Archaeological investigations at Quedgeley Framework Plan 5 Gloucester Gloucestershire

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Summary

Two archaeological investigations were undertaken at Quedgeley Framework Plan 5, Gloucester, Gloucestershire (NGR SO 8115 1330). They were commissioned by Amec Foster Wheeler, acting on behalf of their client, Quedgeley Urban Village Ltd. Outline planning permission has been granted for the mixed use development of the site, the former RAF Quedgeley Royal Air Force Station, and is being undertaken in a phased manner. An archaeological evaluation had previously identified a number of heritage assets at the site and consultation with Gloucestershire City Council established that archaeological excavation of part of the site (Area G) was appropriate.

The investigations revealed two key phases of archaeological activity. A period of later Iron Age activity appears to be focussed in the eastern part of the site where two large pits, which may have been watering holes, and three small ditches, were identified. The two large pits (3044 and 3060) yielded pottery and animal bone, a bone comb and a possible stone weight. Well preserved organic remains including a collapsed hurdle and wooden post were also identified in the pits. Sampling of the organic deposits revealed an assemblage of plant macrofossils and pollen. The datable evidence, including three radiocarbon dates shows that the pits were infilled during the later Iron Age, and at least some of this process may have been rapid. The lack of agricultural and horticultural crops and weeds identified in the plant macro fossil and pollen assemblages indicate that crop processing was not happening in the immediate area of the site. The animal bone assemblage was too small to make any significant interpretations.

A second phase of activity dating to the earlier Roman period appears to have been focused on a group of ditches which may have formed part of a drove or trackway and a ditch orientated perpendicular to the droveway. Pottery from these features dated them to the earlier Roman period. Environmental evidence from this phase of activity was limited to a small assemblage of animal bone which was dominated by the head and upper limb bones of cattle indicating that it originated as food waste.

Later activity on the site, including a post-medieval to modern field boundary, and 20th century pits, were not deemed to be archaeologically significant.

Report

1 Background

1.1 Reasons for the project

Two archaeological investigations were undertaken at Quedgeley Framework Plan 5, Gloucester, Gloucestershire (NGR SO 8115 1330; Figure 1). They were commissioned by Amec Foster Wheeler, acting on behalf of their client Quedgeley Urban Village Ltd. Outline planning permission has been granted for the mixed use development of the site and is being undertaken in a phased manner. An archaeological evaluation had previously identified a number of heritage assets at the site and consultation with Gloucestershire City Council established that archaeological excavation of part of the site (Area G) was appropriate.

The project conformed to a written scheme of investigation (WSI) produced by AMEC Foster Wheeler (Amec Foster Wheeler 2017) and for which a project proposal (including detailed specification) was produced (WA 2017a). Following the excavation phase a *Post-excavation assessment and updated project design* was produced (WA 2017b). The project also conforms to the *Standard and guidance: Archaeological excavation* (ClfA 2014a).

2 Aims

The original aim of the excavation, as outlined in the WSI (Amec Foster Wheeler 2017) was to record, interpret and further understand the archaeological deposits identified as a result of the field evaluation, and to produce a written report and archive.

This aim remains valid but was refined and supplemented by the following site specific aims as part of the updated project design (WA 2017b):

- What is the chronology and sequence of the Iron Age features?
- How do the Iron Age features fit with other evidence in the region?
- What is the chronology and sequence of the Roman features?
- How do the Roman features fit with other evidence in the region?
- Is it possible to refine the dating of the pottery?
- What was the economic and environmental basis for the Iron Age and Roman activity? Is there evidence for change during these periods?

In addition further analysis has the potential to address the following aims identified in the South West Archaeological Research Framework (Webster 2008):

- Improve our understanding of wild and domestic animals in the past (Research Aim 19)
- Improve our understanding of wild and cultivated plants in the past (Research Aim 20)
- Improve our understanding of the environmental aspects of farming (Research Aim 21)
- Improve our understanding of insect faunas and what they can tell us about past environments (Research Aim 22)
- Improve our understanding of non-villa Roman rural settlement (Research Aim 29).

3 Methods

3.1 Personnel

The project undertaken by Graham Arnold, Peter Lovett, Tom Rogers who also managed the project, and Andrew Walsh. The report was produced by Andrew Walsh with illustrations prepared by Carolyn Hunt and Laura Templeton. C Jane Evans contributed the pottery report, Ruth Shaffrey the stone report, Matilda Holmes the animal bone, Kath Hunter the plant macrofossils, Nick Daffern

the pollen assessment, and Elizabeth Pearson the radiocarbon dating report. Radiocarbon dating was by SUERC.

3.2 Fieldwork strategy

On the basis of the results of the trial trenching an area of excavation was agreed between Andrew Armstrong (Gloucester City Council Planning Archaeologist), Andrew Smith (Gardiner and Theobold LLP) and Mike Glyde (Amec Foster Wheeler). Parcel G, which is located in the southern part of the excavation area (Figure 2), was excavated first and forms the basis of this report. The area measures approximately 55m by 35m. A written scheme of investigation for Parcel G was prepared in advance by Amec Foster Wheeler (Amec Foster Wheeler 2017) and set out the agreed method statement for archaeological works. The fieldwork for this area was undertaken between 16th January and 6th February 2017.

A small area to the east of Parcel G was also excavated on the 27th July 2017 in advance of the construction of an electricity substation and is included in this report. This area measured approximately 4.5m by 4.5m. The remaining excavation area(s) will be reported separately.

The site reference number and site code is P4934. Deposits considered not to be significant were removed using a 360º tracked excavator, employing a toothless bucket and under archaeological supervision. 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). On completion of excavation, the trench was reinstated by replacing the excavated material.

3.3 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.

3.4 Artefact methodology, by C Jane Evans

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

3.4.1 Recovery policy

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

3.4.2 Method of analysis

All hand-retrieved finds were identified, quantified and, where possible, dated to period. A *terminus post quem* date was produced for each stratified context. All information was recorded on a pro forma Microsoft Access database.

No artefacts were recovered from environmental samples.

The pottery was examined under x20 magnification, with reference to the Gloucestershire fabric type series (Ireland 1983, Appendix B1; Vince 1983a and 1983b, Appendix B3) and/or, where more appropriate for widely distributed wares, to the national Roman fabric reference collection (Tomber and Dore 1998). Detailed fabric analysis was not undertaken for the small assemblage of ceramic building material. The diagnostic sherds of Late Iron Age pottery are illustrated, to support dating.

Three pieces of stone were submitted for analysis, and recorded on a Microsoft Access database. The data has been archived in an Excel spreadsheet. One was found to be an unworked piece of lias (3051). This is not included in the report and tabulations.

3.4.3 Discard policy

Discard of the following categories/types of material could be discussed with the receiving museum, following submission of this report

- unstratified finds
- post-medieval material and;
- any material specifically assessed as having no obvious grounds for retention.

See the environmental section for other discard where appropriate.

3.5 Environmental archaeology methodology

A total of 17 samples were taken, which included bulk, monolith, spit, wood and spot samples (Table 1). Following a site visit by Worcestershire Archaeology Environmental Archaeologist, potential for recovery of environmental remains was thought to be low, with the exception of organic deposits within two pits interpreted as waterholes (pits [3044] and [3060]). Analysis, therefore, focussed on a sparse scatter of hand-collected animal bone and analysis of organic plant macrofossil and pollen remains from the two pit/waterhole features. Species identification was not possible from a timber stake recovered. Samples from the organic deposits were submitted for radiocarbon dating.

Context	Sample	Spit sample (m BGS)	Feature type	Fill of	Period	Sample volume (L)	Volume processed (L)	Residue assessed	Flot assessed	Comment
3017	1		Ditch	3018	prehistoric	10	1	Yes	No	
3038	6.1	0.52 – 0.65m	Pit	3044	Iron Age	10	1	Yes	Yes	
3039	6.3	0.65 – 0.72m	Pit	3044	Iron Age	10	1	Yes	Yes	
3039	2		Pit	3044	Iron Age	30	0	No	No	
3037 - 3043	4					0	0	No	No	Monolith
3049	6.2		Pit	3044	Iron Age	10	1	Yes	Yes	
3049	3	0.72 – 0.83m	Pit	3044	Iron Age	20	0	No	No	
3054	4					20	0	No	No	
Various [3060]	10		Pit			0	0	No	No	Monolith
3062	17		Pit			0	0	No	No	Timber stake
3087	11.1	0.56 – 0.63m	Pit	3060	Iron Age	10	1	Yes	Yes	
3088	11.2	0.63 – 0.81m	Pit	3060		8	0	No	No	
3089	11.3	0.81 – 0.90m	Pit	3060		8	0	No	No	
3090	11.4	0.90 – 0.44m	Pit	3060	Iron Age	10	1	Yes	Yes	
3094	16					10	0	No	No	
3095	15					0	0	No	No	Hazelnut from (3095)

Table 1: List of environmental samples

3.5.1 Animal bone methodology by Matilda Holmes

Bones were identified using the author's reference collection. Due to anatomical similarities between sheep and goat, bones of this type were assigned to the category 'sheep/ goat', unless a

definite identification (Zeder and Lapham 2010; Zeder and Pilaar 2010) could be made. Bones that could not be identified to species were, where possible, categorised according to the relative size of the animal represented (micro – rat/ vole size; small – cat/ rabbit size; medium – sheep/ pig/ dog size; or large – cattle/ horse size). Ribs were identified to size category where the head was present, vertebrae were recorded when the vertebral body was present, and maxilla, zygomatic arch and occipital areas of the skull were identified from skull fragments.

Tooth wear and eruption were recorded using guidelines from Grant (1982) and Payne (1973), as were bone fusion, metrical data (von den Driesch 1976), anatomy, side, zone (Serjeantson 1996) and any evidence of pathological changes, butchery (Lauwerier 1988) and working. The condition of bones was noted on a scale of 0-5, where 0 is fresh bone and 5, the bone is falling apart (Lyman 1994, 355). Other taphonomic factors were also recorded, including the incidence of burning, gnawing, recent breakage and refitted fragments. All fragments were recorded, although articulated or associated fragments were entered as a count of 1, so they did not bias the relative frequency of species present. Details of associated bone groups were recorded in a separate table. No sieved samples were made available, which may lead to a negative bias in the number and variety of small mammals, fish and bird bones recorded in the assemblage.

3.5.2 Plant macrofossils methodology by Kath Hunter

Following the assessment of five samples from two features interpreted as waterholes excavated by Worcestershire Archive and Archaeology Service, three samples from one of the features (3044) were selected for full analysis based on the relative richness of the surviving assemblage.

All of the samples were processed at Worcestershire Archive and Archaeology Service for the recovery of plant remains. As the potential for recovery of occupational debris was thought to be low based on visual inspection on site, but preservation of organic remains potentially at least moderately high, processing techniques suitable for recovery of organic remains were used as follows.

For each of the samples a sub-sample of 1 litre was processed by the wash-over technique as follows. The sub-sample was broken up in a bowl of water to separate the light organic remains from the mineral fraction and heavier residue. The water, with the light organic faction was decanted onto a 300mm sieve and the residue washed through a 1mm sieve. The remainder of the bulk sample was retained for further analysis.

The flots and residues were analysed using low powered microscopes at a magnification of between x10 and x 20(MTL10 stereo microscope). The nomenclature for the plant remains follows Stace 2010. The identification of the plant remains was carried out using modern reference material and standard reference texts (Beijerinck 1947, Berggren 1967 and 1981, Anderburg 1994, Cappers et al 2006). The results are recorded in Table 6.

3.5.3 Pollen assessment methodology by Nick Daffern

Five pollen sub-samples measuring 2cm³ were recovered by Worcestershire Archaeology's Senior Environmental Archaeologist from selected locations identified as of interest in consultation with the palynologist for the project. Sub-samples were selected based upon their stratigraphic location in the sequence and their ability to compliment the archaeological assessment.

The sub-samples were submitted to the laboratories of the Department of Geography and Environment at the University of Aberdeen for chemical preparation following standard procedures including acetolysis and hydrofluoric acid digestion, as described by Barber (1976) and Moore *et al* (1991).

Where preservation allowed, pollen grains were counted to a total of 150 land pollen grains (TLP) for assessment purposes using a GS binocular polarising microscope at x400 magnification. Identification was aided by using pollen reference slides and the pollen reference manual by Moore et al (1991). Nomenclature for pollen will follow Stace (2010) and Bennett (1994).

Fungal spores and parasite ova were noted and rapid identification was undertaken to genus level. Identifications were aided through reference material and reference manuals Kirk *et al* (2008) and Grant-Smith (2000).

3.6 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 Site location, topography, geology

The Framework Plan 5 site is located within the former HQ site of RAF Quedgeley. It lies approximately 4km south of Gloucester, and east of the historic settlement of Quedgeley. Much of the HQ site around the Framework Plan 5 area has been redeveloped in recent years. The site is on broadly level ground. The geology of the site is mapped as undifferentiated Blue Lias Formation and Charmouth Mudstone Formation, overlain by superficial deposits of Cheltenham Sand and Gravel (BGS 2017).

