Archaeological excavation at land adjacent to Hanborough Station, Long Hanborough, Oxfordshire

Worcestershire Archaeology
Archive and Archaeology Service
The Hive, Sawmill Walk,
The Butts, Worcester
WR1 3PD

Status:	Revision 1 – Orion comments
Date:	27 September 2018
Author:	Richard Bradley and Elspeth Iliff
Email:	rbradley1@worcestershire.gov.uk
Contributors:	Rob Hedge, Laura Griffin, Elizabeth Pearson and Suzi Richer
Illustrator:	Carolyn Hunt
Project reference:	P5281
Report reference:	**2547**
HER reference:	TBC
Oasis id:	fieldsec1-307936

Contents

Archaeological excavation at land adjacent to Hanborough Station, Long Hanborough, Oxfordshire

Richard Bradley and Elspeth Iliff

With contributions by Rob Hedge, Laura Griffin, Elizabeth Pearson and Suzi Richer

Illustrations by Carolyn Hunt

Summary

An archaeological excavation was undertaken in February and March 2018 at land adjacent to Hanborough Station, Long Hanborough, Oxfordshire (NGR SP 443180 214180). It was commissioned by Orion Heritage Ltd on behalf of their client, Bloor Homes Western, in advance of a consented residential development.

The excavation centred on a small spread of burnt stones and charcoal that was interpreted as being part of a possible prehistoric burnt mound, which had been discovered during initial archaeological evaluation of the site. It revealed more of a burnt stone and charcoal soil layer alongside a series of cut features — pits and post/stakeholes — in the immediate surrounds, which were considered to be associated with this layer. The group of features is typical of those often encountered at a prehistoric burnt mound. As is common, the limited finds and environmental assemblage did not elucidate or validate any of the hypotheses for the use of such sites.

Of particular interest in this instance, however, a programme of scientific dating produced early Neolithic to early Bronze Age dates which suggested an unusually early and/or long-lived site perhaps not directly comparable to the conventional middle to late Bronze Age examples of burnt mounds. Flint pieces indicative of a Mesolithic or early Neolithic date and the environmental remains (which included lime wood charcoal) also lent support to the dating of the features.

Overall, the dating and character of the remains would appear to be part of a long-lived burnt mound that has origins in the earlier Neolithic, potentially being amongst the earliest examples from England as a whole. It is clearly at the earlier end of the date range for those identified in the Thames Valley (at places such as Yarnton) and across the midlands. In this regard, this site is a significant component of the prehistoric character of the region.

Report

1 Background

1.1 Reasons for the project

An archaeological excavation was undertaken at land adjacent to Hanborough Station, Long Hanborough, Oxfordshire (NGR SP 443180 214180). It was commissioned by Orion Heritage Ltd on behalf of their client, Bloor Homes Western, in advance of a residential development. Planning permission has been granted by West Oxfordshire District Council on appeal (reference 15/03797/OUT; Appeal reference APP/D3125/W/16/3148400).

The overall site comprises two adjacent fields located on the eastern side of the village of Long Hanborough. A desk-based assessment of the site was produced, and a geophysical survey was completed (Orion Heritage 2015; Archaeological Surveys Ltd 2015). The geophysical survey identified anomalies across both of the fields, some of which suggested ridge and furrow cultivation, and others were potentially indicative of pits and ditches.

Following this, an archaeological evaluation was undertaken as a first stage of mitigation, comprising a 2% sample. The evaluation identified two main phases of activity, but a large area of the site was found to be devoid of archaeological features (Iliff 2018). One phase consisted of a number of medieval to late-medieval features, found to the north-west, characterised as a period of agricultural land use. A prehistoric phase was also present, consisting of a small spread of burnt stones and charcoal that was interpreted as being part of a possible burnt mound. Subsequent radiocarbon dating of charcoal returned a date of 1880–1640cal BC (3430±30 BP; Beta-484595), adding support to the initial interpretation of the feature.

Further consultation with Hugh Coddington, the Planning Archaeologist for Oxfordshire County Council and archaeological advisor to West Oxfordshire District Council, established the requirement for an archaeological excavation to investigate and record the area of prehistoric remains prior to development works.

The project conforms to a Written Scheme of Investigation (WSI) prepared by Orion Heritage Ltd for which a Methods Statement was produced (Orion Heritage 2018; WA 2018). The project also conforms to industry guidelines and standards set out in *Standard and guidance: Archaeological excavation* (CIfA 2014a).

2 Aims and objectives

The principal aims of the archaeological excavation were to:

- determine the character, extent, date, complexity, integrity, state of preservation and quality of the archaeological remains present within a 30m by 30m excavation area, centred on evaluation Trench 18, therefore ensuring their preservation by record.

The general objectives were to ensure:

- the protection and recording of archaeological assets discovered during the archaeological works;
- that any below-ground archaeological deposits exposed were promptly identified; and
- the recording of archaeological remains, to place this record in its local and regional context and to make this record available.

3 Methods

3.1 Personnel

The project was led by Richard Bradley (BA (hons.), MA; MCIfA), who has been practicing archaeology since 2005, assisted by Jem Brewer (BA (hons.); PCIfA), Elspeth Iliff (BA (hons.);

MSc; PCIfA), Morgan Murphy (BA (hons.); MA; PCIfA), Jessica Wheeler (BA (hons.); PCIfA) and Jamie Wilkins (BA (hons.); PCIfA). The project manager responsible for the quality of the project was Robin Jackson (BA (hons.); ACIfA). The report was prepared by Richard Bradley and Elspeth Iliff.

Elizabeth Pearson (MSc; ACIfA) and Suzi Richer (BSc (hons.); MSc; PhD) contributed the environmental and radiocarbon dating report, and Rob Hedge (MA Cantab, PCIfA) and Laura Griffin (BA (hons.); PG Cert; ACIfA) the finds report.

Illustrations were prepared by Carolyn Hunt (BSc (hons.); PG Cert; MCIfA).

3.2 Documentary research

As mentioned above, an archaeological desk-based assessment (DBA) was undertaken by Orion Heritage on behalf of their client (Orion Heritage 2015). This document provides detailed research and background information on the project and, therefore, only a brief summary of this is presented below (Section 4.1).

The DBA consulted the Oxfordshire Historic Environment Record, analysing a search area of 1km radius from the boundary line of the site. This provided access to records of archaeological sites, monuments and findspots within the search area, as well as readily available archaeological and historical information from related documentary and cartographic sources. Ordnance Survey early and modern mapping and aerial photographs were also examined.

3.3 Fieldwork strategy

Fieldwork was undertaken between 26th February and 23rd March 2018, following on from the evalution trenching undertaken in late 2017 (Iliff 2018). The Worcestershire Archaeology project number is P5281.

A single excavation area of just under 900m² was centred on the prehistoric remains identified in evaluation Trench 18. The location and outline of the area is indicated in Figures 1 and 2. This was originally a regular 30m by 30m shape positioned to avoid the projected route of a live but unmapped modern water pipe first encountered during the evaluation (in Trench 10). When the excavation area was opened, however, it was discovered that the water pipe was actually located roughly 21m south-west of the projected route, crossing the south-west edge of the excavation area. As a result, the shape of the area was adjusted to avoid the identified route of the water pipe.

Deposits considered not to be significant were removed under archaeological supervision using a 360º tracked excavator, employing a toothless bucket. Subsequent excavation was undertaken by hand. Clean surfaces were inspected and selected deposits were excavated to retrieve artefactual material and environmental samples, as well as to determine their nature. Deposits were recorded according to standard Worcestershire Archaeology practice (WA 2012). To avoid any crossover with the numbering from the evaluation, features and deposits were assigned context numbers in sequence from '3000'.

On completion of excavation, the excavation area was reinstated by replacing the excavated material.

3.4 Structural analysis

All fieldwork records were checked and cross-referenced. Analysis was effected through a combination of structural, artefactual and ecofactual evidence, allied to the information derived from other sources including radiocarbon dating.

3.5 Artefact methodology, by Rob Hedge

The finds work reported here conforms with the following guidance: for finds work by CIfA (2014b), for pottery analysis by PCRG/SGRP/MPRG (2016), for archive creation by AAF (2011), and for museum deposition by SMA (1993).

3.5.1 Artefact recovery policy

The artefact recovery policy conformed to standard Worcestershire Archaeology practice (WA 2012; appendix 2).

3.5.2 Method of analysis

All hand-retrieved finds and artefacts from environmental samples were examined. They were identified, quantified and dated to period. A *terminus post quem* date was produced for each stratified context. The date was used for determining the broad date of phases defined for the site. All information was recorded on a Microsoft Access database.

Classification of worked flint follows conventions outlined in Ballin (2000), Inizan *et al* (1999), and Butler (2005); the material was catalogued according to type and dated where possible. Visible retouch, edge-damage, cortex, raw material characteristics and quality, burning, and breakage were noted.

3.5.3 Discard policy

Artefacts from topsoil and subsoil and unstratified contexts have been noted but are not normally retained, unless they are of intrinsic interest (eg worked flint or flint debitage, featured pottery sherds, and other potential 'registered artefacts'). All artefacts have been collected from the stratified excavated contexts. Discard of any finds from the post-medieval and earlier prehistoric deposits will only be instituted with reference to museum collection policy and/or with agreement of the local museum.

3.6 Environmental methodology, by Elizabeth Pearson

The environmental project conforms to guidance by CIfA (2014a; 2014b) and by English Heritage (2011).

3.6.1 Sampling policy

Sampling was undertaken according to standard Worcestershire Archaeology practice (WA 2012). A total of 12 samples (each of up to 40 litres) were taken from the site.

3.6.2 Processing and analysis

Following initial assessment, material from selected samples was processed by flotation using a Siraf tank in order to produce environmental remains for radiocarbon dating and analysis. The flots were collected on a 300mm sieve and the residue retained on a 1mm mesh. This allows for the recovery of items such as small animal bones, molluscs and seeds.

The residues were fully sorted by eye and the abundance of each category of environmental remains estimated. A magnet was also used to test for the presence of hammerscale. The flots were fully sorted using a low power MEIJI stereo light microscope and plant remains identified using modern reference collections maintained by Worcestershire Archaeology, and a seed identification manual (Cappers *et al* 2012). Nomenclature for the plant remains follows that in the *New Flora of the British Isles* (Stace 2010).

For selected samples containing a moderate quantity of charcoal fragments, the cell structure of all the non-oak samples was examined in three planes under a MEIJI dark illumination microscope and identifications were carried out using reference texts (Schweingruber 1978 and Hather 2000) and reference slides housed at Worcestershire Archaeology.

3.6.3 Discard policy

Remaining sample material and scanned residues will be discarded after a period of three months following submission of this report unless there is a specific request to retain them.

3.7 Statement of confidence in the methods and results

The methods adopted allow a high degree of confidence that the aims of the project have been achieved.

4 The application site

4.1 Topography, geology and current land use

The development site is located on the eastern side of Long Hanborough, on a south-east facing slope decreasing from *c.* 85m AOD at the north-west end to *c.* 80m AOD at the southern edge and to *c*. 76m in the south-east corner. The underlying geology is mapped as Cornbrash formation in the south-eastern end of the site, with Kellaways Clay Member across the rest of the site (BGS 2018).

The overall development area covers one large field (Field 1) and part of a smaller field to the north-west (Field 2). This part of the site (Field 2) is currently a grass field, in use for pasture, with extant ridge and furrow visible. The eastern part of the site (Field 1) is in arable rotation and had partial crop cover at the time fieldwork was undertaken. The excavation area was located in the far south-eastern corner of Field 1 (Figure 1).

