

**FOX CLOSE  
WOBURN  
BEDFORDSHIRE**

**ASSESSMENT OF POTENTIAL AND  
UPDATED PROJECT DESIGN**

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*The figures are bound at the back of the report*



## **Preface**

*Every effort has been made in the preparation of this document to provide as complete an assessment as possible, within the terms of the brief and project design. All statements and opinions in this document are offered in good faith. Albion Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party, or for any loss or other consequence arising from decisions or actions made upon the basis of facts or opinions expressed in this document.*

## **Acknowledgements**

*This assessment has been prepared by James Newbould (Project Officer), with contributions by Anna Slowikowski and Holly Duncan (artefacts, Albion), Angela Monckton (plant remains, ULAS), Graham Morgan (charcoal, ULAS), Jackie Wells (faunal remains, Albion) and Mark Noel (archaeomagnetic dating, GeoQuest). Samples for archaeomagnetic dating were taken by MOLA. Figures have been created by James Newbould. The document has been edited by Drew Shotliff (Albion Operations Manager).*

*All fieldwork was carried out by Albion Archaeology, under the direction of James Newbould and Joe Abrams (Project Manager). The evaluation was undertaken by Richard Gregson (Archaeological Supervisor) and Iain Leslie (Assistant Archaeological Supervisor). Mitigation works (excavation) were supervised by Ian Turner, with investigation and recording carried out by Marcin Koziminski and Slawomir Utrata (Assistant Archaeological Supervisors). Archaeological observation, investigation and recording of ground-works were undertaken by Iain Leslie. Artefact and ecofact sample processing was undertaken by Slawomir Utrata and Anna Rebisz-Niziolek (Assistant Archaeological Supervisors). All Albion projects are under the overall management of Drew Shotliff.*

*We would also like to acknowledge the comments of Hannah Firth, Central Bedfordshire Council's Archaeologist, who monitored the site on behalf of The Bedford Estates and the Local Planning Authority, respectively.*

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## **Version History**

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## **Structure of the Report**

After an introduction (Section 1) detailing the planning and archaeological background, Section 2 presents the original research objectives of the project. Section 3 provides a provisional summary of the results. The potential of the data to address the original and new research objectives is discussed in Section 4, and these new research objectives are given in Section 5. Section 6 provides an Updated Project Design, which includes detailed method statements for analysis, publication and archiving. Section 7 is a bibliography.

The Appendices (Sections 8–14) contain detailed technical information and discussion of the non-contextual data-sets.

## **Key Terms**

Albion	Albion Archaeology
ACHO	Archaeology & Community Heritage Officer
CBCA	Central Bedfordshire Council's Archaeologist
CBM	Ceramic building material
Client	Project Design Studio Ltd on behalf of The Bedford Estates
HER	Historic Environment Record
IfA	Institute for Archaeologists
LPA	Local Planning Authority
ULAS	University of Leicester Archaeology Service
GQ	GeoQuest Associates
PD	Project Design
Procedures Manual	Procedures Manual Volume 1 Fieldwork, 2nd edn, 2001 Albion Archaeology



## **Non-Technical Summary**

*Project Design Studio Ltd (acting on behalf of Bedford Estates) was granted planning permission (08/259/FULL) for the construction of almshouses at Fox Close, to the rear of 13 Bedford Street Woburn, henceforth known as the Development Area (DA). The then Bedfordshire County Council's, Archaeology & Community Heritage Officer (ACHO) identified the DA as having archaeological potential and advised the Local Planning Authority (LPA) that a programme of archaeological work would be required as a condition of planning permission.*

*The ACHO issued two briefs (BCC 2008a, b), outlining a three-staged approach to the programme of archaeological work:*

*Stage I – archaeological field evaluation.*

*Stage II – appraisal of the results of the archaeological field evaluation.*

*Stage III – implementation of an agreed programme of archaeological investigation and recording (if required, following completion of Stage II).*

*The evaluation (Albion Archaeology 2009a) revealed remains of hitherto unknown Roman activity within the DA. Based on these results, the ACHO issued a third brief (BCC 2009) to secure the implementation of the final stage of the programme of archaeological work. The client commissioned Albion Archaeology to prepare a Project Design (PD, Albion Archaeology 2009b) and implement the Stage III works.*

*In January 2009 these works comprised open area excavation within the footprints of plots 3-6 of the alms houses and areas disturbed by services located in the communal garden and car park area (c. 600m<sup>2</sup>). An area to the immediate south-east of the excavation area, c. 380m<sup>2</sup> in size, was subject to a programme of continuous observation, followed by the investigation and recording of any archaeological remains encountered.*

*Excavation within the DA revealed the remains of a Roman site comprising enclosures, pits, occupation layers and a kiln. Ditches and pits contained evidence of local pottery production in the form of quantities of discarded sherds and fired clay fragments representing kiln plates. The remains of late medieval/post-medieval pits and a boundary ditch and modern buildings, pits and ditches were also revealed.*

*This document presents an assessment of the archaeological remains revealed during the investigations, the data from which have the potential to address a number of national and regional research agendas. The document also contains proposals for further analysis and publication of the data, and the methodologies and resources required to complete the project. The end product will be the publication of the results in a local journal (Bedfordshire Archaeology or Records of Buckinghamshire) and the deposition of the project archive (Accession Number 2009/75) with Luton Museum.*



## 1. INTRODUCTION

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### 1.1 *Project Background*

Project Design Studio Ltd (acting on behalf of Bedford Estates) was granted planning permission (08/259/FULL) for the construction of almshouses at Fox Close, to the rear of 13 Bedford Street Woburn, henceforth known as the Development Area (DA). The then Bedfordshire County Council's, Archaeology & Community Heritage Officer (ACHO) identified the DA as having archaeological potential and advised the Local Planning Authority (LPA) that a programme of archaeological work would be required as a condition of planning permission.

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These works (Fig. 1) comprised open area excavation within the footprints of plots 3-6 of the almshouses and areas disturbed by services located in the communal garden and car park area (c. 600m<sup>2</sup>). An area to the immediate south-east of the excavation area, c. 380m<sup>2</sup> in size, was subject to a programme of continuous observation, followed by the investigation and recording of any archaeological remains encountered.

### 1.2 *Site Location and Geology*

Fox Close lies on the north-eastern side of Woburn, to the rear of 13 Bedford Street (Fig. 1). It lies at c. 120m OD and the land within it slopes downwards to the north-east away from Bedford Street. It is centred on SP 9493 3334 and covers an area of c. 980sqm. The underlying substrate comprises Lower Greensand. Prior to development, land-use was a mixture of gardens and parking.

### 1.3 *Archaeological Background*

The overall archaeological potential for Woburn is outlined in the Extensive Urban Survey or EUS (Albion Archaeology 2000). The most significant components are briefly summarised below.

The extant town dates chiefly from the 17th and 18th centuries. Despite its Georgian appearance, Woburn's origins were previously thought to date back to the Anglo-Saxon period. The town is referred to as 'Woburninga Genaere' in an





Anglo-Saxon charter of AD 969 and is mentioned in Domesday Book. Medieval Woburn is likely to have developed in the 12th century as a consequence of the foundation of the Cistercian Abbey c. 2km to the south-east. Much of the medieval town is thought to have been lost in a series of fires between the 16th and 18th centuries, prompting the Georgian redevelopment (Albion Archaeology 2000).

The results of the archaeological evaluation are summarised in Albion's evaluation report (Albion Archaeology 2009a). In brief, the remains comprised:

- Evidence for 1st–3rd-century AD Roman settlement in the form of ditches and pits in the NW part of the development area.
- Evidence for late 1st–early 2nd-century industrial pottery production in the form of wasters, seconds, fragments of kiln discs/plates and large quantities of pottery.
- Post-medieval and modern activity in the form of ditches, pits and structures in the SW part of the development area.
- The remains of late medieval/early post-medieval field systems in the NE part of the DA,

The results of the evaluation are fully integrated into the following assessment.

#### **1.4 Purpose of this Report**

This report presents an assessment of the results of all stages of the archaeological investigations. An Updated Project Design is included, listing all the tasks that will be required to analyse, publish and archive the results of the fieldwork. The completion of these tasks will fulfil the criteria stipulated in the PD (Albion Archaeology 2009), enabling the discharge of the archaeological planning condition by the LPA.



## 2. ORIGINAL AIMS AND OBJECTIVES OF THE INVESTIGATION

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### 2.1 *Introduction*

A series of research aims were established in the evaluation report (Albion Archaeology 2009a) and were reiterated in the PD (Albion Archaeology 2009b). These were necessary to ensure that the investigation was appropriately targeted in accordance with local, regional and national research priorities.

### 2.2 *National Research Frameworks*

Of general relevance is English Heritage's draft Research Agenda (EH 1997) which aims to advance understanding of England's archaeology, support the development of national, regional and local research frameworks and promote public appreciation and enjoyment of archaeology. Although the Research Agenda was intended for projects seeking English Heritage resources, *i.e.* not those undertaken within the PPG 16 (now superseded by PPS 5) framework, its goals and objectives are relevant to the investigations occasioned by this development.

Of more specific relevance is the national framework for the Roman-British period *Britons and Romans: advancing an archaeological agenda* (James and Millett 2000).

### 2.3 *National Pottery-based Research Agendas*

Other national research documents have been created to address artefact-specific agendas and identify the relevant gaps in current knowledge. Of particular relevance to this project is *Research Frameworks for the Study of Roman Pottery* (Willis 1997) and the English Heritage publication; *The current state of Romano-British pottery studies* (Fulford and Huddleston 1991).

### 2.4 *Regional and County-based Research Agendas*

Broad national research priorities have been formalised by English Heritage in *Exploring our Past* (1991), updated in their draft Research Agenda (1997). On a regional level, a resource assessment and research agenda is now available for Bedfordshire (Oake *et al* 2007).

The County Archaeologists of East Anglia have published a resource assessment (Glazebrook 1997) and a subsequent research agenda and strategy (Brown and Glazebrook 2000) for the eastern counties. This was recently revised and updated to include Bedfordshire (Medlycott and Brown 2008).

### 2.5 *Original Research Objectives*

A number of research objectives, both generic and period-specific, were considered relevant to the work at Fox Close (Table 1). They explore site-specific (objective 1), local (4 and 6) and regional questions (2, 3 and 5). Three (3, 4 and 5) are pottery-specific.



<b>Objective / Theme</b>	<b>Research Aims/Themes</b>
<b>1</b>	Establish the date, nature and extent of activity or occupation in the development site.
<b>2</b>	What is the nature of the Roman settlement at Woburn and how does it fit into the regional settlement pattern?
<b>3</b>	How does the level and nature of pottery production at Woburn compare to other early Roman production sites in the Eastern Region?
<b>4</b>	What does comparison of the Woburn pottery assemblage with those of other nearby early Roman pottery production centres, such as Stagsden and Warren Villas, tell us about changes/similarities in local pottery production technology in this period?
<b>5</b>	How do the fabrics of the Roman pottery at Woburn compare to the medieval fabrics of the surrounding area? What does this tell us about the changes/similarities in technology between these periods?
<b>6</b>	What can the investigation of late-medieval/early post-medieval field boundaries tell us about the origins of extant land division in the locality of the site?

**Table 1: Summary of original research objectives and themes**



### 3. PROVISIONAL SUMMARY OF RESULTS

#### 3.1 Introduction

##### 3.1.1 Methodological approach to assessing contextual data

The contextual data were rapidly assessed in order to establish whether they would provide a coherent spatial and chronological framework. A total of 464 contexts were assigned to provisional Assessment Groups, *e.g.* enclosure, post-holes, gully, *etc.* (Table 2). The allocation of individual contexts to specific Assessment Groups contexts was made on the basis of the following criteria:

- Do the contexts form a coherent spatial unit *e.g.* ditch length, pit group *etc.*?
- Do the contexts represent key positions within the stratigraphic sequence?
- Do the contexts contain suitable dating material?

Assessment Groups were then assigned to a number of distinct Assessment Landscapes, corresponding to larger, coherent and contemporaneous spatial units representing distinct episodes of human activity. Where chronological links were apparent between several Assessment Landscapes, they were in turn assigned to separate chronological Phases (*i.e.* Roman).

The text which follows is structured by chronological phase, and discussed by Assessment Landscape (AL) and Assessment Group (AG).

Phase	Assessment Landscape	Assessment Group	Description	No. Contexts	
Pre-Pleistocene	0	13	Natural geology	8	
Roman	1	2	Root holes	4	
		6	Construction of kiln	2	
			Disuse of kiln	2	
			Fired deposit	1	
			Fired kiln platform	1	
			7	Digging of pits	6
		Primary deposits		4	
		Secondary deposits		5	
		10	Gully	6	
		10.01	Gully	6	
		10.11	Construction and primary silting of ditch	2	
			Secondary deposits	1	
		12	Ditch terminal	6	
		2	10.03	Ditch	8
				10.08	Construction of ditch
			Primary backfill		1
			Primary silting		5
			Secondary backfills		7
			10.09	Construction of ditch	2
	Primary backfill			1	
Secondary backfill	2				
12.01	Gully		4		
3	7.01		Construction of pits	3	
		Primary silting	3		
		Secondary silting	1		



Phase	Assessment Landscape	Assessment Group	Description	No. Contexts
			Backfill	3
		7.04	Possible cess pit	2
			Silting deposit	1
		7.06	Hearth	2
			Burnt deposit	1
		8	Occupation layers	13
			Occupation layers	2
		8.01	Occupation layer	1
		9	Post-holes	4
		9.01	Post-holes (small)	10
			Post-holes (large)	7
			Post-holes with packing	3
		10.02	Ditch terminal	2
		10.04	Ditch	7
			Primary deposits	5
			Secondary deposits	7
	3.01	10.05	Gully	2
			Gully	6
		10.06	Gully	3
			Silting	2
			Backfilling	3
		10.7	Gully terminal	2
			Backfill	1
		10.1	Construction of ditch	6
			Primary deposits	2
			Secondary deposits	6
		10.12	Gully	3
	4	7.02	Construction of pits	3
			Primary silting	1
			Primary backfill	2
			Secondary silting	2
			Secondary backfill	2
			Tertiary silting	2
		7.05	Pit	3
			Backfill	2
			Natural infill	1
		11	Construction of Enclosure 1	4
			Primary deposits	1
			Secondary deposits	4
		11.01	Enclosure 2	16
			Enclosure 2	5
			Rooted upper deposits	3
		11.02	Enclosure 2	10
			Secondary Silting	3
			Tertiary backfill	1
	5	7.03	Construction of pits	3
			Primary backfill	2
			Secondary backfill	3
		11.03	Construction of Enclosure 3	14
			Primary silting	2
			Primary backfill	5
			Secondary silting	2
			Secondary backfill	12
	6	1	Root holes	8



Phase	Assessment Landscape	Assessment Group	Description	No. Contexts
		7.07	Pit	6
		8.02	Occupation layer	1
		14	Primary subsoil	1
Late-medieval/ post-medieval	7	4	Ditches	12
			Pits	19
		5	Ditch	8
		12.02	Construction of ditch terminal	2
			Silting	3
			Backfill	3
		14.01	Secondary subsoil	4
Modern	8	3	Pits	26
		3.01	Ditch	11
			Ditch	14
			Ditch	4
			Buildings	14
		15	Topsoil	5
		16	Make-up layers	7
Un-phased	9	17	Un-dated ditches	4
Total	10	45	97	464

**Table 2: Summary of provisional phasing**

### 3.2 Structural Illustrations

Given the level of truncation from post-medieval and modern activity at the site, the ditches shown on Figures 2–8 are unlikely to entirely reflect their original form. In these cases, dashed lines have been used to indicate their postulated original extent.

