 In the following period, the Neolithic (*c*4,000 – 2,500 BC), large scale monuments such as burial mounds and stone circles begin to appear in the region and one of the most recognisable tool types of this period, the polished stone axe, is found in large numbers across the county, having been manufactured at Langdale in the central Lake District (Hodgson and Brennand 2006, 45). During the Bronze Age (*c*2,500 – 600 BC) monuments, particularly those thought to be ceremonial in nature, become more common still. Cist burials of possible Bronze Age date are believed to have been discovered *c*500m east of the site at the location marked 'cistvaens' on the 1864 edition of the Ordnance Survey map (Ordnance Survey 1864), but there is no known written record of their discovery (WAA 2016, 11).

3.3.3 Settlement sites thought to belong to this period are often identified as such from cropmarks, revealed in aerial photographs; however, this interpretation must remain speculative as these sites are generally undated and little understood. Two areas of cropmarks are recorded in the vicinity of the site, elements of which are within the proposed development area, but these are all of unknown date.

3.3.4 ***Romano-British to Early Medieval Period (1st century AD – 11th century AD)***: The Roman military presence in the North West is apparent from the existence of forts, which in many cases led to the formation of associated civilian settlements (*vici)*, and the supply network of roads and coastal trade, as well as the incidence of Roman artefacts such as coins (Philpott 2006, 71). The Lune and Eden valleys provided a route of access to Carlisle for the Roman advance (*ibid*., 63) and the route northwards is still apparent along the modern A6 between Carlisle and Penrith (Shotter 2004, 31). The route of the Roman road from the fort at Brougham (*Brocavum*) to Old Penrith (*Voreda*) is suggested to pass *c*220m to the east of the site before merging with the route of Inglewood Road *c*1km to the north of the White Ox Farm site (CCC and EH *c*2002; Ordnance Survey 2002). The fort at Old Penrith is located at Plumpton, 7km to the north from the centre of Penrith. It was constructed *c*90-100 AD, abandoned sometime between 125 and 130 AD, and rebuilt around 163 AD (Richardson and Allan 2009, 117). The associated *vicus* was occupied from the 1st to 4th century AD (CCC and EH c2002, 5). A cemetery excavated to the east of the fort at Brougham, *c*2.5km to the south-east of Penrith, contained burials dated to the 2nd to 4th centuries AD (Cool 2004). A section the road at Fair Hill was excavated to the north-west side of Salkeld Road in 2016, and a small quantity of artefacts were retrieved from its surface, dated from the late 1st to 2nd century AD (WAA 2016; 2017; Jackson 2019; see *Section 4.6*). The road comprised a *c*8.4m wide embankment, which formed a raised cambered platform, with a 7m wide cobbled surface between larger kerbstones (WAA 2016; 2017; Jackson 2019). A series of intermittent cobbled surfaces was examined along its northern edge, which could represent fragments of a secondary minor road, resting or passing places, or other temporary roadside structures (WAA 2016; 2017; Jackson 2019). A large proportion of

the identified Romano-British settlement sites in Cumbria are located to the south and east of Penrith (Philpott 2006, 75) and there are extensive field systems around the wider Eden Valley area that are likely to have been in use in this period and beyond, although they may have earlier origins (Higham and Jones 1975; 1991). The status and manner of use of the settlement sites is debatable, although the discovery of a Roman parade helmet on a supposedly 'native' site at Crosby Garrett suggests potentially close contacts with quite high-status members of the Roman military (Breeze and Bishop 2013; Breeze 2018). The size of the 'military market' to the local area must have been of great importance, but it is clear that many 'natives' initially continued to live in much the same way they had before the arrival of the Romans, perhaps supplying them with goods and maybe even benefiting from their arrival (Higham 1986, 216-225). It possible that one or both of the sites revealed as cropmarks might be of Roman period, indeed it has been suggested that one represents the remains of a Roman signalling station (Higham and Jones 1991, 50), although this remains, as yet, unproven.

3.3.5 It has been stated that 'the name Penrith may be of Britannic origin, comprising the elements *pen,* meaning head, chief or top, and *riton*, meaning ford or stream' (Armstrong *et al* 1950, 229-230; quoted in CCC and EH *c*2002, 4). The meaning of Penrith could therefore be 'chief ford'. Older historical sources give the meaning as 'red hill' (Nicholson and Burn 1777; quoted in CCC and EH *c*2002, 4).

3.3.6 Following the cessation of Roman administration in the early fifth century the region fragmented into smaller kingdoms and it is difficult to form a coherent picture of the nature of political control. Much of what is now Cumbria probably came under the control of Rheged, a kingdom that seems likely to have extended across the border between what became England and Scotland and whose central territory may have been focussed on the nearby Lynvennet valley (Clarkson 2010, 68-78; Breeze 2012). However, by the mid-seventh century the area seems to have been securely under Northumbrian rule (Kirkby 1962, 80-81). Firmly dated archaeological evidence for the immediate post-Roman period in the county is sparse due in part to poor site visibility, which often consists of traces of rural settlements which have been heavily truncated (Philpott 2006, 59). Furthermore, there is inevitably a great deal of uncertainty with dating settlement sites on stylistic grounds alone given the persistence of traditional styles from the Roman to the early medieval period. A group of four hogback tombstones and weathered cross-shafts, known as the 'Giant's Grave', and another cross-shaft to the north-west, known as the 'Giant's Thumb', in the churchyard of St Andrew's Church, Penrith are thought to be of Norse origin, dating approximately to the end of the 10th century (Salter 1998, 84). Significantly, pieces of Anglian metalwork, including a hammered copper alloy Northumbrian Styca and a partial copper alloy strap-end, dated to the mid-9th century to 10th century, were found during excavations at Fair Hill (WAA 2017; Jackson 2019, 89-90). Indeed, a settled rural hinterland around the foci at Dacre and Penrith is suggested for the early medieval period (Heawood and Howard-Davis 2002, 168).

3.3.7 The arrival of Norse settlers between perhaps the late ninth and early 10th century had a considerable effect on the area, in particular on the local place-names (Edwards 1998, 7-8). Physical evidence for settlement is rare, although an increasing number of burials of Norse type from both rural and urban contexts are known (see Paterson *et al* 2014; McCarthy and Paterson 2015; McCarthy *et al* 2015) with a furnished Viking burial known at Hesket-in-the-Forest, north of Penrith perhaps the closest to the site (Edwards 1998, 10-12). Several complete and fragmentary 'Viking Age' (late ninth and early 10th century) silver brooches have also been found in the Penrith area, most notably on Flusco Pike, three miles to the west of Penrith (Edwards 1998, 33-36; Richardson 1996), and within Penrith itself the it is clear that the churchyard was a focus of considerable activity from at least the Viking period and there is limited archaeological evidence from elsewhere in the town (Zant 2015). Place-name evidence indicates that there was a complicated mixture of people settled in the area that is now Cumbria, and within the local area containing examples primarily of Old English and Norse origin (Armstrong *et al* 1950). Politically the area remained very mixed though, with a considerable resurgence in the 'British' population during the 9th and 10th century due to the expansion of Strathclyde southward from its base in what is now south-west Scotland, although the exact area that they directly controlled is debated (see Elsworth 2018).

3.3.8 ***Medieval Period (11th century AD – 16th century AD)***: the medieval period in general in Cumbria was one of considerable initial growth, followed by serious decline in the 14th century as a result

of the combined effects of Scottish raids and disease in both people and animals (Winchester 1987, 46-47). Outbreaks of plagues during the 14th century contributed to a drastic decline in the population at that time (CCC and EH *c*2002, 8).

3.3.9 The town of Penrith was believed to be in Scottish hands at the time of the Norman Conquest and is not referred to in the Domesday records (CCC and EH *c*2002, 7). The earliest documentary evidence is from the 12th century when 'Bishops Row' was granted to the diocese of Carlisle at the creation of the see in 1133 (*ibid*). This grant suggests that there was a block of land in the centre of the town that belonged to the church (Newman *et al* 2000, 107). The earliest surviving reference specifically to Penrith is in the Pipe Rolls in 1167, under the pleas of Alan de Nevill of the forest, when the Sheriff rendered account for ten shillings for 'Penred Regis'. This sum was probably for forest offences or for encroachments (CCC and EH *c*2002, 7). The town was granted a market charter in 1222 by Henry III at which time it was a royal borough (CCC and EH *c*2002, 8). In 1291 a house of the Augustinian Friars was founded although no visible remains for this have been located (CCC and EH *c*2002, 8). More recent archaeological work within the town itself also confirm that by the 12th century it was well-established and flourishing (Zant 2015).

3.3.10 Repeated Scottish raids in the 13th and 14th century hit the town hard and it is at this time that the town's castle and other fortified buildings were constructed (CCC and EH *c*2002, 7-8). In 1397, William Strickland was granted a licence 'to crenallate his chamber in Penreth' (Huddleston 1930). It would seem likely that the fortified western tower of St Andrew's church would have been a response to this threat and may have been used by parishioners. What is more, after the town was pillaged and burnt in the Douglas raid of 1345 the burgesses received a licence to erect a defensive wall in 1346; whether the wall was ever completed is a matter of dispute and no physical remains have ever been located (Newman *et al* 2000*,* 109*).* Penrith became a centre of industry in the later medieval period, having markets for cattle, sheep, and horses. Medieval industries in the town included tanning and textiles, and a fulling mill and dye works, as well as weaving shops, cobblers and saddlers (Winchester 1987, 127; CCC and EH *c*2002, 8). The castle itself fell into disrepair by the mid-16th century and its fabric was beginning to be repurposed elsewhere (CCC and EH *c*2002, 8).

3.3.11 ***Post-medieval Period (16th century AD – present)***: The map evidence (see *Section 3.3*) demonstrates that the White Ox Farm site had reached approximately its present state by the beginning of the 19th century, with the field(s) enclosed, and it is likely that relatively little changed in the area immediately following the end of the medieval period. In general, it was not until the Industrial Revolution that rural areas such as this began to see any substantial new development as the population began to rise and demand for land and the need for new housing saw a considerable amount of building take place (Pearsall and Pennington 1989, 256). Population pressures and development continued to increase throughout the Industrial Revolution, although rural areas were perhaps less noticeably affected (Winchester 2016, 232). The area in general has remained semirural in character.

3.4 Conclusion

3.4.1 Although the site lies some distance to the north of the centre of the historic town of Penrith it is in a wider area of archaeological interest, with remains of prehistoric and Roman date found nearby. The map evidence demonstrates that the site, and indeed the wider area around it, has seen no major development with the construction of White Ox Farm (itself based around an earlier small structure of uncertain purpose) the only notable exception. It was not until the 20th century that the wider area began to be encroached upon by housing as the suburbs of Penrith grew.

4. Fieldwork Results

4.1 Trench 1

4.1.1 This trench was approximately 20m long by 1.7m wide, and orientated approximately south-west/north-east. The topsoil comprised a soft mid brownish-grey sandy silt with 5% rounded gravel 0.2m-0.3m thick (***100***). Beneath this was a linear cut running diagonally across the trench. The fill of this comprised a soft mid brownish-orange sand with 5% rounded gravel and some cobble, and was less than 0.1m thick (***101***). The cut of the feature this filled was linear and orientated approximately north/south and was up to 1.8m wide and less than 0.1m deep with a shallow u-shaped profile [***102***]. This was cut into the underlying natural, which comprised a loose mid pinkish-orange sandy clay with 80% angular stone, mostly red sandstone, some perhaps outcropping bedrock (***103***).