4.2 Archaeological context

The archaeological background for the site has previously been detailed in the desk-based assessment, and also presented in the evaluation report, as follows (Orion Heritage 2015; Iliff 2018, 5):

> *No designated heritage assets are recorded on the site or in the immediate vicinity. The nearest Scheduled Monument is a Bronze Age barrow (MOX36, no. 1006358) located c. 900m to the north west of the site. The Old Farmhouse (MXO22724), a Grade II listed building, is the only listed building nearby, situated c. 120m to the west. The site is close to the Blenheim Palace World Heritage Site, which is around 300m to the north.*
>
> *The DBA considered there to be a low potential for prehistoric remains, based on only a small amount of prehistoric archaeology being recorded within the site vicinity, including sherds of prehistoric pottery (MOX2983), two Bronze Age flint scatters (MOX3005 and MOX3011), and the Bronze Age barrow mentioned above. While there was no evidence to specifically suggest the presence of Roman remains at the site, due to the presence of a Roman Villa (MOX12683) and a possible Roman settlement (MOX2954 and MOX2982) roughly 1km away, it was considered possible that the site may have potential for Roman remains connected with this local occupation. There have been no Saxon or medieval remains recorded in the area around the site, although a number of post-medieval remains have been found. These were, however, not considered to have any direct bearing on the site.*
>
> *The site is largely unchanged from how it is depicted on the first edition OS map, and it was considered that the potential for domestic occupation was low. However, the desk-based assessment did suggest that agricultural remains could be present.*

Prior to the current programme of archaeological investigations (geophysical survey, evaluation trenching, excavation), there were no known previous interventions on the site.

5 Archaeological results

5.1 Structural analysis

The extent of the excavation area and the features recorded are shown in Figures 2-5.

5.1.1 Phase 1: Natural deposits

The natural deposits were variable, but could be consistently identified. This mainly comprised limestone brash in a yellow-grey to orangey-brown silty clay matrix, changing to light yellow-orange grey silty clay in the lower-lying southern part of the excavation area (Plates 1-2).

5.1.2 Phase 2: Early prehistoric deposits (Neolithic and early Bronze Age)

The major focus of activity on the site comprised a large spread of burnt material alongside a series of associated cut features (pits and post/stakeholes), all in the vicinity of evaluation Trench 18 (Plate 2; Figures 3-5). The nature of the archaeology and the composition of the inclusions suggested a prehistoric date for this cluster, which was supported by a series of radiocarbon dates.

Detailed scientific dating indicated that there may be longevity of use and individual sub-phases within the early prehistoric period, ranging from the early to middle Neolithic through to the early Bronze Age, although not all features have been securely dated. As such, they are considered here together as an early prehistoric group, but with individual features highlighted where it has been possible to attribute them to a more refined timeframe.

Early to middle Neolithic layer/spread

The burnt deposit consisted of a large diffuse but broadly linear spread of burnt and heat-cracked stone and charcoal in a grey-brown silty clay soil matrix along the south-west edge of the site (3018 / 3030 / 3031; Plates 2-4; Figures 3 and 5). It had probably formed from the spreading or outwash of burnt material from more concentrated areas of burning, with some areas having fewer inclusions of heat-cracked stone and charcoal, potentially being the remains of a burnt mound. Two samples from this charcoal returned dates of 3500–3350cal BC (4625±27 BP; SUERC-81039) and 3630–3370cal BC (4703±27 BP; SUERC-81040), suggesting an early Neolithic date for the deposit.

Slots excavated across the layer revealed a slight variation in depth, between 0.16m and 0.26m, becoming thicker further downslope. The observable area showed it to have an irregular edge, and that it was at least 3.60m in width and continued for at least 9m in length. Whilst the full outline and shape remains unknown due to the positioning of a modern water pipe and a public footpath, it appears that the deposit continued further to the south and south-west beyond the limit of excavation. The majority remained waterlogged during the excavation, reflecting its position in the lowest part of the field.

Possible Neolithic to early Bronze Age pits

Towards the eastern edge and cutting through the burnt layer was a cluster of four intercutting pits (Plate 7; Figures 3 and 4), up to 0.26m in depth and all containing varying quantities of charcoal and fire-cracked stone — [3033], [3035], [3037] and [3039]. The earliest pit in the sequence, Pit [3033], contained charred hazelnut, producing a tight radiocarbon date of 3700–3630cal BC (4860±30 BP; Beta-497197), and a grain dated to 1020–1170cal AD (910±30 BP; Beta-497198); an early Neolithic and medieval date respectively. The early Neolithic date is broadly comparable with that for the burnt layer, although it is slightly earlier and statistically it is not consistent: therefore, it is considered that the charred material is residual from earlier activity and does not securely date the pit itself. The medieval date is incongruous with the nature of the features and the other dating evidence and is thought most likely to be intrusive material caused by the flooding during the excavation. Modern synthetic material was also recovered from the environmental sample of this feature.

Early Bronze Age pit

A larger, oval pit [3017] also cut through the edge of the burnt layer (Plate 5; Figure 3). It measured 1.6m x 2.3m in size and 0.24m deep and had previously been identified as [1810] during the evaluation stage of fieldwork. This contained charcoal and heat-cracked stone within the fill (1809 / 3016), and was radiocarbon dated to 1880–1650cal BC (3430±30 BP; Beta-484595), the early Bronze Age.

Other prehistoric pits and stakeholes

A number of other pits and stakeholes were associated with the edge of the burnt layer. One stakehole [3006] was located close to the early Bronze Age pit [3017], with no others visible in the immediate vicinity. This was 0.08m deep and up to 0.13m in diameter. Further to the east of the layer were two stakeholes 3.20m apart. These varied in size; stakehole [3007] measured 0.16m in depth and 0.14m in diameter and stakehole [3014] measured 0.06m in depth and 0.25m in diameter. Stakehole [3007] could be associated with pit [3009] which was less than a metre to the south-west, or it may be related to the other two stakeholes and form part of an enclosing structure.

Pits [3009] and [3011] were located just over 2m away from the burnt layer, close to stakehole [3007]. The larger of the two, [3009], measured 0.17m in depth and 0.5m x 0.74m in size. This pit contained fire waste and heat-cracked stone (Plate 6). It cut through pit [3011] and a small spread of material (3013) also containing heat-cracked stone. This may have been a heat affected layer that was part of the prehistoric land surface. Pit [3011] was considerably smaller at 0.06m in depth and contained a more sterile, silty fill.

A single, well-defined posthole complete with surviving postpipe [3021] was also located nearby. This feature cut a shallow pit [3019], of which only the base survived. There were no similar postholes nearby with which it obviously formed a structure, although it could have been related to the stakeholes. Adjacent to these was pit [3023], 0.41m in depth and 0.80m wide, which contained burnt material. At the edge of the pit was a layer (3028), which comprised mixed silty clays with a small quantity of charcoal flecking and was thought to be heat-affected clay from burning in the pit. Further east of these was an irregular pit filled with burnt material [3025]; this was perhaps related to the nearby series of four intercutting ones but this was not certain.

There were two additional possible pits or postholes containing heat-cracked stone, [3041] and [3043], both observed when excavating a machine dug slot through the burnt layer. Unfortunately it was not possible to explore these further due to the water inundation on this area of the site. It could, however, be determined that both of these features cut through the layer. These were very different in size and this may suggest that they served different functions.

5.1.3 Phase 3: Post-medieval deposits

Only one feature of this period was uncovered during the course of the excavation. A small gully, measuring 0.09m in depth and 0.5m wide, was aligned north-north-west to south-south-east and continued beyond the excavation area [3004]. This contained a sterile fill and is likely the base of either [1806] or [1804], two land drains previously recorded in evaluation Trench 18.

5.1.4 Phase 4: Modern deposits

The site was overlain with a mid greyish brown silty clay topsoil (3000), and a mid yellowish brown silty clay subsoil that varied in thickness (3001), being deeper over the burnt layer, and not present at all at the northern end of the site. A modern unmapped water pipe was aligned north-west to south-east and crossed the initially proposed excavation area, presumably cutting through the south-west extent of the layer and potentially, therefore, other associated features.

6 Specialist analysis

6.1 Artefact analysis, by Rob Hedge and Laura Griffin

The artefactual assemblage recovered is summarised in the tables below. The group came from eight stratified contexts and could be dated from the Mesolithic/early Neolithic period onwards (see Table 1). The majority of stratified material was prehistoric in date: there was also a background scatter of medieval to modern material within the topsoil and subsoil (Table 3).

period	material class	material subtype	object specific type	count	weight(g)
Mesolithic/early Neolithic	stone	flint	blade	1	0.9
Mesolithic/early Neolithic	stone	flint	flake	1	0.5
prehistoric	stone	flint	burnt chunk	1	1.9
prehistoric	stone	flint	burnt flint	5	1.8
prehistoric	stone	flint	chip	1	0.1
prehistoric	stone	flint	chunk	1	1.5
prehistoric	stone	flint	core fragment	1	3.2
prehistoric	stone	flint	flake	3	10.4
prehistoric	stone	flint	flake fragment	1	2.8
prehistoric	stone	flint	scraper	1	7.1
medieval	ceramic		pot	3	8
late med/early post-med	ceramic		pot	1	3
post-medieval	ceramic		pot	2	35
post-medieval	stone	flint	?gunflint	1	1.6
post-medieval/modern	metal	iron	nails	2	13
modern	ceramic		pot	1	27
modern	other waste	synthetic	modern debris	5	2
undated	bone		burnt bone	8	2.9
undated	ceramic	fired clay		1	1
undated	stone	limestone		1	4
undated	stone	crystal	crystal fragment	2	0.2
undated	stone	quartz	natural quartz	4	12.7
			Totals	**47**	**140.6**

Table 1: Quantification of the assemblage

6.1.1 Worked flint and unworked stone

Prehistoric

The worked flint and stone assemblage (Table 2) was small and contained few diagnostic elements, bar one flake from layer (3018) and a blade from subsoil (3001) which show attributes — platform preparation, blade removal, and soft-hammer percussion — indicative of a Mesolithic or early Neolithic date. This is consistent with the scientific dating obtained for layer (3018). The remainder of the assemblage can only described as broadly prehistoric in date.

Raw material sources are generally consistent: a mid to fine-grained opaque flint of light to mid blue-grey, with occasional traces of a thin beige cortex. The assemblage is too small to confidently ascribe a source, but is consistent with a fairly local origin.

Among the unworked pieces of stone within pit fills are several large fragments of white quartz (from 3010, 3024, and 3027), and some very small fragments of crystal (recovered from environmental samples of stakehole fills 3005 and 3008). Quartz and crystal are frequently interpreted as having symbolic value in prehistory (Reynolds 2009), and the possibility should, therefore, be considered that these are manuports deliberately incorporated into activities carried out at the site in prehistory.

Post-medieval

A squarely-retouched flake fragment showing signs of post-depositional heat damage (possibly from stubble-burning or similar agricultural activity), 14.5mm long and 15.9mm wide, is thought to be a post-medieval gunflint. The dimensions would make it suitable for a smaller flintlock weapon such as a pistol.

Feature		**Topsoil**			**Subsoil**		**Stakehole [3006]**	**Stakehole [3007]**	**Pit [3009]**		**Layer**			**Pit [3025]**			**Pit [3023]**	**Pit [3033]**	**Pit [3037]**	**Total**
Context		3000			3001		3005	3008	3010		3018			3024			3027	3032	3036	
Debitage	flake			1								2				1				**4**
	core frag		1																	**1**
	flake frag				1															**1**
	chip								1											**1**
	chunk														2					**2**
Tool	gunflint	1																		**1**
	blade					1														**1**
	scraper												1							**1**
unworked	quartz									2				1			1			**4**
	limestone										1									**1**
	crystal						1	1												**2**
	flint																	4	1	**5**
Quantity		1	1	1	1	1	1	1	1	2	1	2	1	1	2	1	1	4	1	**24**
Weight		1.6	3.2	4	2.8	0.9	0.1	0.1	0.1	12	4	6.4	7.1	0.6	3.4	0.5	0.6	1.5	0.3	**48.7**
?Retouch		1											1							**8.3%**
?Edge-damage						1														**4.2%**
?Burnt		1									1				1			4		**29.2%**

Table 2: Quantification of the worked flint and unworked stone

6.1.2 Burnt bone

Several contexts (3010 and 3036) yielded small quantities of highly fragmentary, undiagnostic burnt bone.