4.2 Historic environment overview

The most significant archaeological feature within the RAF site is Manor Farm, a group of listed farm buildings and moat, which is a scheduled monument. Manor Farm is located approximately 300m to the north of the Framework Plan 5 area and dates to the medieval period. There is further evidence of a medieval agricultural landscape within the site in the form of both ploughed out and extant ridge and furrow, along with drainage and boundary ditches.

Previous phases of trial trenching within the former RAF site has been undertaken in three stages. Only four trenches were excavated within the Framework Plan 5 area, and no archaeological features were identified within these trenches. Within the wider site, a total of 74 trenches were excavated, and 30 contained archaeological features. To the west of Manor Farm evidence of a 1st century AD settlement, including a number of substantial ditches and smaller gullies was identified. While the trial trenching did reveal fragments of tegula, suggesting a building in the area, no *in situ* evidence for structural remains was found. Further evidence of Roman activity has been identified outside of the site area, including the remains of a villa excavated at Olympus Park to the north.

A second area of features was identified containing ditches, pits and gullies relating to 11th century field boundary and land drainage, although the purpose of the pits was less clear. This area was excavated further in advance of development of Framework Plan 1. The final group of archaeological features identified by the trial trenching were three possible Iron Age and/or Bronze Age enclosures.

Historic maps indicate the Framework Plan 5 area was in agricultural use during the post-medieval period and early modern period. The base was established as a munitions factory during the First World War, although the area of the present site was not incorporated into the facility until the Second World War. The base was in use as an RAF supply depot until 1995, when it was sold to Quedgeley Urban Village Ltd.

4.3 Trial trenching in Framework Plan 5

Twenty two trenches were excavated across the Framework Plan 5 site during an evaluation in 2016 (Walsh and Iliff 2016). Archaeological or potential archaeological features relating to two distinct phases of activity were identified in eleven of the trenches. The first phase of activity was represented by a number of possible enclosure type features in the western part of the site. These features yielded a moderate quantity of Roman pottery typical of rural sites in the area. The second phase of activity was represented by a series of sterile ditches in the eastern and central part of the site. These ditches appear to correlate with field boundaries visible on historic Ordnance Survey maps, and are therefore interpreted as post-medieval in date.

5 Results

5.1 Phasing

The excavation at Parcel G produced evidence for Iron Age, Roman, post-medieval and modern activity. On the basis of the structural and artefactual evidence the site was divided into five phases:

Phase 1 Geological deposits

Phase 2 Later Iron Age

Phase 3 Earlier Romano-British

Phase 4 Post-medieval to modern

Phase 5 Modern

A number of undated features were also identified. Full analysis of the material, combined with the radiocarbon dates, has enabled the dates of Phases 2 and 3 to be refined.

5.2 Structural evidence (Figure 2)

5.2.1 Phase 1: Geological deposits

The underlying natural geology of the Parcel G excavation area and the electricity substation area was a gravely sand which ranged in colour from light brown to a bright reddish orange. This is consistent with the Cheltenham sand and gravel mapped by the BGS (2017).

5.2.2 Phase 2: Later Iron Age

A sequence of inter cutting features were identified in the eastern part of the site. The earliest feature was ditch group 8, which was orientated approximately north-west to south-east and was present within the excavation area for approximately 18m. It measured 0.7m in width and 0.2m in depth, and was filled by a single deposit which yielded no finds.

Ditch 8 was cut by a small pit, 3014, which measured 1.7m in length and 0.2m in depth. It yielded no finds and was in turn cut by ditch group 7. This ditch was broadly orientated from north to south for at least 23m, terminating to the north. It measured 0.7m in width and 0.25m in depth, and was filled by a single deposit which yielded no finds. The northern terminus was partially truncated by a modern feature containing asbestos containing material (ACM) so was not excavated.

Ditch 7 was cut by Pit 3060. This pit measured 5.7m by 4.5m and 0.9m in depth. It was excavated in quadrants, with baulks left between each one enabling each quadrant face to be recorded (Figure 3, S.20, S.21, S.37 & S.38; Plates 1-6). The pit contained at least 14 separate deposits, and 19 sherds of later Iron Age pottery, a bone comb, a possible worked stone, and animal bone fragments were all recovered. In the base of the pit a collapsed wooden hurdle was recorded. It appeared to have been constructed in the western part of the pit, and collapsed inwards toward the centre. It comprised a number of roundwood elements lying flat but, in part set in an interweaving pattern with some elements set perpendicular to each other and others more orientated arbitrarily. The wood was poorly preserved and fragmentary and no evidence of working was noted. To the north west three wooden stakes (3061, 3062, 3063) were set upright in the base of the pit in a line. These were of round wood, approximately 40mm in diameter and protruded to a maximum length of 50mm.

Although there was no significant evidence of re-cutting of the pit in any of the recorded sections, the irregular form of this pit, together with the presence of the hurdle in one part of the feature, suggests that it may have been re-excavated a number of times. A number of the lower fills were much darker and appeared rich in organic remains. The feature was 100% excavated and samples, including monolith and spit, taken for environmental analysis.

To the north of Pit 3060 was Pit 3044. It measured 5.1m by 3.6m and 0.9m in depth and was filled by nine deposits. Three of the lower fills 3038, 3039 and 3049 were extremely rich in dark organic deposits (Figure 3, S.18 & S.40; Plates 6-9). Monolith and spit samples were taken from these deposits for environmental analysis. Finds recovered from this pit include 131 sherds of later Iron Age pottery, animal bone, a possible stone weight and a piece of worked limestone. A single wooden post, 3045, was also identified in-situ in the south-eastern corner of the features (Plate 10). The north-eastern part of the feature was truncated by a modern pit containing ACM, so this part of the feature was not excavated.

Ditch 6 was located to the north of Pit 3044. It measured over 11m in length, 0.8m in width and 0.37m in depth. It was filled by a single deposit which yielded pottery dating to the later Iron Age. It may be contemporary with ditch group 7 which was located to the south, with the gap between the two features forming a possible entrance.

5.2.3 Phase 3: Roman

To the west of the site three ditches were identified, visible for over 20m. Ditch groups 1 and 3 were both shallow ditches measuring a maximum 0.2m and 0.16m in depth respectively. Although no stratigraphic relationship was identified between them, both ditches were aligned on roughly the same curving orientation and are probably contemporary. They yielded pottery dated to the earlier Roman period and may have formed part of a droveway, although only further investigation to the north and south-west of the current excavation area would confirm this interpretation. Ditch 2, which measured 8m in length, 1.2m in width and 0.55m in depth, appears to have been constructed on the outside corner of the droveway, directly adjacent and parallel to ditch group 1. No finds were recovered from this feature.

Groups 4 and 5, located to the north-east of the site, had an unclear relationship. Group 4 appeared to be two intercutting, elongated pits or short linear features, which measured 5m in length and up to 0.4m in depth. These features yielded a small quantity of earlier Roman pottery. Ditch 5 was orientated north-west to south-east for at least 20m with the excavation area. It measured up to 1.05m in width and 0.2m in depth, and was filled by a single deposit which yielded a small quantity of earlier Roman pottery including one sherd of samian ware.

5.2.4 Phase 4: Post-medieval to modern

Ditch 9 was orientated roughly north to south across the middle of the site. This unexcavated ditch corresponded with a post-medieval field boundary which is illustrated on historic Ordnance Survey maps up until at least the early 1920s (OS 1884, OS 1903, OS 1923).

5.2.5 Phase 5: Modern

In the Parcel G excavation area all features and deposits were sealed by a subsoil, which measured up to 0.35m in depth. To the west and north of the site it was overlaid by a 0.3m deep topsoil, and to the east by 'type 1' mineral stone.

A large number of modern pits, which frequently contained ACM, were located across the site truncating many of the archaeological features and deposits. A number of services were also located in the excavation area and these were left in-situ. Two small pits contained dumps of bottles, animal bone and metal apparently dating to the mid-20th century were also identified. All these features were probably associated with development and use of RAF Quedgeley.

No archaeological features were identified in the electricity substation area to the east of Parcel G. A modern service trench orientated north-east to south-west was recorded cutting natural sand. This area was sealed by a 0.5m deep orangey brown sandy subsoil, a 0.3m deep disturbed topsoil, and a 0.05m mixed layer of hardcore.

5.2.6 Undated pits

A number of small sterile pits were also identified across the Parcel G area (3022, 3024, 3026, 3028 and 3034). The origin and function of these features is not clear.

5.3 Artefactual analysis, by C Jane Evans

The artefactual assemblage is summarised in Tables 2 and 3.

The assemblage came from twenty four stratified contexts, associated with two pits and various linear features. The finds dated from the later Iron Age to the early Roman period (Table 2). Full analysis of the pottery has enabled the dates of the activity on the site to be refined. Pottery was the most common find, but a bone weaving comb and a couple of stone finds were also recovered. The majority of the pottery was very fragmentary (average sherd weight 4g) and moderately abraded. The largest assemblages came from Pit 3044 (fills 3036 and 3038).

period	material class	material subtype	object specific type	count	weight(g)
Iron Age	bone	antler	weaving comb	1	67
Later Iron Age	ceramic	earthenware	pot	154	493
prehistoric	stone	flint	flake	1	8
Roman	ceramic	earthenware	pot	19	156
Roman?	ceramic	fired clay	brick/tile	2	35
uncertain	ceramic	earthenware	pot	2	1
undated	bone	animal bone	fragment	447	3185
uncertain	stone	lias	natural?	1	12000
		limestone	pendant/weight	1	64

Table 2: Quantification of the assemblage by period and material class

fabric class	Gloucestershire fabric type	NRFRC code*	count	weight (g)	average weight (g)
grog	TF2	-	2	1	1
Malvernian	TF18	MAL RE A	3	27	9
palaeozoic limestone	TF216	-	151	466	3
samian	TF8B	LGF SA	1	3	3
Severn Valley ware	TF11B	SVW OX 2	16	127	8

oxidised	-	-	2	26	13
Total			**175**	**650**	**4**

*Table 3: Quantification of the pottery by fabric (*Tomber and Dore 1998)*

5.3.1 Summary artefactual evidence by period

The flint

A single fragment of flint was recovered from the upper fill of Pit 3044 (3036). The re-struck flake was not closely datable (Rob Hedge *pers comm*).

Later Iron Age to earlier Roman pottery

The majority of the pottery was in a Palaeozoic limestone fabric (Peacock 1968, group B1; Gloucestershire fabric TF216). This was associated predominantly with Pit 3044, probably representing a couple of vessels, with smaller quantities coming from Pit 3060 and ditch 3071. Previous petrological analysis of this ware and analysis of its distribution has indicated a source in the Woolhope Hills area of Herefordshire (Morris 1983, 116-22, figs 4.17-4.18). The fabric is typical of sites dating broadly from the Middle Iron Age to the Late Iron Age and earliest Roman periods, going out of use *c.* AD 60. Most sherds were fragmentary and undiagnostic so could not be closely dated. However, diagnostic rim sherds were recovered from pits 3044 and 3060, indicating a likely date for other sherds.

Pit 3044 produced two rims, one from a layer of tipped material (3042, Figure 5.1) and another from the upper fill (3036, Figure 5.2). Both were from barrel-shaped jars with upright rims, a fairly long lived form. The blackened and burnished surface finish on these and the other body sherds suggests a later Iron Age date, being characteristic of later Iron Age assemblages from Beckford (unpublished). Two radiocarbon dates of 350-50 cal BC, obtained for associated fills 3038 and 3049, broadly support the ceramic dating, though the pottery hints at a date in the latter half of this date range. Pit 3060 (fill 3054) produced a rounded rim from a globular jar (Figure 5.3); a Late Iron Age form found at Beckford. The Palaeozoic limestone tempered ware was not associated with any diagnostically Roman pottery, suggesting that it pre-dated the Roman activity on the site. A radiocarbon date of 160 cal BC – 20 cal AD, from the bottom fill (3090) supports a Late Iron Age date. The Group 6 ditch (fill 3070) produced a further nine sherds of Palaeozoic limestone tempered ware. There is no independent dating for this feature but it is likely to be contemporary with the pits.

Only three sherds of handmade Malvernian ware were recovered (Peacock 1968, group A; Gloucestershire fabric TF18) from a dark organic layer in Pit 3044 (fill 3049). This fabric also dates broadly from the Middle Iron Age to Roman period, continuing in use into the second century AD. No diagnostic forms were present but the associated radiocarbon date noted above provides more reliable dating.

Two tiny, abraded fragments of grog-tempered pottery were recovered amongst redeposited natural in ditch 3044 (fill 3040). These were far too small to be identified with any confidence. The date of these is uncertain; they might be Late Iron Age/early Roman but could be earlier prehistoric.