Plate 8 (left): Trench 1 following initial cleaning, viewed from the north-east

Plate 9 (right): Trench 1 following initial cleaning, viewed from the south-west

Plate 10: Linear feature *102* before excavation, viewed from the south-east

Plate 11: Section through linear feature *102*, viewed from the east

4.2 Trench 2

4.2.1 This was approximately 20m long by 1.7m wide and orientated approximately south-east/north-west. The topsoil comprised a soft mid brownish-grey sandy silt 0.2m to 0.3m thick with up to 5% rounded gravel (***200***). Beneath this a group of small post-holes or pits was discovered toward the south-east end of the trench, which were sealed or associated with a layer of charcoal rich loose mid brownish orange sandy silt with 1% rounded gravel less than 0.1m wide and covering an area of approximately 2m diameter. Working from the south-east end the pits comprised the following: a soft mid brownish grey sandy silt 0.15m-0.18m diameter and 0.04m deep (***202***) in an oval pit orientated north-west/south-east with shallow sloping sides and a rounded base [***203***]. To the north-west was another with a soft dark greyish-brown sandy silt 0.3m by 0.2m and no more than 0.12m deep (***204***) filling an oval pit orientated north-west/south-east with irregularly sloping sides at approximately 45º and an irregular rounded base [***205***]. Approximately north of this were two further pits close together. The southernmost had two fills, one evidently the remains of a burnt stake or post, comprising soft dark greyish brown or black sandy silt with 80% charcoal, 0.1m in diameter and 0.15m deep and coming to a pointed end (***206***), around which was a soft dark orangey-brown sandy clay 0.15m by 0.25m and 0.2m deep (***207***). These were both within an oval pit orientated north-west/south-east, 0.2m by 0.3m and 0.2m deep with near vertical sides and a rounded base [***208***]. The pit to the north of this had a soft pale yellow mottled with greyish brown sand/silty sand with 1% rounded gravel, 0.2m by 0.3m and 0.12m deep (***209***). This was contained within an oval pit orientated north-east/south-west with steep sides and a rounded base [**210**].

Plate 12 (left): Trench 2 after cleaning, viewed from the south-east

Plate 13 (right): Trench 2 after cleaning, viewed from the north-west

Plate 14: Pits in Trench 2, before excavation, viewed from the east

Plate 15 (left): Pit *203* before excavation, viewed from the north-east

Plate 16 (right): Pit *203* sectioned, viewed from the south-east

Plate 17 (left): Pit *205* before excavation, viewed from the north-east

Plate 18 (right): Pit *205* sectioned, viewed from the south-east

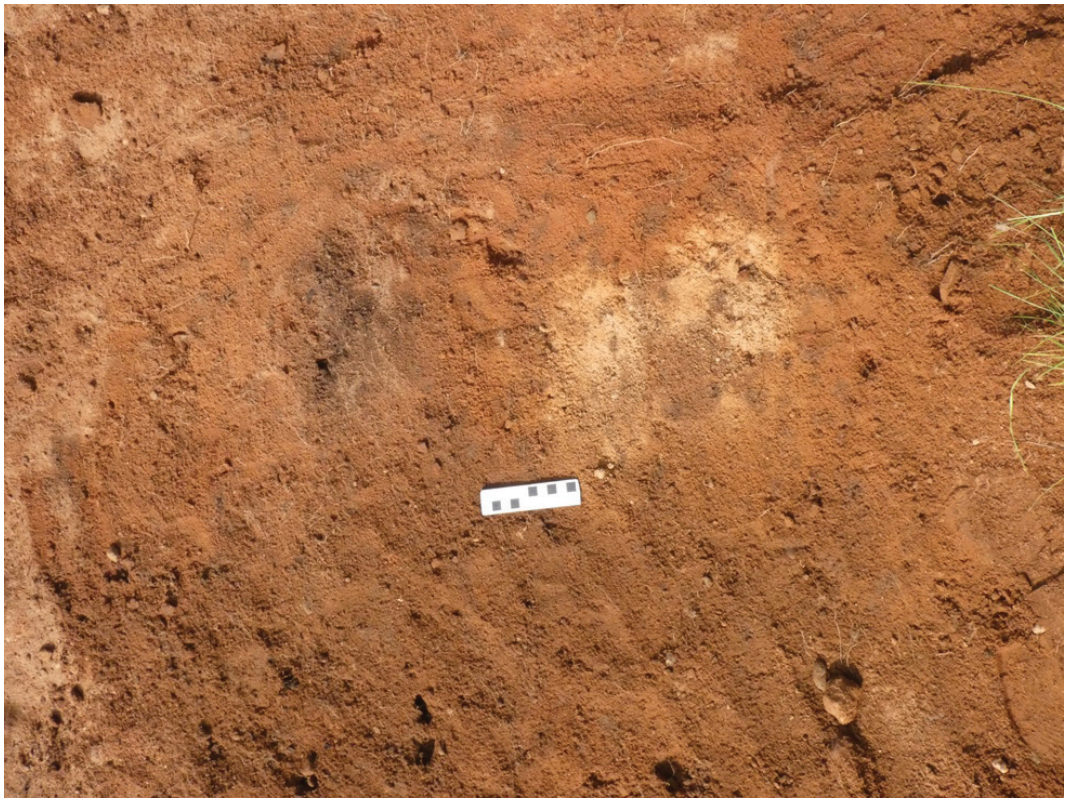


Plate 19: Pits *208* and *210* before excavation, viewed from the east

Plate 20 (left): Pit *208* sectioned, viewed from the south-east

Plate 21 (right): Pit *210* sectioned, viewed from the south-east

4.3 Trench 3

4.3.1 This was approximately 22.5m long and 1.7m wide and orientated approximately north-east/south-west. The topsoil comprised a soft dark greyish brown sandy silt up to 0.2m thick with 10% rounded gravel (***300***). Below this was the natural, which comprised a firm dark brownish orange sandy clay with 20% sub-angular gravel (***301***).

Plate 22 (left): Trench 3 excavated, viewed from the north-east

Plate 23 (right): Trench 3 excavated, viewed from the south-west

4.4 Trench 4

4.4.1 This was approximately 20m long by 1.7m wide and orientated approximately east/west. The topsoil comprised a soft dark greyish brown sandy silt 0.2-0.3m thick with (***400***). Running across the trench on an approximately north/south alignment was a substantial ditch, which was deliberately overcut in this trench in order to make identification easier in the dry conditions. The upper fill of this comprised a friable mottled dark orangey-brown and dark grey brown sandy silt with less than 2% sub-rounded and sub-angular gravels extending the width of the ditch (2.2m) and up to 0.4m thick (***401***). Below this, at the narrower base of the ditch, was a lower fill comprising a friable mid orangey-brown silty sand with less than 2% sub-angular gravel, filling an area 0.65m wide within the ditch and up to 0.3m thick (***402***). The ditch cut itself was linear, orientated approximately north/south and up to 2.2m wide at the top and over 0.7m deep with an initially smooth concave-sided profile changing to a steeper v-shape toward the bottom with an uneven and undulating base [***403***]. This ditch was cut into the underlying natural geology, which comprised a fairly firm light orange to pink sandy clay (***404***).

Plate 24 (left): Trench 4 after initial cleaning, viewed from the east

Plate 25 (right): Trench 4 after initial cleaning, viewed from the west

Plate 26 (right): Section of ditch *403*, viewed from the south-west

4.5 Trench 5

4.5.1 This was approximately 20m long by 1.7m wide and orientated approximately south-west/north-east. The topsoil comprised a soft dark brownish-grey silt up to 0.2m thick and with 10% rounded gravel (***500***). Running across the trench was another section of the same ditch recorded in Trench 4. The upper fill of this comprised a dark brownish orange loose sandy clay with 30% rounded gravel and 2% angular boulders in the form of red sandstone, some with apparently dressed faces. It filled an area 2.3m wide and at least 0.4m thick (***501***). Below this was a lower fill comprising a loose mid-orange sandy clay with 5% rounded gravel, filling an area 0.6m wide and up to 0.4m thick at the base of the trench (***502***). The ditch itself was linear in plan, orientated approximately north/south, 2.3m wide at the top and reducing to 0.6m at the base, starting with a shallow u-shaped cut and stepping to a narrower almost v-shaped cut at the bottom [***503***]. The natural into which it was cut comprised a loose dark- to mid-orange sandy clay with 50% sub-angular gravel and pebbles (***504***).

Plate 27 (left): Trench 5 excavated, viewed from the north-east

Plate 28 (right): Trench 5 excavated, viewed from the south-west

Plate 29: Dressed stones recovered from context *502*

Plate 30: Ditch *503* section, viewed from the south

4.6 Trench 6

4.6.1 This was approximately 20m long by 1.7m wide and orientated approximately north-east/south-west. The topsoil comprised a soft mid- brownish grey silty sand up to 0.3m thick with 5% rounded gravel (***600***). Below this was another section of the same ditch seen in Trenches 4 and 5 running across the trench. The upper fill of this comprised a friable mid grey-brown slightly sandy silt with less than 2% sub-rounded gravel, but to a maximum of 0.62m thick and 3.3m wide (***601***). Below this was a lower fill comprising a loose mid orangey-brown silty sand with very infrequent sub-rounded gravel up to 0.25m wide and extending across an area 0.68m wide (***602***). The cut of the ditch was orientated approximately north-west/south-east at this point and comprised an initial shallow u-shaped profile 3.3m wide with a steeper section in the base almost v-shaped and closer to 0.6m wide at the top [***603***]. The underlying natural into which the ditch was cut comprised a loose dark reddish orange sandy clay with 30% subangular and rounded pebbles, although outcropping pale red sandstone bedrock was exposed on the north-east side of the ditch (***604***).

Plate 31 (left): Trench 6 after initial cleaning, viewed from the north-east

Plate 32 (right): Trench 6 after initial cleaning, viewed from the south-west

Plate 33: Ditch *603* section, viewed from the west

4.7 Trench 7

4.7.1 This was approximately 23m long by 1.7m wide and orientated approximately north-east/south-west. The topsoil comprised a soft dark greyish brown sandy silt 0.3-0.4m thick with 20% rounded gravel (***700***). Below this was the natural, which comprised a firm dark orange sandy clay with 40% angular cobbles (***701***). No features of archaeological interest were discovered.

Plate 34 (left): Trench 7 excavated, viewed from the north-east

Plate 35 (right): Trench 7 excavated, viewed from the south-west

4.8 Trench 8

4.8.1 This was approximately 20m long and 1.7m wide and orientated approximately north-east/south-west. The topsoil comprised a soft dark brownish grey sandy silt up to 0.3m thick with 10% rounded cobbles (***800***). Below this was a fairly soft dark brownish orange sandy clay natural with 30% rounded cobbles and a patch of more angular red sandstone and pale clay near the centre (***801***). No features of archaeological interest were discovered.

Plate 36 (left): Trench 8 following excavation, viewed from the south-west

Plate 37 (right): Trench 8 following excavation, viewed from the north-east

Key:
- site boundary
- trench location
- 8 trench number
- overhead electricity cable

531600
531500
531400
350700
350800
350900

Beechcroft

198.9m

N

Figure 3

FIELD 1
White Ox Farm

DENSE VEGETATION

Figure 4

FIELD 2

BARN

overhead electricity cable

166.3m

0 50m

ANOMALY TYPE	INTERPRETATION
AREA OF STRONG DIPOLAR / BIPOLAR RESPONSES (MAGNETIC DISTURBANCE)	SURFACE / NEAR-SURFACE FERROUS OR FIRED MATERIAL (PROBABLE MODERN)
LIMIT OF VERY STRONG RESPONSE	INTERFERENCE CAUSED BY MODERN MAGNETIC FEATURE (FEATURE MAY BE LOCATED BEYOND THE SURVEY AREA)
APPROXIMATE ORIENTATION OF WEAK, BROADLY PARALLEL POSITIVE LINEARS	AGRICULTURAL FEATURES. MODERN PLOUGHING REGIME
LINEAR / CURVI-LINEAR TREND (WEAK OR DIFFUSE RESPONSE)	UNCERTAIN ORIGIN. COULD BE RELATED AGRICULTURAL ACTIVITY OR NATURAL FEATURE / VARIATION BUT SOME COULD BE CAUSED BY A SUB-SURFACE FEATURE / REMNANT OF FEATURE
ISOLATED POSITIVE RESPONSE	PROBABLE GEOLOGICAL / PEDOLOGICAL VARIATION OR DEEPER BURIED FERROUS / FIRED MATERIAL BUT COULD ALSO BE INFILLED ISOLATED FEATURE
A — CURVI-LINEAR POSITIVE RESPONSE	PROBABLE MODERN TRACKWAY
B — LINEAR / CURVI-LINEAR POSITIVE RESPONSE	UNCERTAIN ORIGIN. POSSIBLE INFILLED FEATURE OF UNKNOWN FUNCTION AND DATE

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Figure 2: Trench locations overlaid on the interpretation of the geophysical survey data