6.1.3 Pottery

Within the topsoil (3000) and subsoil (3001), there was a sparse scatter of small undiagnostic fragments of medieval, post-medieval, and modern domestic pottery. These are likely to have been incorporated onto the site through agricultural activity.

6.1.4 Other finds

Modern nails were recovered from subsoil (3001). Fragments of a black synthetic material were recovered from environmental samples of prehistoric pit fill (3032); these are undoubtedly intrusive.

6.1.5 Summary site dating

context	material class	material subtype	object specific type	count	weight(g)	start date	end date	TPQ date range
3000	ceramic		pot	1	25	16C	18C	AD 1800 - 2000
	ceramic		pot	1	27	19C	20C	
	stone	flint	?gunflint	1	1.6	1625	1850	
	stone	flint	flake	1	4	-10000	43	
	stone	flint	core fragment	1	3.2	-10000	43	
3001	ceramic		pot	1	10	16C	18C	AD 1500 - 1800
	ceramic		pot	1	3	14C	16C	
	ceramic		pot	3	8			
	ceramic	fired clay		1	1			
	metal	iron	nails	2	13			
	stone	flint	flake fragment	1	2.8	-10000	43	
	stone	flint	blade	1	0.9	-10000	-3000	
3005	stone	crystal	crystal fragment	1	0.1			undated
3008	stone	crystal	crystal fragment	1	0.1			undated
3010	stone	quartz	natural quartz	2	11.5			10000 BC - AD 43
	stone	flint	chip	1	0.1	-10000	43	
	bone		burnt bone	3	1			
3018	stone	limestone		1	4			10000 BC - AD 43
	stone	flint	flake	1	5.9	-10000	43	
	stone	flint	flake	1	0.5	-10000	-3000	
	stone	flint	scraper	1	7.1	-10000	43	
3024	stone	quartz	natural quartz	1	0.6			10000 BC - AD 43
	stone	flint	chunk	1	1.5	-10000	43	
	stone	flint	burnt chunk	1	1.9	-10000	43	
	stone	flint	flake	1	0.5	-10000	43	
3027	stone	quartz	natural quartz	1	0.6			undated

context	material class	material subtype	object specific type	count	weight(g)	start date	end date	TPQ date range
3032	other waste	synthetic	modern debris (intrusive)	5	2	(1900)	(2000)	10000 BC - AD 43
	stone	flint	burnt flint	4	1.5	-10000	43	
3036	stone	flint	burnt flint	1	0.3	-10000	43	10000 BC - AD 43
	bone		burnt bone	5	1.9			

Table 3: Summary of context dating based on artefacts

6.1.6 Further analysis and discard/retention

No further work on the assemblage is deemed necessary. The prehistoric material should be retained. Subject to the collection policy of the receiving museum, the residual medieval and later material from the topsoil and subsoil should be considered for discard.

6.2 Environmental analysis, by Elizabeth Pearson

The list of bulk samples is presented in Table 4 and the environmental evidence recovered is summarised in Tables 5 and 6.

Context	Sample	Feature type	Fill of	Site phase	Sample volume (L)	Volume processed (L)	Residue assessed	Flot assessed
3005	300	Stakehole	3006	Early prehistoric	10	10	Yes	Yes
3008	301	Stakehole	3007	Early prehistoric	10	10	Yes	Yes
3010	302	Pit	3009	Early prehistoric	30	10	Yes	Yes
3016	303	Pit	3017	Early prehistoric	30	10	Yes	Yes
3026	304	Pit	3023	Early prehistoric	20	10	Yes	Yes
3029	305	Posthole	3021	Early prehistoric	10	10	Yes	Yes
3030	306	Layer	-	Early prehistoric	40	10	Yes	Yes
3032	311	Pit	3033	Early prehistoric	10	10	Yes	Yes
3034	308	Pit	3035	Early prehistoric	10	10	Yes	Yes
3034	307	Pit	3035	Early prehistoric	20	10	Yes	Yes
3036	309	Pit	3037	Early prehistoric	20	10	Yes	Yes
3038	310	Pit	3039	Early prehistoric	10	10	Yes	Yes

Table 4: List of bulk samples

6.2.1 Plant macrofossils and charcoal

Uncharred remains, consisting mainly of root fragments, are assumed to be modern and intrusive as they are unlikely to have survived in the soils on site for long without charring or consistent waterlogging.

Initial assessment showed that only small quantities of charcoal were identifiable in the area of the burnt layer/spread (3030) and associated pits. Nevertheless, quantifications were produced for fills (3032, 3034 and 3036) from pits [3033, 3035 and 3037] respectively, as it was identified that the burnt layer/spread appears to have had an early origin (see Radiocarbon dating and Synthesis below). Even small quantities may be of importance, therefore, although the results should be treated with some caution. All three pits were in close proximity in the eastern/south-eastern edge of the layer, as exposed in the excavated area.

The burnt layer (3018 / 3030 / 3031), potentially part of a burnt mound, contained only fragmented unidentified charcoal alongside heat-cracked stone, plus a small quantity of fragmented bone. Two radiocarbon dates were obtained which indicated an early to middle Neolithic date.

Charred hazelnut shell from the fill (3032) of pit [3033] at the edge of layer was dated to the early Neolithic (though this is probably residual). Although quantities of charcoal were small for pit fill (3032), lime wood (*Tilia* sp) dominated, with only a single fragment of hazel (*Corylus avellana*) alongside fragments of hazelnut shell and a single wheat tail grain (*Triticum* sp).

Fill (3036) of pit [3037] was also dominated by lime wood, with a small number of fragments of possible pear/apple/whitebeam/hawthorn (Maloideae sp), alder (*Alnus*) and possible hazel (*Corylus*) wood.

The fill (3034) of pit [3035] had a slightly different composition as the charcoal was clearly dominated by pear/apple/whitebeam/hawthorn (Maloideae sp), with a smaller quantity of lime (*Tilia*) and a single hazelnut shell fragment.

Towards the north-western part of the burnt mound, alder/hornbeam/hazel (*Alnus*/*Carpinus*/*Corylus* sp) charcoal recovered from a further pit (fill 1809) during the evaluation stage was radiocarbon dated to the early Bronze Age.

context	sample	large mammal	mollusc	charcoal	charred plant	uncharred plant	artefacts
3005	300			occ		occ*	occ crystal
3008	301	occ	occ	occ	occ	mod*	occ stone
3010	302	occ	occ	occ		mod/abt*	occ shell (other), flint, burnt stone, heat-cracked stones
3016	303			abt	occ	occ*	occ shell, abt heat-cracked stones
3026	304		occ	abt		abt*	occ shell (other), abt heat-cracked stones
3029	305		occ	occ		abt*	occ shell (other), abt heat-cracked stones
3030	306	occ		occ			occ heat-cracked stone, ?worked stone
3034	307		occ	abt			occ oystershell, abt heat-cracked stones
3034	308	occ		abt		occ*	occ shell (other), abt heat-cracked stones
3036	309	occ		abt	occ	occ/mod*	occ flint, mod heat-cracked stones.6
3038	310			mod			occ shell (other), abt heat-cracked stones
3032	311		occ	abt	occ	occ*	occ shell (other), flint/chert, crystal, abt heat-cracked stones

*Table 5: Summary of environmental samples; occ = occasional, mod = moderate, abt = abundant, * = modern and intrusive*

Latin name	Family	Common name	Habitat	3032	3034	3036
Triticum sp tail grain	Poaceae	wheat	F	1		
Maloideae sp	Rosaceae	pear/apple/whitebeam/hawthorn	CF		23	
cf Maloideae sp	Rosaceae	pear/apple/whitebeam/hawthorn	CF		1	4
Tilia sp wood	Tiliaceae	lime	C	7	4	13
cf *Tilia* sp wood	Tiliaceae	lime	C			1
Alnus glutinosa (wood)	Betulaceae	alder	CE			1
Corylus avellana shell fragment	Betulaceae	hazelnut	C	3	1	
Corylus avellana wood	Betulaceae	hazelnut	C	1		
cf *Corylus avellana* wood	Betulaceae	hazelnut	C	1		1
Alnus/*Carpinus*/*Corylus* sp wood	Betulaceae	alder/hornbeam/hazel	C	1		1

Table 6: Plant remains from selected bulk samples

Key:

habitat
A= cultivated ground
B= disturbed ground
C= woodlands, hedgerows, scrub etc
D = grasslands, meadows and heathland

E = aquatic/wet habitats
F = cultivar

6.2.2 Environmental discussion

The radiocarbon dates recovered from the burnt layer and associated pits, representing a possible burnt mound (see Section 7 below), are early Neolithic to early Bronze Age in date and, therefore, particularly early in comparison to such sites in both the region and across the British Isles more generally (although earlier dates are more common in Ireland). As a result, only very limited comparable environmental results are available, and from those few sites that are of similar date the material is sparse. At Parc Bryn Cegin, Bangor, Wales (Gwynedd Archaeological Trust 2008), for example, charcoal was generally unidentifiable from the Neolithic burnt mounds, alongside occasional hazelnut fragments and charred cereal grains which included barley and emmer wheat.

Nevertheless, at Eggington and Willington in the Trent Valley, Derbyshire (Gale 2009), charcoal from early Neolithic cooking pits and a late Neolithic burnt mound included oak (*Quercus robur/petraea*), hazel *(Corylus),* hawthorn group (Maloideae sp), sloe (*Prunus spinosa*) and alder (*Alnus)*. Charred plant remains included mostly charred hazelnut shell, fruit stones of sloe and occasional hawthorn pips which probably represent gathered food. Although no lime (*Tilia*) charcoal was identified (in contrast to Long Hanborough) some similarity in the surrounding landscape profile is evident as pollen from Shardlow, close to Eggington and Willington, shows that lime and oak woodland was still present in the later Neolithic (Greig 2006).

Environmental information available for the early to middle Neolithic environment within the vicinity of Long Hanborough suggests a mix of dense and dispersed woodland or scrub comprising oak, hazel, hawthorn and apple, becoming more open in the late Neolithic (see Hey *et al* 2016, 25-37). Pollen from beneath the Neolithic long barrow at Ascott-under-Wychwood (around 12km north-west of Long Hanborough on the Cotswold limestone) showed lime pollen to be conspicuous and hazel abundant (Dimbleby and Evans 1974). There seems to have been some replacement of lime by hazel woodland, with a corresponding increase in bracken. The interpretation by Dimbleby and Evans (1974) implies that the pollen evidence represents an environment close in date to the formation of the monument (constructed in 3760–3695 cal BC and extended in 3745–3670 cal BC; Bayliss *et al* 2007). The samples in this case were taken from the rendzina, immediately beneath the monument.

The presence and possible dominance of lime (*Tilia)* charcoal in the pits at Long Hanborough therefore reflects the composition of the early prehistoric landscape in the wider midlands area at this time, with lime a significant element of the woodland landscape. This pre-dates the lime decline which, in the British Isles, is typically dated to the late Neolithic to early Bronze Age (Daffern 2014; 2016).

6.3 Radiocarbon dating, by Suzi Richer

A total of five radiocarbon determinations have been achieved from fragmented charcoal, seeds or nuts from the site. Two samples (SUERC-81039 and 81040) of fragmented charcoal from alder and a non-oak species were taken from a burnt layer (3030) containing charcoal and burnt stone – this is interpreted as a possible burnt mound. Two determinations from a charred hazelnut shell (Beta-497197) and a charred *Triticum* sp. grain (and Beta-497198) were from the fill (3032) of pit [3033] which cut into the edge of the burnt layer (3030). A final determination (Beta-484595) consisted of unidentified charred material from fill (1809 / 3016) that was within a large oval pit [1810 / 3017] that also cut the edge of the burnt layer (3030).