### 3.3 Phase 0: Pre-Pleistocene

#### 3.3.1 AL0: Natural geology

The undisturbed natural geology consisted of a combination of silt and clay sands of the Greensand formation.

### 3.4 Phase 1: Roman Pottery Manufacture, Pits and Enclosures (Fig. 2)

#### 3.4.1 AL1: Pottery kiln with associated pits and gullies (Fig. 3)

AL1 is focused around a probable pottery kiln (AG6), located to the eastern edge of the site and a group of three small pits (AG7) to the immediate west of the kiln. The deposits within the kiln contained fired clay and hammerscale. Thirty-four sherds of locally made, 1st–2nd-century Roman pottery were also recovered, including seven sherds from fired deposits forming the base and sides of the kiln. This suggests the existence of an earlier kiln in the vicinity. Fired deposits making up the kiln platform (1185) were sampled for archaeomagnetic dating.

It is likely, based on its morphology and associated artefactual material, that the kiln was used for the production of pottery. The adjacent pits may represent small-scale quarrying of clay and sand for use in pottery production or for associated processes such as puddling. Indirect evidence, including fired clay,



kiln furniture, wasters, and pottery found throughout the sequence suggests pottery manufacture persisted into later phases of the site.

A number of ditch terminals (AG10.01, AG10.11, AG1) and a curvilinear gully (AG10) demonstrate a sequence of broadly NW-SE and NE-SW aligned land divisions. These boundaries set the alignments of field systems within AL 2-5 and are even mirrored in the layout of modern and extant boundaries (AL8).

#### **3.4.2 AL2: Land boundaries/enclosures (Fig. 3)**

AL2 comprises three gullies (AG10.03, 10.08/10.09 and 12.01) which maintain the NW-SE/NE-SW alignments of the boundaries of AL1. They represent a shift from industrial activity to the division of land into plots or small enclosures. Although no direct evidence of pottery production is apparent in this phase of the site, the levels of locally made pottery and fired clay (kiln discs/plates) suggest that pottery production continued nearby, within the vicinity. In addition, sufficient pottery of identifiable (non-locally made) fabrics was present to suggest human occupation beyond the production of pottery.

#### **3.4.3 AL3: Occupation (Fig. 4)**

AL3 contains evidence of occupation layers (AG8) at the northern end of the site, which overlay the NW-SE aligned boundaries of AL2. These layers contained several kilos of fired clay and locally made pottery, suggesting that pottery production continued nearby into this phase. The formation of layers suggests that direct use/occupation of the land within the DA had increased from AL2. The layers may represent the truncated remains of an episode of dumped material associated with pottery production.

Towards the southern end of the site, a group of postholes (AG9.01) and an associated hearth (AG7.06), appear to form the partial remains of a small structure. It is likely that truncation has obscured the true layout of these remains and their collective function is unclear, though it is possible they may be associated with pottery making. Many of the disuse fills of the postholes contained pottery, suggesting that people continued to use the area soon after the removal/disuse of the posts.

A group of three similarly shaped and sized pits (AG7.01) located to the north and south of AG9.01 may be associated with this phase of activity. The heterogeneous fills of pit [1221] contained pottery, burnt stone and fired clay, suggesting it may have been used as a rubbish pit, associated with nearby industrial activity.

Two parallel ditches (AG10.02, 10.04) maintain the NW-SE alignments formalised in AL2 and represent the continued redrawing of boundaries throughout this phase. Both contained locally made pottery. The presence of this material within the ditch suggests deliberate backfilling. A small pit (AG7.04) was also identified in the south-east part of the DA. It contained a greenish fill (1236) indicative of a possible cess deposit. However sampling revealed it to be heavily contaminated by rooting from the extant trees above, precluding further analysis..



#### 3.4.4 AL3.01: Re-alignment of land divisions (Fig. 4)

AL3.01 represents the further redrawing of the land into small parcels, in this case on a predominantly NE-SW axis, perpendicular to those of AL3. As with those of AL3, the ditch fills contained locally made pottery, including a sizeable, deliberate single deposit of some 2.7kg within AG10.07.

The truncated remains of a shallow, broadly N-S aligned boundary (AG10.05), were also found in the centre of the site. It had two phases, suggesting maintenance. It may be related to the remains of a similarly aligned and proportioned gully (AG10.12) 10m to the north.

#### 3.4.5 AL4: Enclosure 1 and pits (Fig. 5)

AL4 represents the earliest of several small enclosures located in the centre of the DA. It comprises two phases (AG11) and (AG11.01, 11.02), although it is not clear whether AG11 was a full enclosure or a short length of boundary ditch. It is possible that the south-eastern side of the enclosure was truncated by the modern ditch (AL8), although it could equally have been open-ended.

These remains demonstrate the need for the enclosure of a small area, possibly defining some sort of activity area. No contemporary internal features were encountered, although significant post-Roman truncation may be responsible. The ditches contained locally made pottery, fired clay, and occasional animal bone fragments.

At the same stratigraphic level were four pits (AG7.02, 7.05), located to the north of the enclosure. Pits AG7.02 were cut through the occupation layers of AL3 and are, therefore, unlikely to represent quarries. Pit AG7.02 was cut into the undisturbed geology but shared morphological characteristics with those of AG7.05. Like the adjacent enclosure, the pits, particularly [1160] contained large quantities (over 16 kg) of locally made pottery, fired clay, animal bone fragments, slag and hammerscale.

Although present, the quantities of iron-working products (Section 4.4, Appendix 1) were insufficient to suggest metalworking within the DA; they suggest that these activities were undertaken nearby. The volumes of ceramic artefacts in AL4 suggest continued pottery production and further demonstrate the persistent habit of using disused boundaries and pits as dumping grounds for waste associated with that industry.

#### 3.4.6 AL5: Enclosure 2 and pits (Fig. 5)

AL5 comprises a second enclosure (AG11.03 and two pits AG7.03) which define a smaller area than Enclosure 1. It may also have had its south-eastern side truncated, in this case by late-medieval ditch (AL7).

The contrasting fills of the enclosure ditches were characterised by erosional silting to the east and deliberate backfilling to the north and west. The backfilled deposits contained large quantities of locally made pottery, fired clay (kiln furniture) and lesser quantities of non-local fabrics. Indeed, of all ALs, AL5 contained the highest proportion of locally made pottery and fired clay





(Appendix 2). This suggests a more intensive and/or geographically nearer phase of pottery production in the immediate vicinity.

AG7.03 comprised two morphologically similar pits. One of these [1177] appeared to post-date the enclosure but nonetheless contained similar fills and artefacts. It is possible that it may have been created whilst the enclosure was still visible, but out of use, having at that stage been partially backfilled. The final stages of backfilling of the enclosure and this pit were probably contemporaneous.

The locations of the backfilled deposits in the enclosure and pit [1177] suggest that the source of the deposits was to the north-west of the enclosure. The silted deposits identified in the eastern part of the enclosure were stratigraphically later than the backfilling and represent the final abandonment of the enclosure and weathering of the ditch sides. These remains represent the latest phase to contain significant evidence for pottery production in the Roman period.

### **3.4.7 AL6: Cessation of pottery production (Fig. 6)**

AL6 is characterised by the formation of layers overlying enclosure AG8.02 (AL5), the colonisation of the area by trees/shrubs (AG1) and the appearance of two shallow, intercutting pits (AG7.07) containing 2nd–3rd-century Roman pottery and ceramic building material (CBM).

Although the root-hole (AG1) contained 1st–2nd-century Roman pottery, it is likely to be residual. Layer AG8.02 appears to have been derived from the underlying pottery-rich enclosure ditch fills and may represent root disturbance or ploughing of the area. It is probably also associated with the formation of post-Roman subsoil AG14, which separates all Roman remains from the late medieval and post-medieval remains of AL7.

AL6 appears to represent the cessation of 1st–2nd-century pottery production within the immediate area of the DA. It suggests that the area underwent a period of agricultural use or was left un-maintained after the early, 1st–2nd-century phases. However, the presence of pits AG7.07 and the artefactual remains within them suggest a return to/reuse of this area during or after the 2nd–3rd centuries.

## **3.5 Phase 2 – Late Medieval/Post-medieval Ditches and Pits (Fig. 7)**

### **3.5.1 AL7: Field boundaries and pits (Fig. 7)**

A large NE-SW aligned ditched boundary AG5 was located toward the centre of the DA. Its primary fills contained late medieval/early post-medieval (*c.* 1500) pottery and CBM. A large fragment of dressed limestone was also recovered from the upper fills (Section 4.4, Appendix 1). This ditch may represent part of a medieval field boundary.

A second, smaller ditch terminal AG12.02 lay *c.* 15m to the south of, and parallel to, AG5. AG4 consisted of a recut NW-SE aligned gully at the southern end of the site and two pits of unknown function, towards the northern end. All



contained post-medieval pottery and CBM and are therefore considered to post-date AG5. The gullies probably represent part of a small land boundary or internal division. The recut is evidence that the boundary was at one time maintained and extended.

Pit [1073] was cut through the upper, post-medieval subsoil (AG14.01) directly into the latest Roman enclosure AG8.02 (AL5). It contained several sherds of post-medieval pottery as well as over 1kg of residual 1st–2nd-century Roman pottery, suggesting that the arisings from the excavation of the pit were put back into it.

### **3.6 Phase 3: Modern Pits, Ditches and Structures (Fig. 8)**

Modern remains comprise the foundations of brick-built structures and several ditches and pits (AG3, 3.01). AL8 also includes modern brick rubble make-up layers in the western part of the DA (AG16) and topsoil in the eastern part of the DA (AG15) which together formed the ground surface at the time of the investigations.

The structure is related to a building shown on the 1st edition OS map, probably the old butcher's shop. Several of the modern pits contained animal burials probably associated with this phase of activity. The large ditches may represent landscaping associated with the construction of modern buildings such as the butcher's shop (a local man claimed to have worked there from the 1940s onward and had buried several animals, including pigs and dogs). Both species could be substantiated by finds of modern remains. The smaller ditch may be associated with the gardens shown on the 1st edition OS map.

### **3.7 Phase 4: Un-phased Ditches (Fig. 8)**

Two shallow ditches AG17 were identified in the south-eastern part of the DA. They were aligned broadly north-south, contained no datable artefactual material and were morphologically similar to ditches identified within the Roman and modern phases of the site.



## 4. ANALYTICAL POTENTIAL OF THE DATA

### 4.1 Introduction

For the following discussion, the data-sets recovered during the investigations have been divided into three main classes: contextual; artefactual; and ecofactual.

- **Contextual** data relate to the identification of individual events such as the digging of a ditch, its primary infilling *etc.* These have been recorded as context records during the evaluation and open area excavation. All contexts have a detailed record sheet; many have a plan and section drawing along with photographs.
- **Artefactual** data comprise manmade objects recovered during the open area excavation. These have been divided for ease of discussion into other artefacts, pottery and fired clay.
- **Ecofactual** data comprise natural materials found within excavated deposits. These are able to yield information on the nature of past human activity and its environmental setting. They include animal bones and information obtained from environmental samples (*e.g.* plant remains).

Results for individual data-sets are summarised and discussed below. Each contains a statement of the potential of the data-set to contribute to the original research objectives; *high, medium, low* or none (-), as well as recommendations for further analysis where appropriate.

Each data-set is accompanied by an appendix, which presents detailed methodology, results and discussion, including (where appropriate) quantification, provenance (spatial and chronological) and condition. All these factors are important in deciding the potential of the material for analysis.

Contextual data are discussed first in the following sections, as they have provided the framework for the preceding summary of results and the subsequent data-set discussions.

### 4.2 Contextual Data

#### 4.2.1 Quantity of records

Table 3 presents a breakdown of the total quantity and type of contextual records.

Contexts	Plan Sheets	Sections	Photographs
464	6	89	374

**Table 3: Quantity of records**

These comprise the written description/interpretation of a deposit/feature (context sheets), a map-like drawing showing the location and inter-relationship between features (a plan), a profile drawing through a feature and its fills (section), and photographs.



#### 4.2.2 Survival and condition of remains encountered

The majority of the significant remains identified were from the early Roman period (1st–2nd centuries AD); others were modern (AD1750 onwards), late-medieval/post-medieval (AD1500–1750) or early 2nd–3rd century AD Roman in date. The remains represent the first evidence of Roman occupation in Woburn, including direct and indirect evidence of 1st–2nd-century Roman pottery production. The distribution of certain types of artefact (*e.g.* pottery, wasters, kiln plates and discs) has in some phases assisted in identifying where pottery production was focused.

The Roman archaeological remains had been truncated by late-medieval/post-medieval and modern activity (AL7, 8). The presence of relic medieval field boundaries (AG5) also provides indirect evidence that ploughing may have taken place within this period. The lack of internal features within both phases of enclosure (AL4, 5) and the relative incoherence of post-holes (AG9, 9.01) may be a result of such disturbance. Deeply cut, negative features such as ditches and pits survived best whilst no positive features, such as floor layers or banks to accompany the deep ditches, survived.