Figure 3: Plan of Trenches 1 and 2

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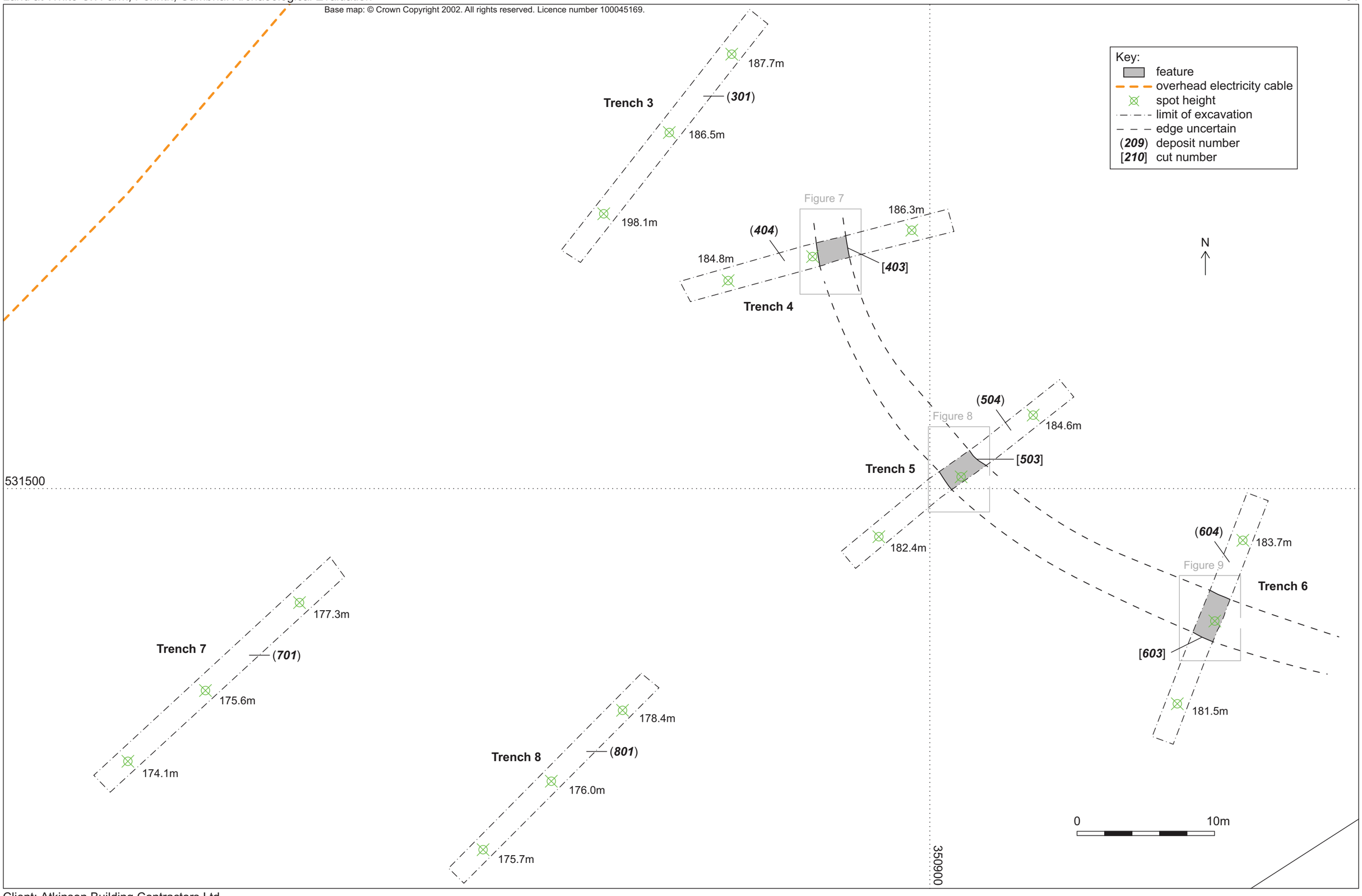

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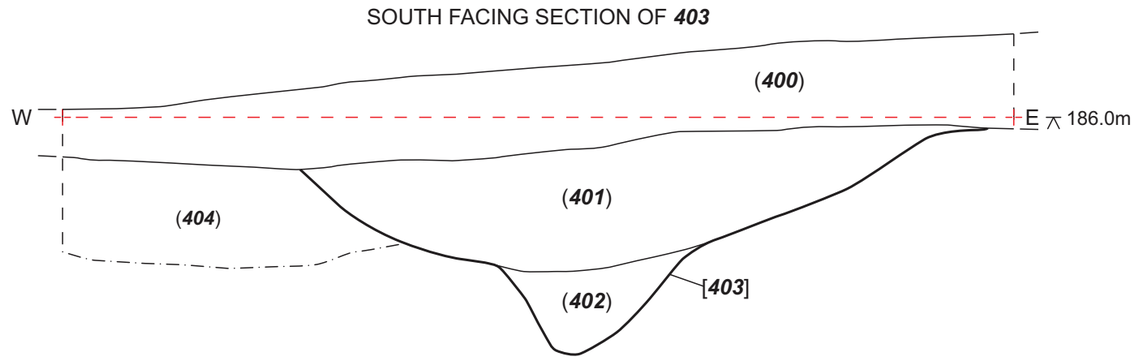
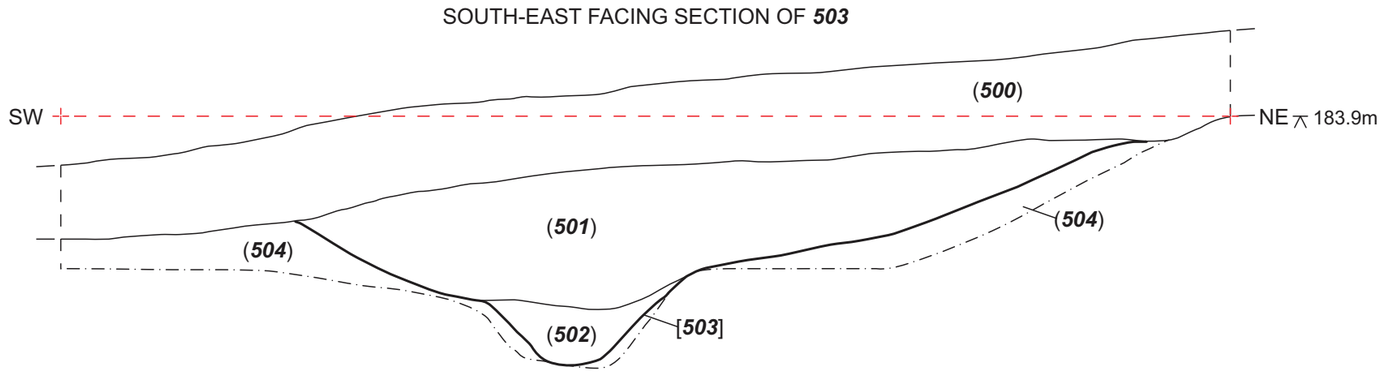
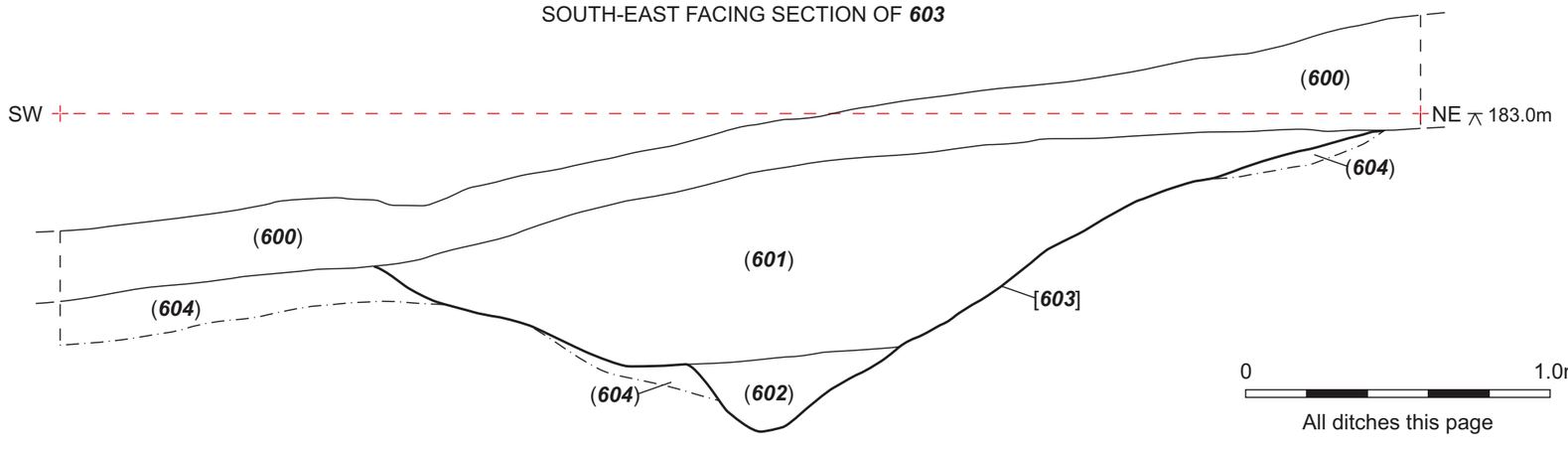
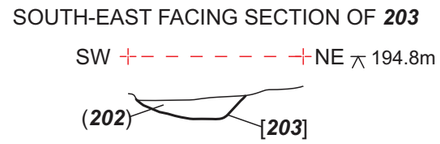
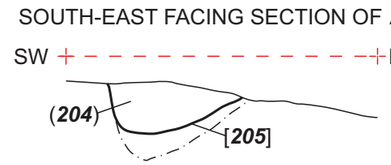
Figure 4: Plan of Trenches 3 to 8