Samples were dated at Beta Analytic and the Scottish Universities Environmental Research Centre (SUERC-) by AMS. Those dated at SUERC were processed and dated using the methods described in Dunbar *et al* (2016). The results (Table 7) are conventional radiocarbon ages (Stuiver and Polach 1977), and quoted in accordance with the international standard known as the Trondheim convention.

6.3.1 Calibration

The calibrations of these results, which relate the radiocarbon measurements directly to the calendrical time scale, are given in Table 7. They have been calculated using the datasets published by Reimer *et al* (2013) and the computer program OxCal v4.3 (Bronk Ramsey 1995; 1998; 2001; 2009). The calibrated date ranges cited are quoted in the form recommended by Mook (1986), with the end points rounded outward to 10 years. The ranges for calibrated dates in Table 7 have been calculated according to the maximum intercept method (Stuiver and Reimer 1986) and are cited at two sigma (95% confidence).

6.3.2 Bayesian modelling

The radiocarbon results are presented here in Bayesian chronological models (Tables 7, 8 and 9; and Figure 6) (Buck *et al* 1996). Calibration of radiocarbon dates provides us with an accurate estimate of the age of the dated sample. Whilst this is useful, archaeological questions are often more searching, and it is the event that the sample represents that is usually of more interest. These events include when a site came into use, the duration of its usage and the likelihood of contemporaneity. Using the radiocarbon measurements in conjunction with archaeological information we can provide realistic estimates, called *posterior density estimates*, for such archaeological events. All posterior density estimates derived from the Bayesian modelling are reported in *italics*. It should be emphasised that the posterior density estimates produced by this modelling are not absolute. They are interpretative estimates, which can and will change as further data become available and as other researchers choose to model the existing data from different perspectives. The modelling technique used is a form of Markov Chain Monte Carlo sampling and has been applied using the program OxCal v4.3 (http://c14.arch.ox.ac.uk/). Details of the algorithms employed by this program are available in Bronk Ramsey (1995; 1998; 2001; 2009) or from the online manual.

6.3.3 Results

The five radiocarbon determinations date from the early Neolithic through until to the medieval period. Three determinations fall within the early to middle Neolithic (Beta-497197, SUERC-81039 and SUERC-81040), one falls within the early Bronze Age (Beta-484595) and the final measurement (Beta-497198) falls within the medieval period. The last determination (Beta-497198) has been excluded from the main model here as it is thought to result from intrusive material: comparable deposits from similar archaeological features on site have been shown to be early prehistoric in date. Equally, the early Neolithic determination (Beta-497197) is from the same context (3032) and as such is not wholly reliable. It has, therefore, also been excluded from the stratigraphic model (Figure 6). However, the hazelnut shell that was dated was generally in good condition (pers. comm. Liz Pearson), suggesting that taphonomically it had not travelled far and is indicative of activity within the area at this time. Because of this, the determination (Beta-497197) has been retained for comparison with the other Neolithic dates (see Table 9).

The stratigraphic model has good overall agreement (Amodel = 98) and has been used to provide estimates for archaeological events.

It can be estimated that deposition of the burnt layer began by 4855–3365 cal BC (95% probability; Start_Phase 1; Table 8 and Figure 6) or 3795–3390 cal BC (68% probability; Start_Phase 1; Table 8 and Figure 6) and had ended by 3500–2455 cal BC (82% probability; Phase 1_Phase_2; Table 8 and Figure 6) or 3495–2855 cal BC (68% probability; Phase 1_Phase_2; Table 8 and Figure 6). This allows an estimate with a 95% probability that the burnt layer represents a period of activity that lasted for 5–1010 years with a 68% probability (distributions not shown).

It is also estimated that two or more phases of activity occurred during the Neolithic on site, or that two points with a long period of use occurred. The two determinations from context 3030 (SUERC-81039 and SUERC-81040) have been tested with a Ward and Wilson chi-square test (1978) to see if they are consistent with each other: they were found to be consistent at a 95% confidence level (df=1, T=0.0, cf. 3.8; distribution not shown), which suggests they could be dating the same event.

The third determination from the Neolithic, from context 3032 (Beta-497197), is not consistent with those from context 3030 at a 95% confidence (df=1, T=34.773, cf. 6.0; distribution not shown): this suggests that Beta-497197 pertains to another phase of activity. Because this sample is likely to be residual, however, it is not possible to relate the determination to a specific feature from this phase. Using the *Order* function in OxCal the phase of activity represented from Beta-497197 is estimated to have occurred before that of context 3030 (*100%* and *98.5% probability*; Table 9).

Laboratory number	Material and context	Radiocarbon Age (BP)	$\delta^{13}C$ (‰)	Calibrated date (95% confidence)	*Posterior Density Estimate (68% probability)*	*Posterior Density Estimate (95% probability)*
Beta-497198	Charred *Triticum* sp. tail grain, feature 3033, context 3032.	910±30	-21.3	cal AD 1020–1170	*Not included in the model.*	*Not included in the model.*
Beta-484595	Unidentified charred material, feature 1810 / 3017, context 1809 / 3016	3430±30	-25.2	1880–1650 cal BC	*1865–1850 cal BC (5%) 1770–1685 cal BC (63%)*	*1880–1655 cal BC*
SUERC-81039	Charcoal, cf. Alnus sp., context 3030	4625±27	-24.3	3500–3350 cal BC	*3500–3455 cal BC (49%) 3380–3360 cal BC (19%)*	*3510–3425 cal BC (70%) 3385–3350 cal BC (25%)*
SUERC-81040	Charcoal non-oak, context 3030	4703±27	-24.4	3630–3370 cal BC	*3525–3495 cal BC (15%) 3455–3375 cal BC (53%)*	*3630–3590 cal BC (8%) 3535–3485 cal BC (20%) 3475–3370 cal BC (66%)*
Beta-497197	Charred *Corylus avellana* nutshell, Feature 3033, context 3032.	4860±30	-23.6	3700–3630 cal BC	*Not included in model.*	*Not included in model.*

Table 7: All radiocarbon dates from Long Hanborough

Parameter	*Posterior Density Estimate (68% probability)*	*Posterior Density Estimate (95% probability)*
End_Phase_2	*1825–1090 cal BC*	*1875 cal BC–cal AD 60*
Phase 1_Phase_2	*3495–2855 cal BC*	*3500–2455 cal BC (82%) 2370–2330 cal BC (1%) 2135–1725 cal BC (12%)*
Start_Phase 1	*3795–3390 cal BC*	*4855–3365 cal BC*

Table 8: Posterior density estimate for the start and end of the context 3030 (Phase 1) and for context 1809 (Phase 2) at Long Hanborough (also see Figure 6)

Probability *t*1 < *t*2			
t_1	***t*2**		
	SUERC-81039 (context 3030)	***SUERC-81040 (context 3030)***	***Beta-497197 (context 3032)***
SUERC-81039 (context 3030)	*0%*	*40.5%*	*0%*
SUERC-81040 (context 3030)	*59%*	*0%*	*1.5%*
Beta-497197 (context 3032)	*100%*	*98.5%*	*0%*

Table 9: Probability matrix for the ordering of the Neolithic contexts at Long Hanborough. Determined by analysis of the modelled radiocarbon dates from the pits. The cells show the

probability of the distribution in the left-hand column being earlier than the distribution in the top row

7 Discussion

The excavation has expanded upon the archaeological evidence from the evaluation trenching, revealing more of a burnt stone and charcoal soil layer alongside a series of cut features —pits and post/stakeholes — in the immediate surrounds, which are considered likely to be associated. The group of features is largely typical of those often encountered at a prehistoric burnt mound site, although in this instance the scientific dating suggests an unusually early and/or long-lived site perhaps not directly comparable to the conventional Bronze Age examples. Overall, whilst the site does display some of the general characteristics for such features, it has variation within these parameters.

7.1 Burnt mound characteristics and dating

Burnt mounds are created as a build-up of waste products from 'hot-stone technology', the placing of fire-warmed stones into water to heat it. Generally, they comprise charcoal and heat-cracked stone in an irregular linear, oval or crescent arrangement; are found in or on the margins of wet or boggy ground with a water source nearby; are distant from settlement; rarely contain artefacts; and are associated with or overlie hearths, pits, stakeholes as well as a stone, timber or clay-lined trough (Barfield and Hodder 2010; Hodder 2017, 29-32). These features are common to Ireland (where they are normally termed '*fulachta fiadh*'), Scotland and south-west Wales, but are regularly found in the midlands, particularly in the greater Birmingham area and in peaty wetlands in Shropshire, or further east and south in places such as the Fens and the New Forest (see Hurst 2011, Fig 3.1; Hey and Hind 2014, 134; Hodder 2017, 29-32; Wigley 2017, 86-89). In recent years they have been identified more frequently in the Thames Valley, including a number of eroded or ploughed-out burnt mounds dating from the early Bronze Age onwards excavated at Yarnton, roughly five kilometres to the south-east of Long Hanborough (see Hey *et al* 2016, 79-80).

Although the typical date range is generally in the middle to late Bronze Age (*c* 1700-800 BC), there is increasing evidence for burnt mounds from the earlier Bronze Age and from the Neolithic period. Sites across the Trent Valley, such as Eggington and Willington in Derbyshire, as well as places such as Dunton Bassett in Leicestershire, Meriden Quarry in Warwickshire and Clifton Quarry in Worcestershire, have all yielded late Neolithic finds and/or radiocarbon dates (see Knight and Howard 2004, 56-57; Beamish 2009; ULAS 2005; Bradley 2014; Lovett 2017). Early to middle Neolithic examples have been identified in Ireland — where there are over forty examples — and in both Scotland and north Wales (Brindley *et al* 1990; Gwynedd Archaeological Trust 2008; Hawkes 2014). In the north-west of England, a pit that was part of a burnt mound on the Carlisle Northern Development Route produced an early Neolithic radiocarbon date but was considered too early for the feature type: other examples, both on this scheme and in the wider Cumbria region, have been dated to the late Neolithic and the early to middle Bronze Age (Oxford Archaeology 2011, 82; Brown 2014).

Despite being one of the most common prehistoric site types in Britain and Ireland, their exact function remains unclear, with small numbers of artefacts or animal bone preventing any consensus on the specific usage and overall role of burnt mounds. Various suggestions have been put forward, including for boiling/cooking (O'Kelly 1954; Hedges 1975), as sweat lodges/saunas or bathing places (see Barfield and Hodder 1987; O'Drisceoil 1988), as areas of specialised craft activities such as textile production (Jeffery 1991), or as places associated with metallurgy and metalwork deposits (Bradley 2007). Experiments have also shown how they may have been used to produce beer (Quinn and Moore 2009), and others have suggested that they acted as multi-functional ritual sites (Loktionov 2013). A recent comprehensive environmental study of Irish burnt mounds and troughs concluded that variations in size and design imply that it is unlikely that all had the exact same use, but that a frequent association with the remains of common dyeing plants implies that the main function revolved around textile production, particularly the cleaning and dyeing of wool or the cleaning and tanning of hides (Brown *et al* 2016).

7.2 The possible burnt mound at Long Hanborough

A number of the characteristics of burnt mound sites were clearly identifiable in this possible example at Long Hanborough; this included the long slightly irregular linear spread of heat-cracked stone and charcoal, a limited number of artefacts, the group of associated pits alongside — some with evidence of heat-affected layers around — and the dispersed stakeholes. Although these did not appear to be directly associated with an obvious water source, and no lined trough was located, it is conceivable that both of these were beyond the limit of excavation in the area of the modern water pipe and public footpath.