The impact on the archaeology of post-medieval/modern buildings within and around the DA is not fully understood. It is likely that cellared structures would have caused severe truncation of Roman remains. However those constructed with strip footings may contain pockets of preservation within their footprints.

In the modern era, no mechanised ploughing took place. Indeed, cartographic evidence demonstrates that the DA was enclosed within the town by the end of the 19th century, prior to the development of these techniques. 20th-century make-up layers, probably associated with the demolition of Georgian buildings, had thickened the overburden within the DA, forming a protective layer.

Continuity in the alignments of ditches throughout the entire sequence demonstrates that some Roman boundaries or positive features may have survived in the landscape long enough to be translated into medieval, post-medieval and modern layouts.

Overall soil preservation conditions for ceramics were very good. Although few faunal or plant remains were recovered, it is likely that this reflects absence of material rather than poor preservation. Furthermore, the majority of plant remains that were identified appear to be intrusive (Section 4.9).

#### 4.2.3 Potential

Contextual data has varied potential to contribute to the original research objectives. It has demonstrated the presence of a kiln within the DA as well as domestic occupation and continued pottery production and iron-working adjacent to the DA. Indeed, within AL5 it has been possible through stratigraphic evidence to establish that off-site activity is likely to have taken place to the north-west of the DA. However, the contextual data is limited in extent, hampering interpretation. It is therefore considered to have *medium potential* to address research objective 1.



The relatively small extent of Roman remains precludes detailed comparison with other Roman sites in the region. However, the presence of a Roman site and its geographical juxtaposition with other Roman settlements allows limited discussion of regional settlement patterns (objective 2). The potential to address this objective is considered to be *low*.

Objectives 3, 4 and 5 are more specifically related to the pottery assemblage. However, the contextual data provides a background for the comparison of different assemblages as it elucidates the levels of pottery production through time (objective 3 – *low potential*). It also elucidates the nature and status of the occupation relative to different production sites (objective 4 – *low potential*). It has also provided information on the types of kiln technology employed at the site (objective 5 – *low potential*).

In relation to objective 6, the contextual data has also demonstrated that Roman-period ditch alignments were broadly the same as those used in the Middle Ages and the modern era. However, the extent of the Roman and late-medieval/post-medieval remains is very limited and is considered to have *low potential* to contribute to this objective.

### **4.3 Cartographic Sources**

#### **4.3.1 Summary of available sources**

Available mapping sources for Woburn comprise the following: 1851 Woburn Tithe Map (MAT52), 1881 1st edition OS map and 1901 2nd edition OS map. These provide information on the post-medieval and modern character of Woburn town. Boundaries and buildings shown on these maps may relate to post-medieval and modern archaeological remains identified within the DA.

#### **4.3.2 Potential**

The historical maps are better suited to investigation of post-medieval and modern buildings and field boundaries than late-medieval/post-medieval boundaries. Therefore, they are considered to have *low potential* to contribute to original research objectives 1 and 6. They have *no potential* to address objectives 2-5.

### **4.4 Other Artefacts**

#### **4.4.1 Summary of other artefacts**

The assemblage was limited in quantity, material and artefact types (see Table 18, Appendix 1). It provides evidence of iron-working (slag, hammerscale and hammerslag) construction materials (stone and flint) and domestic activity (burnt stone and a quern stone). A single glass bead of probable modern date was also identified, although beads of this type are also known from Bronze Age, Iron Age and Roman contexts.

The iron-working by-products were present throughout the Roman phase, although in very small quantities. Hammerscale and hammerslag were not associated with any smithing slag, as might be expected in the vicinity of



smithing activity. Indeed, the single piece of fayalitic slag (263g) was not found with other iron-working by-products. These remains are therefore likely to represent evidence of iron-working outside the DA, rather than within it.

Building materials comprised a piece of tabular flint (AL3), possibly used for paving, although other examples have been used for grinding (Appendix 1). A large scoinson of Totternhoe limestone was removed from a late-medieval/post-medieval ditch (Phase 2). Although this stone type was quarried in the Roman period, production at the quarries peaked between the 12th and 16th centuries. It is likely to represent part of a demolished medieval or post-medieval building within Woburn.

#### 4.4.2 Potential

The assemblage has low or no potential to address the six original research objectives.

The presence of the quern stone is compatible with the date suggested for activity in Phase 1, AL1 and suggests some domestic activity. The identification of iron-working by-products, although not directly associated with remains within the DA, also speaks of the type of occupation within the wider site. The assemblage is therefore considered to have *low potential* to contribute further to research objectives 1 and 2. The assemblage has *no potential* to address research objectives 3-6.

### 4.5 Pottery

#### 4.5.1 Summary

The bulk of the assemblage (4595 sherds, 79.7kg) comprised locally manufactured Roman period wares of the late 1st–late 2nd century (Appendix 2). These, represent the products of a hitherto unknown kiln or kilns, referred to as the Woburn industry. The pottery is a reduced, sandy ware, designated fabric R43A in the Bedfordshire Ceramic Type Series. A smaller quantity of Roman pottery not attributable to the Woburn industry was also identified (140 sherds, 4.1kg). The remainder of the assemblage comprised medieval (15 sherds, 277g) and post-medieval (13 sherds, 612g) fabrics.

Locally manufactured and non-local Roman pottery appeared throughout the Roman sequence (Phase 1, AL1-6) and was present as residual material within Phases 2 and 3. Dating of the pottery is not of a high enough resolution to enable closer dating of AL 1-6. However, changing volumes of pottery throughout the Roman sequence indicate that AL4-5 saw a peak in production and / or a shift in the location of production closer to the DA.

#### 4.5.2 Potential

Assessment of the assemblage has revealed variable potential to address the original research objectives. The latter covered site-specific, local and regional questions. Broadly, the potential for the pottery to address these objectives diminishes as the geographical area covered by the objective increases. The potential for pottery to address site-specific objective 1 is considered to be *high*.



It has *medium potential* to address local, pottery-specific objective 4 and *low potential* to address regional objective 2, and pottery-specific, regional objectives 3 and 5. It has *no potential* to address objective 6.

## **4.6 Fired Clay and Ceramic Building Material**

### **4.6.1 Summary**

A total of 518 fragments, weighing 18.7kg, of fired clay were recovered, appearing throughout the Roman phases (AL1-6, Appendix 3). It comprised a single, very hard fired, rough and sandy fabric type, the same as that used in the locally produced pottery, with the addition of organic matter in the form of straw or grass. This material is likely to represent part of a kiln structure in the form of lining or a temporary dome cover.

The CBM assemblage (Appendix 3) comprised 5 abraded fragments of Roman brick (1347g) from pit G7.07 (AL6, Phase 1) and 87 fragments of post-medieval tile (7056g) from Phases 2 (late-medieval/post-medieval) and 3 (modern).

### **4.6.2 Potential**

The fired clay is considered to have *medium potential* to address original research objective 1 and *low potential* to address objective 4. It has *no potential* to address remaining objectives. Discussion of the fired clay will be integrated with that of the pottery assemblage. CBM is considered to have *no potential*. No further analysis of either data-set is required.

## **4.7 Scientific Dating**

### **4.7.1 Background and Methodology**

Following consultation with English Heritage's Regional Science Advisor, Central Bedfordshire Council's ACLO requested the sampling of fired deposits making up the kiln platform (1185) for archaeomagnetic dating. A total of 15 samples of fired sandy clay were taken.

### **4.7.2 Results**

Of the 15 samples taken on-site, only 10 were useable during tests. Archaeomagnetic vectors in these samples were too dispersed to enable a reliable mean. A resulting date could therefore not be estimated. The reasons for the poorly defined archaeomagnetism are likely to be:

- The very weak magnetisation might have been difficult to resolve with sufficient precision in the laboratory fluxgate magnetometer.
- Fired deposits had been disturbed by root action.
- Despite the rust-red colouration, the sandy clay contained a very low proportion of ferrimagnetic iron oxides on which an archaeomagnetism might be imprinted.
- The material had not been fired to sufficient temperature (>580°C) for it to acquire a strong magnetisation in the ancient field direction.



### 4.7.3 Potential

Given the likelihood that this kiln was fired below 580°C, it may be possible to compare suggested firing temperatures of this kiln to those of other kiln sites. As such, this data-set would have *low potential* to contribute to research objectives 4 and 5. Otherwise, this data-set has *no potential* to address the original research objectives. No further analysis of this data-set is required.

## 4.8 Animal Bone

### 4.8.1 Summary of results

The assemblage mostly derives from larger mammals (cattle and sheep/goat) but includes a single fragment of bird bone (Appendix 5). The majority of the bone is associated with late-medieval/post-medieval field boundaries (Phase 2); the remainder derives from Roman features (Phase 1).

### 4.8.2 Potential

The quality of the animal bone assemblage indicates that conditions for its preservation were good throughout Phases 1 and 2. This suggests the limited size of the assemblage is likely to reflect actual deposition levels rather than post-depositional preservation factors.

The animal bone assemblage supports the contextual and ceramic evidence in suggesting that Roman activity had an industrial focus, rather than a domestic one. As such the potential of this data-set to contribute to original research objectives 1 and 2 is *low*. It has *no potential* to contribute to objectives 3-6.

The limited size of the assemblage precludes any further useful analysis.

## 4.9 Plant Remains

### 4.9.1 Summary of results

Of the 24 samples taken, 22 were from deposits datable by pottery to the Roman period (AL1-5, Appendix 6). The remaining 2 samples (3 and 101) were from late medieval and post-medieval deposits (AL7).

The majority of samples appear to contain medieval or post-medieval material comprising medieval-type plant remains and coal. A few of the samples have chaff fragments of bread wheat showing the use of this crop, with oats, rye and some barley.

Although there are sporadic occurrences of bread wheat type grains (rye and oats - mainly wild oats), none are common in the Roman period in England and usually occur together with spelt. Indeed, the main cereals of the Roman period were spelt and barley. In contrast, the cereals identified within the Fox Close samples are commonly found in medieval and post-medieval deposits and often occur together. The assemblage is similar to those seen elsewhere in medieval deposits at sites in Leicester and recently at Norse Road, Bedford (Albion Archaeology 2011). The medieval cereals may represent waste from kilns used to parch grain (grain was parched to dry damp crops for storage or to facilitate





milling). However, no direct evidence was revealed for such activity and their presence within Roman deposits and their association with coal indicate that they are intrusive.

Typical Roman plant remains were identified in samples 117 (AL4) and 119 (L5), and possibly 113 (AL4), 112 (AL5) and 101 (AL7). Sample 101 was taken from a post-medieval pit (AG4) which was cut into earlier Roman deposits. It is therefore possible that the plant remains within it are re-deposited.

Roman-type remains comprised chaff fragments (wheat glume bases - including spelt) single flax and wild radish seeds, a few cereal grains/fragments as well as weed seeds including seeds of grassy vegetation. The latter comprised ribwort plantain (*Plantago lanceolata*) and heath grass (*Danthonia decumbens*). However, all can occur as arable weeds. This material may represent small-scale cleaning of cereals for domestic consumption of spelt wheat and barley, with the possible use of grassy material as kindling in hearths.

#### 4.9.2 Potential

Despite being sampled from Roman deposits (AL1-5) the majority of plant remains comprised medieval-type grains and seeds. Much of the material is abraded and broken; suggesting that it has been raked out of hearths or kilns and so may be re-deposited. Many samples also contained small fragments of coal. Although coal was used in Roman times (usually near natural coal sources), this is very unlikely in Woburn which has no nearby coalfields. The coal is considered to be intrusive medieval or post-medieval material.

Because of the contaminated nature of the samples and the relatively small amounts of Roman-type plant remains, this assemblage has *no potential* to address the original research objectives. No further analysis is required.

#### 4.10 Charcoal

Species present comprised Oak (*Quercus* spp.), Hazel (*Corylus avellana*), Ash (*Fraxinus excelsior*), Rowan-type (*Sorbus* spp.) and Elm (*Ulmus* spp.). These species are typical of open woodland or hedgerow landscapes but are not characteristic of any particular historical period (Appendix 7).

The majority of the charcoal was fragmentary and concreted which indicates that water has been moving through it and possibly washing the small fragments down through the soil profile. They could, therefore, represent remains from the Roman or medieval periods through to the modern era. These remains have *no potential* to address the original research aims. No further analysis is required.



#### 4.11 Potential of Data-sets to Address Original Research Objectives

Objective	Contextual	Cartographic Sources	Other Artefacts	Pottery	Fired Clay	CBM	Scientific Dating	Animal Bone	Plant Remains	Charcoal
1 Establish the date, nature and extent of activity or occupation in the development site.	Medium	Low	Low	High	Medium	-	-	Low	-	-
2 What is the nature of the Roman settlement at Woburn and how does it fit into the regional settlement pattern?	Low	-	Low	Low	-	-	-	Low	-	-
3 How does the level and nature of pottery production at Woburn compare to other early Roman production sites in the Eastern Region?	Low	-	-	Low	-	-	-	-	-	-
4 What does comparison of the Woburn pottery assemblage with those of other nearby early Roman pottery production centres, such as Stagsden and Warren Villas, tell us about changes/similarities in local pottery production technology in this period?	Low	-	-	Medium	Low	-	Low	-	-	-
5 How do the fabrics of the Roman pottery at Woburn compare to the medieval fabrics of the surrounding area? What does this tell us about the changes/similarities in technology between these periods?	-	-	-	Low	-	-	Low	-	-	-
6 What can the investigation of late-medieval/early post-medieval field boundaries tell us about the origins of extant land division in the locality of the site?	Low	Low	Low	-	-	-	-	-	-	-

**Table 4: Potential of recovered data-sets to address the original research objectives**

High	Data-set is able to contribute direct, significant data which can expand our knowledge in this area.
Medium	Data-set can contribute direct data which will be relatively standard for this chronological period and region.
Low	Data-set has a relatively low potential to augment our knowledge of this subject. It may be of only minor relevance to the research aim, or may help to add to a database of 'less significant evidence' which, when combined, is useful in recognising patterns, <i>e.g.</i> pottery assemblages, settlement types.
-	Data-set has no potential to provide useful information on this subject.



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## 5. RESEARCH OBJECTIVES FOR ANALYSIS

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### 5.1 Introduction

Following assessment of the data-sets, it has been possible to refine and add to the original objectives (Table 4). The ways in which these research objectives will be addressed are listed below, with reference to national and regional research frameworks. The original research objectives 1, 2, 4 and 6 have been retained and amended, whilst objectives 3 and 5 (Table 4) will not be pursued in analysis. Additional research questions have also been developed.