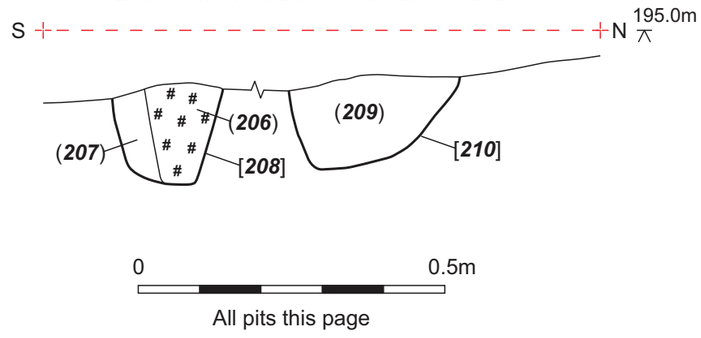












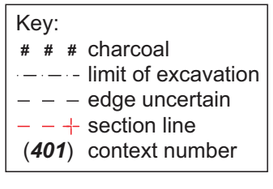


Figure 5: Sections of features in Trenches 2 and 4-6

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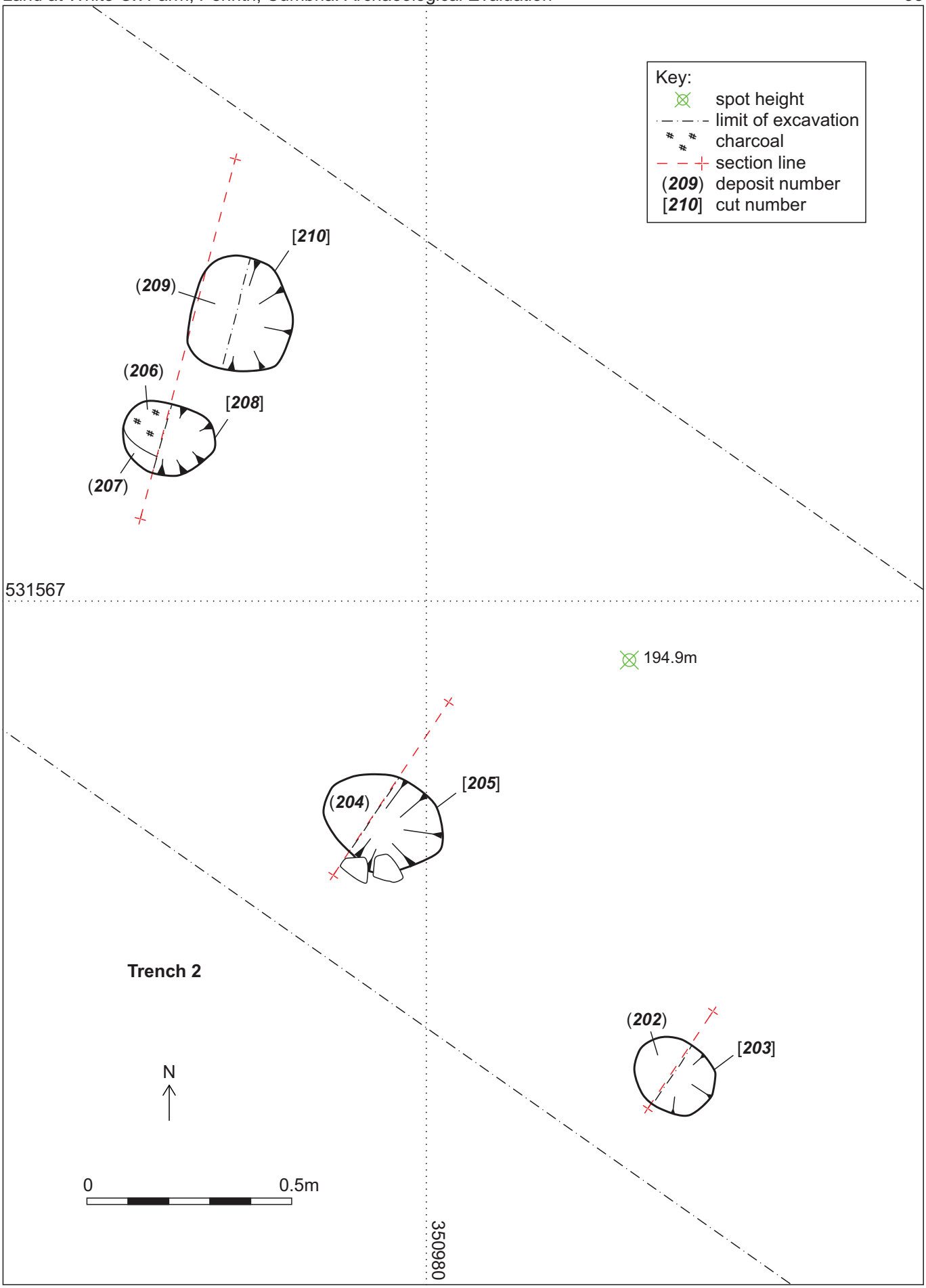

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Figure 6: Plan of *203*, *205*, *208* and *210*

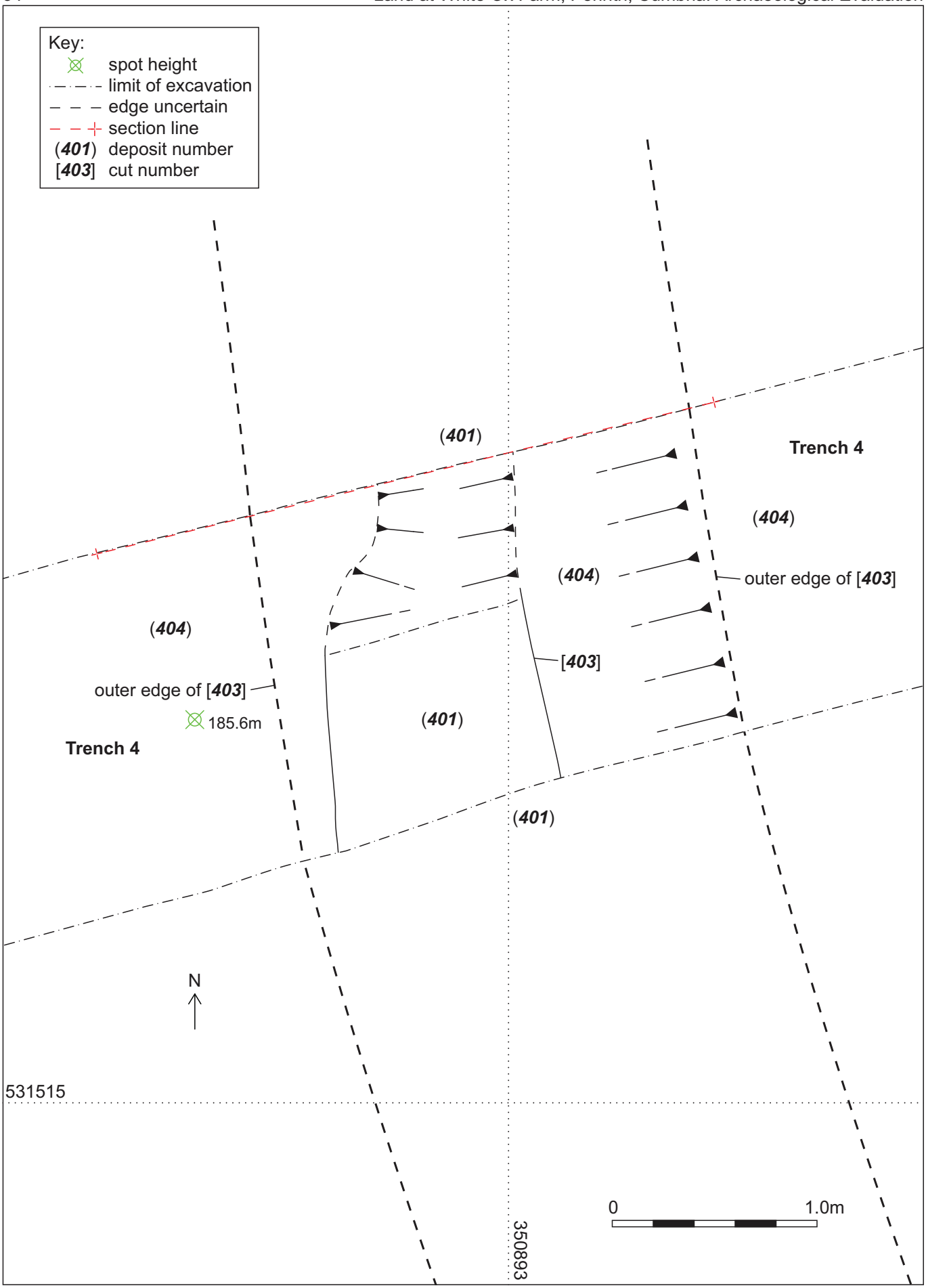
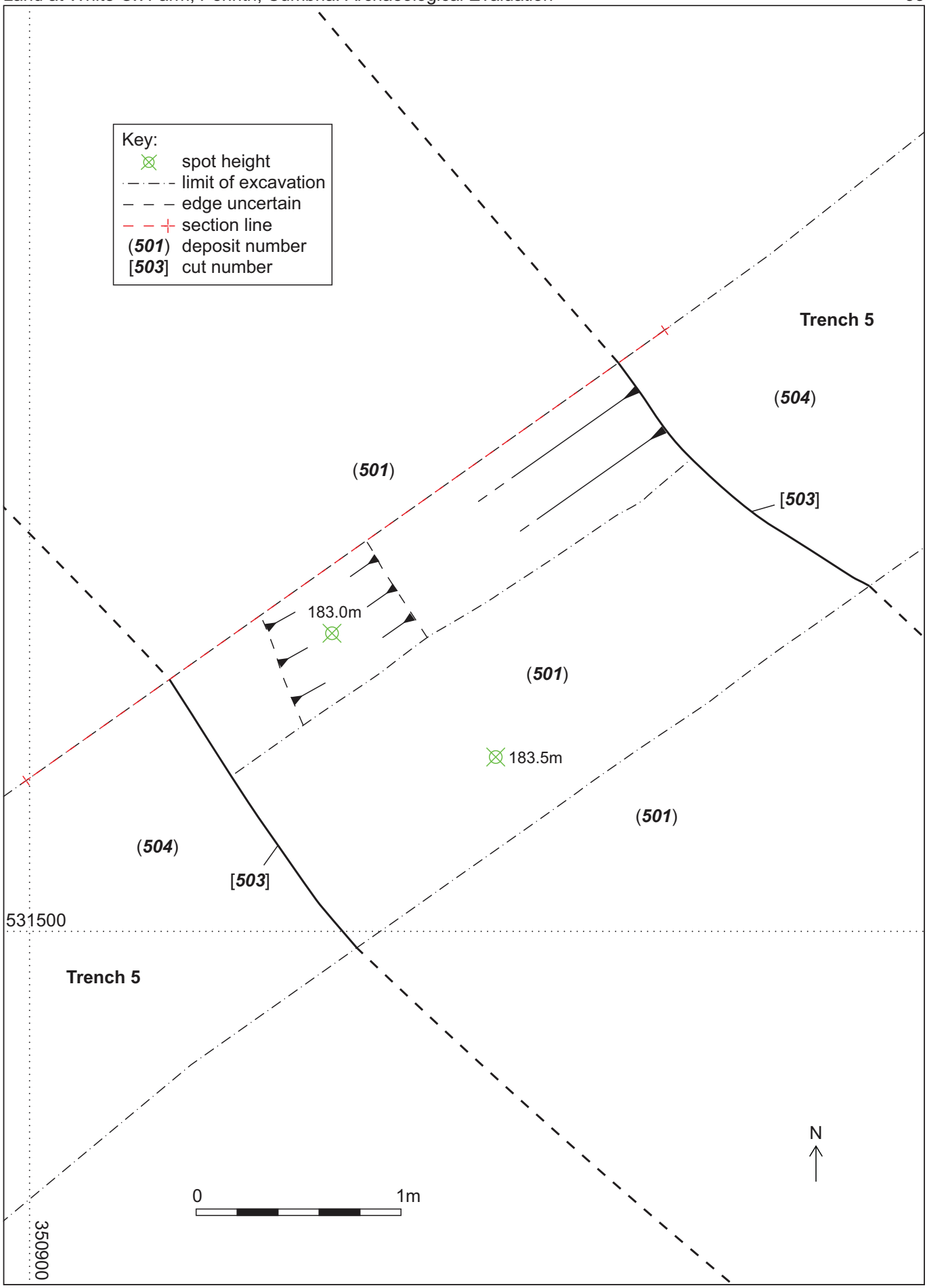


Figure 7: Plan of *403*

Client: Atkinson Building Contractors Ltd



Client: Atkinson Building Contractors Ltd

Figure 8: Plan of *503*

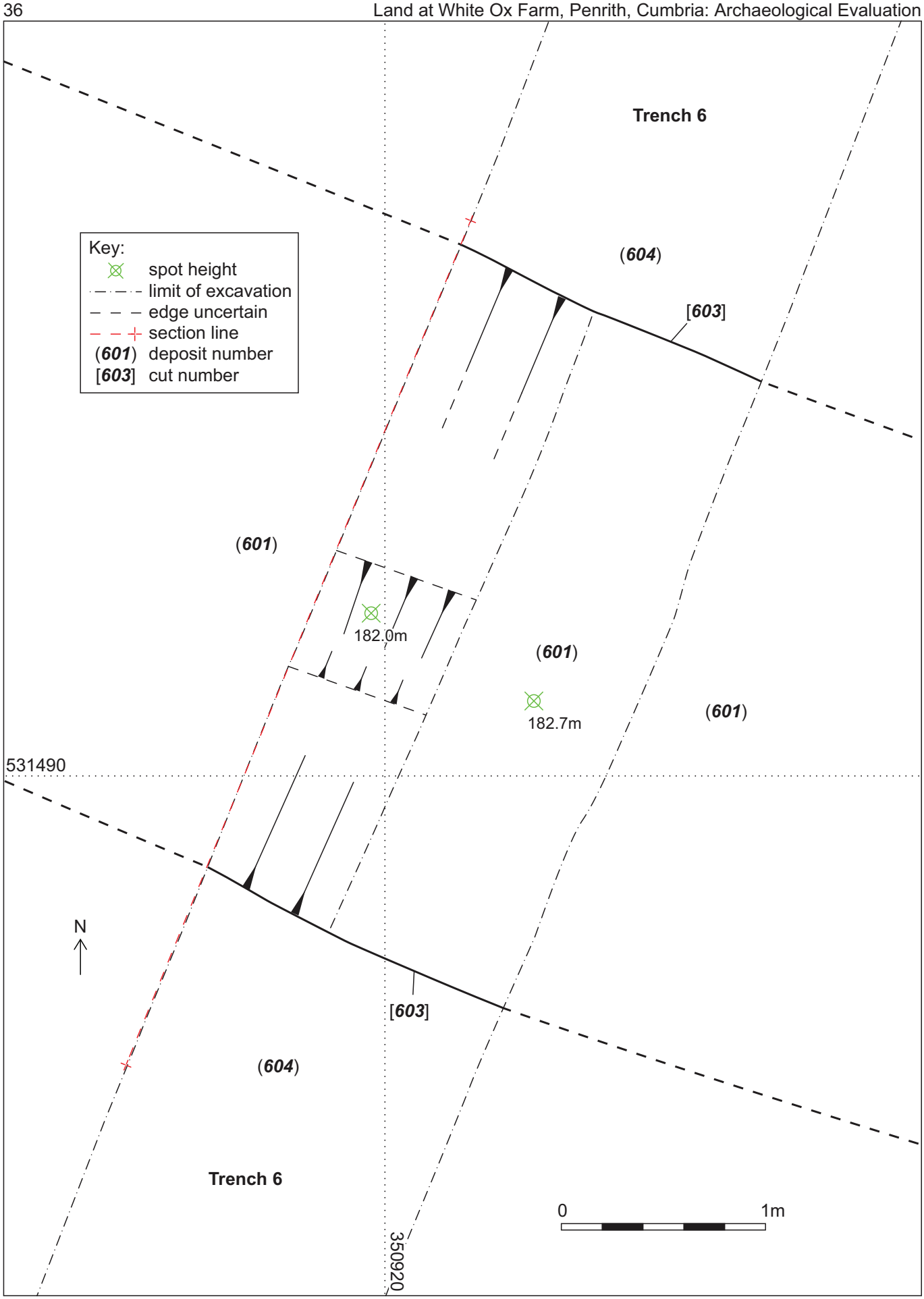


Figure 9: Plan of *603*

Client: Atkinson Building Contractors Ltd

4.9 Finds

4.9.1 ***Introduction***: in total, 29 finds were recovered by hand during the evaluation, all of which are of probable or definite post-medieval date and recovered from topsoil deposits. A full list of the finds is presented in *Appendix 3* with a discussion below.