The features were also located in the lowest part of the field where the water table was very high, suggesting that the area was unsuitable for occupation. As noted above, burnt mounds are often located in or on the margins of wet, boggy ground or other areas not conducive to permanent settlement, and no evidence for habitation was identified on the wider site either during the excavation or the preceding evaluation. This may indicate that the site is likely to fit into a previously identified typology: not being located in direct physical association with a settlement but potentially related to one positioned on nearby drier ground (see Barfield and Hodder 2010, 40). Whilst the immediately surrounding landscape has only a few glimpses of prehistoric activity, it does include a Bronze Age barrow, flint scatters *c* 1km to the north and north-west, and sherds of prehistoric pottery found in an adjacent field around 130m south-east of the site, which may be of particular relevance (Orion Heritage 2015). The site is also located at the edge of a wide loop in the River Evenlode (the river is both 375m north and 500m to the east): confluences and river bend locations remain significant as ritual landscapes throughout the later Neolithic and Bronze Age.

As is often the case in examples outside of Ireland and Scotland, the layer of heat-cracked stone and charcoal was not a clear 'mound', being a shallow elongated spread of material. This is common to arable land where there has been considerable truncation from ploughing since at least the medieval period. It is possible, however, that this layer actually represents an earlier Neolithic horizon where burnt material has accumulated in a low-lying depression, rather than what might be considered a standard burnt mound deposit, but there is also no reason why it could not be an early example of the formation of a burnt mound in a location that was clearly favourable for such a feature. Whilst this remains uncertain, further, more conventional, late Neolithic and Bronze Age burnt mound deposits could have existed slightly to the south and south-west, beyond the limit of excavation, perhaps reflecting intermittent use of the same landscape over a wide timespan.

The radiocarbon dating from the pits cutting the burnt layer suggested multiple phases or stages of activity, reflected in the early Neolithic to early Bronze Age range of dates, although residuality is partly a factor. The Bronze Age date is comparable to the recognised concentration of burnt mound activity from such sites. It may be that the other pits and stakeholes containing similar deposits in the surrounds are all related and represent re-use of the area during the early Bronze Age, located on a site that has origins in the early to middle Neolithic. A number of sites have demonstrated that burnt mounds had short duration, intense phases of use, that were then left before being re-used intermittently over widely separate periods. There are also indications, however, based on soil micromorphology and microfossil analysis, that some burnt mounds may have been long-lived, perhaps seasonally attended sites, comprising multiple deposits that had accumulated over hundreds of years (see Gardner 2018).

The limited finds and environmental assemblage did not elucidate or validate any of the hypotheses for the use of burnt mounds, though both the flint and environmental remains (lime wood charcoal) did lend some support to the earlier Neolithic date for at least some of the features. Of particular interest was the amount of flint and quartz pieces which, although not always worked, is amongst the upper end of examples in the wider region. For instance, a burnt mound site excavated at Cob Lane, Birmingham produced just one flint, and there the whole mound was sieved (Hodder 2011). In contrast, some burnt mound sites have yielded large numbers of finds, such as the assemblage of over 250 sherds of late Bronze Age pottery from Green Park, although this an exception (Brossler *et al* 2004). It is also interesting to note the presence of a scent-

producing wood charcoal (Maloideae sp) in the environmental assemblage: pleasant smells during burning may have been required if a bathing or specialised ritual function is considered to be the purpose of such sites.

7.2.1 Regional frameworks

If the burnt layer and the associated pits identified here at Long Hanborough are accepted, as the dating and character of the remains would indicate, to be part of a long-lived burnt mound that has origins in the earlier Neolithic, then this would, potentially, be amongst the earliest examples from England as a whole. It is clearly at the earlier end of the date range for those identified in the Thames Valley (e.g. at places such as Yarnton; Hey *et al* 2016) and across the midlands. In this regard, this site is a significant component of the prehistoric character of the region. It also specifically addresses a regional research agenda question: *8.7.2 — Burnt mounds are usually thought of as a later Bronze Age phenomenon, but a few are now dated to the early Bronze Age (or even late Neolithic). Are these more common than we had imagined?* Overall, whilst the debate about the function of burnt mounds remains ongoing, this example offers an important addition to the body of data being amassed about this enigmatic form of prehistoric activity.

8 Publication summary

Worcestershire Archaeology has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, Worcestershire Archaeology intends to use this summary as the basis for publication through local or regional journals. The client is requested to consider the content of this section as being acceptable for such publication:

An archaeological excavation was undertaken in February and March 2018 at land adjacent to Hanborough Station, Long Hanborough, Oxfordshire (NGR SP 443180 214180). It was commissioned by Orion Heritage Ltd on behalf of their client, Bloor Homes Western, in advance of a consented residential development.

The excavation centred on a small spread of burnt stones and charcoal that was interpreted as being part of a possible prehistoric burnt mound, which had been discovered during initial archaeological evaluation of the site. It revealed more of a burnt stone and charcoal soil layer alongside a series of cut features — pits and post/stakeholes — in the immediate surrounds, which were considered to be associated with this layer. The group of features is typical of those often encountered at a prehistoric burnt mound. As is common, the limited finds and environmental assemblage did not elucidate or validate any of the hypotheses for the use of such sites.

Of particular interest in this instance, however, a programme of scientific dating produced early Neolithic to early Bronze Age dates which suggested an unusually early and/or long-lived site perhaps not directly comparable to the conventional middle to late Bronze Age examples of burnt mounds. Flint pieces indicative of a Mesolithic or early Neolithic date and the environmental remains (which included lime wood charcoal) also lent support to the dating of the features.

Overall, the dating and character of the remains would appear to be part of a long-lived burnt mound that has origins in the earlier Neolithic, potentially being amongst the earliest examples from England as a whole. It is clearly at the earlier end of the date range for those identified in the Thames Valley (at places such as Yarnton) and across the midlands. In this regard, this site is a significant component of the prehistoric character of the region.

9 Acknowledgements

Worcestershire Archaeology would like to thank the following for their kind assistance in the successful conclusion of this project:

Cathy Patrick (Orion Heritage Ltd);

Anthony Tang and Chris Shaw (Bloor Homes Western);

Hugh Coddington (Planning Archaeologist, Oxfordshire County Council).

10 Bibliography

AAF 2011 *Archaeological archives: a guide to the best practice in the creation, compilation, transfer and curation,* Archaeological Archives Forum, http://www.archaeologyuk.org/archives/

Archaeological Surveys, 2015 *Land adjacent to Hanborough Station, Long Hanborough, Oxfordshire, Magnetometer Survey Report for Orion Heritage Ltd,* Archaeological Surveys Ltd, unpublished report dated September 2015

Ballin, T, 2000 'Classification and description of lithic artefacts: a discussion of the basic lithic terminology', *Lithics*, [online] 21, 9-15. Available at: http://journal.lithics.org/index.php/lithics/article/viewFile/490/475

Barfield, L, and Hodder, M, 1987 'Burnt mounds as saunas, and the prehistory of bathing', *Antiquity*, **61**, 370–9

Barfield, L, and Hodder, M, 2010 'Burnt mounds in south Birmingham: excavations at Cob Lane in 1980 and 1981, and other investigations', *Transactions of the Birmingham and Warwickshire Archaeological Society*, **114**, 13–46

Bayliss, A, Benson, D, Galer, D, and Humphrey, L, 2007 'One Thing After Another: the Date of the Ascott-under-Wychwood Long Barrow', *Cambridge Archaeological Journal*, **17**, Issue 51, 29–44

Beamish, M G, 2009 'Island visits: Neolithic and Bronze Age activity on the Trent valley floor. Excavations at Egginton and Willington, Derbyshire, 1998–1999', *Derbyshire Archaeological Journal*, **129**, 17–172

BGS 2018 *Geology of Britain Viewer*, http://mapapps.bgs.ac.uk/geologyofbritain/home.html, British Geological Survey, accessed May 2018

Bradley, R, 2007 *The prehistory of Britain and Ireland*, New York

Bradley, R, 2014 *Meriden Quarry, Meriden, Warwickshire. Archaeological Watching Brief (Phases 1 and 4): Interim Report,* Worcestershire Archaeology, Worcestershire County Council, report **2045**

Brindley, A L, Lanting, J N, and Mook, W G, 1990 'Radiocarbon dates from Irish fulachta fiadh and other burnt mounds', *Journal of Irish Archaeology*, **5**, 25–33

Bronk Ramsey, C, 1995 'Radiocarbon calibration and analysis of stratigraphy: the OxCal program', *Radiocarbon*, **37**, 425–430

Bronk Ramsey, C, 1998 'Probability and dating', *Radiocarbon*, **40**, 461–474

Bronk Ramsey, C, 2001 'Development of the radiocarbon calibration program OxCal', *Radiocarbon*, **43**, 355–363

Bronk Ramsey, C, 2009 'Bayesian analysis of radiocarbon dates', *Radiocarbon*, **51**, 337–360

Brossler, A, Early, R, and Allen, C, 2004 *Green Park (Reading Business Park) Phase 2 excavations,* Thames Valley Landscapes monograph **19**, Oxford Archaeology

Brown, F, 2014 'The excavation and analysis of a burnt mound, Drigg, Cumbria', *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society*, Third Series **XIV**, 9–37

Brown, A G, Davis, S R, Hatton, J, O'Brien, C, Reilly, F, Taylor, K, Emer Dennehy, K, O'Donnell, L, Bermingham, N, Mighall, T, Timpany, S, Tetlow, E, Wheeler, J, and Wynne, S, 2016 'The Environmental Context and Function of Burnt-Mounds: New Studies of Irish *Fulachtaí Fiadh*', *Proceedings of the Prehistoric Society*, **82**, 259–290

Buck, C E, Cavanagh, W G and Litton, C D, 1996 *Bayesian Approach to Interpreting Archaeological Data*, Chichester

Butler, C, 2005 *Prehistoric flintwork,* Stroud

Cappers, T R J, Bekker, R M, and Jans, J E A, 2012 Digitale Zadenatlas van Nederland: Digital seed atlas of the Netherlands, *Groningen Archaeological Studies,* **4**, Barkhuis Publishing and Groningen University Library: Groningen

CIfA 2014a *Standard and guidance: Archaeological excavation,* Chartered Institute for Archaeologists, http://www.archaeologists.net/codes/ifa

CIfA 2014b *Standard and guidance for the collection, documentation, conservation and research of archaeological materials,* Chartered Institute for Archaeologists, http://www.archaeologists.net/codes/ifa

Daffern 2014 'Pollen', in R Bradley, *Meriden Quarry, Meriden, Warwickshire archaeological watching brief (Phases 1 and 4): interim report*, Worcestershire Archaeology report, **2045**, 15–23

Daffern, N, 2016 'Two Palaeochannels, the Lime decline and the Identification of Worcester's first Stratified Neolithic Deposits - Worcester Arena, Hylton Rd, Worcester', *Transactions of the Worcestershire Archaeological Society*, **25**, Ser 3, 101–121

Dimbleby, G W, and Evans, J G, 1974 'Pollen and land-snail analysis of calcareous soils', *Journal of Archaeological Science*, **1**, 117–133

Dunbar, E, Cook, G, Naysmith, P, Tripney, B, & Xu, S, 2016 'AMS 14C Dating at the Scottish Universities Environmental Research Centre (SUERC) Radiocarbon Dating Laboratory', *Radiocarbon*, **58**, 9–23

English Heritage 2011 *Environmental archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*, Centre for Archaeology Guidelines

Gale, R, 2009 'The Charcoal' in M Beamish, 'Island visits: Neolithic and Bronze Age activity on the Trent valley floor. Excavations at Egginton and Willington, Derbyshire, 1998–1999', *Derbyshire Archaeological Journal*, **129**, 119–124

Gardner, T H, 2018 'Assessing the contribution of integrated geoarchaeological approaches to understand the formation and function of burnt mounds: the example of Hoppenwood Bank, North Northumberland', *Archaeological Journal*

Greig, J, 2006 *Report on pollen from Shardlow quarry, SQB04, Derbyshire,* Unpublished Report 06.05, in Birmingham Archaeology 2017 *Shardlow Quarry, Derbyshire. A Programme of Archaeological Investigations* [data-set]. Available at https://doi.org/10.5284/1046284