It has also been possible to demonstrate the limited potential of a number of data-sets to address these objectives. The following data-sets will not be taken through to analysis and are not shown in Table 5: other artefacts, fired clay and CBM, scientific dating, animal bone, plant remains and charcoal. As required, the assessment results will be integrated into the final publication.

Table 5 summarises the potential (Low, Medium, High) of each data-set to contribute to the revised research objectives for analysis.

### 5.2 Character, Development and Chronology

#### 5.2.1 What are the date, nature and extent of the activity identified within the development area? (Going and Plouviez 2000, 19)

Investigations at Fox Close revealed the first evidence of Roman-period occupation in Woburn. Although the nature of the wider settlement is unknown, direct and indirect evidence of 1st–2nd-century Roman pottery production within and around the DA has been identified.

#### 5.2.2 How do the Roman remains at Woburn fit into the region's geographical and chronological settlement pattern?

Investigation of the distribution of Roman sites in Bedfordshire and eastern Buckinghamshire will allow the remains at Fox Close to be placed in a wider spatial and chronological context.

#### 5.2.3 What can the investigation of historic maps tell about post-medieval and modern field boundaries and buildings within the DA and the origins of extant land division in the locality of the site?

Historic maps show the layout of field and property boundaries within land surrounding the DA. These have the potential to shed light on the origins of the late medieval, post-medieval and modern boundary ditches identified within the DA. It may also be possible to determine whether any of these boundaries survive to the present. The remains of walls encountered within the DA can be identified with buildings shown on the 1st edition OS map.

### 5.3 Pottery Production

National pottery research agenda (Fulford and Huddleston 1991, 43; Willis 1997, 43) highlight the importance of publishing small kiln sites. Analysis and



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publication of the Fox Close pottery assemblage will contribute to this overarching national research objective.

**5.3.1 What can analysis of the pottery assemblage and kiln tell us about the nature and longevity of the manufacturing process used at Woburn?**

Analysis of the pottery assemblage and kiln structure has the potential to shed light on the nature of the manufacturing process. In conjunction with contextual data, investigation of stylistic differences within the assemblage has the potential to provide information on the potters themselves and the longevity of the workshop.

**5.3.2 What does comparison of the Woburn pottery assemblage with those of other nearby early Roman pottery production centres tell us about changes/similarities in local pottery production technology in this period? (Willis 1997, 43).**

Analysis of forms and fabric types from the Woburn assemblage will allow comparison with assemblages from other sites in the locality and wider region.



Category	Objective	Contextual	Cartographic Sources	Pottery
<b>1 Character, development and economy</b>	• What are the date, nature and extent of the activity identified within the development area?	Medium	-	High
	• How do Roman remains at Woburn fit into the region's geographical and chronological settlement pattern?	Low	-	Medium
	• What can the investigation of historic maps tell us about post-medieval and modern field boundaries and buildings within the DA and the origins of extant land divisions in the locality of the site?	-	Medium	-
<b>2 Pottery production</b>	• What can analysis of the pottery assemblage and kiln tell us about the nature and longevity of the manufacturing process used at Woburn?	Low	-	Medium
	• What does comparison of the Woburn pottery assemblage with those of other nearby early Roman pottery production centres tell us about changes/similarities in local pottery production technology in this period?	-	-	Medium

**Table 5: Research objectives for analysis and potential of data-sets**

High	Data-set is able to contribute direct, significant data which can expand our knowledge in this area.
Medium	Data-set can contribute direct data which will be relatively standard for this chronological period and region.
Low	Data-set has a relatively low potential to augment our knowledge of this subject. It may be of only minor relevance to the research aim, or may help to add to a database of 'less significant evidence' which, when combined, is useful in recognising patterns, e.g. pottery assemblages, settlement types.
-	Data-set has no potential to provide useful information on this subject.



## 6. UPDATED PROJECT DESIGN

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### 6.1 Introduction

This section provides a task list for the analysis, publication and archiving programme. Tables 6–13 provide a summary of the tasks associated with analysing each data-set, while Table 14 summarises the tasks associated with publication, archiving and overall project management. Table 15 provides a combined summary of all tasks. Table 16 describes the project team and lists their initials, and Table 17 details the proposed timescale for completion of each key stage in the project.

### 6.2 Analysis of Contextual Data (inc. Cartographic Sources)

#### 6.2.1 Liaison/meetings

On-going discussion will take place between the principal members of the Albion project team and internal and external specialists. These will involve discussion over the nature of the work required, as well as commissioning the work and addressing any queries that arise during the course of the analysis.

#### 6.2.2 Analysis of documentary, cartographic and photographic sources

Central Bedfordshire's Historic Environment Record (HER) will be visited to provide background information on archaeological sites in the vicinity. The focus will be on Roman and post-medieval/modern sites in the vicinity. Relevant maps have already been identified and will be analysed with contextual data (Section 4.3). All relevant photographs and other documents will also be examined.

#### 6.2.3 Digitisation/structural analysis

The size of the data-sets means that they would benefit from digitisation. Albion operates a fully integrated computer-based system of structural analysis using databases (through Access) and a mini GIS (G-sys) for interrogation. Basic contextual information has been entered into a database table and has been successfully utilised within this report.

The digitised all-features drawing produced for the assessment will require checking and correcting to ensure it is linked correctly with the contextual database. Once this is complete, the drawings can be fully interrogated and manipulated by any database table.

Once this is achieved, it will be possible to rapidly interrogate data-sets within the G-sys programme. For example, it would be possible to plot the distribution of specific find types, or all features which are considered to be contemporary. This type of interrogation will greatly enhance the analysis of data and is, therefore, likely to assist in the interpretation of the archaeological remains. It also provides a basis for publication figures to be produced rapidly.

Any relevant historical maps or data from earlier archaeological excavations will be geo-referenced and digitised to permit cross-examination with the all-features drawing.

#### 6.2.4 Sub-group and Group analysis

Each context will be assigned to a single Sub-group (SG), consisting of one or more (usually several) contexts that are closely related both stratigraphically and interpretatively. The SG to which each is assigned will be determined by analysis of the primary contextual information, specifically context sheets and section drawings that were produced on site. Assessment of data suggests that contexts will be assigned to SG types including:

- ◆ Post-hole
- ◆ Pit
- ◆ Primary silting

When assigning contexts to SGs, the artefactual and ecofactual assemblage recovered from each context will be considered. This will identify any that contained significant assemblages



which may need to be referred to in detail in the descriptive section of the publication text. Such contexts will be separated out at SG level.

The SG allocation for each context will be entered into the contextual database table. A SG text will then be written directly into the SG database table so that it can be easily accessed. The text will contain a factual, descriptive section as well as an interpretative section, setting out the rationale behind the definition of the SG. SG plans will not be routinely produced, but this information will be available via the relational database tables.

Any Sub-groups which have limited or no further analytical value (*e.g.* features/deposits of geological origin) will not be subject to any further analysis. Each remaining SG will be assigned to a single Group (G) representing a higher level of interpretation. It is likely that most Gs will comprise multiple SGs that are all similar both stratigraphically and interpretatively. Assessment of the data suggests that the SGs will be assigned to G types including:

- ◆ Enclosure system
- ◆ Structures and gullies

The G allocation for each SG will be entered into the Group database table. A text will then be written directly into the database table, so that it can be easily accessed. It will contain a descriptive section as well as an interpretative section.

### **6.2.5 Landscape and Phase analysis**

Any Groups which have limited or no further analytical value (*e.g.* features/deposits of unknown date) will not be subject to any further analysis. Each Group will be assigned to a higher level of interpretation known as a Landscape, which may contain one or more Group. Each Landscape will be composed of Groups that are broadly contemporary, and will represent the sum total of archaeological remains at a given stage in the site's development. A plan will be produced for each Landscape, with the location of all relevant Groups marked. Each Landscape will, in turn, be assigned to a chronological Phase.

The Phase allocation for each Landscape will be entered into the Landscape database table. A Phase text will then be written directly into the Phase database table so that it can easily be accessed. It will contain a descriptive section as well as an interpretative section, and will form the basis for the site narrative section of the publication text.

The completion of the Phase analysis represents a key stage in the analytical programme, and is the precursor to the production of publication text and illustrations.

## **◆KEY STAGE 1**

### **6.2.6 Final phasing/publication liaison**

Once the final phasing has been established, the various specialists will be informed. Each will receive detailed phasing information, the required format of their publication text, and any other information that they may require.

### **6.2.7 Site narrative text**

The site narrative will form the basis of the descriptive section of the publication text. It will be organised by Phase, Landscape and, where appropriate, Group.

### **6.2.8 Structural illustration**

The digitised plan and section data will be interrogated via the relational database tables to produce mock-up publication illustrations. Plans will be produced to show all features in each Phase and Landscape with Groups identifiable as appropriate.

## **◆KEY STAGE 2**



Task	Staff	Days
Structural analysis liaison/meetings	PM/PO/Ills	1.5
Analysis of HER and historical maps	PO	1
Digitisation	PO	1
Sub-group and Group analysis	PO	2
Landscape and Phase analysis	PO	2
Assistance with structural analysis	PM	1
<b>◆ KEY STAGE 1</b>		
Structural phasing/publication liaison	PM/PO	1
<b>◆ KEY STAGE 2</b>		

**Table 6: Summary of structural analysis tasks**

### 6.3 Other Artefacts

#### 6.3.1 Publication text

No further analysis of this data-set is required. The assessment presented in this document will be integrated into the final publication, as appropriate, during Key Stage 3.

#### ◆KEY STAGE 2

Task	Staff	Days
Other artefacts phasing/publication liaison	AM/PO	0.25
Other artefacts publication text	AM	0.25
<b>◆ KEY STAGE 2</b>		

**Table 7: Summary of other artefacts analysis**

### 6.4 Analysis of Pottery

#### 6.4.1 Quantification and recording

Pottery will be laid out in context order and will be quantified by minimum vessel and sherd count, and weight. Fabric identifications will be in accordance with the Bedfordshire Ceramic Types Series, currently maintained by Albion Archaeology. All attributes such as decoration, evidence of function (sooting, wear marks etc.), and manufacturing techniques (firing characteristics *etc.*) will be recorded. All quantified data will be entered on to the relevant table within the site database.

Petrological thin section and chemical analysis will be carried out on a sample of the locally produced pottery (fabric R43A) in order to provide a detailed minerographic description of the fabric. Results will be included within a database of petrological and chemical data and a reference collection of thin-section slides are in existence (Alan Vince archive in the British Museum). This will allow for future comparison of the Woburn industry pottery.

#### 6.4.2 Production of technical text

A detailed description, incorporating the results of petrological and chemical analysis, will be produced of the locally produced pottery, including fabric and form definitions. Analysis will also include discussion of vessel forms and parts, surface appearance, decoration and manufacturing. The assemblage will also be compared to other contemporary production sites.

Selection of pottery vessels for publication-standard illustration will be made at this juncture. This will comprise the production of a rim type series for the Woburn industry pottery. A representative sample of complete profiles will also be illustrated.





## ◆KEY STAGE 1

### 6.4.3 Publication text

A specialist text will be produced summarising the pottery assemblage by fabric type, forms, decoration and attribute. The text will refer to comparative assemblages (published or unpublished). In addition, where appropriate, the pottery assemblage from individual elements of the structural hierarchy, *e.g.* Landscapes and Groups, will be discussed.

### 6.4.4 Illustration

Illustration of the material selected for inclusion in the technical text will be carried out in consultation with the artefact analyst.

## ◆KEY STAGE 2

Task	Staff	Days
Pottery liaison/meetings	AM/PO	0.5
Pottery quantification and recording	AM	5
Pottery technical text (type series)	AM	1
Petrochemical and thin section analysis	UCL/AM	-
<b>◆ KEY STAGE 1</b>		
Pottery phasing/publication liaison	AM/PO	0.25
Pottery publication text	AM	3.5
Pottery illustration	Ills/PO	5
Pottery photography	AM/PO	1.25
<b>◆ KEY STAGE 2</b>		

**Table 8: Summary of pottery analysis**

## 6.5 Fired Clay and CBM

### 6.5.1 Publication text

No further analysis of this data-set is required. The assessment presented in this document will be incorporated into the final publication, as appropriate, during Key Stage 3.

## ◆KEY STAGE 2

Task	Staff	Days
Fired clay/CBM liaison/meetings	AM/PO	0.25
Fired clay/CBM publication text	FO	0.5
<b>◆ KEY STAGE 2</b>		

**Table 9: Summary of fired clay analysis**

## 6.6 Scientific Dating

### 6.6.1 Publication text

No further analysis of this data-set is required. The assessment presented in this document will be integrated into the final publication, as appropriate, during Key Stage 3.

## ◆KEY STAGE 2



Task	Staff	Days
Scientific dating liaison/meetings	ext/PO	0.25
Scientific dating publication text	PO	0.25
<b>◆ KEY STAGE 2</b>		

**Table 10: Summary of scientific dating analysis**

## 6.7 Animal Bone

### 6.7.1 Publication text

No further analysis of this data-set is required. The assessment presented in this document will be integrated into the final publication, as appropriate, during Key Stage 3.

#### ◆KEY STAGE 2

Task	Staff	Days
Animal bone phasing/publication liaison	FO/PO	0.25
Animal bone publication text	PO	0.25
<b>◆ KEY STAGE 2</b>		

**Table 11: Summary of animal bone analysis**

## 6.8 Plant Remains

### 6.8.1 Publication text

No further analysis of this data-set is required. The assessment presented in this document will be used to formulate specialist publication text to be incorporated into the final publication during Key Stage 3.

#### ◆KEY STAGE 2

Task	Staff	Days
Plant remains phasing/publication liaison	ULAS/PO	1
Plant remains publication text	PO	1
<b>◆ KEY STAGE 2</b>		

**Table 12: Summary of plant remains analysis**

## 6.9 Charcoal

### 6.9.1 Charcoal publication text

No further analysis of this data-set is required. The assessment presented in this document will be integrated into the final publication, as appropriate, during Key Stage 3.

#### ◆KEY STAGE 2



Task	Staff	Days
Charcoal phasing/publication liaison	ULAS/PO	0.25
Charcoal publication text	PO	0.25
<b>◆ KEY STAGE 2</b>		

**Table 13: Summary of charcoal analysis**

## **6.10 Overall Publication, Archiving and Project Management**

### **6.10.1 Integration of all specialist reports to form site narrative**

All the specialist reports will be read and edited to ensure a consistency in approach. They will then be integrated to form a site narrative.