4.9.2 ***Pottery***: the vast majority of the finds recovered, 23 fragments in total, comprised post-medieval pottery, which was recovered from the topsoil in every trench except Trench 2. These included utilitarian wares such as brown- and black-glazed red earthenwares (for kitchenware such as crocks), which can be broadly dated to the late 17th to early 20th century, and brown-glazed grey-bodied stoneware dated to the 19th to early 20th century. The finewares included white earthenware fragments (some with transfer-printed patterns – Broseley, Willow, and Marble), and other factory produced wares including glazed buff-bodied earthenware and bone china tea wares. All of these types are very common for the area and the period, and most likely represent waste from domestic settings, either deposited accidently or as nightsoil.

4.9.3 ***Glass***: four fragments of glass were recovered, all from bottles from the topsoil across the site, dating to the 19th and 20th centuries.

4.9.4 ***Metal***: two items of iron were recovered from topsoil contexts ***700*** and ***800***. Both were very corroded and approximately rectangular in section and most probably formed parts of large nails, although without x-ray and further conservation it is impossible to be sure. Dating is difficult, as square or rectangular nails were made from at least the Roman period onwards, but these are most likely to be post-medieval in date.

4.10 Environmental Samples

4.10.1 ***Introduction*** 12 bulk sediment samples were recovered from suitable contexts during the evaluation. The aims of the assessment were to assess the presence, preservation and abundance of any environmental remains and to determine the potential of the material for indicating the character and significance of the deposit. The results of the assessment are presented in *Appendix 4* and *Appendix 5*.

4.10.2 ***Retents***: a small amount of material was recovered from the retents, primarily carbonised organic material, mostly evidently wood. In addition, uncharred material in the form of insect egg casings was recovered from five samples, and very small pieces of bone, probably burnt, from four samples (Samples 4, 5, 7 and 8 – contexts ***101***, ***601***, ***201*** and ***202***). Other finds included a single nodule of unworked cream coloured flint from Sample 9 (context ***204***), possible prill from Sample 12 (context ***206***), and what appear to be small pieces of glass from Sample 7 (context ***201***).

4.10.3 ***Flots***: charcoal was evident in all of the flots, with the exception of that from Sample 8 (***202***; although a small amount of charcoal was recovered from the retent from this sample). The majority of it comprised wood charcoal derived from oak, although rose, hazel, and ash were also present in smaller quantities. A full assessment is presented in *Appendix 6*.

5. Discussion

5.1 Results

5.1.1 The evaluation revealed features of archaeological interest in five of the eight trenches: Trenches 1 and 2 and 4-6. Trenches 3, 7, and 8 did not contain any features of archaeological interest and it is likely that any anomalies in these areas identified in the geophysical survey were the result of variations in the local geology. Specific discussion of the different features is presented in the following sections. No finds were uncovered from any of these features, with the exception of some possible dressed stone from context ***501***; the only finds from the entire evaluation comprised material from the topsoil (see *Section 4.9* above), all of which were of probable or definite post-medieval date. These almost certainly derived primarily from rubbish disposal as part of nightsoiling and midden collection, and represent fairly typical vessels and items dating to the 17th to 20th century found in the area.

5.1.2 ***Trench 1***: the linear feature [***102***] in Trench 1 was not dated and was very shallow, suggesting it was produced through a relatively non-invasive process. Its orientation, running toward the farm buildings to the north, perhaps suggests that it formed a rough track, although it was not metalled and so was arguably more of a hollow way, albeit very narrow. It is not deep enough to have formed an effective field boundary or land division and does not correspond to anything shown on the early maps.

5.1.3 ***Trench 2***: the group of small pits or post holes [***203***, ***205***, ***208*** and ***210***] are also undated, but it seems reasonable to suppose that they form the remains of a structure of uncertain form and size. None were particularly deep and only ***208*** contained any obvious remains relating to a timber post, which had apparently been burnt *in situ*. The overlying deposit of material (***201***) seems likely to represent an associated demolition layer, given the quantities of charcoal present within it, or even an occupation horizon; two small fragments of glass were recovered from the sample taken from this and while difficult to date they do perhaps support the idea that this resulted from occupation although they could easily have been intrusive and are not easy to date in themselves. A small amount of possible prill was also recovered from the sample taken from post hole [***208***], which is indicative of iron smithing being carried out nearby; however, this is again difficult to date, could be intrusive, and is of relatively low significance in such small quantities. Small amounts of bone were also recovered from samples taken from features in Trench 2, and also from the fill of the linear feature [***102***] in Trench 1, again potentially suggesting this was an area of occupation, and certainly contrasting with the samples taken in Trenches 4-6.

5.1.4 ***Trenches 4-6***: it is evident that the substantial ditch found running across Trenches 4-6 corresponds with the crop mark visible in recent aerial photographs and the anomaly found during the geophysical survey. Again, no finds were recovered that would enable it to be dated, although it is apparent that it saw two phases of infilling; the first filling the narrower v-shaped slot at the base (***402***, ***502*** and ***602***) and the second filling the wider top part of the feature (***401***, ***501*** and ***601***). The homogenous nature of the later fill and presence of dumped stone (apparently broken up from larger pieces) in one of these deposits (***501***) perhaps suggests that this was a deliberate act of rapid infilling intended to entirely obliterate the ditch. Although it is impossible to date in itself the dressed stone potentially suggests that this was done at quite a late date, perhaps even in the post-medieval period, although fine dressing of this type was achievable from at least the Roman period onwards. Material recovered from the environmental samples comprised largely wood charcoal, predominately oak, and again demonstrates human activity in the immediate vicinity.

5.2 Conclusion

5.2.1 The evaluation revealed several features of archaeological significance, some of which clearly form part of a substantial ditch feature that was revealed in aerial photographs and the earlier geophysical survey. While the absence of any finds makes all of the features encountered impossible to date in themselves, the form in section of the ditch revealed in Trenches 4-6 is suggestive of a late prehistoric or Romano-British date, based on comparisons with other excavated examples (eg Blake 1959; Higham 1981; 1983; Bewley 1986; 1998; Kirby 2010). The lack of finds would certainly suggest a pre-Roman Iron Age date; such sites are notorious for being aceramic and generally lacking in artefacts in the region (Hodgson and Brennand 2006, 51). The overall form of the ditch, even taking into account

the wider cropmarks, is difficult to interpret, although it could be similar to so called 'banjo' enclosures. An example of one site of this type was excavated at Ewanrigg in Cumbria and found to have evidence for use from the Bronze Age into the 4th century AD (Bewley 1992). It is possible that the group of pits/post holes represent structural remains within a larger enclosed area, such as a hut or other building, although their function remains unknown at this stage and the size of the pits/post holes would suggest it was something relatively small.

5.2.2 It is apparent that the ditch revealed in Trenches 4-6 extends both to the north and south, beyond the boundary of the current development site. While further archaeological investigation of the ditch might arguably be of limited usefulness given that three sections have been cut through it and no dateable finds were recovered, there is some uncertainty in the cropmark and geophysical survey evidence as to whether the north end terminates within the same field or whether it continues towards the buildings. Some further investigation of this line north of Trench 4 might therefore be considered useful. In addition, scientific dating of the ditch should be carried out through the radiocarbon dating of suitable material recovered from the samples. In the area around Trench 2 there is clearly the potential for more archaeological remains to be present and further archaeological investigation in this area would be worthwhile in order to attempt to reveal the extent of the structural remains discovered during the evaluation. Again, assuming that no finds suitable for dating are recovered during any further investigation, radiocarbon dating of material recovered from samples should also be undertaken.

6. Bibliography

6.1 Primary and Cartographic Sources

CAC(C) DRC/8/150, 1849 *Plan of the Parish of Penrith in the County of Cumberland*

CAC(C) DRC/8/150, 1843 *Apportionment of the Rent Charge in Lieu of Tithes in the Parish of Penrith in the County of Cumberland*

CAC(C) ST/3/63, early 19th century *Tracing of the Road from the White Ox Northwards*

Ordnance Survey, 1864 *Cumberland Sheet* **XLIX.16**, 1:2,500, surveyed in 1860

Ordnance Survey, *c*1864 *Cumberland Sheet* **LVIII.4**, 1:2,500, surveyed in 1860

Ordnance Survey, 1900a *Cumberland Sheet* **XLIX.16**, 1:2,500, surveyed in 1860, revised in 1898

Ordnance Survey, 1900b *Cumberland Sheet* **LVIII.4**, 1:2,500, surveyed in 1860, revised in 1898

Ordnance Survey, 1925a *Cumberland Sheet* **XLIX.16**, 1:2,500, surveyed in 1860, revised in 1923

Ordnance Survey, 1925b *Cumberland Sheet* **LVIII.4**, 1:2,500, surveyed in 1860, revised in 1923

Ordnance Survey, 2002 *The English Lakes: North-eastern area, Penrith, Patterdale and Caldbeck*, **OL5**, 1:25,000

6.2 Secondary Sources

Armstrong, AM, Mawer, A, Stenton, FM, and Dickins, B, 1950 *The Place-Names of Cumberland: Part I – Eskdale, Cumberland and Leath Wards*, English Place-Name Soc, **20**, Cambridge

Bewley, RH, 1986 Survey and Excavation in the Solway Plain, Cumbria (1982-4), *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2nd ser, **86**, 19-40

Bewley, RH, 1992 Excavations of Two Crop-Mark Sites in the Solway Plain, Cumbria. Ewanrigg Settlement and Swarthy Hill 1986-1988, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2nd ser, **92**, 1-6

Bewley, RH, 1998 Survey and Excavation of a Cropmark Enclosure at Edderside, Cumbria 1989-1990, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2nd ser, **98**, 107-117

Blake, B, 1959 Excavations of Native (Iron Age) Sites in Cumberland, 1956-58, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2nd ser, **59**, 1-14

Breeze, A, 2012 The Names of Rheged, *Trans Dumfries Galloway Nat Hist Antiq Soc*, **86**, 51-62

Breeze, DJ (ed), 2018 *The Crosby Garrett Helmet*, CWAAS extra ser **48**, Kendal

Breeze, DJ, and Bishop, MC, 2013 *The Crosby Garrett Helmet*, Pewsey

Chartered Institute for Archaeologists (CIfA), 2020a *Standards and Guidance for Archaeological Field Evaluation*, revised edn, Reading

CIfA, 2014b *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives*, revised edn, Reading

Cherry, PJ, and Cherry, J, 2002 Coastline and Upland in Cumbrian Prehistory, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 3rd ser, **2**, 1-19

Clark, P, 2010 Excavations at Stainton, Carlisle, Ahead of the Carlisle Northern Development Route, *CWAAS Newsletter*, **64**, 4-5

Clarke, J, Watson, A, Dickson, A, and Hamilton-Gibney, A, 2008 *Fieldwalking in the Vale of Eden*, interim report **01**, Penrith