Catalogue of Late Iron Age pottery (Figure 5):

1 Rim from a barrel-shaped jar with a rounded, upright rim. Fabric TF216. Diameter 16cm, 7%. Pit 3044, fill 3042

2 Rim from a barrel-shaped jar with a flat-topped, upright rim. Diameter 18cm, 5%. Pit 3044, fill 3036

3 Rim from a globular jar with a rounded rim. Diameter uncertain. Pit 3060, fill 3054

Nineteen sherds of diagnostically Roman pottery were recovered, none of which are illustrated. All came from linear features. The majority were in Severn Valley ware (Gloucestershire Fabric TF11B). These included a bead-rim jar only broadly datable to the second to third centuries (Webster 1976, fig 2.A7), from group 1 linear 3004 (fill 3003); a rim from a jar or bowl, also broadly dating to the second to third century, from group 4, linear 3075 (fill 3074); and a sherd from a bead rim flagon dating to the late first to early second century, from group 3, ditch 3069 (fill 3068). A sherd of very abraded samian, from La Graufesenque in South Gaul (Gloucestershire Fabric TF 8B), probably also dates to the late first century. This was found in group 5 ditch 3079 (fill 3078). The only other Roman pottery comprised an oxidised body sherd from group 1 curvilinear 3004 (fill 3003).

Ceramic building material

Two small and abraded fragments of ceramic building material were found in ditch 3030 (fill 3029). These were not diagnostic but might possibly be Roman.

The worked stone by Ruth Shaffrey

The only find of real interest is a small, perforated, oval-shaped stone (Figure 6.1), found in a later Iron Age pit (3044). The stone has a small perforation at one end of the hollow and was probably suspended, although there is no wear providing evidence of this. The purpose of the stone is not clear. It is possible that it was a small weight perhaps for use on a loom, but the weight (64g) is on the low side as loom weights typically weigh in the hundreds of grams up to about 1.5kg (Shaffrey in press 2017, 232). However, small loom weights are known. In pre-Roman Italy, for example, Gleba found groups of loom weights weighing 75-85g and as light as 30-40g (2008, 169). If this stone is a loom weight, it is likely that it was being used to weave very fine fabrics. Another possibility is that the stone is a pendant and was worn or used for decorative purposes. Such pendants are most commonly found in Bronze Age features, but Iron Age and Roman examples are known from sites such as Croft Ambrey (Stanford 1974, 182).

A second large piece of lias, from the basal fill of the same pit (fill 3043), has one hollowed face. There are no tool marks, suggesting that the hollowed face is not man-made and although it may have served a purpose as a structural post-pad, it is not actually worked. Both these stones can now be discarded. A third fragment, from Pit 3060 (fill 3051) is natural and has not been included in the analysis.

The antler weaving comb

Another interesting find was a weaving comb (Figure 6.2), found in the backfill of Pit 3060 (fill 3052). The comb was made of antler, probably from a red deer (Matilda Holmes *pers comm*). It was plain, rather than decorated, and originally had nine teeth, all of which were broken in antiquity. This pattern of breakage, with all or most of the teeth broken on a level as a result of use, was the most common evidence for wear noted at Danebury (Sellwood 1984, 371). The butt end of the handle is polished with use, as are the two sides, while the upper surface has scratch/cut marks, also presumably from wear.

Such combs date predominantly to the middle and later Iron Age; at Danebury they were markedly more common in ceramic phase 7-8, dated c.300-100/50 BC (ibid). This is consistent with the dating evidence here; the basal fill of Pit 3060 provided a radiocarbon date of 160 cal BC-20 cal AD. They are a common find on sites of this date, providing evidence for domestic craft activity in the vicinity. They have traditionally been interpreted, as the name suggests, as tools used for beating down horizontal weft threads on a warp-weighted loom. More recent studies, including use-wear analysis, suggest they may have had other uses, for example associated with the manufacture of braids or straps or working fleeces (Chittock 2014, 316).

Catalogue of other finds (Figure 6):

1 Small oval-shaped, perforated stone with one rounded convex face and one hollowed face. Maximum length 60.5mm, maximum width 50.5mm, maximum thickness 21mm. Pit 3044, fill 3039

2 Antler weaving comb with broken teeth. The butt end of the handle is slightly thickened. Length of handle to base of teeth 114mm, maximum width of handle near teeth 42mm, minimum width of handle near butt 33.5mm, width of butt 41mm. Pit 3060, fill 3052

5.3.2 Significance

The artefacts provide evidence for some level of domestic activity on the site in the later Iron Age and earlier Roman periods, ie the late first to early second century. There is a clear chronological distinction between the pottery from the pits and ditch group 6, dating to the later Iron Age, and the other linear features, which produced diagnostically Roman pottery. Much of the later Iron Age assemblage comprised undiagnostic body sherds in Palaeozoic limestone tempered ware. The more diagnostic rims, and the surface treatment of the pottery in general, indicated a later Iron Age data. The sherds from Pit 3044 probably represent a small number of vessels and therefore a discrete period of occupation. The pottery dating was supported by the radiocarbon dates. Other associated finds, a bone weaving comb and a possible loomweight made in stone, were indicative of craft activities.

A very small assemblage of Roman pottery was recovered. Where there was clear dating evidence this suggested activity on the site from the late 1st to early 2nd century. A couple of pottery forms broadly dating from the second to third centuries would be consistent with this date range, and the absence of Black burnished ware might also hint at a *taq* of c.AD 120.

5.4 Discard and retention

The pottery, bone weaving comb and stone weight should be retained. The two unworked stones (from Pit 3044, fill 3043 and Pit 3060, fill 3051) have been recommended for discard by Ruth Shaffrey, and have now been discarded. Any further discard should be discussed with the receiving museum.

5.5 Environmental analysis

5.5.1 Animal bone by Matilda Holmes

Taphonomy and Condition

The state of preservation was highly varied (Table 4), although generally bones were in fair to poor condition. They were friable, with a high proportion of fresh breaks and refitted fragments. The absence of gnawing on any of the remains and high number of teeth remaining in the mandible in the later Iron Age phase suggests that bones were buried soon after use and were not subject to much post-depositional movement. The reverse is true in the Roman phase, when most teeth are loose, indicating that either bones were not buried immediately, but were left exposed long enough for the connective tissue holding the teeth in to break down, or that they were disturbed post-burial. No butchery marks were observed, which could be due to the poor condition of the bones. There were no obvious deposits of butchery, craft-working or skin-processing waste. The nature of the assemblage is very similar between phases and it possible that there has been some mixing of deposits in the later phase.

Condition	LIA	Roman
Fresh		
Very good	2	
Good		2
Fair	10	8
Poor	8	5
Very poor		

Total	20	15
Gnawed		
Fresh break	10	7
Burnt	1	
Butchered		
Refit	7=63	6=41
Loose mandibular teeth*	1	5
Teeth in mandibles*	10	2
*dp4 and molars only included		

Table 4: Condition and taphonomic factors affecting the assemblage. Teeth not included unless stated

Despite the absence of canid gnaw marks, the partial skeleton of a large, muscular, adult dog c.55-60cm tall at the shoulder was recorded from the bottom of Pit 3044 (context 3049). This appeared to have been partially waterlogged for some of the duration of the burial, which is consistent with the nature of the lower fills of the pit. This bone group comprised the mandibles, fore and hind limbs and part of the front paws. Other axial elements were missing (crania, scapula, pelvis and all vertebrae but a single cervical vertebra). It is most likely that the animal was not fully excavated, though it could have been subject to reburial, or deposited following dismemberment (although there were no butchery marks). The absence of tail bones, phalanges and most of the metapodials could indicate that it was skinned first. Pit 3044 has been interpreted as a waterhole, but the placement or disposal of a dead animal in such a feature may indicate that it was not used for drinking. The deliberate deposition of animals (particularly dogs) in watery places is not uncommon in the later Iron Age and it is possible that it was originally placed in the pit/ waterhole as an offering.

The Assemblage

The major domesticates are recorded in the later Iron Age period (Table 5), although the sample is too small to make any further comment. The Roman assemblage is dominated by the head and upper limb bones of cattle indicating that it originated as food waste as these are the major meat-bearing bones. Equid bones are next most common, also represented by the limb bones, which implies they were subject to the same taphonomic pathway as cattle. Bones from other taxa are limited to head and lower leg elements.

		Later Iron Age					Earlier Roman		
	Element	Cattle	Sheep/ goat	Pig	Equid	Canid	Cattle	Equid	Canid
Head	Skeleton					1			
	Horn core + frontal		1						
	Zygomatic						1		
	Loose Maxillary tooth						10		
	Mandible with teeth	1		1		1	1		1
	Loose mandibular tooth						5		
	Loose tooth								
Upper fore	Scapula						1		
	Humerus						5		
	Radius							2	
	Carpal						2		
Upper hind	Pelvis						1	2	
	Femur								

	Tibia				1				
	Calcaneus								
Lower	Metatarsal	1					1		
	Metapodial				2				
	Total Identified	**2**	**1**	**1**	**3**	**2**	**27**	**4**	**1**
	Unidentified mammal								
	Large mammal						200		
	Medium mammal								

Table 5: Anatomical element representation for each taxa (NISP). Unidentified fragment counts are given for each phase

Where data were available, the bones of cattle and equid from early or intermediate fusion stage bones were fused indicating that most of the animals were older than juvenile or subadult. The only late stage bone available was a cattle femur, which was unfused and indicates the presence of an animal that died before reaching maturity. The only teeth suitable for ageing suggested that an aged cow was also present, that died at wear stage J.

Summary

This assemblage is too small to provide a reliable account of the economy or status of the settlement. However, the abundance of likely food waste from large animals implies that they came from domestic origins. The inclusion of equids in this is more consistent with an Iron Age practice, as the consumption of horse meat in the Roman period was largely taboo, except at some religious sites.

5.5.2 Plant macrofossils by Kath Hunter

The assemblage from these samples represents a mixture of plants that would commonly be found growing next to water with woodland and scrub species as well as some plants from disturbed open habitats. There are no significant changes in the habitats represented through time apart from the presence of the stones and possible fruit of dogwood (*Cornus sanguinea*) from the middle context. This may suggest that the plants native to woodland margins and scrub on calcareous soils became established close to the waterhole but were subsequently cleared. Species such as fat hen (*Chenopodium album*), Orache (*Atriplex* sp.) in the upper two fills and common nettle (*Urtica dioica*), present in all three, suggest an open, disturbed habitat which has been enriched with nitrogen. This may have resulted from the grazing, and therefore subsequent manuring, of the surrounding area by domestic livestock. The lack of aquatic plant species, with the exception of a single horned pondweed (*Zannichellia palustris*) achene (3049) and water pepper (Persicaria hydropiper) (3038 and 3039), may suggest the continued use of the waterhole either for watering livestock or domestic and industrial usage. This could have acted to keep the feature clear of invasive plants. The relative abundance of surviving plant remains including seeds, wood and leaf fragments from terrestrial plants suggests that the absence of other aquatic plants is not simply due to a preservation bias. The remains of a caddis fly larvae case (context 3038) and water flea (daphnia sp.) ephippium (3039 and 3049) may also suggest that the waterhole retained a relatively well oxygenated environment throughout its use. There is no evidence of cultivated crops or their associated weeds from the deposits. However, species such as bramble (*Rubus* sp.), Hazel (*Corylus avellana*), Elder (*Sambucus nigra*) and Blackthorn (*Prunus spinosa*) are examples of plants which could have been utilised by the local population.
The survival of waterlogged plant remains in an area of free draining calcareous soil would not be expected, except where anaerobic conditions were present. A waterhole by its nature produces such conditions as it is designed to retain water where natural sources are not available. It is possible to suggest the nature of the vegetation in the local area through the identification of the surviving plant species. The relative abundance of identifiable waterlogged plant remains from these three samples have made it possible to suggest the local vegetation during the time that the

waterhole was in use. The lack of agricultural and horticultural crops and weeds from this assemblage suggests that crop processing was not happening in the immediate area. Similar features from the south-east of Britain have produced cereal crop processing waste and evidence of other human activity (Carruthers 2003 2010, Hunter 2013). The assemblage suggests that the vegetation in area around the waterhole at site P4934 was a mixture of scrub and woodland with possible evidence for animal grazing. Although waterholes from different periods have been identified in Gloucestershire, none have so far produced assemblages of plant remains (Brossler et al 2002, Hart 2004). Whilst the interpretation of the assemblage from site P4934 is limited, it does highlight the potential for waterlogged plant remains to survive in similar features on other sites located on the free-draining, calcareous soils characteristic of Gloucestershire. A waterhole from a site at Hucclecote, Gloucestershire recently excavated by Wessex Archaeology has been sampled for waterlogged remains and may provide a comparable assemblage in the future. (pers comm Andy King).