### **6.10.2 Production of synthesis**

A synthetic text will be produced, discussing the key elements of the site, probably within the major chronological periods.

### **6.10.3 Amendments and queries in consultation with specialists during article preparation**

During the production of the synthesis, it is likely that a number of questions will arise that the various specialists will need to address.

#### **◆KEY STAGE 3**

### **6.10.4 Albion refereeing process**

Albion has a policy of circulating the first draft of articles intended for publication to the client, CBCA and any other interested parties. This task includes time for any required discussion with the referees.

#### **◆KEY STAGE 4**

### **6.10.5 Submission of article and amendments resulting from editor's comments to publication text and figures**

Amendments to publication text and figures based on comments received from Albion's refereeing process, following submission of the publication article to the editor of *Bedfordshire Archaeology or Records of Buckinghamshire*.

### **6.10.6 Printing and proof reading**

The printing of the article will be arranged by the editor of *Bedfordshire Archaeology or Records of Buckinghamshire*, but proof reading will be necessary.

### **6.10.7 Archiving and accessioning**

Upon completion of the report, the written and material archives will be prepared for accessioning to Luton Museum (accession number 2008/75).

### **6.10.8 Project management**

All project tasks will be tracked on Albion's Time Recording System (TRS) so that expenditure and resources can be monitored throughout the life of the project. The management of the project includes monitoring the task budgets, programming tasks, checking timetables, and liaising with all members of the project team.



## ◆KEY STAGE 5

### Keystage 2: completion of all specialist text

Structural illustration	Ills	4
Assistance with structural illustration	PO	1
Integration of all specialist publication reports to create site narrative report	PO	2
Amendments and queries in consultation with specialists during article preparation	PO	0.5
Production of synthesis	PO	5
Editing publication text	PM/OM	2

### Keystage 3: completion of 1st Draft

Albion's refereeing process	PM/OM	1
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### Keystage 4: Submission to local journal

Submission to local journal		
Amendments resulting from editor's comments	PO	0.5
Printing	External	-
Proof reading	PO	0.25
Archive preparation (Structural)	PO	1
Archive preparation (Artefacts)	FO/AM	2
Archive preparation and liaison with Museum	AM/AO	0.5
Archive microfiching	External	-
Archive transfer (storage costs)	External	-
Archive transfer	PO	-
Project management (Overall)	PO	1
Project management (Albion)	PM	1
Project management (Albion)	PM	

### Keystage 5: end of project

**Table 14: Overall publication, archiving and management tasks**

## 6.11 Publication

A report will be submitted to the CBCA that is suitable for inclusion in an approved archaeological journal, in this case *Bedfordshire Archaeology* or *Records of Buckinghamshire*. The chronological phased development of the site will provide the basic structure for the site narrative. Within each Phase, text will be organised by Landscape and where appropriate Group, with artefactual and ecofactual information integrated into the text as appropriate. Evidence from documentary, cartographic and photographic sources will be integrated into this chronological framework.

Technical detail on the pottery will be presented in a specific pottery section. A final synthesis will present overall conclusions.

The suggested format is set out below with indicative page and figure counts. The article is likely to be approximately 17 pages in length and include 9 figures

### 1. Introduction

- Project background 0.5 pages
- Site location and description 0.5 page, 1 figure
- Archaeological and historical background 1 page, 1 figure

### Results of the investigations

- Roman pottery production site 4 pages, 2 figures
- Late medieval/post-medieval ditches and pits 0.5 pages, 1 figure
- Modern structures, pits and ditches 0.5 pages, 1 figure



<b>2. The pottery</b>	
• Results	5 pages, 3 figures
• Discussion	1 page
<b>3. Synthesis</b>	2.5 pages
Acknowledgements	0.5 pages
References	1 page

The outline of the publication should be considered as only a guideline, and may be altered during the analysis and pre-publication stages if the results of analysis warrant it.

## 6.12 Archiving

On publication of the final report the archive of materials (subject to the landowner's permission) and accompanying records will be deposited with Luton Museum, Accession Number 2008/75.

## 6.13 Summary of All Tasks

Description	Title/ Organisation initials	Days
Structural analysis liaison/meetings	PO/Ills	1.5
Analysis of HER and historical maps	PO	1
Digitisation	PO	1
Sub-group and Group analysis	PO	2
Landscape and Phase analysis	PO	2
Assistance with structural analysis	OM	1
Pottery liaison/meetings	AM/PO	0.5
Pottery quantification and recording	AM	5
Pottery technical text (type series)	AM	1
Petrochemical and thin section analysis	UCL/AM	-
<b>Keystage 1: completion of analysis</b>		
Structural phasing/publication liaison	PO/PO	1
Other artefacts phasing/publication liaison	AM/PO	0.25
Other artefacts publication text	AM	0.25
Pottery phasing/publication liaison	AM/PO	0.25
Pottery publication text (incl. samian)	AM	3.5
Pottery illustration	Ills/PO	5
Pottery photography	AM/PO	1.25
Fired clay/CBM liaison/meetings	AM/PO	0.5
Fired clay publication text	AM	0.5
Scientific dating liaison/meetings	GQ/PO	0.25
Scientific dating publication text	PO	0.25
Animal bone phasing/publication liaison	FO/PO	0.25
Animal bone publication text	PO	0.25
Plant remains phasing/publication liaison	ULAS/PO	1
Plant remains publication text	ULAS	1
Charcoal phasing/publication liaison	ULAS/PO	0.25
Charcoal publication text	ULAS	0.25
<b>Keystage 2: completion of all specialist text</b>		
Structural illustration	Ills	4
Assistance with structural illustration	PO	1
Integration of all specialist publication reports to create site narrative report	PO	2
Amendments and queries in consultation with specialists during article preparation	PO	0.5



Description	Title/ Organisation initials	Days
Production of synthesis	PO	5
Editing publication text	OM	2
<b>Keystage 3: completion of first draft</b>		
Albion's refereeing process	OM	1
<b>Keystage 4: Final publication text</b>		
Submission to local journal		
Amendments resulting from editor's comments	PO	0.5
Printing	External	-
Proof reading	PO	0.25
Archive preparation (Structural)	PO	1
Archive preparation (Artefacts)	FO/AM	2
Archive preparation and liaison with Museum	AM/AO	0.5
Archive microfiching	External	-
Archive transfer (storage costs)	External	-
Archive transfer	PO	-
Project management (Overall)	PO	1
Project management (Albion)	OM	1
<b>Keystage 5: end of project</b>		

**Table 15: Summary of all tasks**

#### 6.14 The Project Team

To ensure a consistency of approach, the same specialists will be used (as far as possible) who have been involved in the assessment stage of the project.

Task	Organisation, Title and Name	Initials of Title
Overall management	Albion, Operations Manager, Drew Shotliff	OM
Structural analysis and synthesis	Albion, Project Officer, James Newbould	PO
Other artefact analysis	Albion, Artefacts Manager, Holly Duncan	AM
Pottery/Fired clay analysis	Albion, Artefact Manager, Anna Slowikowski	FO
Scientific dating	GeoQuest Associates, Mark Noel	GQ
Animal Bone	Albion, Finds Officer, Jackie Wells	
Plant remains	University of Leicester Archaeology Service, Angela Monckton	ULAS
Charcoal	University of Leicester Archaeology Service, Graham Morgan.	ULAS
Illustration	Albion, James Newbould	Ills
Archiving	Albion, Archives Officer, Helen Parslow	AO

**Table 16: The project team**

#### 6.15 Timetable

Following acceptance by the client and ACLO of the assessment and Updated Project Design, Albion would like to proceed rapidly with analysis and publication of the results. This would ensure that project momentum is maintained.

There are five key stages within the analysis and publication programme (Table 17). An indication of the time required to reach the first three key stages is indicated, and these could serve as appropriate monitoring points, if required.



<b>Task</b>	<b>Anticipated date of completion</b>
Structural Analysis	May 2011
Quantification and recording by specialists	May 2011
<b>Completion of KEY STAGE 1</b>	
Compilation of specialist reports	May 2011
<b>Completion of KEY STAGE 2</b>	
Compilation of 1st draft	May 2011
<b>Completion of KEY STAGE 3</b>	
Refereeing	June 2011
<b>Completion of KEY STAGE 4</b>	
Publication of report*	TBC
Deposition of archive	TBC
<b>Completion of KEY STAGE 5</b>	

**Table 17: Provisional timetable to complete the project**

\*Publication, and therefore deposition of the archive with Luton Museum, will be dependent on the publication timetable of *Bedfordshire Archaeology or Records of Buckinghamshire*.



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## 8. APPENDIX 1: OTHER ARTEFACTS

Holly Duncan, Albion Archaeology

### 8.1 Methodology

Each object was assigned a preliminary identification and functional category and was quantified by number and/or weight. This data was entered into the project database. No metalwork, beyond iron-working by-products, was recovered and hence no radiography was required.

### 8.2 Quantification, Range and Typological Date

The assemblage was limited in quantity, material and artefact type (Table 18).

Material	No.	Wt (g)	Artefact type
Glass	1		Bead
Flint	1		Utilised tabular block
Stone	6		Building stone; quern; burnt un-worked stone
Slag		263	Ferrous fayalitic run
Hammerscale	15		Ferrous flake
Hammerslag	15		Ferrous spheroidal

**Table 18: Other artefact assemblage by material and artefact type**

Iron-working by-products cannot be typologically dated beyond the broad spectrum of Iron Age onwards. However, the quern, comprising the upper stone of a ‘bun-shaped’ quern of Hertfordshire Puddingstone, can be typologically dated. Examples of puddingstone querns from other sites have been found in dated contexts ranging from the late Iron Age to the end of the Roman period, although most are thought to pre-date AD200 (King 1986, 71). Well stratified examples of puddingstone querns are rare but an example from Colchester was securely stratified in a deposit predating AD60/61 (Buckley and Major 1983, 76). At Dragonby, Lincs. five puddingstone querns were found; one example occurred in a Flavian to mid to late Antonine context and two others were found in a late 1st-century BC, Roman conquest deposit (Wright 1996, 369).

The building stone is a scoinson of Totternhoe Stone. Although this stone type was quarried in the Roman period, production at the quarries peaked between the 12th and 16th centuries. The scoinson has numerous tooling marks on four of its faces, some of which have been provisionally identified as claw tooling. If correct, this would indicate that it post-dates the first half of the 12th century; indeed, claw tooling was in common use throughout the 13th and 14th centuries (Harris forthcoming, 3).

The single bead recovered was a tiny, hexagonal-sectioned, cylinder bead in opaque ‘black’ glass (diameter 2mm; height 1.4mm; perforation diameter <1mm). Dating of these ‘microbeads’ is problematic as they have only started to come to light with the advent of regular environmental sampling. Similarly minute beads are sometimes found in Roman contexts, but also in 17th-century and later contexts and more recently in Bronze Age and late Iron Age deposits (pers. comm. H E M Cool). Eight microbeads found in early prehistoric, earlier Iron Age and Roman period deposits at Ferrybridge, Yorkshire all proved to be intrusive, as indicated by chemical composition and manufacturing methods (Duncan 2005, 163). The minute size of these beads means that they can easily be displaced in the soil by, for example, worm activity and this may well be true for the example here.



### 8.3 Provenance

The assemblage is presented by Phase and Assessment landscape (AL) in Table 19. The majority of the assemblage derived from deposits phased to the Roman period. The best represented class of evidence was iron-working by-products, mainly composed of flake hammerscale and spheroidal hammerslag.

Phase	AL	AG	G type	Artefact	No	Wt (g)
1	1	6.0	Kiln	Bead	1	
			Kiln	Hammerscale	1	
			Kiln	Hammerslag	3	
		7.0	Pits	Quern	1	
			Pits	Hammerscale	4	
		2	10.03	Ditch	Hammerscale	1
	3	7.01	Pits	Building stone (tabular flint)	1	
		7.06	Hearth	Hammerscale	1	
			Hearth	Hammerslag	1	
		9.01	Postholes	Hammerscale	2	
	3.01	10.04	Ditch	Hammerslag	1	
			10.06	Gully	Hammerslag	3
	4	10.06	Gully	Hammerscale	4	
			7.02	Pit	Fayalitic run	
		7.05	Pit	Hammerslag	3	
		11.01	Enclosure ditch	Hammerslag	1	
		11.02	Enclosure ditch	Hammerslag	2	
			Enclosure ditch	Hammerscale	2	
	5	7.03	Pit	Burnt stone		12,571
11.03		Enclosure ditch	Hammerslag	1		
2	7	5	Ditch	Building stone (Totternhoe Stone)	1	

**Table 19: Other artefacts assemblage by Phase Al and AG**

Flake hammerscale consists of fish-scale like fragments of the oxide/silicate skin of the iron dislodged during working. Spheroidal hammerscale results from the solidification of small droplets of liquid slag expelled during hot working, particularly when two objects are being fire-welded together or when the slag-rich bloom of iron is first worked into a billet or bar (Starley 2008, 5).

Although hammerscale is often found concentrated in the immediate vicinity of the smithing hearth and anvil, at Fox Close it was found in very small quantities, across a variety of features in Phase 1 deposits. If iron smithing were being carried out in the immediate vicinity, one might also expect large quantities of smithing slag, including hearth bottoms.

The only other evidence of iron-working recovered was 263g of fayalitic run, a ‘dribble’ of dense slag. Although commonly found with evidence of iron smelting, fayalitic runs are also known to form in smithing hearths (Starley 2008, 3). The fayalitic run was found within pit AG7.02 (AL4) and was not associated with hammerscale or hammerslag. Due to both the spread and the small quantities of hammerscale / hammerslag, and the absence of substantial quantities of other smithing slags, it is possible that this material was wind-borne, and subsequently moved down through the soil. A similar situation has been noted on other excavations (Rackham *et al* 2009, App. 4.III 52). The fayalitic run does suggest some iron-working, but the location of this in relation to the DA remains unknown.



AL1 is likely to be of modern origin. Little can be said of the utilised block of tabular flint from pit AG7.01 in AL3. With its worn edge and worn surface of cortex it could have been used in a building or as a paving stone, or possibly a grinding slab, as has been suggested for a utilised block of tabular flint from early-middle Iron Age deposits at Beauford Farm, near Biggleswade (Wells in prep).