Clarkson, T, 2010 *The Men of the North: The Britons of Southern Scotland*, Edinburgh

Cool, HEM, 2004 *The Roman cemetery at Brougham, Cumbria: Excavations 1966-67*, Britannia Monograph 21, London

Countryside Commission, 1998 *Countryside Character, Volume 2: North West*, Cheltenham

Cumbria County Council (CCC) and English Heritage (EH), *c*2002 *Extensive Urban Survey, Archaeological Assessment Report: Penrith*, unpubl rep

Edwards, BJN, 1998 *Vikings in North West England: The Artifacts*, Lancaster

Elsworth, DW, 2018 The Extent of Strathclyde in Cumbria: Boundaries and Bought Land, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 3rd ser, **18**, 87-104

Google, 2019 *Google Maps*, https://www.google.com/maps/@54.6763255,-2.7630738,359m/data=!3m1!1e3

Greenlane Archaeology, 2019 *Land at White Ox Farm, Penrith, Cumbria: Archaeological Desk-Based Assessment and Geophysical Survey*, unpubl rep

Hather, JG, 2000 *The Identification of the Northern European Woods: A Guide for Archaeologists and Conservators*, London

Heawood, R, and Howard-Davis, C, 2002 Two Early Medieval Settlement Sites in Eastern Cumbria?, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 3rd ser, **3**, 145-169

Higham, NJ, 1981 Two Enclosures at Dobcross Hall, Dalston, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2nd ser, **81**, 1-6

Higham, NJ, 1983 A Romano-British Farm Site and Field System at Yanwath Wood, near Penrith, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2nd ser, **83**, 49-58

Higham, NJ, 1986 *The Northern Counties to AD 1000*, London

Higham, NJ, and Jones, GBD, 1975 Frontiers, Forts and Farmers, Cumbrian Aerial Survey 1974-75, *Archaeol J*, **132**, 16-53

Higham, NJ, and Jones, GBD, 1991 *The Carvetii*, 2nd edn, Stroud

Hodgson, TH, 1895 Bone Spear or Harpoon Heads from Terra del Fuego, Found on Peat Near Crosby-on-Eden, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 1st ser, **13**, 402

Hodgson, J, and Brennand, M, 2006 Prehistoric Period Resource Assessment, in M Brennand (ed), *The Archaeology of North West England – An Archaeological Resource Framework for North West England Volume 1: Resource Assessment*, Archaeology North West, **8**, 23-58

Hodgkinson, D, Huckerby, E, Middleton, RH, and Wells, CE, 2000 *The Lowland Wetlands of Cumbria*, North West Wetlands Survey, Lancaster Imprints **8**, Lancaster

Huddleston, F, 1930 Penrith Castle, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2nd ser, **30**, 13-26

Jackson, D, 2019 Archaeological Investigation of a Roman Road at Fairhill, Penrith, Cumbria, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 3rd ser, **19**, 79-96

Kirkby, DP, 1962 Strathclyde and Cumbria: A Survey of Historical Development to 1092, *Trans Cumberland and Westmorland Antiq and Archaeol Soc*, n ser, **62**, 77-94

Kirby, M, 2010 Excavation of a Roman Ditched Enclosure and Field System Adjacent to Vallum House Hotel, Burgh Road, Carlisle, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 3rd ser, **10**, 103-118

McCarthy, M, Montgomery, J, Lerwick, C, and Buckberry, J, 2015 Were There Viking's in Carlisle?, in SE Harding, D Griffiths, and E Royles, *In Search of Viking's: Interdisciplinary Approaches to the Scandinavian Heritage of North-West England*, London, 137-148

McCarthy, M, and Paterson, C, 2015 A Viking Site at Workington, Cumbria: Interim Statement, in SE Harding, D Griffiths, and E Royles, *In Search of Viking's: Interdisciplinary Approaches to the Scandinavian Heritage of North-West England*, London, 127-136

Middleton, R, Wells, CE, and Huckerby, E, 1995 *The Wetlands of North Lancashire*, North West Wetlands Survey **3**, Lancaster Imprints **4**, Lancaster

Moseley, F (ed), 1978 *The Geology of the Lake District*, Yorkshire Geological Society, occ publ **3**, Leeds

Newman, R, Hair, NJ, Howard-Davies, CLE, Brooks, C, and White, A, 2000, Excavations at Penrith Market 1990, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2nd ser, **100**, 105-131

Nicholson, J, and Burn, R, 1777 *The History and Antiquities of the Counties of Westmorland and Cumberland*, London

Paterson, C, Parsons, AJ, Newman, RM, Johnson, N, and Howard-Davies, C, 2014 *Shadows in the Sand: Excavation of a Viking Age Cemetery at Cumwhitton*, Lancaster Imprints **22**, Lancaster

Pearsall, WH, and Pennington, W, 1989 *The Lake District*, London

Philpott, R, 2006 The Romano-British Period Resource Assessment, in M Brennand (ed), *The Archaeology of North West England – An Archaeological Resource Framework for North West England Volume 1: Resource Assessment*, Archaeology North West, **8**, 59-90

Richardson, A, and Allan, TM, 1990 The Roman road over the Kirkstone Pass: Ambleside to Old Penrith, *Trans Cumberland Westmorland Antiq Archaeol Soc*, 2nd ser, **90**, 105-125

Salter, M, 1998 *The Old Parish Churches of Cumbria*, Malvern

Schweingruber, FH, 1982 *Microscopic Wood Anatomy*, 2nd ed, Zurich

Shotter, D, 2004 *Romans and Britons in North-West England*, Lancaster

Smith, I, Wilkinson, DM, O'Regan, HJ, 2013 New Lateglacial Fauna and Early Mesolithic Human Remains from Northern England, *J Quaternary Science*, **28:6**, 542-544

Stace, C, 2010 The New Flora of the British Isles, 3rd ed, Cambridge

WAA, 2016 *Land at Salkeld Road, Penrith, Cumbria: Archaeological Evaluation Report*, unpubl rep

WAA, 2017 *Land at Fairhill, Penrith, Cumbria: Post-Excavation Assessment Report*, unpubl rep

Winchester, AJL, 1987 *Landscape and Society in Medieval Cumbria*, Edinburgh

Winchester, AJL (ed), 2016 *Cumbria: An Historical Gazetteer*, Lancaster

Young, R, 2002 The Palaeolithic and Mesolithic Periods in Northern England: An Overview, in Brooks, C, Daniels, R, and Harding, A, (ed), *Past, Present and Future: The Archaeology of Northern England*, Architect Archaeol Soc Durham Northumberland, res rep **5**, 19-36

Zant, J, 2015 *Penrith: The Historic Core*, CWAAS CARR **6**, Bowness-on-Windermere

Appendix 1: Project Design

Archaeological Evaluation Cover Sheet and Project Design

The Site	
Site Name	Land at White Ox Farm, Penrith
County	Cumbria
NGR	350892 531511 (centre)

Client	
Client Name	Atkinson Building Contractors Ltd

Planning	
Pre-planning?	No
Planning Application No.	16/1029
Condition number	-
Local Planning Authority	Eden District Council
Planning Archaeologist	Jeremy Parsons, Historic Environment Officer, Cumbria County Council

Archaeological work	
Desk-based assessment done as previous phase of work?	Yes, and geophysical survey
Approximate number and dimensions of trenches proposed	Eight trenches, each 20m long

Archiving	
Relevant Record Office(s)/Archive Centre(s)	Carlisle
Relevant HER	Cumbria
Relevant Museum	Penrith and Eden Museum/Tullie House

1. Introduction

1.1 Project Cover Sheet

1.1.1 All the details specific to this project are set out on the cover sheet of this project design. The project design itself covers all elements that are involved in archaeological evaluation.

1.2 Greenlane Archaeology

1.2.1 Greenlane Archaeology is a private limited company based in Ulverston, Cumbria, and was established in 2005 (Company No. 05580819). Its directors, Jo Dawson and Daniel Elsworth, have worked continuously in commercial archaeology since 2000 and 1999 respectively, principally in the north of England and Scotland. Greenlane Archaeology is committed to a high standard of work, and abides by the Chartered Institute for Archaeologists' (CIfA) Code of Conduct. The various elements of the project will be carried out according to the Standards and Guidance of the Chartered Institute for Archaeologists (CIfA 2014a-c).

1.3 Staff

1.3.1 ***Dan Elsworth (MA (Hons)), ACIfA)*** graduated from the University of Edinburgh in 1998 with an honours degree in Archaeology, and began working for the Lancaster University Archaeological Unit, which became Oxford Archaeology North (OA North) in 2001. Daniel ultimately became a project officer, and for over six and a half years worked on excavations and surveys, building investigations, desk-based assessments, and conservation and management plans. These have principally taken place in the North West, and Daniel has a particular interest in the archaeology of the area. He has managed many recent projects in Cumbria and Lancashire including several archaeological evaluations.

1.3.2 ***Tom Mace (BA (Hons), MA, MIfA)*** has extensive experience of working on a variety of archaeological projects, especially watching briefs, but also excavations, evaluations, and building recordings, as well as report writing and illustration production. He joined Greenlane Archaeology in 2008 having worked for several previous companies including Archaeological Solutions and Oxford Archaeology North. He currently works on a broad range of projects and is also responsible for the production of all illustrations for reports and publications as well as some post-excavation assessments. He is a Member of the Chartered Institute for Archaeologists.

1.3.3 ***Jo Dawson (MA (Hons), ACIfA)*** graduated from University of Glasgow in 2000 with a joint honours degree in Archaeology and Mathematics, and since then has worked continuously in commercial archaeology. Her professional career started at Glasgow University Archaeological Research Division (GUARD), following which she worked for Headland Archaeology, in Edinburgh, and then Oxford Archaeology North, in Lancaster. During this time she has been involved in a range of different archaeological projects. She has extensive experience of both planning and pre-planning projects, and has undertaken assessments of all sizes. Since establishing Greenlane Archaeology in 2005 she has managed numerous projects in south Cumbria, including desk-based assessments and evaluations. She currently mainly carries out quality control of reports and post-excavation assessments. She is an Associate member of the Chartered Institute for Archaeologists.

1.3.4 ***Specialists***: Greenlane Archaeology have a range of outside specialists who are regularly engaged for finds and environmental work. Engagement is dependent upon availability, but specialists typically engaged are as follows:

Specialism	**Specialist**
Animal bone	Naomi Sewpaul
Ceramic building material, medieval and Roman	Phil Mills
Conservation	York Archaeological Trust
Clay tobacco pipe	Peter Davey (or Tom Mace in house for smaller assemblages)
Flots	Headland Archaeology, Edinburgh
Human bone	Malin Holst
Industrial residue	Gerry McDonnell
Medieval pottery	Chris Cumberpatch for assemblages from the North East of England
Miscellaneous find types, for example Roman glass and medieval and earlier metalwork	Chris Howard-Davis
Prehistoric pottery	Blaise Vyner
Radiocarbon dates	Scottish Universities Environmental Research Centre
Roman pottery	Ruth Leary
Samian	Gwladys Monteil
X-ray of metal finds	York Archaeological Trust

2. Objectives

2.1 Rapid Desk-Based Assessment

2.1.1 To examine early maps of the site and any other relevant primary and secondary sources in order to better understand the site, and set it in its historic context.

2.2 Archaeological Evaluation

2.2.1 To excavate evaluation trenches as specified in the project design cover sheet, in order to identify the presence of any archaeological deposits, features, and structures on the site and establish their form, function, and date where possible.

2.3 Report

2.3.1 To produce a report detailing the results of the evaluation, which will outline the form and date of any archaeological features encountered.

2.4 Archive

2.4.1 Produce a full archive of the results of the project.

3. Methodology

3.1 Rapid Desk-Based Assessment

3.1.1 Where an archaeological desk-based assessment has not already been carried out in a previous phase of work, a rapid examination of easily available sources, particularly maps, relating to the site will be carried out. The sources that will be used as part of the desk-based assessment will include:

- ***Record Office/Archive Centre***: the majority of original and secondary sources relating to the site are deposited in the relevant Record Office(s) or Archive Centre(s), as specified in the cover sheet of this project design. Of principal importance are early maps of the site, particularly Ordnance Survey maps but also the Tithe Map, but other relevant primary sources such as the census, taxation records, parish registers, wills, deeds and other documents will also be consulted. In addition relevant secondary sources will also be consulted and all of this information will be utilised to better understand the historical and archaeological development of the site and set it in context;
- ***Historic Environment Record***: this is a list of all of the recorded sites of archaeological interest recorded in the county, and is the primary source of information for a study of this kind. Each site is recorded with any relevant references, a brief description and location related to the National Grid. The HER will be consulted and relevant information relating to any sites in close proximity to or within the proposed development area. In addition, relevant secondary sources, particularly previous archaeological investigations in the immediate area and aerial photographs, will also be examined;
- ***Online Resources***: where available, mapping such as Ordnance Survey maps and tithe maps will be consulted online;
- ***Greenlane Archaeology***: a number of copies of maps and local histories are held by Greenlane Archaeology. These will be consulted in order to provide information about the site.