				Sample	**6.1**	**6.3**	**6.2**
				Context	**3038**	**3039**	**3049**
TAXA	**Common name**	**Component**	**Habitat**				
Ranunculaceae							2
Ranunculus acris L./*repens* L.	buttercup meadow/creeping	achene	grass (damp),bankside		3	2	
*Prunus spinosa*L.	blackthorn	stone	hedge, scrub, woods			3	3
cf.Prunus sp.		drupe				4	
cf. *Rubus* sp.	brambles	spine			2	1	3
Rubus sp.	brambles	seed			82	82	106
Urtica dioica L.	common nettle	achene	disturbed, waste ground		9	17	16
Corylus avellana L.	hazel	nut shell	woods, hedgerow			1	
Persicaria maculosa Gray	redshank	achene	disturbed arable		76		
Persicaria hydropiper L.	water-pepper	achene	bankside, aquatic (shallow)		15	1	
Persicaria sp.	knotweeds	achene			8		
*Polygonum aviculare*L.	knotgrass	achene	all sorts of open ground		10		
Rumex sp.	dock	achene			12	6	1
Rumex sp.	dock	tepal			12		2
Rumex cf.*acetosella* ssp. *pyrenaicus* (Pourr.) Ackeroyd	possible sheep's sorrel	achene with tepal	heathy open ground, acid soils		3		
Rumex conglomeratus Murray	clustered dock	achene in tepal	damp places, grassy or bare, especially by ponds and rivers			3	
*Rumex*cf.*conglomeratus* Murray	clustered dock	achene in partial tepal	damp places, grassy or bare, especially by ponds and rivers			11	
Stellaria cf.*neglecta* Weihe	greater chickweed	seed	shady, usually damp places		1		
Mysoton aquaticum (L.) Moench	water chickweed	seed	marsh, ditches, banks		3	7	3
Chenopodium album L.	fat-hen	seed	waste and cultivated ground				1
Chenopodium sp.L (Blitum L.)	goosefoots	seed			3	4	
Atriplex sp.	orache	seed			23	1	
*Montia fontana*ssp. *chronrosperma* (Fenzl) Walters	blinks	seed	many kinds of damp places		1		

				Sample	6.1	6.3	6.2
				Context	3038	3039	3049
TAXA	**Common name**	**Component**	**Habitat**				
*Cornus sanguinea*L.	dogwood	stone	woods and scrub on limestone or base rich clays			27	
cf. *Cornus* sp.	dogwood type	stone			1		
cf. *Cornus* sp.	dogwood type	drupe				4	
Solanum cf. *dulcamara*	possible bittersweet	seed	scrambling, wall hedges, wood, ditches, fens, pond sides, rough ground.		1	12	12
Lamium sp.	dead-nettle type	nutlet			2		
Galeopsis sp.	hemp-nettle	nutlet			1		
Asteraceae						4	3
Cirsium sp.	thistles	achene			7		1
*Lapsana communis*L.	nipplewort	achene	Open woods, hedgerows, waste and rough ground			1	
cf.*Crepis* sp.	hawks beard	achene					1
Sambucus nigra L.	elder	seed	woods, hedgerow		19	37	35
Torilis japonica (Houtt.)DC	upright hedge-parsley	fruit	grassy places, hedgerows wood margin		1	2	
Zannichellia plaustris L.	horned pondweed	achene	rivers, streams, ditches and ponds				1
Cyperaceae							1
Schoenoplectus sp.	club-rush type	nut				1	
Carex sp.	sedge	nutlet (trigonous)			1	1	
indet.		seed			1	4	1
	moss	leaf/stem				*	*
	dicotyledon	leaf fragments				****	
	charcoal				(*)**		
	wood				****	*	
	tree buds				**	**	
	roots				**	***	
	indet	fruit stone fragment					4
	caddis fly larvae case sand				1		
	daphnia ephippium					*	**

Key

*	1-5
**	6-20
***	21-50
****	50+

(*)*** value in bracket indicated charcoal or wood greater than 2mm in all dimension

Table 6: Taxa table

5.5.3 Pollen assessment by Nick Daffern

Two monoliths were taken by the excavation team from two pits (Information listed in Tables 7 and 8). Monolith 5 sampled Pit 3044 whilst Monolith 10 sampled Pit 3060, both features were found to contain organic, peaty fills which were considered to have the potential for the preservation of palaeoenvironmental remains.

Depth Below Ground Level (BGL)	Depth from top of monolith (ToM)	Context	Pollen Sample and depth from top of monolith	Lithology and Descriptions
< 0.40m	NOT SAMPLED	3036	×	NOT SAMPLED
0.40m – 0.52m	0.00 – 0.12m	3037	✓ 0.07m	Soft, mid-orangish brown to mid-bluish grey clay sand
0.52m – 0.65m	0.12m – 0.25m	3038	×	Moderately compacted, mid-greyish brown humic sand
0.65m – 0.74m	0.25m – 0.34m	3039	✓ 0.30m	Firm, mid-reddish brown peaty sand
0.74m – 0.83m	0.34m – 0.43m	3049	✓ 0.41m	Moderately compacted, mid-brownish grey silty sand (humic)
0.83m <	NOT SAMPLED	3043	×	NOT SAMPLED

Table 7: Monolith 5/Pit 3044 - Context descriptions and pollen sample locations

Depth (BGL)	Depth (ToM)	Context	Pollen Sample and depth from top of monolith	Lithology and Descriptions
0.56 – 0.63m	0.00 – 0.12m	3087	✓ 0.05m	Moderately compact mid blue-grey silty sand
0.63 – 0.81m	0.12m – 0.25m	3088	×	Moderately compact light-grey silty sand
0.81 – 0.90m	0.25m – 0.34m	3089	×	Moderately compact mid blue-grey sandy silt
0.90 – 1.00m	0.34m – 0.44m	3090	✓ 0.40m	Moderately compact mid grey-blue sandy silt
1.00 – 1.06m	0.44m – 0.50m	N/A	×	Sand and Gravel Natural

Table 8: Monolith 10/Pit 3060 - Context descriptions and pollen sample locations

Monolith 5, Pit 3044, Table 7

Pollen preservation in the upper two samples was poor with only limited identifiable grains being present. Grains were frequently encountered which were broken, pitted and/or folded which is likely to be a result of drying out and or mechanical damage through transportation of the grains.

This could be through human agency ie redeposition of the sediment although it is probably more likely to be a natural process resulting from water table fluctuations and bioturbation.

The basal sample exhibited good pollen preservation and medium - high abundance which is likely to be a result of the lower position in the sequence making the grains within the sediment less vulnerable to water table fluctuations and/or mechanical damage through bioturbation or human disturbance.

Depth (BGL)	Depth (ToM)	Pollen Present	Pollen abundance	Pollen Preservation	Observed taxa
0.47m	0.07m	Yes	Low	Poor	Apiaceae undiff*, Cichorium intybus*-type, Cyperaceae, **Poaceae**, *Urtica dioica*
0.70	0.30m	Yes	Low	Poor	*Cerealia* indet*,* Cyperaceae, *Pinus*, **Poaceae**
0.81m	0.41m	Yes	Medium - High	Good	Apiaceae undiff, *Alnus,* Caryophyllaceae, *cf Gentiana pneumonanthe*, Chenopodioideae, *Cichorium intybus*-type, *Cirsium*-type, Fabaceae undiff, *Filipendula*, *Plantago lanceolata*, **Poaceae**, *Quercus, Ranunculus acris*-type, Rosaceae undiff, Rumex acetosa, Rumex acetosella, *Solidago virgaurea*-type, *Urtica dioica, Vicia cracca*

Table 9: Summary of the pollen assessment from Monolith 5 (Taxa or groups in BOLD are dominant in the sample)

Monolith 10, Pit 3060, Table 8

Pollen preservation in the upper sample from the sequence was moderate with low – medium abundance. Given the domination of Poaceae in the sample and the presence of broken and folded grains, it is likely that this sample exhibits an element of preferential preservation with less robust grains having been damaged or destroyed.

It is considered likely that the upper margins of the monolith, similarly to Monolith 5, have been subject to post-depositional disturbance. This is likely, once again, due to water table fluctuations and bioturbation.

Depth (BGL)	Depth (ToM)	Pollen Present	Pollen abundance	Pollen Preservation	Observed taxa
N/A	0.05m	Yes	Low - Medium	Moderate	Caryophyllaceae, Cerealia indet*,* Chenopodioideae, *Cichorium intybus*-type, Cyperaceae, *Papaver rhoeas*-type *Pinus*, **Poaceae**, *Quercus*, *Solidago virgaurea*-type

Depth (BGL)	Depth (ToM)	Pollen Present	Pollen abundance	Pollen Preservation	Observed taxa
N/A	0.40m	Yes	Medium	good	*Acer campestre*, Caryophyllaceae, Cerealia indet*,* Chenopodioideae, *Cichorium intybus*-type, *Corylus avellana*-type, Cyperaceae, Fabaceae undiff, *Filipendula, Hypericum perforatum*-type, cf *Mercurialis perennis*, *Plantago lanceolata*, **Poaceae**, *Prunella vulgaris*-type, *Ranunculus acris*-type, *Rumex acetosa*, *Quercus*, *Salix, Solidago virgaurea*-type, *Urtica dioica*

Table 10: Summary of the pollen assessment from Monolith 10 (Taxa or groups in BOLD are dominant in the sample)

Discussion

Both sequences (where pollen is preserved) are dominated by species indicative of an open meadow and disturbed grassland landscape with grasses and other herbaceous species such as daisies/goldenrods, ribwort plantain, meadow buttercup, docks, dandelions/chicory, thistles and nettles.

Unsurprising was the presence of species indicative of damp and/or marshy environments including sedges but specifically of interest was the presence of meadowsweet, a species which is characteristic of sites where water levels fluctuate and is absent from permanently waterlogged ground. This fluctuation is likely to add credence to the hypothesis that these features acted as seasonal watering holes rather than permanent water sources. These variations in water level would also preclude the possibility that these features could have been used for the storage of materials.

Evidence of cultivation was limited although several indeterminate cereal grains were present in both sequences although caution should be advised due to the crossover between the wild and cultivated grass species. The singular presence of a Papaver rhoeas-type (common poppy) grain, which is considered an archaeophyte and is associated with arable fields and disturbed ground, may lend some credence arable cultivation within the vicinity.

The absence of cultivars (aside from the limited evidence discussed above) or industrial indicators (such as microcharcoal) within the samples would indicate that these features were unlikely to have been associated with arable or industrial activity.

The contribution of tree and shrub species was limited throughout the sequence and the majority of those that were identified were probably resident in hedgerows (hazel) or damp scrub (willow, alder) which lay immediately adjacent to the site. It is also possible that some of the more established, long-lived species such as oak, Scots pine and field maple may remain as components of more distant, established woodland.

No species diagnostic of period were identified during the assessment although the extensively cleared landscape and the presence of archaeophytes and species indicative of open, disturbed ground clearly place this in at least later prehistory, if not afterwards. Brown (1982) and Daffern (forthcoming) have established that the late Neolithic/early Bronze Age marked a significant phase in the vegetational history of the terraces of the Severn Valley. Indications of large-scale clearance of the lime-dominated wildwood occur by *c*.2000 cal BC with primary woodland clearance being extensively completed between the mid-Bronze Age and early Iron Age although later Iron Age and Roman clearances are known.

Given the likely post-depositional impact on the preservation of the sequence and, in the absence of important or key indicator species that would be useful in determining the chronology of use and

function or giving a detailed picture of the landscape to provide context to the features, no further palynological work was recommended on the samples or the sequences.

5.5.4 Radiocarbon dating by Elizabeth Pearson

The results are conventional radiocarbon ages (Stuiver and Polach 1977) and are listed in Table 11. The calibrated date ranges for the samples have been calculated using the maximum intercept method (Stuiver and Reimer 1986), and are quoted with end points rounded outwards to ten years. The probability distributions of the calibrated dates, calculated using the probability method (Stuiver and Reimer 1993) are shown in the radiocarbon certificates presented in Appendix 3. They have been calculated using OxCal v4.2 (Bronk Ramsey 2009) and the current internationally-agreed atmospheric calibration dataset for the northern hemisphere, IntCal13 (Reimer *et al* 2013).

The date from Pit 3060, fill 3090 (Figure 3, S.38) shows infilling of the feature from the later Iron Age. The dates from the middle fills (3038 and 3049) of Pit 3044 (Figure 3, S.18) are the same, suggesting rapid build-up of deposits over at least 0.20m in depth during the later Iron Age period.

Laboratory code	Context number	Material	$\delta^{13}C$ (‰)	Conventional Age	OxCal calibrated age (95.4% probability or 2 sigma)
SUERC-74421 (GU44568)	3090, fill of Pit 3060	Organic plant remains: various	-25.0 %	2042 ± 24 BP	160 cal BC – 20 calAD
SUERC-74422 (GU44569)	3038, fill of Pit 3044	Organic plant remains: *Rubus* sp	-26.9 %	2129 ± 25 BP	350 – 50 calBC
74423 (GU44570)	3049, fill of Pit 3044	Organic plant remains: *Sambucus nigra*	-27.8%	2134 ± 27 BP	350 – 50 calBC

Table 11: Radiocarbon dating results

6 Synthesis

The investigations at Quedgeley Framework Plan 5 revealed two key phases of archaeological activity. The later Iron Age activity appears to be focussed in the eastern part of the site where two large pits, which may have been watering holes, and three small ditches, were identified. The earlier Roman activity appears to have been focused on a group of ditches which may have formed part of a droveway and a ditch orientated perpendicular to the droveway. The later activity on the site, including a post-medieval to modern field boundary, and 20th century pits, are not deemed to be archaeologically significant.