The Hertfordshire Puddingstone quern from pit AG7 (AL1) must have been deposited in the pit at the end of its life which may suggest domestic activity in this area prior to the establishment of the kiln. There is little other evidence within the assemblage for any domestic activity beyond the 12.5kg of burnt stone from pit AG7.03 in AL5, which presumably represents clearing of a hearth.

Only one 'other artefact' was found in AL7 deposits, a scoinson of Totternhoe Stone. If the claw tooling marks have been correctly identified, this may date to the 13th–14th centuries. It should be noted that large quantities of Totternhoe stone were used to build the Duke of Bedford's mansion of Woburn Abbey.

#### **8.4 Potential and Recommendations**

Generally, the assemblage has low or no potential to address the project's research objectives.

The presence of the puddingstone bun-shaped quern is compatible with the date suggested for activity in Phase 1, AL1 and indicates some domestic activity within or adjacent to the DA. It therefore is considered to have *low potential* to contribute further to research objectives 1 and 2. Other artefacts have no potential to address research objectives 3-6. Overall, no further analysis of this assemblage is required.



## 9. APPENDIX 2: POTTERY

Anna Slowikowski, Albion Archaeology

### 9.1 Methodology

For each context, pottery was recorded by fabric type and quantified by minimum sherd count and weight. This information was entered onto the Context Assemblage Table in the project database.

### 9.2 Quantification, Range and Variety

A total of 4,763 pottery sherds (84.7kg) from the Roman to post-medieval periods were recovered. Fabrics are listed below (Table 20) in chronological order, using common names and type codes in accordance with the Bedfordshire Ceramic Type Series, currently maintained by Albion Archaeology.

Fabric code	Common name	No. Sherd	Wt (g)
<b>Roman: pottery made on the site (Woburn industry)</b>			
R43A	Reduced sandy	4,595	79,723
<b>Sub-total</b>		<b>4,595</b>	<b>79,723</b>
<b>Roman: non-Woburn industry pottery</b>			
F05	Grog and shell	1	15
F06C	Coarse Grog	6	185
F07	Shell	4	65
F09	Sand and Grog	10	690
F24	Buff Shelly	5	99
R01B	Samian (Southern Gaulish)	2	6
R03A	Verulamium whiteware	2	55
R03E	Fine whiteware	3	15
R06B	Coarse greyware	17	238
R06C	Fine greyware	12	298
R06H	White-slipped greyware	14	544
R07B	Sandy blackware (local)	18	597
R09A	Pink grogged	9	350
R11E	Oxford white mortaria	5	99
R12B	Nene Valley Colour Coat	1	16
R13	Shelly	2	122
R18A	Pink Gritty	4	29
R18B	Pink Fine	25	650
<b>Sub-total</b>		<b>140</b>	<b>4,073</b>
<b>Medieval</b>			
C01	Sandy	13	271
C09	Brill/Boarstall type (fine)	2	6
<b>Sub-total</b>		<b>15</b>	<b>277</b>
<b>Post-medieval</b>			
P01	Glazed Red Earthenware (fine)	4	185
P03	Black-glazed Earthenware	1	29
P12	Cistercian ware	1	3
P19	Mottle/Speckle-glazed Ware	2	54
P37	White salt-glazed Stoneware	3	335
P38	Creamware	2	6
<b>Sub-total</b>		<b>13</b>	<b>612</b>
<b>Grand total</b>		<b>4,763</b>	<b>84,685</b>

**Table 20: Pottery quantified by sherd count and weight (g)**

The bulk of the Roman assemblage comprised locally made, reduced, sandy ware pottery from a hitherto unknown kiln site. A much smaller quantity of non-Woburn



industry Roman fabrics and medieval and post-medieval pottery were also identified (Table 20).

### 9.3 Provenance, Phasing and Date Range

The bulk of the assemblage (99% by sherd count and weight) is of Romano-British origin, dating from the 1st and 2nd centuries, with the majority of this (97% by count, 95% by weight) being produced locally (fabric R43A), either within or adjacent to the DA (Table 20).

AL no.	1	2	3	3.01	4	5	6	7	8	Totals	
Fabric R43A	293	472	378	185	1168	1963	15	115	6	4595	
	1579	8177	3773	2980	18014	43706	172	1226	96	79723	
All non-Woburn industry Roman and Iron Age fabrics	F05		1							1	
			15							15	
	F06C		1				3	1	1		6
				14			40	56	75		185
	F07						1	3			4
							27	38			65
	F09	3	1		1	2	3				10
		192	32		15	95	356				690
	F24		3	2							5
			51	48							99
	R01B		1	1							2
			2	4							6
	R03A						1	1			2
							48	7			55
	R03E		1					1	1		3
			4					9	2		15
	R06B	3	1			2	6	3	2		17
		63	6			46	74	37	12		238
	R06C		1	3		1	3	1	3		12
			30	92		61	89	7	19		298
	R06H		1	4	1	2	6				14
			59	90	62	196	137				544
	R07B		4		5	1	6		2		18
		245		123	69	121		39		597	
R09A	1	1					5	2		9	
	49	18					257	26		350	
R11E							5			5	
							99			99	
R12B								1		1	
								16		16	
R13		2								2	
		122								122	
R18A	1							2	1	4	
	19							8	2	29	
R18B		23					2			25	
		638					12			650	
All med/post-med			3				1	16	8	28	
			17				20	428	424	889	
Totals	301	513	391	192	1176	1992	38	145	15	4763	
	1902	9413	4024	3180	18481	44598	714	1851	522	84685	

**Table 21: Pottery by AL, quantified by sherd count and weight (g)**

The Woburn industry assemblage largely comprised vessels which were the potter's failures. The degree of fragmentation for this material is, therefore, high, as indicated by a low average sherd weight of 17.3g. However, some of the vessels are represented by more than one sherd. This confirms the contextual evidence in suggesting that much of this material occurs in its primary context, close to areas where the pottery was being made.



Woburn industry and non-local Roman pottery appeared throughout the Roman sequence (Phase 1, AL1-6) and was also present as residual material within Phases 2 (late-medieval/post-medieval) and 3 (modern).

The dating of the pottery is not of a high enough resolution to enable closer dating of AL1-6 and there are no significant changes in pottery type throughout the development of the site. However, the volumes of pottery (measured by sherd count and weight) do change through the ALs. Table 22 shows volumes of pottery by sherd count and weight per AL as a percentage of the total assemblage.

Phase no.		1 (Roman)								2	3
AL no.		1	2	3	3.01	4	5	6	7	8	
% all pottery	Sherd count	6.3	10.8	8.2	4.0	24.7	41.8	0.8	3.0	0.3	
	Weight	2.2	11.1	4.8	3.8	21.8	52.7	0.8	2.2	0.6	
% Roman pottery	Sherd count	6.4	10.8	8.2	4.1	24.8	42.1	0.8	2.7	0.1	
	Weight	2.3	11.2	4.8	3.8	22.1	53.2	0.8	1.7	0.1	
% Woburn industry	Sherd count	6.4	10.3	8.2	4.0	25.4	42.7	0.3	2.5	0.1	
	Weight	2.0	10.3	4.7	3.7	22.6	54.8	0.2	1.5	0.1	
% non-Woburn industry	Sherd count	5.7	29.3	7.1	5.0	5.7	20.7	15.7	10.0	0.7	
	Weight	7.9	30.3	5.7	4.9	11.5	21.9	12.8	4.8	0.05	

**Table 22: % Roman pottery by AL (sherd count and weight)**

Volumes are greatest in AL4-5, which are both characterised by the appearance and development of enclosures with associated pitting. This suggests that either pottery production peaked during this time or was carried out closer to the DA than previously. With non-Woburn industry fabrics, the percentage volume is also high in AL5, indicating that general activity/occupation within the site increased at this time.

An earlier, smaller peak is also noticeable in all Roman fabrics in AL2. It is also notable that AL1 contained a very low percentage of the total assemblage, despite containing the remains of a kiln AG6. It is possible that firing of this earlier kiln produced less waste or that the waste was dumped elsewhere, outside the DA.

#### 9.4 Potential

Assessment of the assemblage has revealed it has variable potential to contribute to the original research objectives. Research objectives are set out to address site-specific, local and regional questions. Broadly, the potential for pottery to address these objectives diminishes as the geographical area covered by the objective increases.

The potential for pottery to address site-specific objective 1 is considered to be *high*. It has *medium potential* to address local, pottery-specific objective 4 and *low potential* to address regional objective 2, and pottery-specific regional objectives 3 and 5. It has *no potential* to address objective 6.

#### 9.5 Recommendations for Analysis and Publication

The lack of well excavated and published kiln sites in the UK (Fulford and Huddleston 1991, 43) and specifically in East Anglia and the East Midlands has been acknowledged (Willis 1997, 43). Analysis of the assemblage will include a detailed description of the new Woburn industry fabric R43A. It is recommended that thin section (petrological) and chemical analysis is performed on a sample of the fabric. The results will provide detailed minerographic information which will contribute to the overall description of the fabric. Results will be included within a





database of petrological and chemical data and a reference collection of thin-section slides are in existence (Alan Vince archive in the British Museum). This will allow for future comparison of the Woburn industry pottery.

Illustration will comprise the production of rim type series for the Woburn industry pottery. In addition, a representative sample of complete profiles will be illustrated. Because this is a kiln site, the number of illustrations needed for a representative sample will be greater than would be required for publication of a non-production site.

Analysis will also include detailed discussion of vessel forms and parts, surface appearance and decoration as well as discussion on manufacturing (kiln firing process, sources of raw materials). The assemblage will also be compared to contemporary local production sites. It may also be possible to discuss the duration of the Woburn industry and determine whether one or more potters were involved in manufacture.



## 10. APPENDIX 3: FIRED CLAY AND CBM

Anna Slowikowski, Albion Archaeology

### 10.1 Methodology

For each context, fired clay was recorded by fabric type, and quantified by minimum fragment count and weight. CBM was also quantified and, where possible spot-dated.

### 10.2 Quantification and Description

A total of 518 fragments, weighing 18.726kg, of fired clay were recovered from throughout Roman Phase 1 (AL1-6). Two residual fragments were also present in Phases 2 and 3. The entire assemblage is of the same fabric type. Quantification by count and weight for each AL is shown in Table 23.

AL no.	Quantity	Weight (g)
1	31	1008
2	43	1112
3	42	2002
3.01	2	5
4	81	3374
5	308	10839
6	9	281
7	1	27
8	1	78
<b>Totals</b>	<b>518</b>	<b>18726</b>

**Table 23: Fired clay by AL (count and weight)**

The fabric is very hard fired, rough and quite sandy to the touch and is the same as that used for the Woburn industry pottery with the addition of organic matter in the form of straw or grass. The organic inclusions are visible to the naked eye as elongated voids which may be up to 60mm in length. The most likely source for this organic material is straw introduced in the form of dung.

This material is likely to represent part of a kiln structure in the form of lining or a temporary dome cover. On completion of each firing, the clay dome would be removed to extract the vessels. A new dome would be erected for the next firing.

### 10.3 Ceramic Building Material (CBM)

A small quantity of abraded CBM broadly datable to the Roman period (5 fragments, weighing 1347g) was found within pit AG7.07 (AL6, Phase 1). The remaining assemblage was found within Phases 2 (late-medieval/post-medieval) and 3 (modern) and consisted of post-medieval material (87 fragments, weighing 7056g) comprising predominantly sandy flat roofing tiles, some of which have round peg holes.

### 10.4 Potential and Recommendations

No further analysis of this data-set is recommended. However, to better contribute to discussion of the kiln, fired clay will be integrated with the pottery during its analysis. As such this data-set is considered to have *medium potential* to address original research objective 1 and *low potential* to address objective 4. It has *no potential* to address remaining objectives.



## 11. APPENDIX 4: SCIENTIFIC DATING

Mark Noel – GeoQuest Associates

### 11.1 Introduction to Magnetic Dating

Magnetic dating is based on comparing the remnant magnetisation in an archaeological structure with a calibrated reference curve for the geomagnetic secular variation. Two distinct methods have evolved.

The intensity technique relies on obtaining estimates of the past strength of the Earth's magnetic field while directional magnetic dating uses archaeomagnetic measurements to derive the orientation of the geomagnetic vector in antiquity. Intensity dating can only be applied to fired materials which have acquired a thermoremanent magnetisation upon cooling from high temperatures (>600°C) while the directional method enables the age of a broader range of archaeological materials to be determined. For example, sediments and soils may have acquired a dateable 'detrital remnance' if magnetic grains had been aligned by the ambient field during deposition. The growth of magnetic minerals during diagenesis or as a result of manufacturing processes can also give rise to a magnetisation which may enable materials such as iron-rich mortars, for example, to be dated. However hearths, kilns and other fired structures are the most common features selected for magnetic dating primarily because their thermoremanence is generally strong, stable and sufficiently homogeneous that the ancient field can be determined with sufficient precision from a small set of specimens. An analysis of dated archaeomagnetic directions, largely from fired structures, together with lake sediment and observatory records has enabled a master curve for the UK region to be synthesised for the period 2000 B.C. to the present (Clark *et al*, 1988).

For directional magnetic dating it is essential to obtain specimens of undisturbed archaeological material whose orientation with respect to a geographic coordinate frame is known. A number of sampling strategies have evolved, enabling specimens to be recovered from a range of archaeological materials with orientations being recorded relative to topographic features, the direction of the sun, magnetic or geographic north. For this feature the miniaturised 'button method', was employed (Clark *et al*, 1988). Modern archaeomagnetic magnetometers are sufficiently sensitive that only small volumes of material (~1ml) are required for an accurate remnance measurement (Molyneux, 1971). This has the advantage of reducing the impact of sampling on archaeological features - of particular significance if they are scheduled for conservation and display. For dating, all archaeomagnetic vectors are transposed to Meriden, the reference location for the UK Master Curve (Noel & Batt, 1990).

### 11.2 Methodology

Sampling was via button method with orientation by north-seeking gyro compass. Archaeomagnetic remnance measured using a Molspin fluxgate spinner magnetometer and stability was assessed using stepwise, alternating field demagnetisation. Secondary components of magnetisation were removed by partial demagnetisation.