3.2 Archaeological Evaluation

3.2.1 The anticipated number and dimensions of evaluation trenches are set out on the cover sheet of this project design. The evaluation methodology, which is based on Greenlane Archaeology's excavation manual (Greenlane Archaeology 2007), will be as follows:

- The trenches will be excavated with regard to the position of any known constraints, focussing on the areas of high archaeological interest or potential, and avoiding areas which are likely to have been severely damaged or truncated by later activity, unless they are considered to have a high potential;
- The overburden, which is unlikely to be of any archaeological significance, will be removed by machine under the supervision of an archaeologist until the first deposit beneath it is reached;

- All deposits below the overburden will be examined by hand in a stratigraphic manner, using shovels, mattocks, or trowels as appropriate for the scale. Deposits will only be sampled, rather than completely removed, below the first identified level of archaeological interest, unless specified by the Planning Archaeologist (see cover sheet), with the intension of preserving as much *in situ* as possible;
- The position of any features, such as ditches, pits, or walls, will be recorded and where necessary these will be investigated in order to establish their full extent, date, and relationship to any other features. Negative features such as ditches or pits will be examined by sample excavation, typically half of a pit or similar feature and approximately 10% of a linear feature;
- All recording of features will include hand-drawn plans and sections, typically at a scale of 1:20 and 1:10, respectively, and photographs in photographs in colour digital format (both RAW files and JPEG format at at least 12meg resolution) will be taken;
- All deposits, trenches, drawings and photographs will be recorded on Greenlane Archaeology *pro forma* record sheets;
- All finds will be recovered during the evaluation for further assessment as far as is practically and safely possible. Should significant quantities of finds be encountered an appropriate sampling strategy will be devised;
- All faunal remains will also be recovered by hand during the evaluation, but where it is considered likely that there is potential for the bones of fish or small mammals to be present appropriate volumes of samples will be taken for sieving;
- Deposits that are considered likely to have, for example, preserved environmental remains, industrial residues, and/or material suitable for scientific dating will be sampled. Bulk samples of between 20 and 60 litres in volume (or 100% of smaller features), depending on the size and potential of the deposit, will be collected from stratified undisturbed deposits and will particularly target negative features (e.g. gullies, pits and ditches) and occupation deposits such as hearths and floors. An assessment of the environmental potential of the site will be undertaken through the examination of samples of suitable deposits by specialist sub-contractors (see *Section 1.3.4* above), who will examine the potential for further analysis. All samples will be processed using methods appropriate to the preservation conditions and the remains present;
- Any human remains discovered during the evaluation will be left *in situ*, and, if possible, covered. The Planning Archaeologist will be immediately informed as will the local coroner. Should it be considered necessary to remove the remains this will be carried out under the guidance of the local coroner, and a licence obtained from the Ministry of Justice, under Section 25 of the Burial Act of 1857;
- Any objects defined as 'treasure' by the Treasure Act of 1996 (HMSO 1996) will be immediately reported to the local coroner and securely stored off-site, or covered and protected on site if immediate removal is not possible;
- The evaluation trenches will be backfilled following excavation although it is not envisaged that any further reinstatement to its original condition will be carried out.

3.2.2 Should any significant archaeological deposits be encountered during the evaluation these will immediately be brought to the attention of the Planning Archaeologist so that the need for further work can be confirmed. Any additional work will be carried out following discussion with the Planning Archaeologist and subject to a new project design, and the ensuing costs will be agreed with the client.

3.3 Report

3.3.2 The results of the evaluation will be compiled into a report, which will provide a summary and details of any sources consulted. It will include the following sections:

- A front cover including the appropriate national grid reference (NGR);
- A concise non-technical summary of results, including the date the project was undertaken and by whom;
- Acknowledgements;
- Project Background;
- Methodology, including a description of the work undertaken;
- Results of the rapid desk-based assessment;

- Results of the evaluation, including finds and samples;
- Discussion of the results including phasing information;
- Bibliography;
- Illustrations at appropriate scales including:

  - a site location plan related to the national grid;

  - a plan showing the location of the evaluation trenches in relation to nearby structures and the local landscape,;

  - plans and sections of any features discovered during the evaluation;

  - photographs of any features encountered during the evaluation and general shots of the evaluation trenches;

  - extracts from historic mapping.

3.4 Archive

3.4.1 The archive, comprising the drawn, written, and photographic record of the evaluation trenches, formed during the project, will be stored by Greenlane Archaeology until it is completed. Upon completion it will be deposited with the relevant Record Office or Archive Centre, as detailed on the cover sheet of this project design, together with a copy of the report. The archive will be compiled according to the standards and guidelines of the CIfA (CIfA 2014c). In addition details will be submitted to the Online AccesS to the Index of archaeological investigationS (OASIS) scheme. This is an internet-based project intended to improve the flow of information between contractors, local authority heritage managers and the general public.

3.4.2 A paper and digital copy of the report will be provided to the client and a digital copy of the report will be provided to the relevant Historic Environment Record, as detailed on the cover sheet of this project design.

3.4.3 The client will be encouraged to transfer ownership of the finds to a suitable museum. Any finds recovered during the evaluation will be offered to an appropriate museum (see cover sheet). If no suitable repository can be found the finds may have to be discarded, and in this case as full a record as possible would be made of them beforehand.

4. Work timetable

4.1 Greenlane Archaeology will be available to commence the project on the date specified on the Order Form, or at another date convenient to the client. It is envisaged that the elements of the project will carried out in the following order:

- ***Task 1***: rapid desk-based assessment (where this has not already been carried out as a previous phase of archaeological work);
- ***Task 2***: archaeological evaluation;
- ***Task 3***: processing and assessment of finds and samples;
- ***Task 4***: production of draft report including illustrations;
- ***Task 5***: feedback on draft report, editing and production of final report;
- ***Task 6***: finalisation and deposition of archive.

5. Other matters

5.1 Access and clearance

5.1.1 Access to the site will be organised through co-ordination with the client and/or their agent(s).

5.2 Health and Safety

5.2.1 Greenlane Archaeology carries out risk assessments for all of its projects and abides by its internal health and safety policy and relevant legislation. Health and safety is always the foremost consideration in any decision-making process.

5.3 Insurance

5.3.1 Greenlane Archaeology has professional indemnity insurance to the value of **£1,000,000**. Details of this can be supplied if requested.

5.4 Environmental and Ethical Policy

5.4.1 Greenlane Archaeology has a strong commitment to environmentally and ethically sound working practices. Its office is supplied with 100% renewable energy by Good Energy, uses ethical telephone and internet services supplied by the Phone Co-op. In addition, the company uses the services of The Co-operative Bank for ethical banking, Naturesave for environmentally-conscious insurance, and utilises public transport wherever possible. Greenlane Archaeology is also committed to using local businesses for services and materials, thus benefiting the local economy, reducing unnecessary transportation, and improving the sustainability of small and rural businesses.

6. Bibliography

Chartered Institute for Archaeologists (CIfA), 2014a *Standard and guidance for historic environment desk-based assessment*, revised edn, Reading

CIfA, 2014b *Standards and Guidance for Archaeological Field Evaluation*, revised edn, Reading

CIfA, 2014c *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives*, revised edn, Reading

HMSO, 1996 *Treasure Act*, http://www.opsi.gov.uk/acts/acts1996/1996024.htm

Appendix 2: Summary Context List

Context	Type	Description	Interpretation
100	Deposit	Mid brownish-grey soft sandy silt, 0.2m – 0.3m thick, 5% rounded gravel	Topsoil
101	Deposit	Mid brownish orange soft sand, no more than 0.1m thick, 5% rounded gravel	Fill of linear ***102***
102	Cut	Linear, approximately north/south orientation, 1.8m wide and up to 0.1m deep with a flattish u-shaped profile	Cut of linear feature
103	Deposit	Mid pinkish-orange loose sandy clay, 80% angular red sandstone cobble and some more rounded volcanics	Natural
200	Deposit	Mid brownish-grey soft sandy silt, 0.2m-0.3m thick, 5% rounded gravel	Topsoil
201	Deposit	Mid brownish-orange sandy silt, less than 0.1m thick, 1% rounded gravel, covering area of approximately 2m diameter	Deposit spread over pits
202	Deposit	Mid brownish-grey soft sandy silt, 0.15m by 0.18m diameter and 0.04m thick	Fill of pit ***203***
203	Cut	Oval, orientated north-west/south-east, 0.15m by 0.18m and 0.04m deep, with shallow sloping sides and a rounded base	Small pit
204	Deposit	Dark greyish brown soft sandy silt, 0.2m by 0.3m and 0.12m deep	Fill of pit ***205***
205	Cut	Oval, orientated north-west/south-east, 0.2m by 0.3m and 0.12m deep with irregular sides at approximately 45º and an irregularly rounded base	Small pit
206	Deposit	Dark greyish brown/black, soft sandy silt with 80% charcoal, 0.1m diameter and 0.15m deep	Burnt end of stake/post in post hole ***208***
207	Deposit	Dark orangey brown soft sandy clay, 0.15m by 0.25m and 0.2m thick	Fill of post hole ***208***
208	Cut	Oval, orientated north-west/south-east, 0.2m by 0.3m and 0.2m deep with near vertical sides and a rounded base	Post hole
209	Deposit	Pale yellow sandy mottled with greyish brown silty sand, 0.2m by 0.3m and 0.12m deep, with 1% rounded gravel	Fill of pit ***201***
210	Cut	Oval, orientated north-east/south-west, 0.2m by 0.3m and 0.12m deep, with steep sides and a rounded base	Small pit
300	Deposit	Dark greyish-brown soft sandy silt, up to 0.2m thick 10% rounded gravel	Topsoil
301	Deposit	Dark brownish-grey firm sandy clay, 20% sub-angular gravel	Natural
400	Deposit	Dark greyish brown soft sandy silt, 0.2m-0.3m thick, few inclusions	Topsoil
401	Deposit	Mottled dark orangey brown friable sandy silt, up to 0.4m thick, less than 25% sub-angular gravel	Upper fill of ditch ***403***
402	Deposit	Mid orangey-brown friable silty sand, less than 2% sub-angular gravel	Lower fill of ditch ***403***
403	Cut	Linear, orientated approximately north/south, up to 2.2m wide and 0.7m deep, with an initially shallow u-shaped profile becoming more v-shaped at the base	Cut of ditch
404	Deposit	Varying from light orange to pink firm sand (overcut compared to other trenches)	Natural
500	Deposit	Dark brownish-grey soft silt up to 0.2m thick, 10% rounded gravel	Topsoil
501	Deposit	Dark brownish-orange loose sandy clay, 0.35m-0.4m thick, 30% rounded gravel, 2% angular red sandstone boulder, some dressed	Upper fill of ditch ***503***
502	Deposit	Mid orange loose sandy clay, 0.4m thick, 5% rounded gravel	Lower fill of ditch ***503***
503	Cut	Linear, orientated approximately north/south, 2.3m wide at the top, less than 0.6 wide at the base and approximately 0.8m deep. Initially a shallow u-shaped section becoming more v-shaped at the base	Cut of ditch
504	Deposit	Dark to mid orange firm sandy clay clay, 50% sub-angular gravel and pebbles	Natural
600	Deposit	Mid brownish-grey soft silty sand, up to 0.3m thick, 5% rounded gravel	Topsoil
601	Deposit	Mid greyish-brown friable slightly sandy silt, up to 0.62m thick, less than 2% sub-rounded gravel	Upper fill of ditch ***603***