Gwynedd Archaeological Trust, 2008 *Recent Excavations at Llandygai, near Bangor, North Wales. Full excavation report volume 1: the text*, GAT project G1857, report **764**

Hather, J G, 2000 *The identification of the northern European hardwoods: a guide for archaeologists and conservators*, Archetype Publications Ltd

Hawkes, A, 2014 'The beginnings and evolution of the *fulacht fia* tradition in early prehistoric Ireland', *Proceedings of the Royal Irish Academy: Archaeology, Culture, History, Literature*, **114C**, 89–139

Hedges, J, 1975 'Excavation of two Orcadian burnt mounds at Liddle and Beaquoy', *Proceedings of the Society of Antiquaries of Scotland* **106**, 39–98

Hey, G, Bell, C, Dennis, C, and Robinson, M, 2016 *Yarnton: Neolithic and Bronze Age Settlement and Landscape, results of excavations 1990–1998*, Thames Valley Landscapes Monographs **39**, Oxford Archaeology

Hey, G, and Hind, J, 2014 *Solent-Thames Research Framework for the Historic Environment Resource Assessments and Research Agendas*, Project Report, Oxford Wessex

Hodder, M 2011 *Birmingham the hidden history,* Stroud

Hodder, M, 2017 'Burnt mounds and beyond: the later prehistory of Birmingham and the Black Country', in D Hurst (ed) *Westward on the high-hilled plains: The Later Prehistory of the West Midlands*, Oxford: Oxbow, 29–36

Hurst, D, 2011 'Middle Bronze Age to Iron Age: a research assessment overview and agenda', in S Watt (ed) *The Archaeology of the West Midlands: A Framework for Research,* Oxford: Oxbow, 101–126

Iliff, E, 2018 *Archaeological evaluation at land adjacent to Hanborough Station, Long Hanborough, Oxfordshire*, Worcestershire Archaeology, Worcestershire County Council, unpublished report **2529** revision 1, dated 5 February 2018

Inizan, M, Féblot-Augustins, J, Reduron-Ballinger, M, Roche, H, and Tixier, J, 1999 *Technology and terminology of knapped stone*, Nanterre: Cercle de Recherches et d'Études Préhistoriques

Jeffery, S, 1991 'Burnt mounds, fulling and early textiles', in M A Hodder and L H Barfield (eds) *Burnt Mounds and Hot Stone Technology. Papers from the Second International Burnt Mound Conference, Sandwell, 12th–14th October 1990*, West Bromwich, Sandwell Metropolitan Borough Council, 97–107

Knight, D, and Howard, A, 2004 *Trent Valley Landscapes. The archaeology of 500,000 years of change*, King's Lynn: Heritage Publishing

Loktionov, A, 2013 'Something for everyone: a ritualistic interpretation of Bronze Age burnt mounds from an ethonographic perspective', *The Post Hole*, **26**, available at http://www.theposthole.org/read/article/187, accessed 24/4/2018

Lovett, P, 2017 *Archaeological investigations 2012-2016 at Clifton Quarry, Kempsey, Worcestershire*, Worcestershire Archaeology, Worcestershire County Council, unpublished report **2314**, dated 31 March 2017

Mook, W G, 1986 'Business meeting: recommendations/resolutions adopted by the twelfth International Radiocarbon Conference', *Radiocarbon*, **28**, 799

Ó Drisceoil, D A, 1988 'Burnt mounds: cooking or bathing?', *Antiquity* **62**, 671–80

O'Kelly, M J, 1954 'Excavations and experiments in ancient Irish cooking places', *Journal of the Royal Society of Antiquities of Ireland* **84**, 105–55

Orion Heritage 2015 *Land adjacent to Hanborough Station Heritage Desk-Based Assessment,* Orion Heritage Ltd, unpublished document dated September 2015.

Orion Heritage 2018 *Land adjacent to Hanborough Station, Long Hanborough Archaeological Written Scheme of Investigation,* Orion Heritage Ltd, unpublished document dated February 2018

Oxford Archaeology North 2011 *Stainton West (Parcel 27) CNDR, Cumbria: Post-excavation assessment*, unpublished document, project **L10066**

PCRG/SGRP/MPRG, 2016 *A standard for pottery studies in archaeology*

Quinn, B and Moore, D, 2009 '*Fulacht fiadh* and the beer experiment', in M Stanley (ed) *Dining and Dwelling*, NRA Monograph Series **6**, Dublin, 43–53

Reimer, P J, Bard, E, Bayliss, A, Beck, J W, Blackwell, P G, Ramsey, C B, Buck, C E, Cheng, H, Edwards, R L, Friedrich, M, Grootes, P M, Guilderson, T P, Haflidason, H, Hajdas, I, Hatté, C, Heaton, T J, Hoffmann, D L, Hogg, A G, Hughen, K A, Kaiser, K F, Kromer, B, Manning, S W, Niu, M, Reimer, R W, Richards, D A, Scott, E M, Southon, J R, Staff, R A, Turney, C S M and van der Plicht, J, 2013 'IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP', *Radiocarbon*, **55**, 1869–87

Reynolds, F, 2009 'Regenerating substances: quartz as an animistic agent', *Time and Mind: The Journal of Archaeology, Consciousness and Culture*, Vol **2**(2), 153–166

Schweingruber, F H, 1978 *Microscopic wood anatomy: structural variability of stems and twigs in recent and subfossil woods from central Europe*, Swiss Federal Institute of Forestry Research

SMA 1993 *Selection, retention and dispersal of archaeological collections,* Society for Museum Archaeology, http://www.socmusarch.org.uk/publica.htm

Stace, C, 2010 *New flora of the British Isles*, Cambridge University Press (3rd edition)

Stuiver, M and Polach, H A, 1977 'Reporting of 14C data', *Radiocarbon*, **19**, 355–363

Stuiver, M and Reimer, P J, 1986 'A computer program for radiocarbon age calculation ', *Radiocarbon*, **35**, 215–230

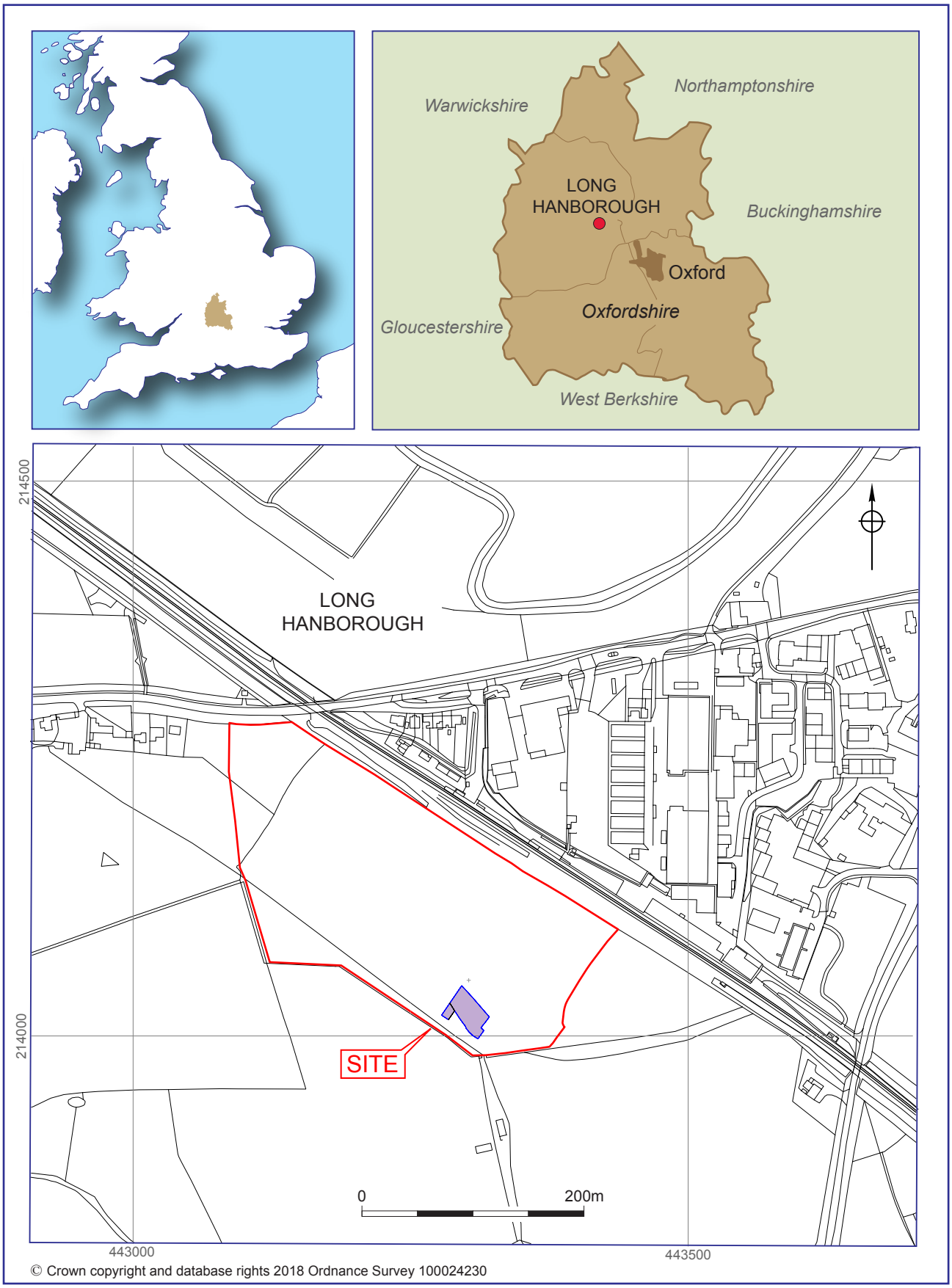
ULAS 2005 *Archaeological Excavations at Dunton Bassett, Leicestershire,* University of Leicester Archaeological Service, report **2005-168**

WA 2012 *Manual of service practice, recording manual*, Worcestershire Archaeology, Worcestershire County Council, report **1842**