6.1 Later Iron Age activity and landscape

Only one of the three small Iron Age ditches yielded datable finds. The other two were stratigraphically earlier than the upper fills of Pit 3060, and they are all probably broadly contemporary with the pits. It is also possible that Ditches 6 and 7 are related, and that the physical gap between them is the remains of an opening or entrance into an enclosure or field formed by them. However, only further excavation to the east and south of Parcel G would confirm this interpretation.

The two large pits (3044 and 3060) yielded moderate quantities of pottery and animal bone, a bone comb and a possible stone weight. Well preserved organic remains including a collapsed hurdle and wooden post were also identified in the pits. These organic deposits also revealed an

assemblage of plant macrofossils and pollen, and radiocarbon dating was undertaken using samples from short lived plant species from the organic remains.

The datable evidence shows that the pits were infilled during the later Iron Age period. The radiocarbon dating indicates that Pit 3044 was slightly earlier (350-50 calBC) than Pit 3060 (160 cal BC – 20 calAD), although the pottery from Pit 3044 hints at date towards the end of the date range suggesting that the two pits are broadly contemporary. Two radiocarbon dates from separate deposits within Pit 3044 produced identical dates (350-50 calBC) indicating that the build-up of the organic deposits in the pit was relatively rapid.

The two pits appear likely to have been used, at least initially, as watering holes. The presence of well-preserved organic remains within them indicates the continuous presence of anaerobic conditions for a period of time, and both pits appear physically similar to waterholes identified elsewhere in the region. However, of note is the presence of meadowsweet pollen, a species which is characteristic of sites where water levels fluctuate and is absent from permanently waterlogged ground which suggests regular fluctuation in the water levels. It is also of note that the two pits cut natural sand, and they were not lined with clay or any other material to help retain water. This suggests they may have acted as seasonal watering holes rather than permanent water sources. The excavation of the pits was undertaken in winter 2017 and no water was encountered during their excavation. It is possible that there has been a significant change in level of the water table since the later Iron Age period.

The function of the hurdle is not clear. Three stakes were set in the base of the pit, which might imply that the hurdle had formed a division within the pit itself, but it is more probable that the stakes simply pressed into the base when the hurdle collapsed and that it had formed part of a barrier at the edge of the watering hole, possibly to prevent livestock from poaching the edge whilst drinking.

The plant macro fossil species identified in the organic deposits in the pits indicate that the area around them was a mixture of scrub and woodland with possible evidence for animal grazing, although the animal bone sample from this phase was too small to make any further comment about livestock practices. However, the pollen sequences were dominated by species indicative of an open meadow and disturbed grassland landscape with grasses and other herbaceous species. The lack of agricultural and horticultural crops and weeds in both the plant macro fossil and pollen assemblages indicate that crop processing was not happening in the immediate area.

6.2 Earlier Roman activity and landscape

The earlier Roman activity appears to have been focused on a group of ditches which may have formed part of a possible drove or trackway, located to the west of the site (Ditches 1-3), and a ditch which was orientated perpendicular to the droveway, to the north of the site (Ditch 5). Finds from these features suggest they are broadly contemporary although no physical relationship was established between them. Future excavation as other parcels of land at the site are developed may reveal this relationship.

The finds provide evidence that the activity was focused in the earlier Roman period. There were no diagnostically later finds such a black-burnished ware pottery suggesting the features may have already filled in by mid-2nd century. The environmental evidence from the earlier Roman phase was limited to an animal bone assemblage which was too small to provide a reliable account of the economy or status of the activity. However, the abundance of likely food waste from large animals implies that domesticated animals were being consumed at the site. The later Iron Age and earlier Roman animal bone assemblages were generally similar in nature suggesting that there was little change between the two phases.

The archaeological investigations at the site have helped contribute to the research aims identified in the South West Archaeological Research Framework (Webster 2008) and outlined in Section 2, except Research Aim 22. Further excavation to the north and east of Parcel G will continue to reveal the extent of these features, and potentially allow further refinement of their date. It should

also help to establish their relationship with other Roman features identified to the north-east during the evaluation (Walsh and Illiff 2016, section 5.1.2).

7 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.

Two archaeological investigations were undertaken at Quedgeley Framework Plan 5, Gloucester, Gloucestershire (NGR SO 8115 1330). They were commissioned by Amec Foster Wheeler, acting on behalf of their client Quedgeley Urban Village Ltd. Outline planning permission has been granted for the mixed use development of the site and is being undertaken in a phased manner. An archaeological evaluation had previously identified a number of heritage assets at the site, the significance of which may be affected by the development.

The investigations revealed two key phases of archaeological activity. A period of later Iron Age activity appears to be focussed in the eastern part of the site where two large pits, which may have been watering holes, and three small ditches, were identified. The two large pits yielded pottery and animal bone, a bone comb and a possible stone weight. Well preserved organic remains including a collapsed hurdle and wooden post were also identified in the pits, and sampling of the organic deposits revealed an assemblage of plant macrofossils and pollen. The datable evidence, including three radiocarbon dates shows that the pits were infilled during the later Iron Age, and at least some of this process may have been rapid. The lack of agricultural and horticultural crops and weeds identified in the plant macro fossil and pollen assemblages indicate that crop processing was not happening in the immediate area of the site. The animal bone assemblage was too small to make any significant interpretations.

A second phase of activity dating to the earlier Roman period appears to have been focused on a group of ditches which may have formed part of a drove or trackway and a ditch orientated perpendicular to the droveway. Pottery from these features dated them to the earlier Roman period. Environmental evidence from this phase of activity was limited to a small assemblage of animal bone which was dominated by the head and upper limb bones of cattle indicating that it originated as food waste.

Later activity on the site, including a post-medieval to modern field boundary, and 20th century pits, were not deemed to be archaeologically significant.

8 Acknowledgements

Worcestershire Archaeology would like to thank the following for their kind assistance in the successful conclusion of this project; Mike Glyde and Laurence Munden (Amec Foster Wheeler), Andrew Smith (Gardiner and Theobold LLP) and Andrew Armstrong (Archaeologist, Gloucester City Council).

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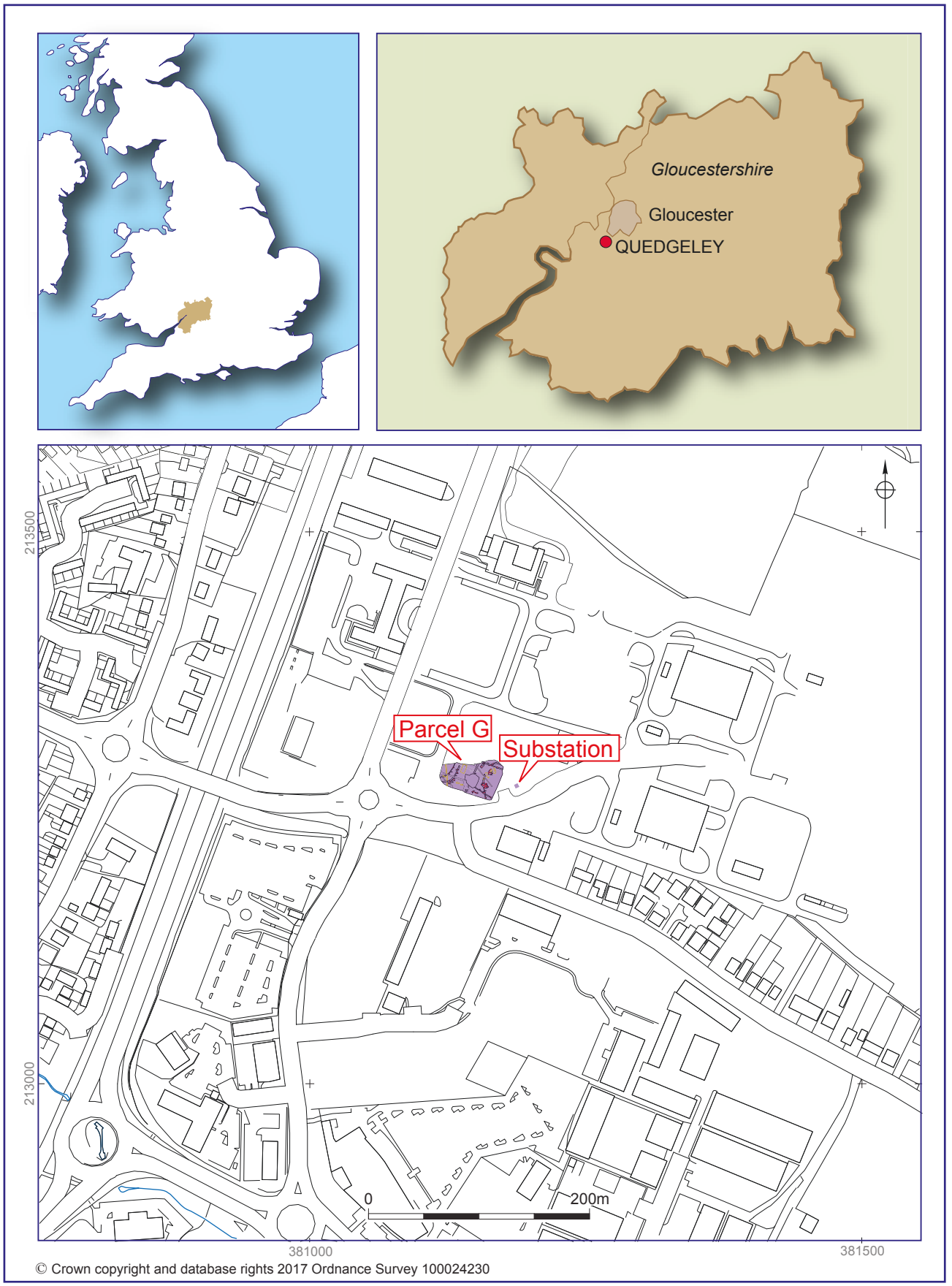
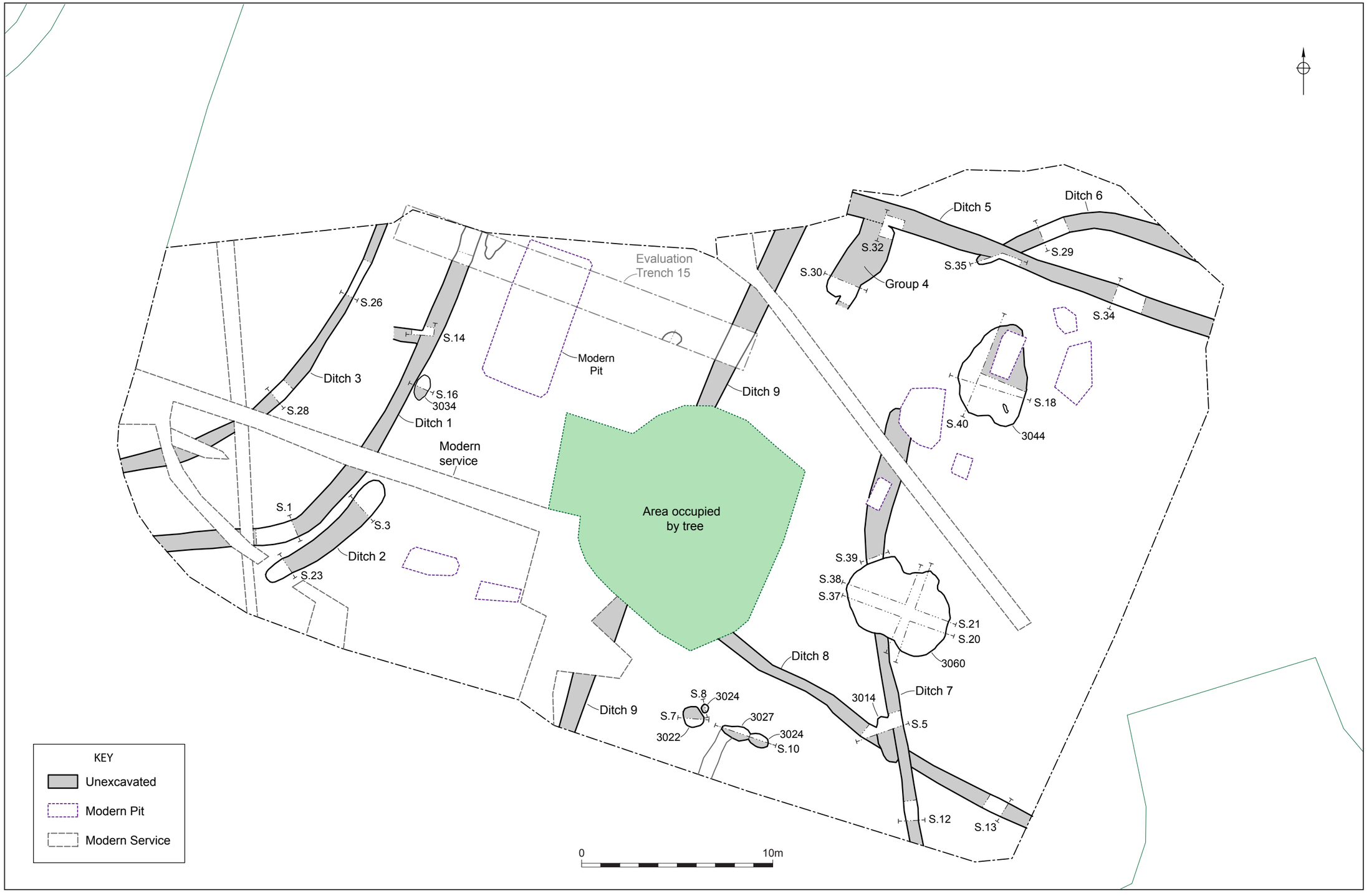
Figures