Context	Type	Description	Interpretation
602	Deposit	Mid orangey-brown friable silty sand, up to 0.25m thick, less than 2% sub-angular gravel	Lower fill of ditch ***603***
603	Cut	Linear, orientated north-west/south-east, up to 3.3m wide at the top and over 0.8m deep. Initially a shallow u-shaped becoming more v-shaped at the base, with bedrock exposed on north-east edge	Cut of ditch
604	Deposit	Dark reddish orange loose sandy clay, 30% subangular and rounded pebbles with outcropping red sandstone bedrock exposed	Natural
700	Deposit	Dark brownish-grey soft sandy silt, 0.3m-0.4m thick, 20% rounded gravel	Topsoil
701	Deposit	Dark orange firm sandy clay, 40% angular cobble and gravel	Natural
800	Deposit	Dark brownish-grey soft sandy silt, 0.3m thick, 10% rounded cobble	Topsoil
801	Deposit	Dark brownish-orange soft sandy clay, 30% rounded cobbles	Natural

Appendix 3: Summary Finds List

Context	Type	Quantity	Description	Date range
100	Pottery	2	Pearlware hollowware base fragment and body fragment	Late 18th – early 19th century
100	Pottery	1	White earthenware blue transfer-printed Broseley pattern flatware body fragment	19th – early 20th century
100	Pottery	1	Bone china body fragment	19th – 20th century
100	Glass	1	Light blue bottle fragment	19th century
300	Pottery	1	Red earthenware flower pot (?) rim fragment, with unglazed white slip line externally	Late 18th – early 20th century
400	Pottery	1	Brown-glazed red earthenware coarseware hollowware body fragment	Late 17th – early 20th century
400	Pottery	1	Red earthenware flower pot body fragment, slightly abraded	Late 18th – 20th century
400	Pottery	1	Brown-glazed grey-bodied stoneware hollowware body fragment	18th – early 20th century
400	Pottery	1	White earthenware hollowware body fragment with blue transfer-printed pattern	19th century
400	Pottery	1	White earthenware plate base with triple footrim and smalt blue transfer-printed Willow pattern	Late 19th – early 20th century
400	Pottery	2	Refitting glazed factory-produced buff-bodied earthenware hollowware body fragments with bands of slip decoration	Late 18th – early 20th century
500	Pottery	3	White earthenware comprising plain rim fragment, blue transfer-printed hollowware body fragment, and lilac transfer-printed Marble sheet pattern (?) small fragment	19th century
600	Pottery	1	Brown-glazed red earthenware coarseware crock body fragment	Late 17th – early 20th century
600	Pottery	2	White earthenware: blue sponge-printed bowl (?) rim fragment, and blue transfer-printed Broseley pattern small fragment	19th century
700	Pottery	1	Black-glazed red earthenware coarseware hollowware body fragment	Late 17th – early 20th century
700	Pottery	3	White earthenware: blue transfer-printed chinoiserie pattern hollowware base fragment, blue transfer-printed Broseley pattern saucer rim fragment, and plain bowl rim fragment	19th century
700	Glass	1	Dark green bottle neck and lip fragment	19th – early 20th century
700	Glass	1	Very light turquoise bottle base fragment	19th – early 20th century
700	Fe	1	Corroded lump, approximately rectangular in section but with wider head, part of a large nail?	Post-medieval?
800	Pottery	1	Porcelain basket rim	18th – early 20th century
800	Glass	1	Dark green bottle body fragment	19th – 20th century
800	Fe	1	Small corroded bar, rectangular section, part of a large nail?	Post-medieval?

Appendix 4: Environmental Sample Data

Sample number	Context number	Size (litres)	Context type
1	***401***	**10**	Upper fill of ditch section ***403***
2	***402***	**10**	Lower fill of ditch section ***403***
3	***502***	**30**	Lower fill of ditch section ***503***
4	***101***	**20**	Fill of linear ***102***
5	***601***	**10**	Upper fill of ditch section ***603***
6	***602***	**20**	Lower fill of ditch section ***603***
7	***201***	**8**	Deposit over post holes/pits
8	**202**	**2**	Fill of pit ***203***
9	**204**	**6**	Fill of pit ***205***
10	***207***	**8**	Lowest fill of post-hole ***208***
11	**209**	**9**	Fill of pit ***210***
12	**206**	**3**	Burnt stake/post fill in post-hole ***208***

Table 2: Summary of samples taken

Sample number	1	2	3	4	5	6	7	8	9	10	11	12
Uncharred organic			+	+				+		+	+	
Charred organic	++	+	++	+++	+	+	+++	+++	+++	+++	+	+++
Burnt bone				+	+		+	+				
Flint									+			
Prill?												+
Glass							+					

Table 3: Contents of retents (Key: + = 1-9, ++ = 10-20, +++ = 21-50, ++++ = >51)

Appendix 5: Flot Assessment Report

EXECUTIVE SUMMARY

Wardell Armstrong LLP (WA) was commissioned by Greenlane Archaeology to undertake an assessment of the flots from the bulk samples from the site at White Ox Farm, Penrith, Cumbria.

The majority of the flots yielded oak charcoal with a few presenting hazel, ash and rose. One sample, **<8>** from fill (***202***) of pit [***203***], did not produce charcoal. No other ecofactual material was observed.

Whilst there is enough charcoal for radiocarbon determination caution should be employed due to the possible longevity of the oak in cases where other, more suitable, material is not available.

No further work is recommended on this assemblage.

ACKNOWLEDGEMENTS

Wardell Armstrong LLP (WA) would like to thank Dan Elsworth of Greenlane Archaeology for commissioning us to undertake the assessment of the flots from the bulk samples from the site at White Ox Farm, Penrith, Cumbria, and for all their assistance throughout the work.

The sorting of the flots and identifications were undertaken by Freddie Sisson. The report was authored by Lynne Gardiner and approved and edited by Frank Giecco.

FLOT ASSESSMENT

INTRODUCTION

In September 2020, Wardell Armstrong LLP (WA) was commissioned by the Client to undertake an assessment of the flots from samples taken during fieldwork at White Ox Farm, Penrith, Cumbria.

The samples were processed elsewhere and the resulting twelve flots were forwarded for assessment.

This report presents the results of that assessment.

METHODOLOGY

This report presents the results of the assessment of the environmental samples, and charcoal remains in accordance with Campbell *et al* (2011) and English Heritage (2008).

The flots were scanned using a stereo microscope (up to x45 magnification). Any non-palaeobotanical finds would be noted on the flot pro forma (Table 1).

All suitable sized fragments of charcoal (>2mm of transverse section) were selected for identification. This accounted for approximately half of the assemblages.

The charcoal was identified to species as far as possible, using Hather (2000), Schweingruber (1982) and the author's reference collection. Nomenclature for plant taxa followed Stace (2010)

The environmental assemblage has been assessed for its local, regional and national potential and for its potential to contribute to the relevant research frameworks.

RESULTS

None of the samples yielded any charred plant remains or other ecofactual material except charcoal.

Charcoal was not observed in only one sample, **<8>** from fill (***202***) of pit [***203***].

The combined greatest weight of charcoal was from posthole [***208***]. The lower fill (***207***) **<10>** yielded 12.14g whilst (***206***) **<12>** presented 10.34g.

The pits and postholes from Trench 2 collectively yielded the most charcoal.

The ditch sections (through Trenches 4, 5 and 6), especially the lower fills, yielded very little quantities of charcoal with the upper fill in [***603***] **<5>** (***601***) yielding the greatest weight. Only hazel (Corylus avellana) twigs and small branches were observed. The lower fill (***602***), **<6>**, presented only ash (Fraxinus excelsior) charcoal.

The preservation of the charcoal ranged from poor (were species was difficult to determine due to the quality of the fragments) to good (where species and other morphological data, such as tyloses, could be observed).

Most fragments were identified as oak (Quercus sp.). In Table 1 those samples that yielded only oak are shaded in blue. Very small amounts of rose (Rosaceae), hazel and ash were also present in those not shaded.

Rose was present in fill (***101***) **<4>** of linear [***102***], and also (***502***) **<3>** of lower fill of ditch [***503***].

DISCUSSION

Whilst it cannot be said with certainty it may be that the upper fills of the ditches were where the initial discard of the charcoal occurred. In Trench 6 the upper fill yielded a greater quantity than the lower fill. The presence of the charcoal in the lower fill may have been present through bioturbation.

However, this theory is not applicable to Trench 4 as the yield from both the lower and the upper are similar. It may be that the dumping of the charcoal is sporadic and not uniform.

There is also a non-uniform presence of charcoal within the pits and postholes in Trench 2. Pit [***208***], with the burnt post in situ (pers comm D. Elsworth) containing the greatest quantity of charcoal, yet there

are only minimal quantities from the closest pit [***210***]. Pit [***205***] yielded charcoal yet none was observed in pit [***203***]. These pits may, therefore, have been opened at different times.

As oak was the only species observed in greater quantities it is almost certain to have been obtainable in the vicinity. However, the presence of the charred post may suggest that it was used as a building material and may have been imported in from elsewhere.

Rose, ash and hazel will also reflect the local species available for human use.

STATEMENT OF POTENTIAL AND RECOMMENDATIONS

All the samples that yielded charcoal have material that may be suitable for radiocarbon submission. However, as most fragments were oak, caution should be employed to mitigate against the old-wood effect, whereby the returned radiocarbon dates do not reflect the archaeological date due to the possible longevity of the oak. Therefore, if possible, hazel or the rose fragments should be used in the first instance.

Due to the lack of variety of species observed, and no other ecofactual material presented, no further work is warranted on this assemblage as it would not provide any further environmental or enhance any archaeological information.

It is recommended that the charcoal and flot remains are retained until the project has been completed and is presented for archive. It is at this point that the flots and charcoal may be discarded.

BIBLIOGRAPHY

Campbell, G., Moffett, L. and Straker, V. ,2011. *Environmental Archaeology. A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation* (second edition), English Heritage, Portsmouth

English Heritage,2008. MoRPHE Project Planning Note 3 Archaeological Excavations

Hather, J.G., 2000. *The Identification of the Northern European Woods: A Guide for Archaeologists and Conservators*. Archetype, London

Schweingruber, F.H., 1982. *Microscopic Wood Anatomy* (2nd Ed), Swiss Federal Institute of Forestry Research, Zurich

Stace, C., 2010. *The New Flora of the British Isles*. 3rd edition. Cambridge University Press: Cambridge

Table 1: flot data

C	<>	Comments	Description of flot	Flot weight	Flot volume	Charcoal (g)	Charcoal Preservation	Flot discarded
401	1	500 micron	comminuted charcoal 20%: fine rootlets 30%: very fine rootlets 10%: sand 40%	63.9	50			No
		250 micron	sand 100%	12	25	0.59	Good	No
402	2	250 micron	sand 100%	29.8	25			No
		500 micron	charcoal 10%: comminuted charcoal 20%: very fine rootlets 30%: sand 40%	5.8	12	0.51	Good	No
502	3	250 micron	sand 100%	30.2	24			No
		500 micron	comminuted charcoal 10%: very fine rootlets 20%: sand 100%	5.7	15	0.08	Poor	No
101	4	250 micron	sand 100%	49.1	50			No
		500 micron	fine rootlets 100%	10.2	150	0.5	Poor	No
601	5	250 micron	sand 100%	86.5	90			No
		500 micron	charcoal 30%: comminuted charcoal 20%: sand 50%	18.7	50	4.21	Good	No
602	6	250 micron	sand 100%	47.7	50			No
		500 micron	comminuted charcoal 20%: very fine rootlets 10%: sand 70%	3.4	7	0.21	Poor	No
201	7	250 micron	**sand 100%**	40.9	40			No
		500 micron	charcoal 20%: fine rootlets 80%	14.5	150	2.6	Poor	No
202	8	250 micron	sand 100%	4.1	5			No
		500 micron	comminuted charcoal 5%: very fine rootlets 95%	1.3	10			No
204	9	250 micron	sand 100%	15.2	18			No
		500 micron	charcoal 20%: comminuted charcoal 40%: very fine rootlets 40%	19.7	100	6.04	Good	No
207	10	500 micron	sand 100%	26.8	32			No
		500 micron	charcoal 20%: fine rootlets 60%: sand 20%	48	200	12.14	Good	No
209	11	250 micron	sand 100%	8.4	10			No
		500 micron	comminuted charcoal 10%: fine rootlets 90%	3.3	25	0.14	Poor	No
206	12	250 micron	sand 100%	9.3	15			No
		500 micron	charcoal 80%: fine rootlets 10%: sand 10%	35.7	100	10.34	Good	No

Key: samples that presented oak only are shaded in blue