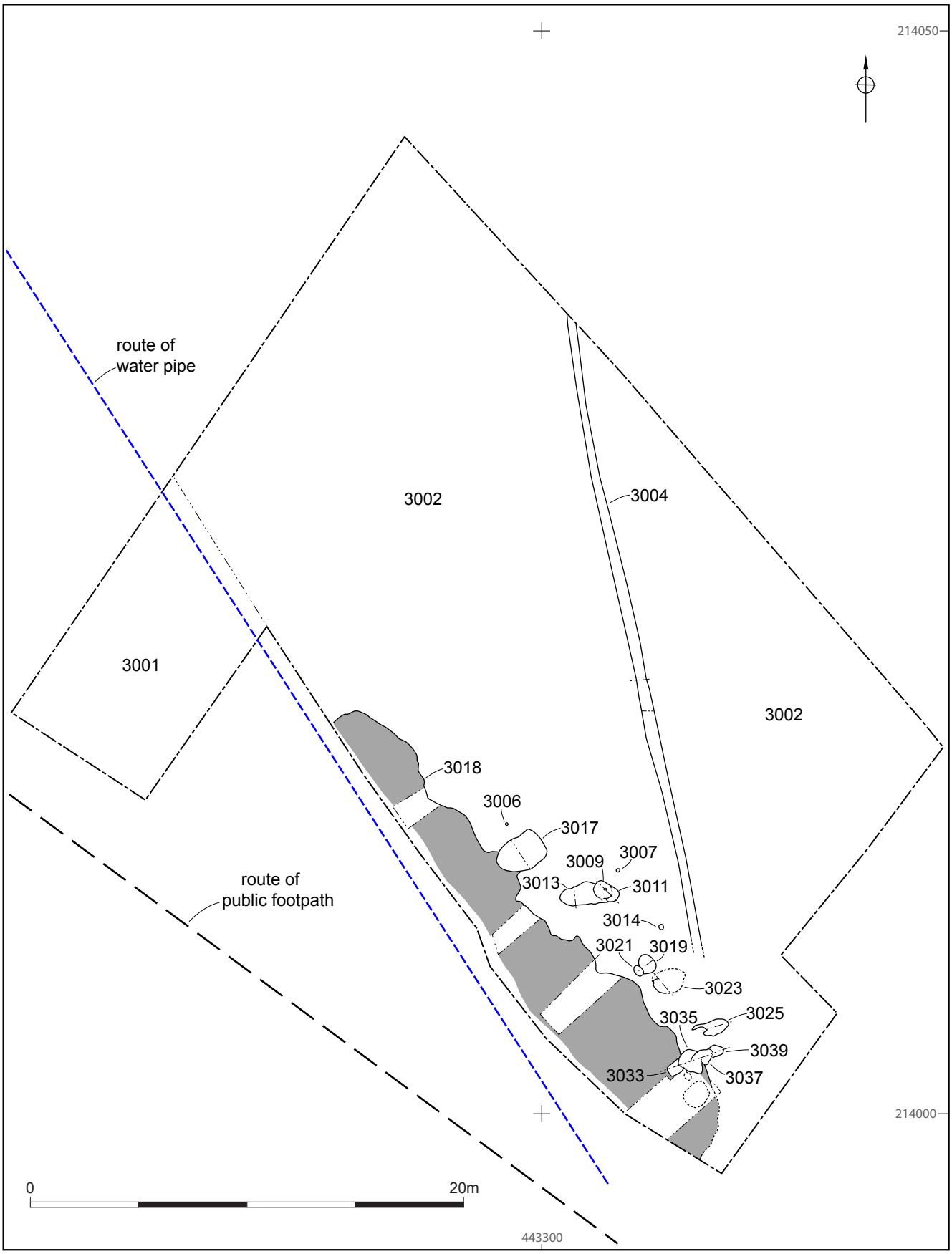
WA 2018 *Methods Statement for an archaeological excavation on land adjacent to Hanborough Station, Long Hanborough, Oxfordshire*, Worcestershire Archaeology, Worcestershire County Council, unpublished document dated 16 February 2018, **P5281**

Wigley, A, 2017 ‘Fugitive pieces: towards a new understanding of the later second and first millennia BC in Shropshire', in D Hurst (ed) *Westward on the high-hilled plains: The Later Prehistory of the West Midlands*, Oxford: Oxbow, 85–96