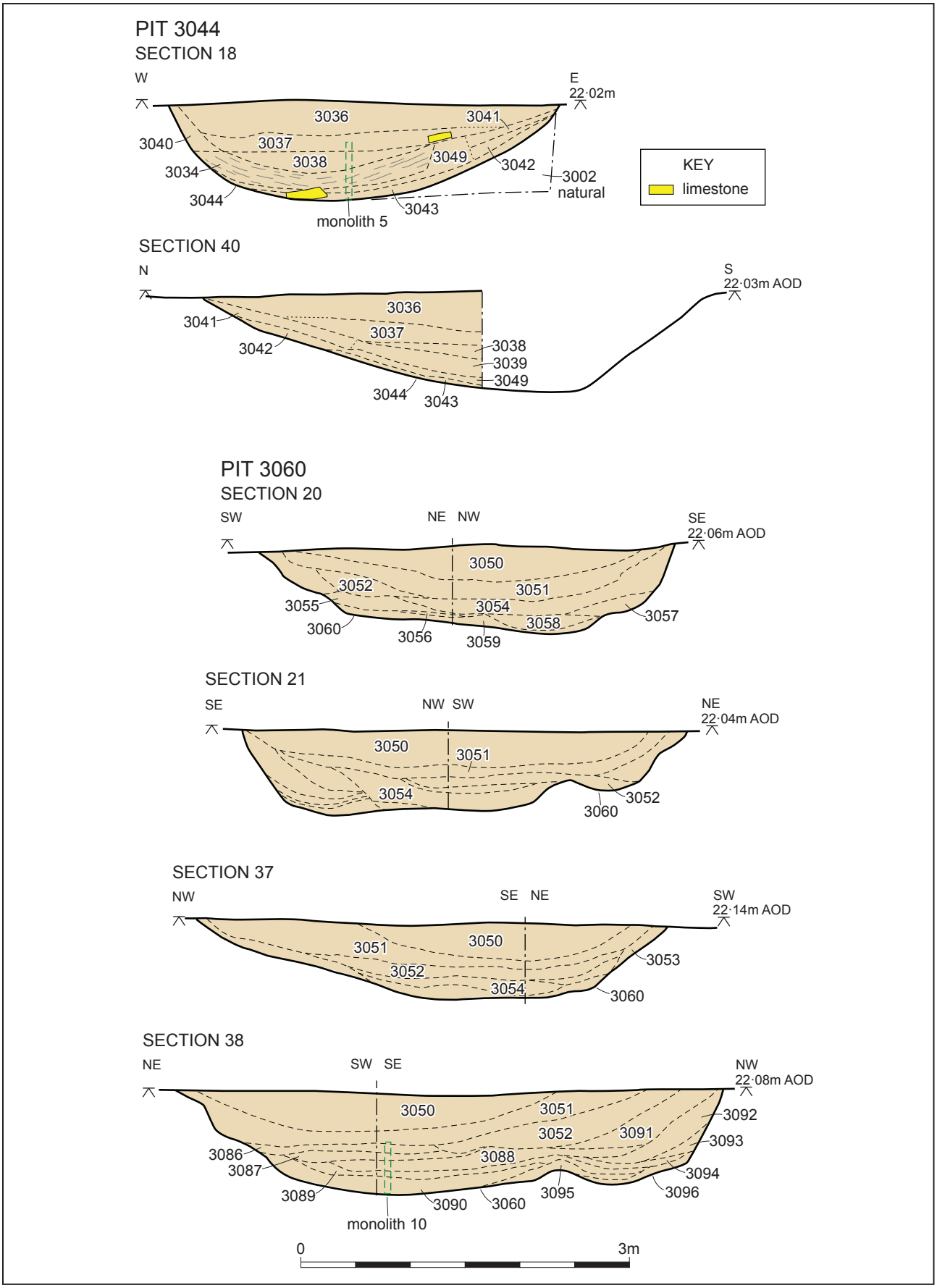


Location of the site *Figure 1*



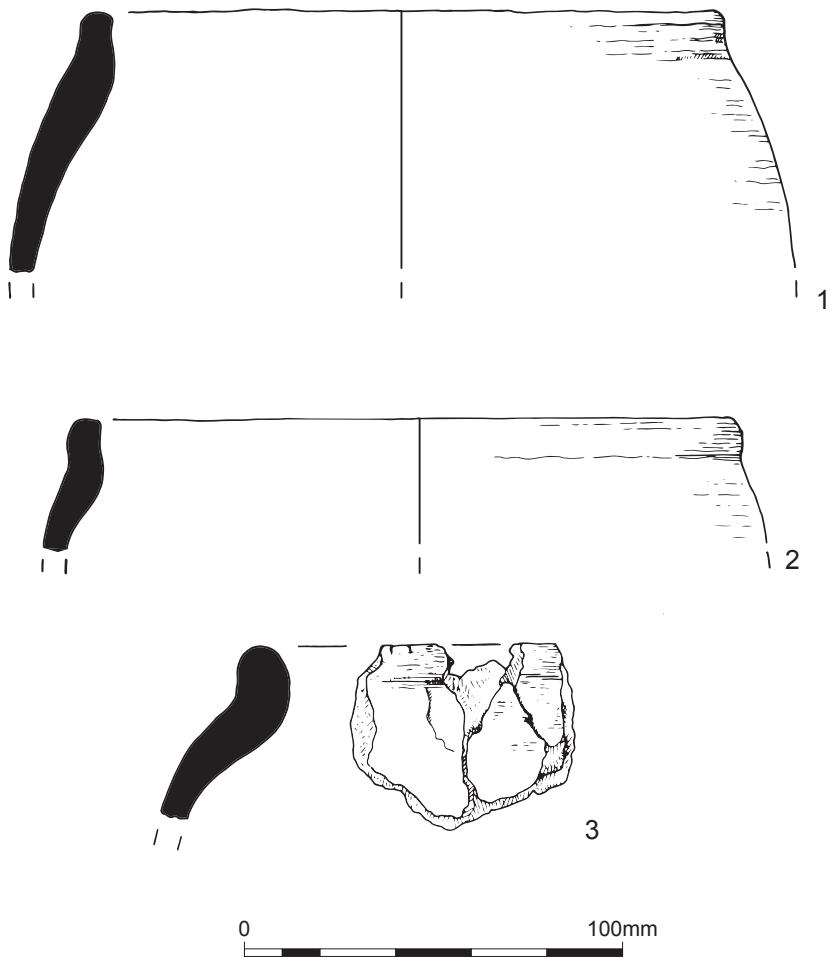
Plan of trench

Figure 2



Sections

Figure 3



The Late Iron Age pottery *Figure 4*

Stone object and bone comb *Figure 5*

Plates

Plate 1. Pit 3060 showing the four excavated quadrants before the baulks were removed; looking south-west; 2x 1m scales

Plate 2. The north-east quadrant of Pit 3060; looking north-west; 1m scale

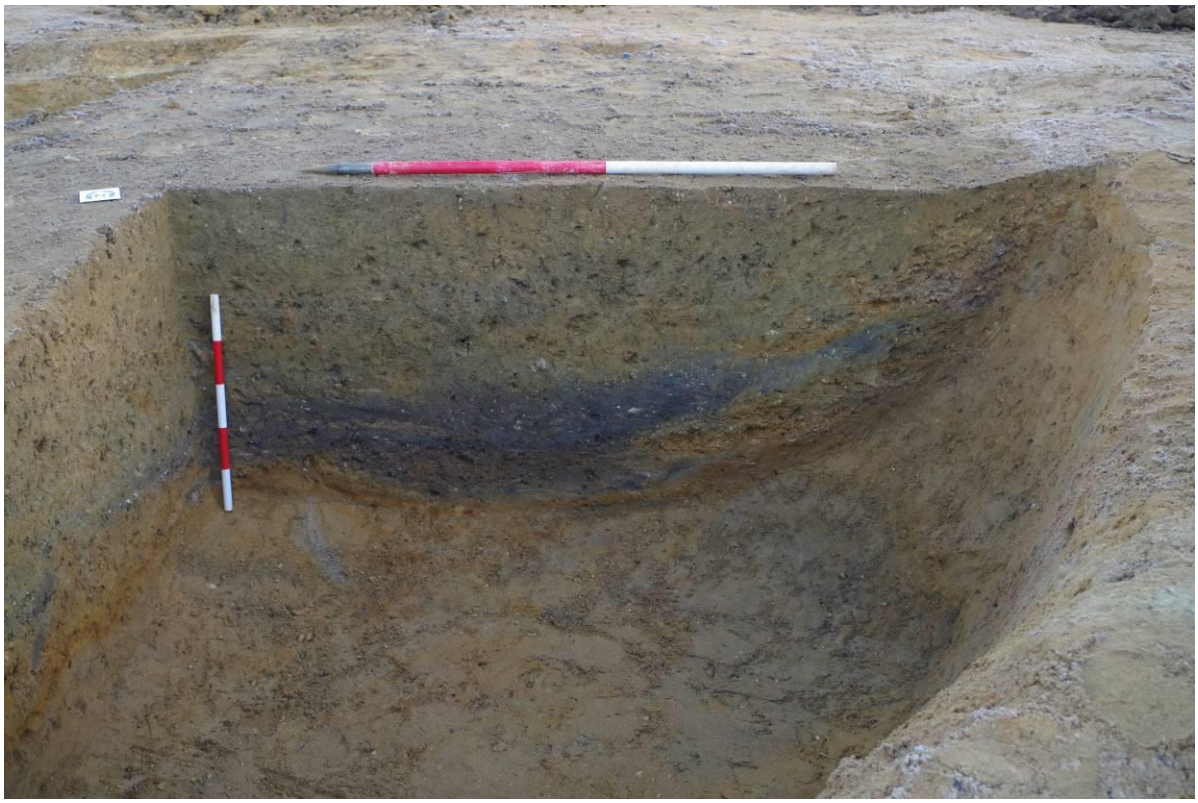


Plate 3. South-east quadrant of Pit 3060; looking north-east; 0.5m and 1m scales

Plate 4. South-west quadrant of Pit 3060; looking south-east; 1m scale

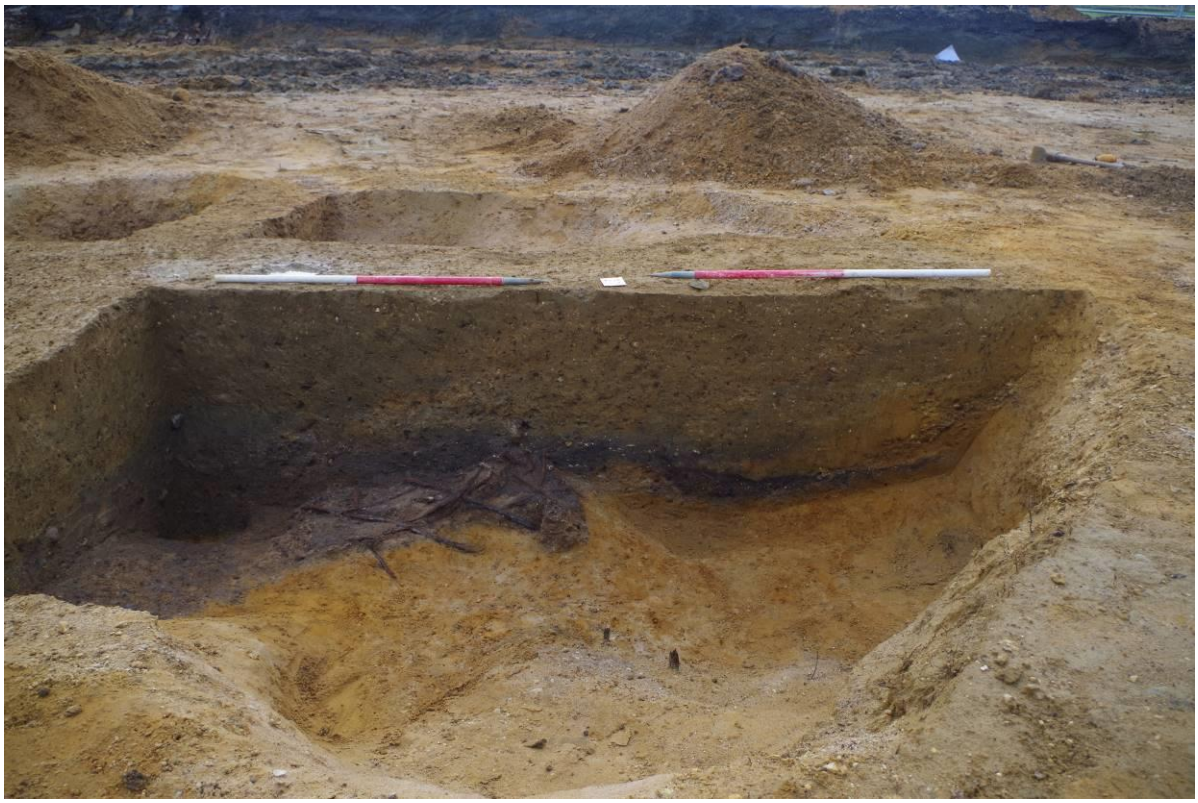


Plate 5. North-west quadrant of Pit 3060; looking south-west; 2x 1m scales; note the collapsed wooden hurdle and in-situ upright stakes