A total of fifteen samples of fired sandy clay were removed from context (1185) for the purpose of archaeomagnetic analysis and dating. This context was thought to represent the remains of a possible Roman pottery kiln. Specimens were oriented in situ using the button method, combined with spirit levels and a north-seeking gyro compass.

### 11.3 Results and Potential

During the cutting process five of the samples disintegrated, despite having been impregnated with PVA. The archaeomagnetism in the remaining ten samples was found



to be exceptionally weak and demagnetisation tests showed it to be only moderately stable. The archaeomagnetic vectors in this remaining group were unfortunately too dispersed to enable a reliable mean and resulting date to be estimated. Therefore this data-set has no potential for further analysis.

The reasons for the poorly defined archaeomagnetism are likely to be:

- The very weak magnetisation may have been difficult to resolve with sufficient precision in the laboratory fluxgate magnetometer.
- Despite the rust-red colouration, the sandy clay contained a very low proportion of ferrimagnetic iron oxides on which an archaeomagnetism might be imprinted.
- The material had not been fired to sufficient temperature (>580C) for it to acquire a strong magnetisation in the ancient field direction.

SAMPLE	J	D	I	A.F.	D	I
WOB2	0.48	331.2	61.3	2.5	56.3	60.9
WOB4	1.78	31.1	69.1	2.5	5.7	67.6
WOB6	1.41	343.2	71.3	2.5	324.0	76.2
WOB8	1.20	16.0	66.2	2.5	4.1	77.7
WOB9	1.14	38.6	64.5	2.5	19.1	78.1
WOB11	0.79	254.1	67.9	2.5	256.8	83.6
WOB12	1.86	9.5	25.2	2.5	20.5	25.1
WOB13	0.45	58.7	13.6	2.5	84.7	9.8
WOB14	3.55	35.4	26.2	2.5	34.8	26.3
WOB15	1.51	38.9	55.3	2.5	41.4	63.5

D=declination, I=inclination, J=intensity in units of  $\text{mAm}^{-1}\times 10^{-3}$ . A.F.=peak alternating demagnetising field in milliTesla. K=precision parameter, c.s.e.=circular standard error, alpha95=semi-angle of the 95% cone of confidence. Samples with numbers missing from the table were too small for analysis.

**Table 24: Results of Scientific Dating**



## 12. APPENDIX 5: ANIMAL BONE

Jackie Wells, Albion Archaeology

### 12.1 Introduction and Summary of Results

Forty-four animal bone fragments, weighing 456g, were collected. Individual pieces are small, with an average weight of 10g. They survived in variable condition; some are well preserved, while others are abraded and display much surface erosion. The majority of the bone is associated with late-medieval / post-medieval field system (Phase 2), with the remainder occurring in features of Roman date (Phase 1 – Table 25). There was no difference in preservation levels between the two phases, suggesting the limited assemblage size represents actual deposition levels.

Phase	AL	Description	Wt (g)
1	2	Enclosure	21
	3	Domestic activity focus	6
	4	Enclosure	160
	5	Enclosure	29
	6	Domestic activity focus	3
2	7	Field system	237

**Table 25: Summary of animal bone by Phase and Landscape**

The assemblage derives almost entirely from larger mammals, with no recovery of fish, amphibians or small mammals, and only a single fragment of bird bone. Diagnostic elements include a sheep/goat mandible, cattle horn core, and long bone, rib, scapula and vertebrae fragments of indeterminate species. Cranial elements are represented by a number of loose cattle and sheep tooth fragments, most of which are severely degraded.

### 12.2 Conclusion

The quality of the animal bone assemblage indicates that conditions for its preservation were good throughout Phases 1 and 2. This suggests that the limited size of the assemblage is likely to reflect actual deposition levels rather than post-depositional preservation factors.

The animal bone assemblage supports the contextual and ceramic evidence in suggesting that Roman activity had an industrial focus, rather than a domestic one. As such the potential of this data-set to contribute to original research objectives 1 and 2 is low. It has no potential to contribute to objectives 3-6.

The limited size of the animal bone assemblage precludes any further useful analysis.



## 13. APPENDIX 6: PLANT REMAINS

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Angela Monckton, University of Leicester Archaeology Service

### 13.1 Methodology

A total of 24 samples taken for the recovery of ecofactual remains were wet-sieved in a York tank using a 0.5mm mesh with flotation into a 0.3mm mesh sieve; 10 litres of each sample was processed for this assessment. The flotation fractions (flots) were air-dried and packed carefully in self-seal polythene bags. The residues were also air-dried and sorted for finds.

The flots were sorted for plant and animal remains using an x10-30 stereo microscope and the remains removed to glass specimen tubes. Plant remains were identified by comparison with modern reference material at the University of Leicester Archaeological Services and were counted and recorded below (Table 26). The plant names follow Stace (1991), both botanical and common names. Proportions and ratios of different types of remains (i.e. cereal grains, chaff and weed seeds) were considered to help interpret the samples (van der Veen 1992). Some uncharred seeds were present in the samples in small numbers probably as modern contamination because many of the samples contained root material.

### 13.2 Results

All flots contained charred plant remains with some charcoal. The majority of samples contained coal fragments. As with many archaeological sites, small numbers of root material and modern seeds were also present.

#### 13.2.1 Cereals

The majority of the samples contained a wide variety of cereals including free-threshing wheat grains of bread wheat type and occasional fragments of bread wheat rachis (*Triticum aestivum* s.l.). These occurred together with grains of rye (*Secale cereale*) and oats (*Avena* sp.), some of which were large and probably cultivated, although no chaff was found to confirm this. Occasional grains of barley were also present. A few of the oat and rye grains appeared to be germinated. Preservation was very poor as many grains were broken and abraded. Although sampled from Roman deposits, this group of cereals is typical of assemblages found at many medieval sites (Greig 1991).

Small numbers of other cereals including glume wheat were found in small numbers within two of the samples 117 (AL4) and 119 (AL5). Identifiable cereal grains included emmer or spelt glume wheat (*Triticum dicoccum/spelta*). Barley grains (*Hordeum vulgare*) were also found, but most were abraded and could not be identified further. The few chaff fragments of glume wheat included some of spelt (*Triticum spelta*). Spelt and six-row barley are the common cereals of the Roman period (Greig 1991) with sporadic occurrences of emmer and bread wheat type grains at some Roman sites.

#### 13.2.2 Other plants

Charred weed seeds were present in some of the samples. Where present they were mainly of plants of arable or disturbed ground such as the large grasses possibly including brome grass (*Bromus* sp.). Another common weed was vetch or vetchling (*Vicia/Lathyrus*) which is also a plant of grassy vegetation. Other plants were also present and most are likely to have been arable weeds included with the cereals and are mentioned below.



Uncharred seeds were also found in small numbers. The most numerous seeds were of bramble (*Rubus fruticosus* agg.), elder (*Sambucus nigra*) and goosefoots (*Chenopodium* sp.) which are ubiquitous. These are likely to represent modern contamination.

### 13.2.3 Roman-type plant remains

All samples (except 3 and 101) were from Roman features. However, only a few contained typically Roman plant remains; samples 117 (AL4) and 119 (AL5), and possibly 113 (AL4) and 112 (AL5). Only the first two contained any glume wheat chaff (probably spelt); sample 119 from ditch 1106 and 117 from pit 1160. The latter was the most productive Roman-type sample. However, with only 6.0 charred items per litre of soil it was not a rich sample. Sample 101 (AL7) also contained Roman-type remains but was taken from a post-medieval pit (AG4). The pit was cut into earlier Roman deposits and it is therefore possible plant remains within it are residual.

The chaff fragments (wheat glume bases - including spelt) were only present in single numbers with a few cereal grains or fragments and weed seeds, including seeds of grassy vegetation; ribwort plantain (*Plantago lanceolata*) and heath grass (*Danthonia decumbens*). However, all can occur as arable weeds. This material may represent small-scale cleaning of cereals for consumption on a domestic scale, with the possible use of grassy material as kindling in hearths.

Other samples which may have Roman-type remains have fewer remains in total and contain cereal grains and grain fragments with single seeds of flax (*Linum usitatissimum*) and wild radish (*Raphanus raphanistrum*). It is possible, from the absence of other remains that these are Roman. The remains in these deposits may represent part of a scatter of waste from food preparation suggesting the consumption of spelt wheat and barley.

### 13.2.4 Medieval-type plant remains

All samples (except 3 and 101) were taken from deposits within excavated features datable to the Roman period (AL1-5). However, the majority of these contained coal and medieval-type plant remains.

The most productive samples were from AL1 sample 110, AL3 samples 115, 102 and 107, and AL4 sample 114. Most of the remaining samples also appear to contain medieval or post-medieval material. Unfortunately there was very little in the post-medieval pit sample 3. The richest sample was sample 115 which was rich in grains as were several of the samples. A few of the samples had chaff fragments of bread wheat as well as oats, rye and some barley.

The cereal waste could be from kilns used to parch grain (grain was parched to dry damp crops for storage or to facilitate milling). The few germinated grains may indicate the former. As these remains appear to constitute a spread of waste in other features, the samples have little potential for analysis. Much of the material is abraded and broken which suggests that it has been raked out of hearths or kilns and possibly moved around the site and therefore may be mixed and re-deposited.

## 13.3 Discussion

The main cereals of the Roman period were spelt and barley and although there are sporadic occurrences of bread wheat type grains (rye and oats - mainly wild oats), none are common in the Roman period in England and usually occur together with spelt. In contrast these cereals are commonly found in medieval and post-medieval deposits and often occur together. The cereal remains at Fox Close are very similar to those seen elsewhere in medieval deposits at sites in Leicester and recently in Bedford at Norse Road (Albion Archaeology 2011).



Coal can occur in Roman deposits and in some places (near natural coal sources) was used in Roman times. However such use is unlikely in Woburn which has no nearby coalfields. Therefore, it is concluded that the majority of samples from the Roman phase are contaminated with medieval and post-medieval remains. This is likely to be the result of post-depositional processes such as rooting and insect burrowing.

There was clearly some medieval or post-medieval cereal related activity at this site possibly with kilns to process cereals by parching but the assemblage has no associated dating evidence. As such there is little potential for analysis.

#### **13.4 Potential**

The samples have little potential for further analysis. There are too few remains in the uncontaminated Roman samples. The remaining 19 samples contain medieval or post-medieval material. Although some are in sufficient quantity for some analysis, they are intrusive and have no associated dating evidence. Therefore, no further analysis is recommended.





Asst. Landscape	Asst. Group	Sample No.	Cont No.	Feat No.	Feature type	Sample Vol. Litres	Flot Vol. mls	Chc	Gr Ch	Cf ch	Se Ch	Se un	Other	i/L Ch	Charred plant remains and comments.
1	6	110	1190	1189	Hearth? kiln	10	15	+	49	2	9	+	-	6.0	Wheat free-threshing grains, barley, rye, oats. Few weeds, vetch and docks. ? Medieval.
	7	118	1280	1278	Pit	10	12	+	20a	1	2	+	-	-	Wheat f-th, oats, barley. V.charred and abraded.Vetch seeds.
2	10.03	108	1110	1109	Ditch	10	7	+	12a	-	+	+	N	-	Wheat f-th, oats. A flax seed, a frag of nutshell.
	10.08	1	131	129	Ditch	10	5	-	+	-	1	-	-	-	Coal and roots. Cereal grain frags, a vetch seed.
		2	130	129	Ditch	10	7	-	-	-	-	+	-	-	Coal, roots, mod straw. Nothing.
3	7.01	116	1225	1221	Pit	10	10	+	4	-	4	+	-	-	Broken grains ?rye, weed seeds of persicaria and ribwort plantain.
	7.04	120	1236	1235	Pit	10	10	+	-	-	-	-	-	-	All roots and dried leaves (modern intrusion)
	7.06	115	1220	1218	Hearth	10	15	+	75a	2	20a	-	-	9a	Mainly grains, wheat f-th, rye, oats, few barley. Barley rachis, weeds incl cornflower. Medieval
	9.01	102	1016	1015	Structure	10	20	+	50a	2	5a	-	-	-	Large oats few germinated, bread wheat chaff and grains, rye. Abraded cereals. Few seeds.
	10.04	106	1041		1040	Ditch	10	5	-	5a	-	-	-	-	-
		109	1153	1153	Ditch	10	5	+	10a	-	3	+	-	-	Grains of wheat f-th, oats. Seeds of vetch and goosefoots.
3.01	10.06	107	1067	1064	Ditch	10	15	+	20a	-	3a	+	L	-	Wheat f-th, broken grains, Legume frags, a seed of cleavers.
4	7.02	105	1058	1053	Quarry pit	10	10	-	+	-	-	+	-	-	Coal, roots. Few broken grain frags.
		117	1161	1160	Pit	10	20	+	+	6	20a	+	-	-	Spelt wheat chaff, seeds of ribwort plantain, heath grass, docks, persicaria, and others. Few cereal grain frags. Roman.
	7.05	113	1122	1119	Pit	10	10	++	5a	-	1	+	-	-	Few indet. wheat grains. A flax seed? Roman.
	11.01	100	1044	1358	Ditch	10	5	-	20a	-	-	+	-	-	Rye, oats, barley, few wheat abraded.
		114	1212	1211	Ditch	10	12	+	50a	1	10a	+	-	-	Mostly grains, bread wheat chaff frag and grains, oats few germinated, rye, barley. Few seeds.
	11.02	111	1096	1195	Ditch	10	7	-	10a	-	-	+	-	-	Rye and broken abraded cereal grains. Poor sample.
5	7.03	103	1046	1045	Pit	10	15	++	+	-	-	-	L	-	Roots and leaves. Grain and legume frags.
	11.03	104	1051	1050	Ditch	10	10	+	+	-	+	-	-	-	Roots and leaves. Few grains oat and barley, a vetch seed. Poor sample.
		119	1106	1105	Ditch	10	20	+	1	3	22	+	-	2.4	Spelt chaff, weed seeds including persicaria and sedges. Roman
		112	1098	1098	Ditch	10	7	+	+	-	1	+	-	-	Wheat, barley, broken grains. A wild radish pod frag.
7	4	3	134	132	Pit	10	7	-	+	-	2	+	-	-	Roots, grass and coal. Indet. cereal, seeds of cleavers and docks. Poor.
		101	1020	1019	Ditch	10	5	-	10	-	1	+	-	-	Wheat grains mixed, a pod frag of wild radish.