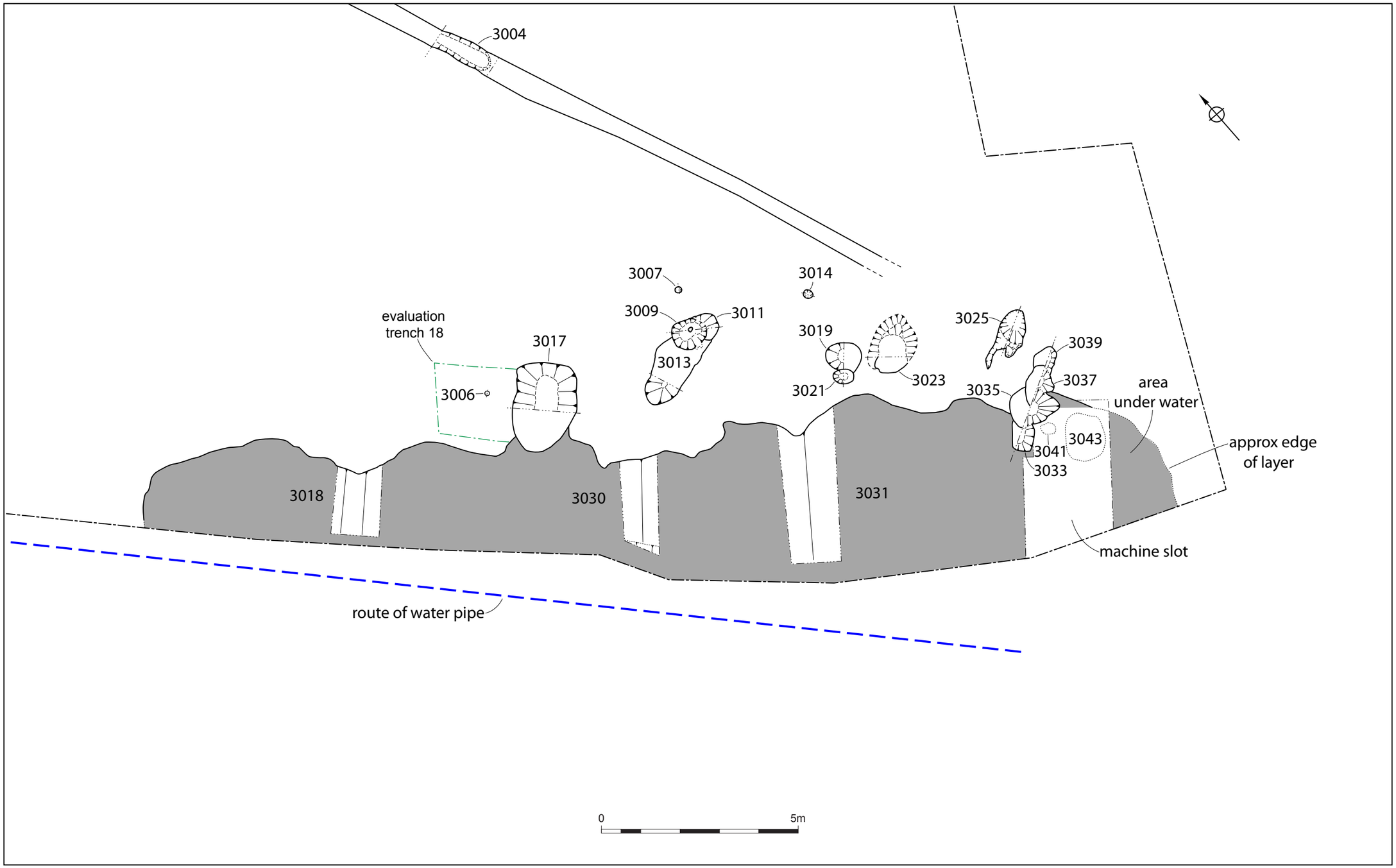
Figures



Location of the site (excavation area shaded) *Figure 1*

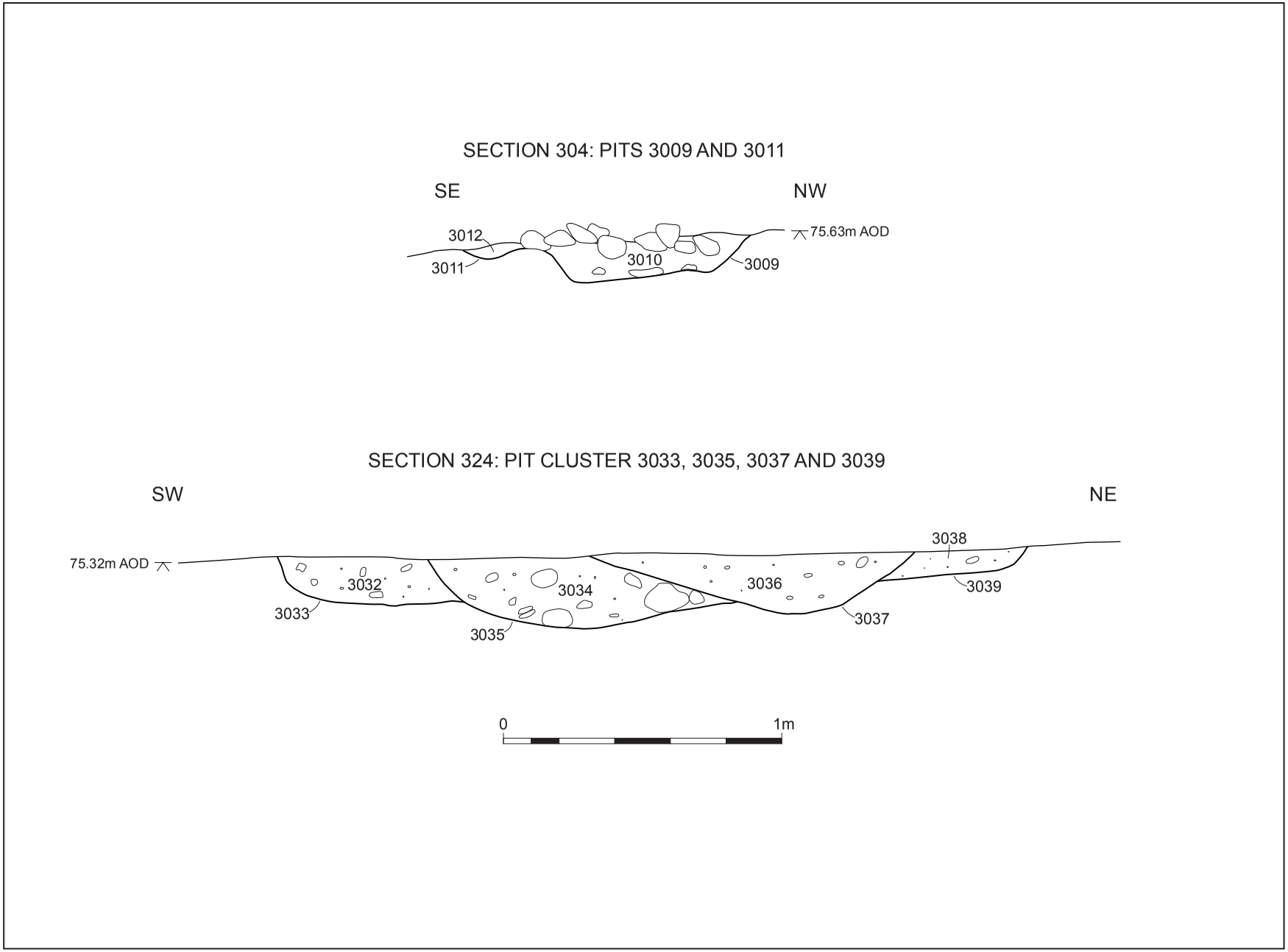


Trench plan (all features) *Figure 2*



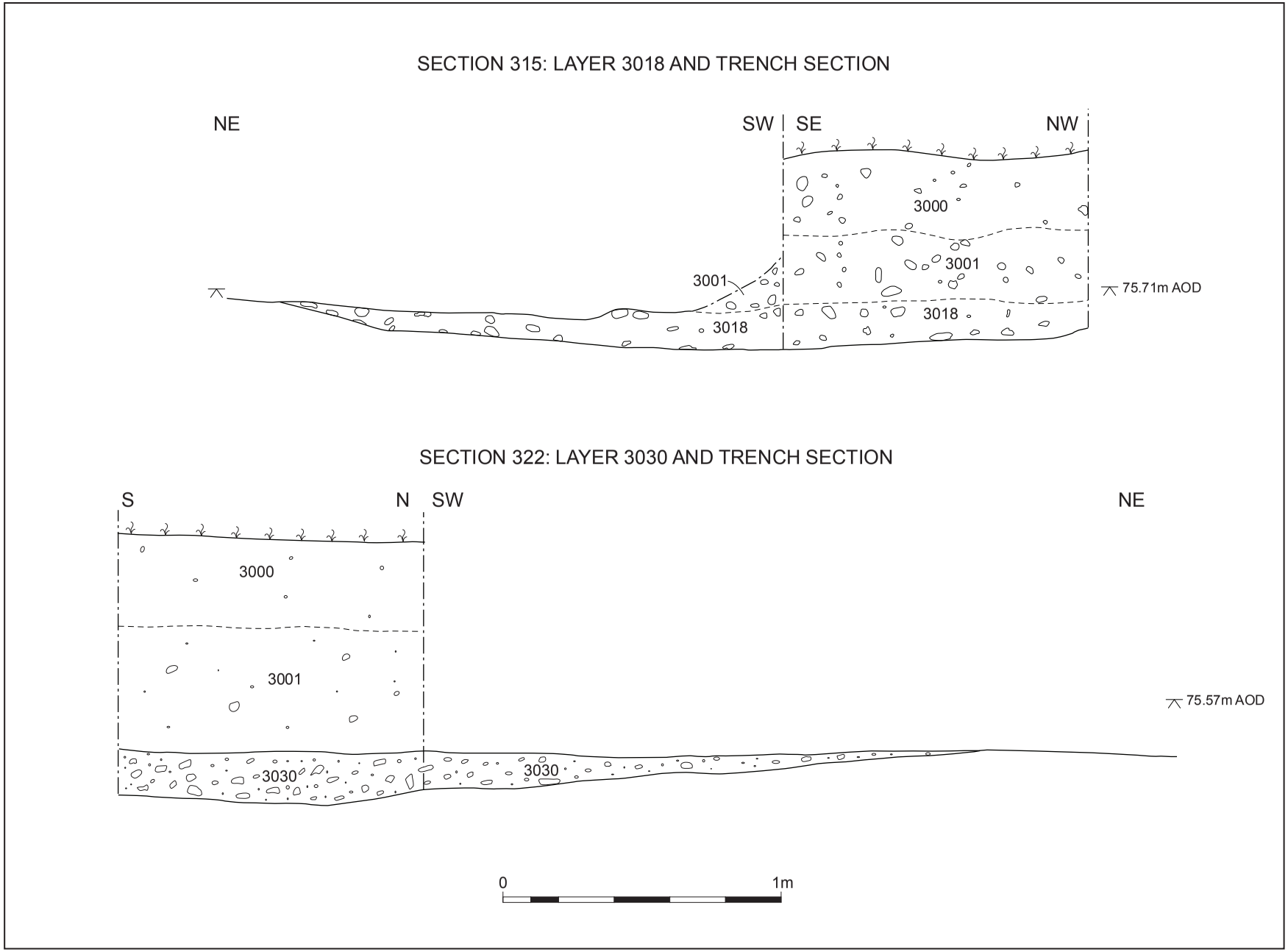
Detail of area of burnt layer (shaded) and pits

Figure 3



Sections

Figure 4



Sections

Figure 5

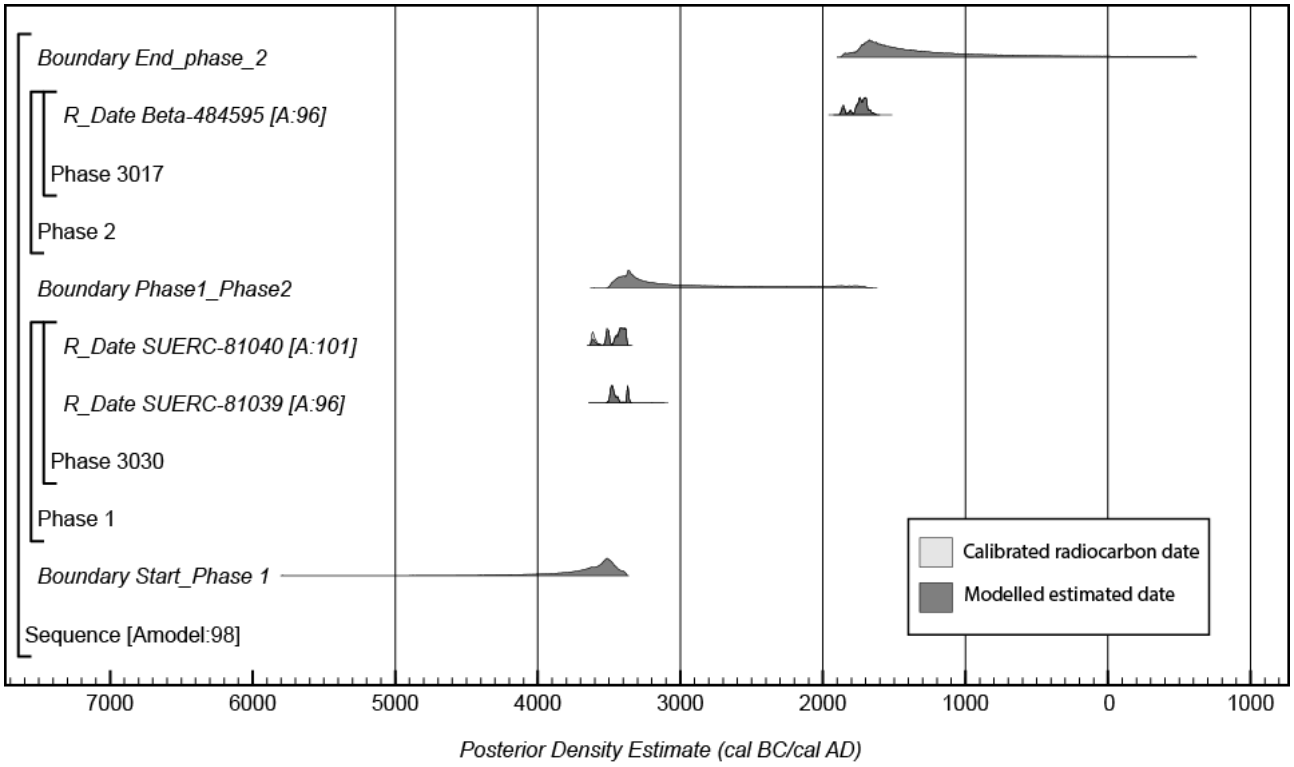


Figure 6: Probability distributions of prehistoric dates from Long Hanborough. Each distribution represents the relative probability that an event occurs at a particular time. Two distributions have been plotted for each radiocarbon calibration: the pale grey outline is the result of the simple radiocarbon calibration, and the dark grey is based on the chronological model. Other terms and distributions in the image correspond to other aspects of the model, for example, 'Boundary Start_Phase' is the estimate for the beginning of context 3030.

Plates

Plate 1: The site during machine excavation, facing south

Plate 2: Layer of burnt material (left) with pits alongside, pre-excavation, facing north-west (1m scales)

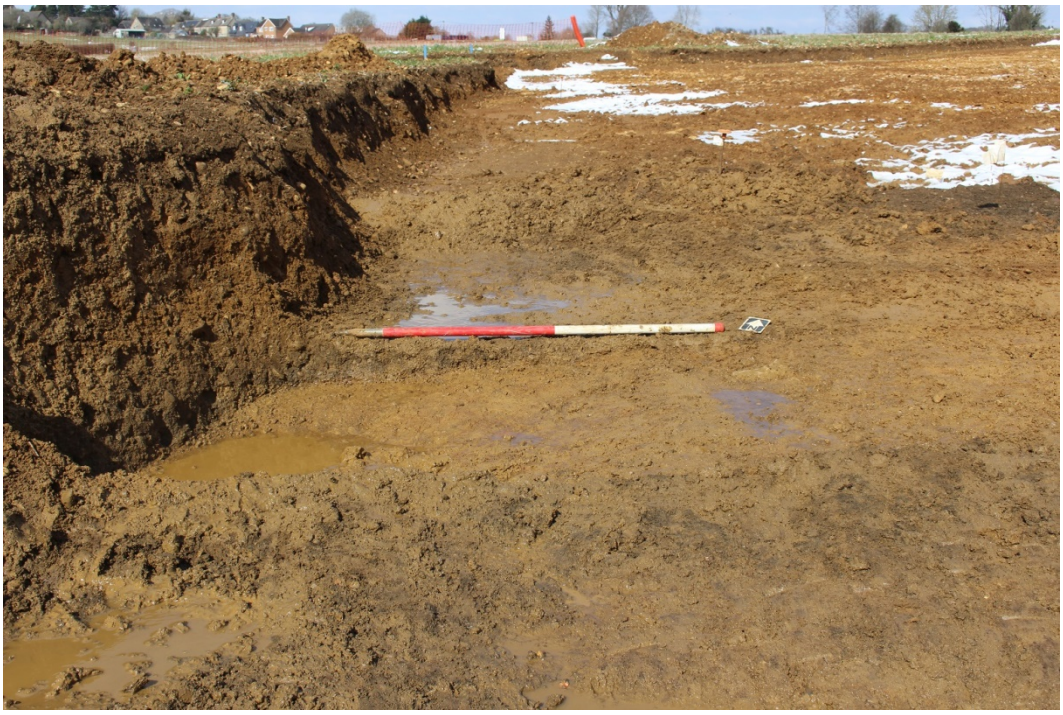


Plate 3: Slot in layer (3030) below topsoil and subsoil, facing north-west (1m scale)

Plate 4: Working shot of slot in layer (3031), oblique view facing west (1m scales)

Plate 5: Pit feature 3017 half sectioned, facing south-west (1m scale)

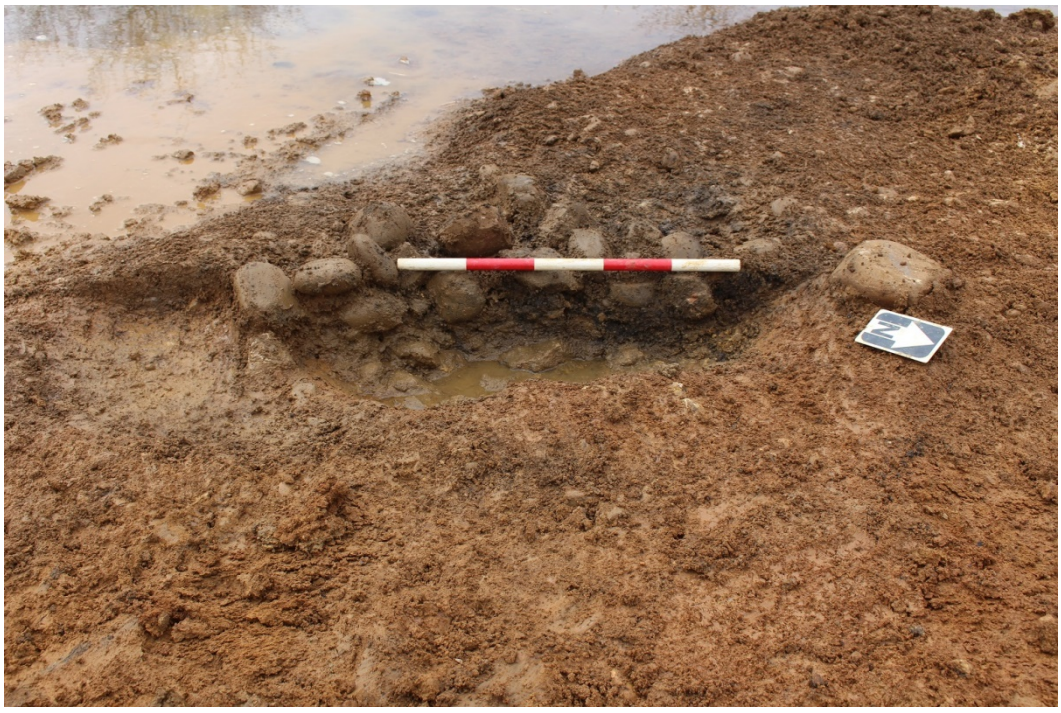


Plate 6: Pit feature 3009 half sectioned, facing south-west (0.5m scale)

Plate 7: Intercutting pits, 3033, 3035, 3037, 3039, oblique view facing north-west (1m scales)

Appendix 1 Technical information

The archive

The archive consists of:

35	Context records AS1
6	Field progress reports AS2
3	Photographic records AS3
1	Black and white photographic films
98	Digital photographs
1	Drawing number catalogues AS4
27	Scale drawings
1	Context number catalogues AS5
1	Sample number catalogues AS18
1	Box of finds
1	Copy of this report (bound hard copy)

The project archive is intended to be placed at:
Oxfordshire County Museum and Archive Store
Cotswold Dene
Standlake
Oxon, OX29 7QG

A copy of the report will be deposited with the Historic Environment Record (HER).