Plate 6. Wooden remains in the base of Pit 3060 once the baulks had been removed; looking south-west; 2x 1m scales

Plate 7. Pit 3044; the dark organic rich deposits are clearly visibly near the base of the feature, and post 3045 is to the lower right; looking north-west; 2x 1m scales

Plate 8. Pit 3044; the modern pit cutting the feature is visible beyond the section; looking north; 2x 1m scales and 0.5m scale

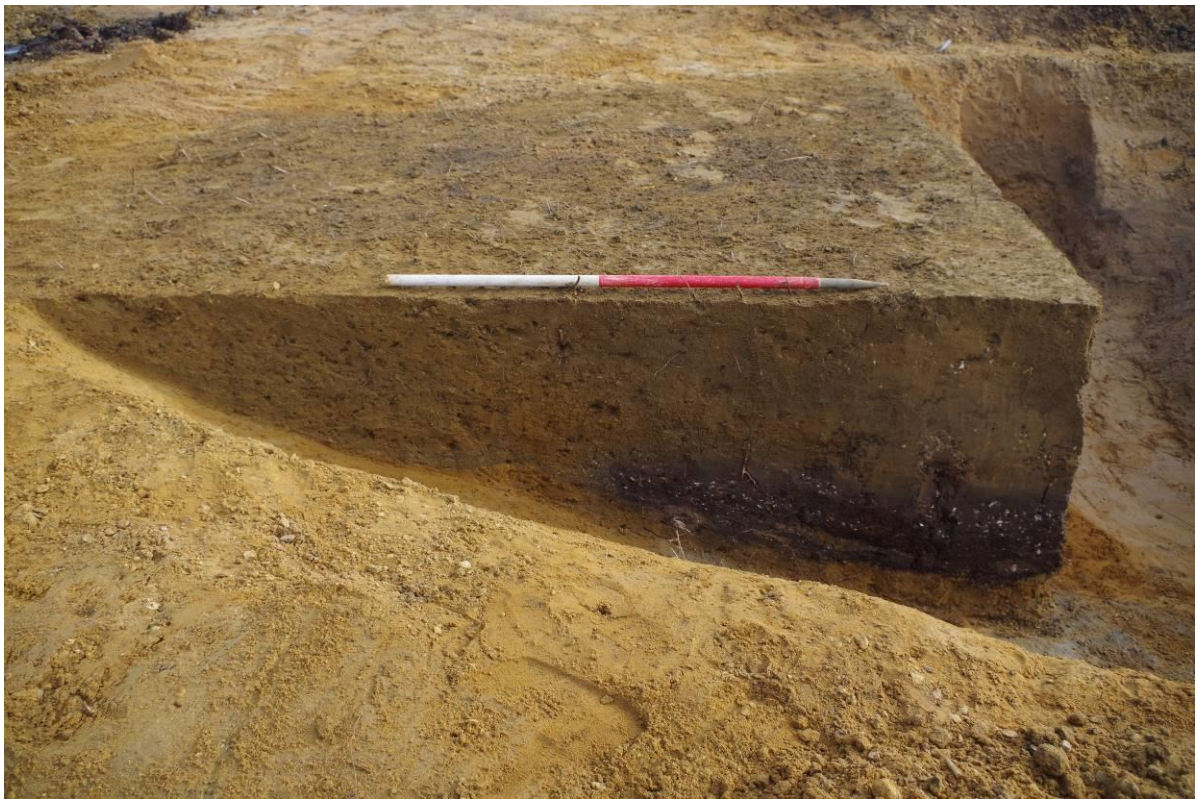


Plate 9. The northern part of Pit 3044; looking south-east; 1m scale

Plate 10. In-situ post 3045, in Pit 3044; 0.5m scale

Appendix 1 Context descriptions

Trench	Context	Context summary	Group	Group summary
Area G	3000	Topsoil		
Area G	3001	Subsoil		
Area G	3002	Natural		
Area G	3003	Fill of curvi-linear 3004	1	Curvi-linear ditch, to east of and parallel to Group 3
Area G	3004	Cut of curving linear feature	1	Curvi-linear ditch, to east of and parallel to Group 3
Area G	3005	Upper fill of ditch 3008	2	Short curvi-linear ditch immediately SE of Group 1
Area G	3006	Silting fill of ditch 3008	2	Short curvi-linear ditch immediately SE of Group 1
Area G	3007	Basal fill of ditch 3008	2	Short curvi-linear ditch immediately SE of Group 1
Area G	3008	Cut of ditch terminus	2	Short curvi-linear ditch immediately SE of Group 1
Area G	3009	Fill of ditch 3010	9	Post-medieval field boundary
Area G	3010	Cut of post-med field boundary ditch	9	Post-medieval field boundary
Area G	3011	Fill of ditch 3012	7	Curvi-linear ditch cut by Pit 3060
Area G	3012	Cut of ditch	7	Curvi-linear ditch cut by Pit 3060
Area G	3013	Fill of pit 3014		
Area G	3014	Cut of pit		
Area G	3015	Fill of 3016	8	Ditch cut by Group 7
Area G	3016	Cut of ditch/gully	8	Ditch cut by Group 7
Area G	3017	Fill of 3018	7	Curvi-linear ditch cut by Pit 3060
Area G	3018	Cut of ditch/gully	7	Curvi-linear ditch cut by Pit 3060
Area G	3019	Fill of 3020	8	Ditch cut by Group 7
Area G	3020	Cut of ditch/gully	8	Ditch cut by Group 7
Area G	3021	Fill of pit 3022		
Area G	3022	Cut of pit		
Area G	3023	Fill of 3024		
Area G	3024	Cut of pit		
Area G	3025	Fill of pit 3026		
Area G	3026	Cut of pit		
Area G	3027	Fill of pit 3028		
Area G	3028	Cut of pit		
Area G	3029	Fill of ditch 3030	1	Curvi-linear ditch, to east of and parallel to Group 3
Area G	3030	Cut of ditch	1	Curvi-linear ditch, to east of and parallel to Group 3
Area G	3031	Fill of ditch 3032		
Area G	3032	Cut of ditch		
Area G	3033	Fill of pit 3034		
Area G	3034	Cut of pit		
Area G	3035	Void		

Trench	Context	Context summary	Group	Group summary
Area G	3036	Upper fill of Pit 3044		
Area G	3037	Reddish compact layer in 3044		
Area G	3038	Greyish black above 3039		
Area G	3039	Peaty layer in 3044		
Area G	3040	Tip/redeposited natural on west side of 3044		
Area G	3041	Reddish brown tip on east side of 3044		
Area G	3042	Greyish brown tip on east side of 3044		
Area G	3043	Reddish orange sand in base of 3044		
Area G	3044	Cut of large pit		
Area G	3045	Wooden stake in 3046		
Area G	3046	Cut of posthole		
Area G	3047	void		
Area G	3048	void		
Area G	3049	Dark organic layer under 3039		
Area G	3050	Upper fill of Pit 3060		
Area G	3051	Backfill of Pit 3060		
Area G	3052	Backfill of Pit 3060		
Area G	3053	Slump in Pit 3060		
Area G	3054	Organic fill of Pit 3060		
Area G	3055	Slump in Pit 3060		
Area G	3056	Clay lens in Pit 3060		
Area G	3057	Slump in Pit 3060		
Area G	3058	Organic fill in Pit 3060		
Area G	3059	Sandy basal fill of Pit 3060		
Area G	3060	Cut of large pit		
Area G	3061	In-situ stake in Pit 3060		
Area G	3062	In-situ stake in Pit 3060		
Area G	3063	In-situ stake in Pit 3060		
Area G	3064	Fill of ditch terminus 3065	2	Short curvi-linear ditch immediately SE of Group 1
Area G	3065	Cut of ditch terminus	2	Short curvi-linear ditch immediately SE of Group 1
Area G	3066	Fill of ditch 3067	3	Curvi-linear ditch, to west of and parallel to Group 1
Area G	3067	Cut of ditch	3	Curvi-linear ditch, to west of and parallel to Group 1
Area G	3068	Fill of ditch 3069	3	Curvi-linear ditch, to west of and parallel to Group 1
Area G	3069	Cut of ditch	3	Curvi-linear ditch, to west of and parallel to Group 1
Area G	3070	Fill of ditch 3071	6	Curvi-linear cut by Group 5
Area G	3071	Cut of ditch	6	Curvi-linear cut by Group 5
Area G	3072	Fill of 3073	4	Group of short linear features or possibly elongated pit(s)

Trench	Context	Context summary	Group	Group summary
Area G	3073	Cut of pit to west of 3075	4	Group of short linear features or possibly elongated pit(s)
Area G	3074	Fill of short linear 3075	4	Group of short linear features or possibly elongated pit(s)
Area G	3075	Cut of short linear	4	Group of short linear features or possibly elongated pit(s)
Area G	3076	Fill of terminus 3077	4	Group of short linear features or possibly elongated pit(s)
Area G	3077	Cut of ditch terminus	4	Group of short linear features or possibly elongated pit(s)
Area G	3078	Fill of ditch 3079	5	NW-SE aligned ditch, cuts Group 6
Area G	3079	Cut of ditch	5	NW-SE aligned ditch, cuts Group 6
Area G	3080	Fill of ditch 3081	5	NW-SE aligned ditch, cuts Group 6
Area G	3081	Cut of ditch	5	NW-SE aligned ditch, cuts Group 6
Area G	3082	Fill of ditch 3083	5	NW-SE aligned ditch, cuts Group 6
Area G	3083	Cut of ditch	5	NW-SE aligned ditch, cuts Group 6
Area G	3084	Fill of 3085	6	Curvi-linear ditch cut by Group 5
Area G	3085	Cut of ditch	6	Curvi-linear ditch cut by Group 5
Area G	3086	Fill of Pit 3060		
Area G	3087	Fill of Pit 3060		
Area G	3088	Fill of Pit 3060		
Area G	3089	Fill of Pit 3060		
Area G	3090	Fill of Pit 3060		
Area G	3091	Fill of Pit 3060		
Area G	3092	Fill of Pit 3060		
Area G	3093	Fill of Pit 3060		
Area G	3094	Fill of Pit 3060		
Area G	3095	Fill of Pit 3060		
Area G	3096	Fill of Pit 3060		
Area G	3097	Fill of ditch 3098	7	Curvi-linear ditch cut by Pit 3060
Area G	3098	Cut of ditch cut by Pit 3060	7	Curvi-linear ditch cut by Pit 3060
Electricity substation	3100	Hardcore		
Electricity substation	3101	Topsoil		
Electricity substation	3102	Subsoil		
Electricity substation	3103	Natural		

Appendix 2 Technical information

The archive (site code: P4934)

The archive consists of:

43	Context records AS1 (plus ARK records)
1	Field progress reports AS2
3	Photographic records AS3
191	Digital photographs
1	Drawing number catalogues AS4
3	Context number catalogues AS5
1	Spit sample record AS16
1	Sample number catalogues AS18
1	Auger hole record AS26 (monolith sketch)
10	Permatrace scale drawings AS34
1	Trench record sheets AS41
1	Box of finds
1	CD-Rom/DVDs
1	Copy of this report (bound hard copy)

Note: Context data and records were also recorded using ARK (Archaeological Recording Kit) and will be included on the CD or DVD.

It is anticipated that the project archive will be deposited together with the evaluation archive (site code: P4848) and any later phases of the archaeological investigations.

The archive is intended to be placed at:

Museum of Gloucester
Brunswick Road
Gloucestershire
GL1 1HP

Appendix 3 Radiocarbon dating certificates

Scottish Universities Environmental Research Centre
Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

16 August 2017

Laboratory Code	SUERC-74421 (GU44568)
Submitter	Liz Pearson Worcestershire Archaeology The Hive Sawmill Walk The Butts Worcester WR1 3PB
Site Reference	Quedgeley, Gloucestershire
Context Reference	3090
Sample Reference	P4934/3090
Material	organic plant remains : various
$\delta^{13}C$ relative to VPDB	-25.0 ‰ assumed
Radiocarbon Age BP	2042 ± 24

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

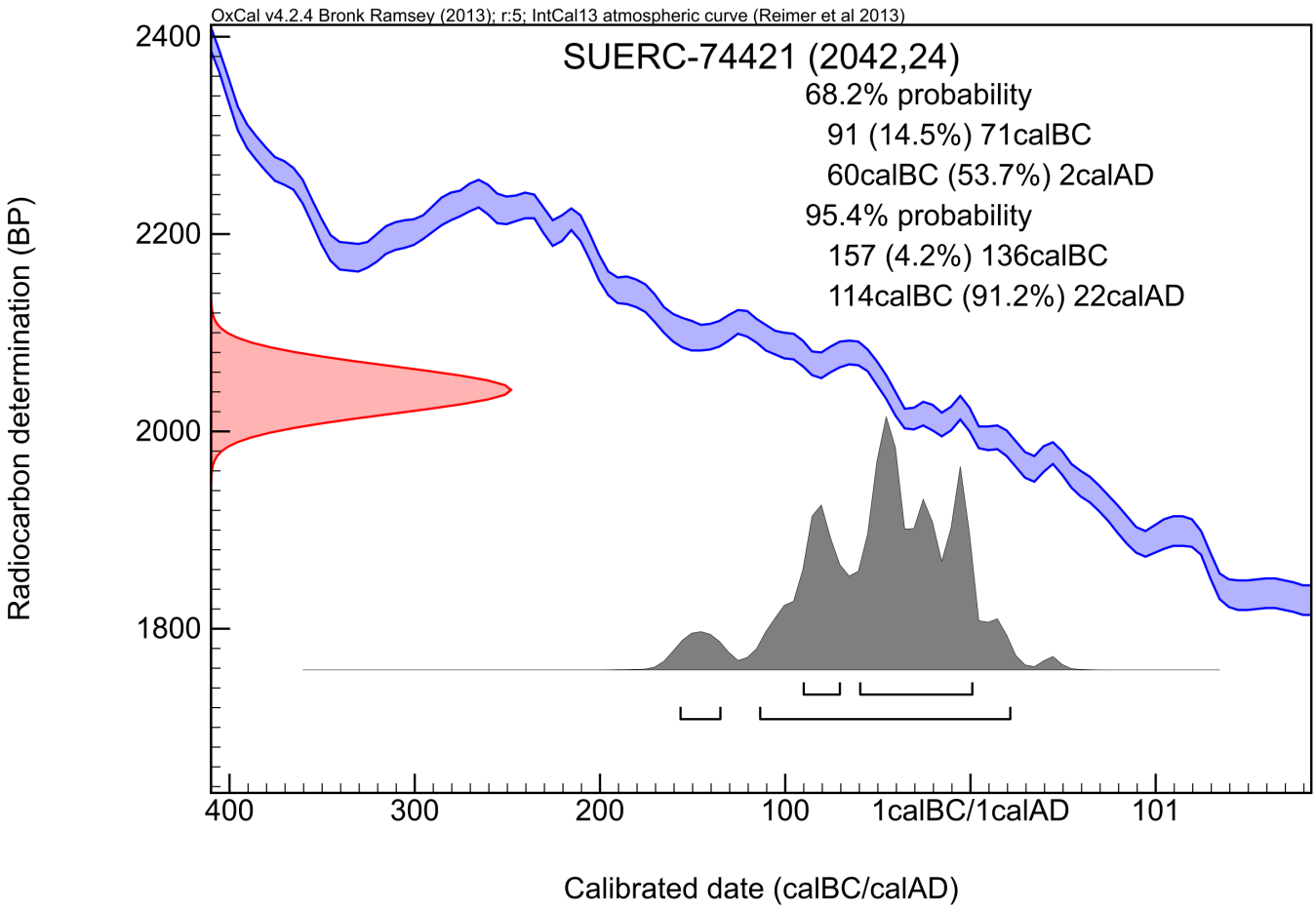
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by : P. Nayont



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

Scottish Universities Environmental Research Centre
Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

16 August 2017

Laboratory Code	SUERC-74422 (GU44569)
Submitter	Liz Pearson Worcestershire Archaeology The Hive Sawmill Walk The Butts Worcester WR1 3PB
Site Reference	Quedgeley, Gloucestershire
Context Reference	3038
Sample Reference	P4934/3038
Material	organic plant remains : Rubus sp
$\delta^{13}C$ relative to VPDB	-26.9 ‰
Radiocarbon Age BP	2129 ± 25

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

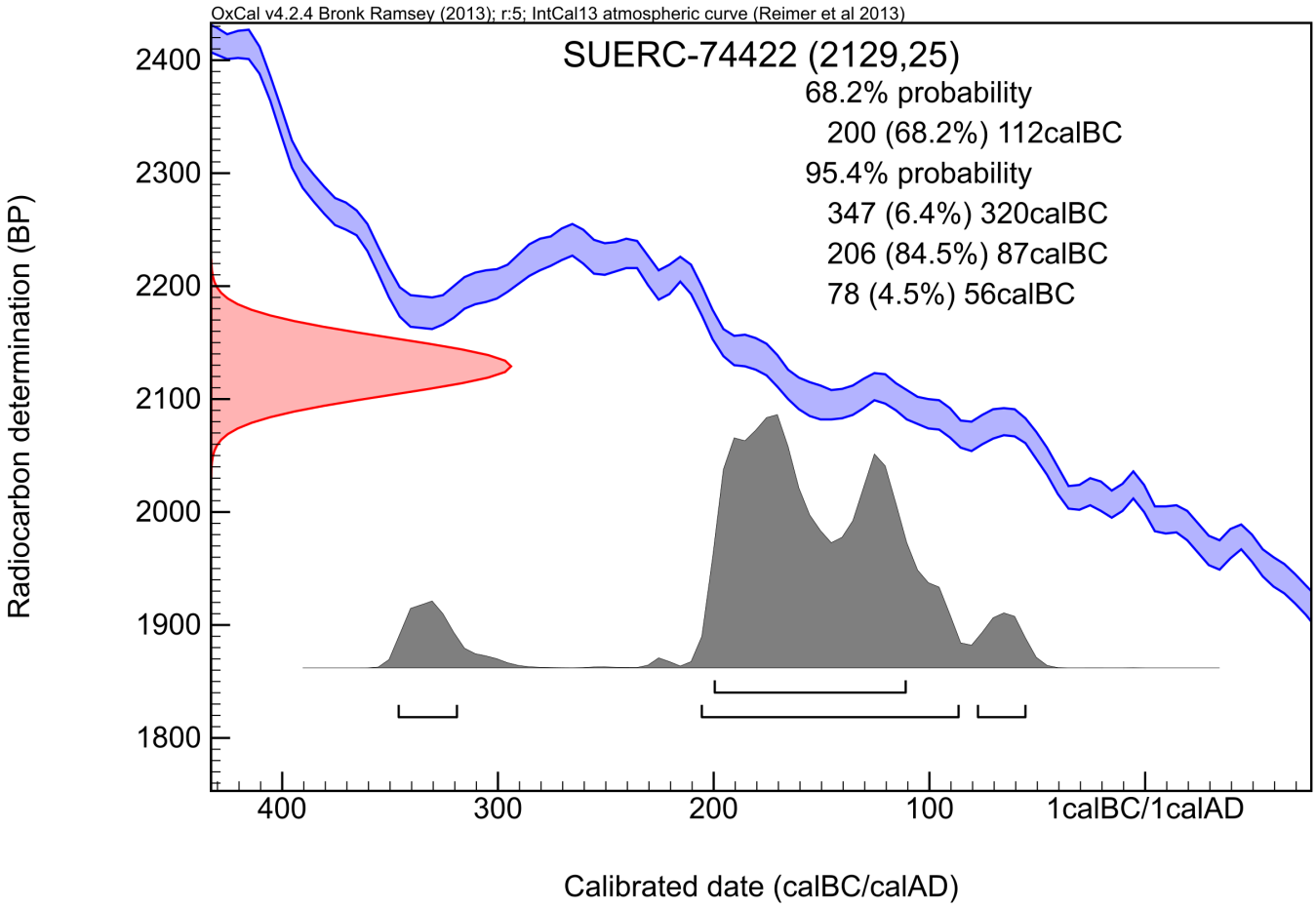
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by : P. Nayont



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

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RADIOCARBON DATING CERTIFICATE

16 August 2017

Laboratory Code	SUERC-74423 (GU44570)
Submitter	Liz Pearson Worcestershire Archaeology The Hive Sawmill Walk The Butts Worcester WR1 3PB
Site Reference	Quedgeley, Gloucestershire
Context Reference	3049
Sample Reference	P4934/3049
Material	organic plant remains : Sambucus nigra
$\delta^{13}C$ relative to VPDB	-27.8 ‰
Radiocarbon Age BP	2134 ± 27

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

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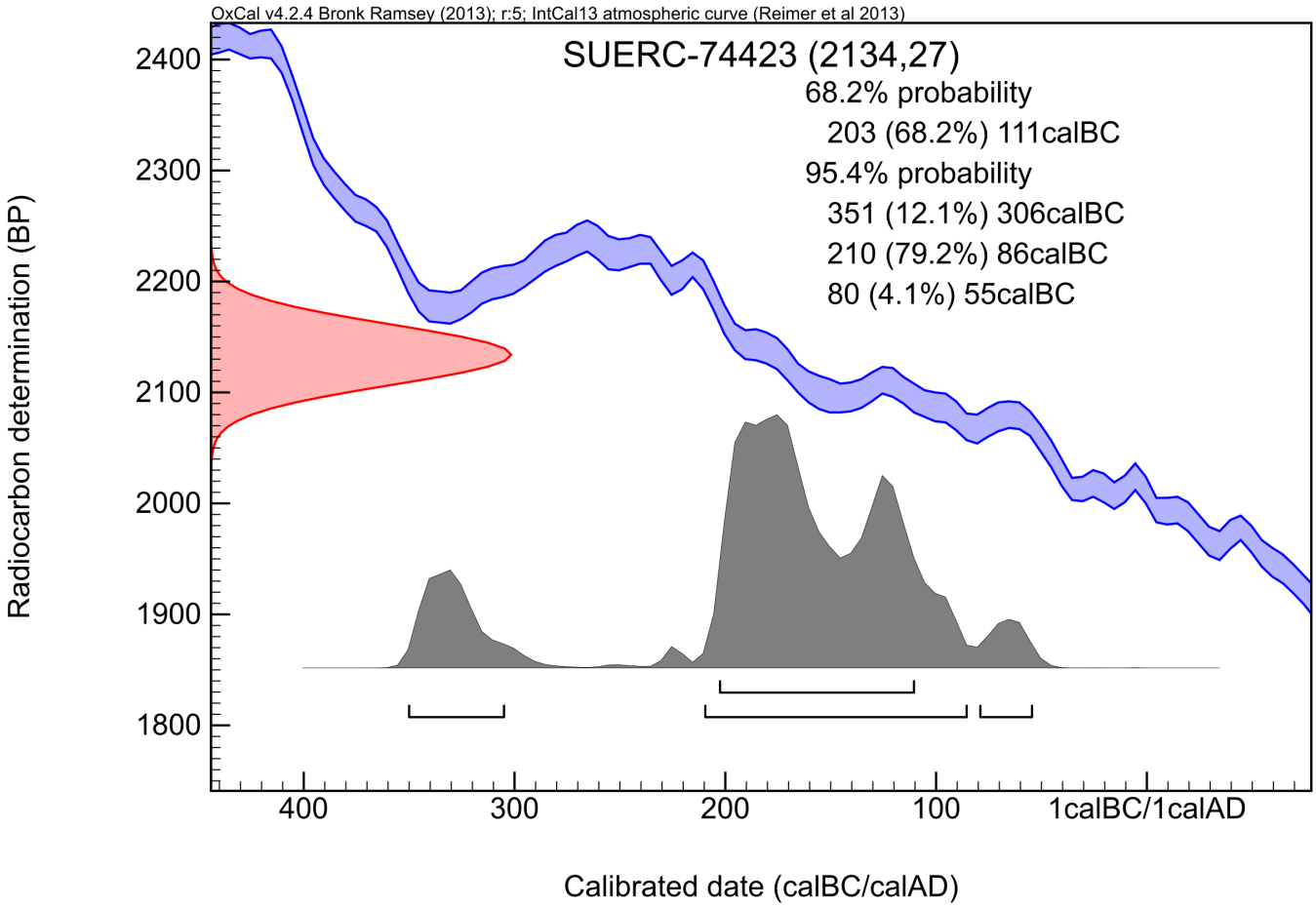
Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by : P. Nayont



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The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

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