Key: Gr = cereal grain, Cf = chaff, Se = seed, ch = charred, un = uncharred, L = legume, N = hazel nutshell, Chc = charcoal, fl = flecks, fr = fragments, lg = large, sm = small, + = present, ++ = moderate amount, +++ = abundant, a = approx number, fr-th = free-threshing. Density of charred plant remains, i/L = charred items per litre of soil processed.

**Table 26: Abundance of charred and waterlogged plant remains by Assessment Landscape**



## 14. APPENDIX 7: CHARCOAL

Graham Morgan, University of Leicester Archaeology Service

### 14.1 Introduction and Methodology

Charcoal extracted from 18 environmental samples from 18 deposits was submitted for assessment. The charcoal fragments were identified to species and, where possible, diameter, ring count and age estimations were undertaken.

### 14.2 Results

Identification of the assemblage is described in Table 27 below.

AL	AG	Sample	Context	Diameter mm	Rings	Age Yrs.	Species	
1	6	110	1190	10	2	2	elm	
	7	118	1280	20	3	5	oak	
				10			hazel	
2	10.03	108	1110	frag			elm	
	10.08	2	130	5	2	2	rowan root?	
				frag			oak	
3	7.01	116	1225	frag			oak	
				frag			maple	
	7.04	120	1236	frag			unidentified	
	10.04	106	1041	frag			oak	
		109	1153	15	3	3	hazel	
4	7.02	105	1055	frag			hazel	
				15	4	4	oak	
				nut shell			hazel	
	117	1161			frag			oak
					10	4	4	rowan?
					frag	3	3	oak
					10			rowan?
					frag			oak
	7.05	113	1122		30	8	10	maple
					frag			mature oak
					30	6	6	oak
	11.01	100	1044	15	2	5	oak	
		114	1212	frag			elm	
11.02	111	1096		frag			mature elm	
				10	4	4	rowan?	
frag				frag			oak	
				frag			oak	
5	7.03	103	1046	frag			oak	
				10	3	3	rowan?	
	11.03	104	1051	20	2	2	hazel	
		112	1098	frag			oak	
				frag			rowan?	
7	4	101	1020	frag			oak	

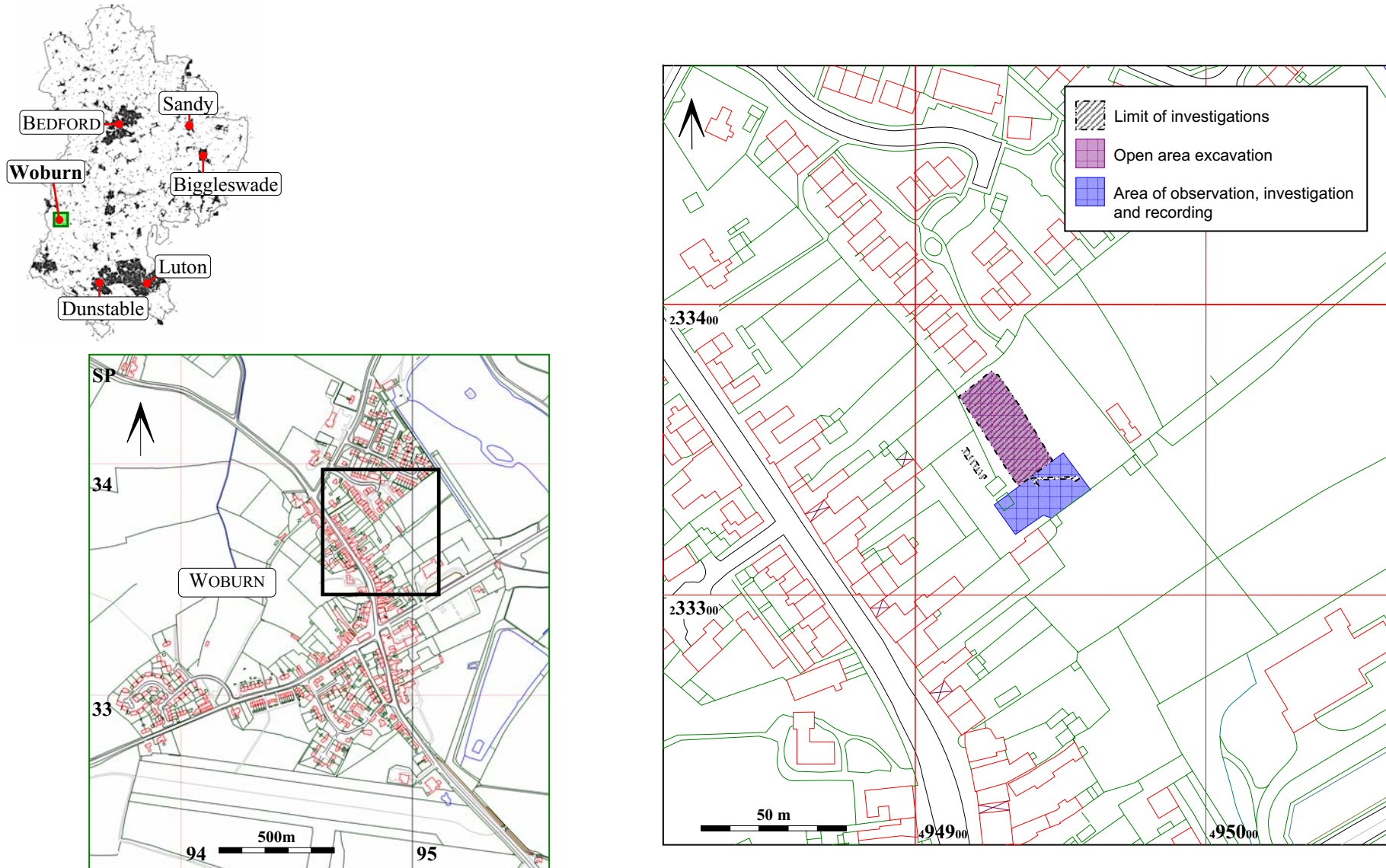
**Table 27: Charcoal remains by Assessment Landscape**

### 14.3 Summary and Potential

The species present are summarised as follows: Oak (*Quercus* spp.), Hazel (*Corylus avellana*), Ash (*Fraxinus excelsior*), Rowan type (*Sorbus* spp.) and Elm (*Ulmus* spp.).

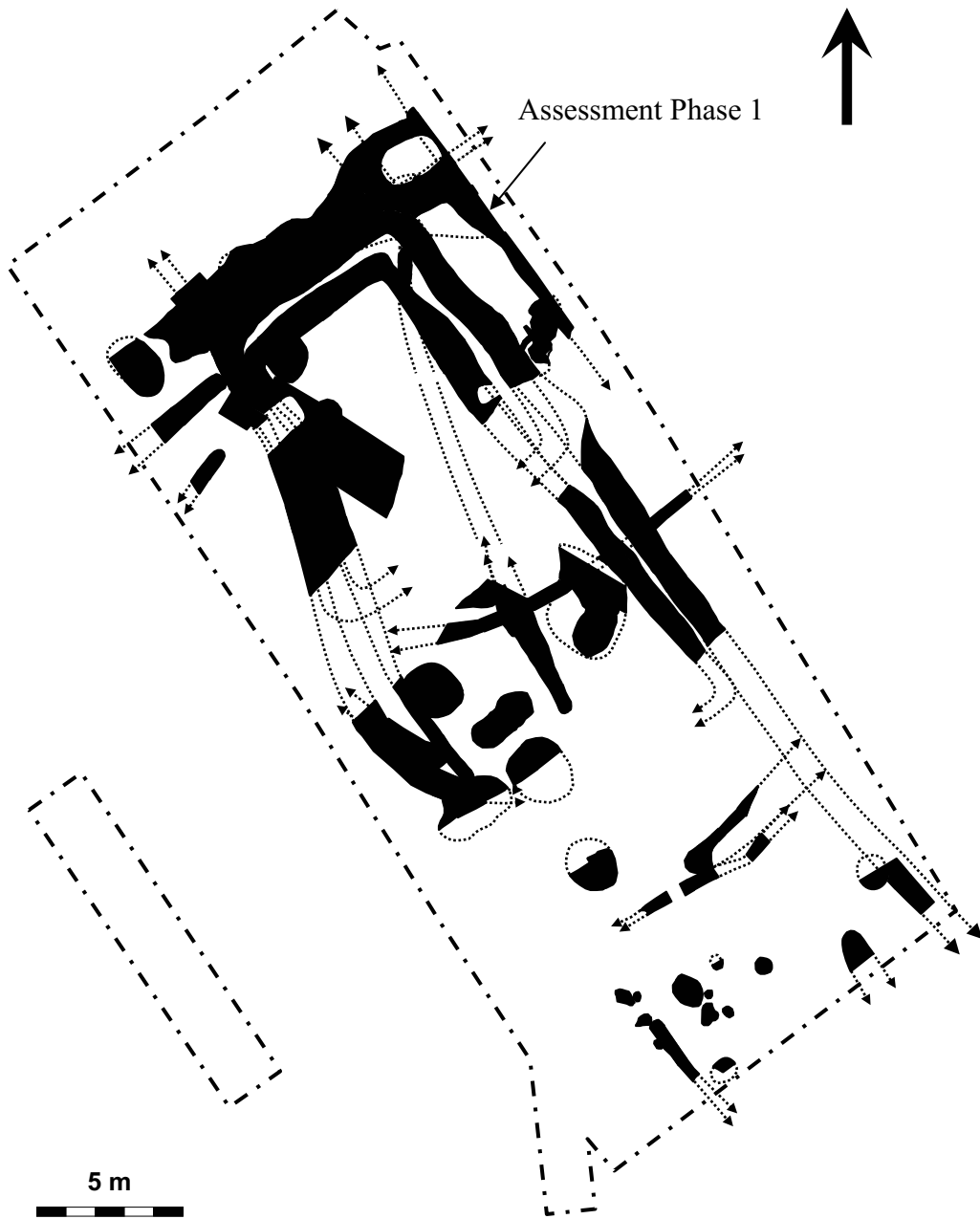


The assemblage would appear to represent a typical open woodland or hedgerow landscape but it is not characteristic of any particular historical period. The possibility of contamination from later deposits is supported by the concreted nature of the charcoal which indicates that water has been moving through it and possibly washing the small fragments down through the soil profile. They therefore could represent remains from the Roman or medieval periods through to the modern era. With this proviso in mind, there is no potential in undertaking further analytical work on this material.



**Figure 1: Site location and areas of archaeological investigation**

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**Figure 2:** Assessment Phase 1 (Roman)



Figure 3: Assessment Landscapes 1 and 2 (Roman)

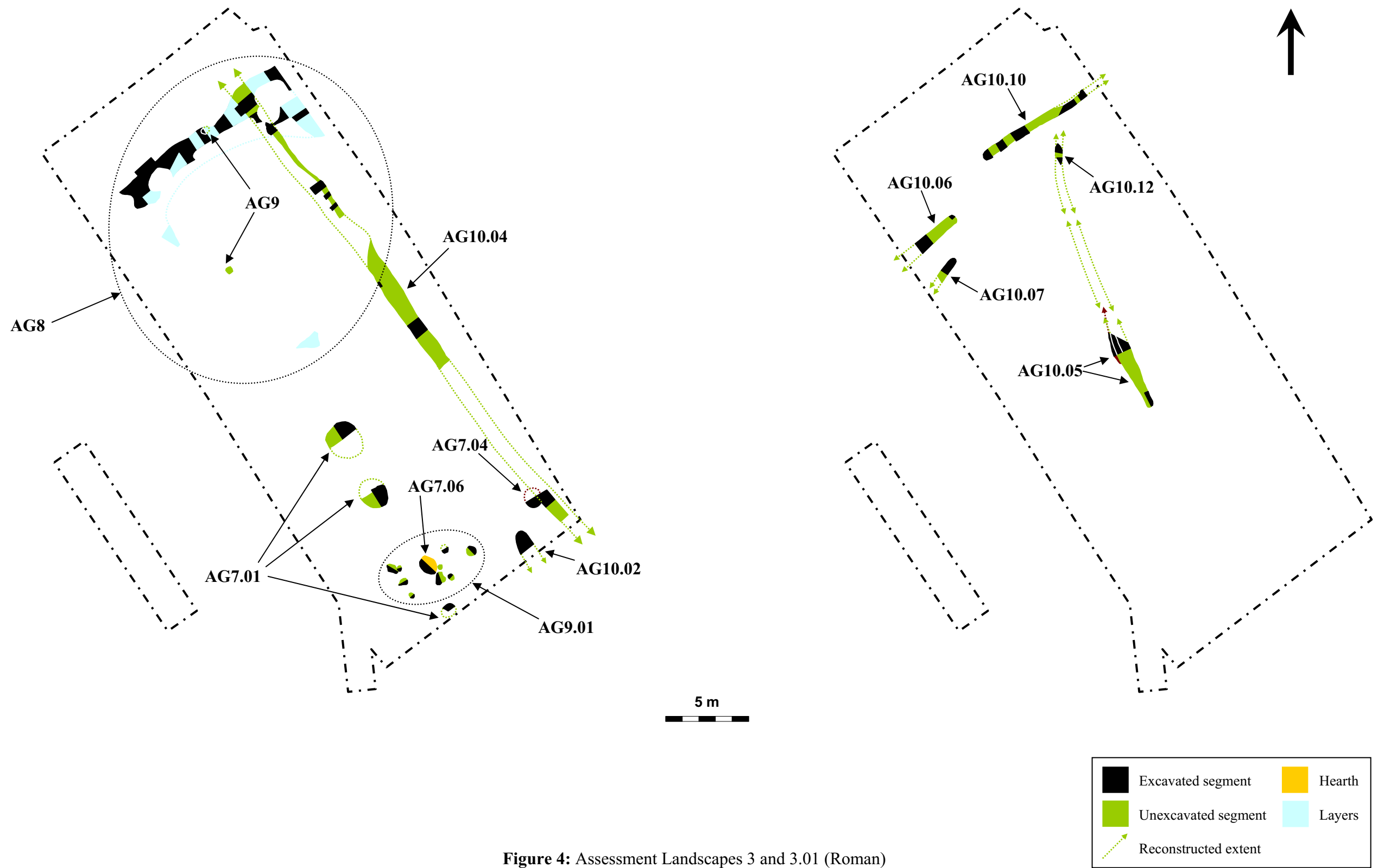


Figure 4: Assessment Landscapes 3 and 3.01 (Roman)

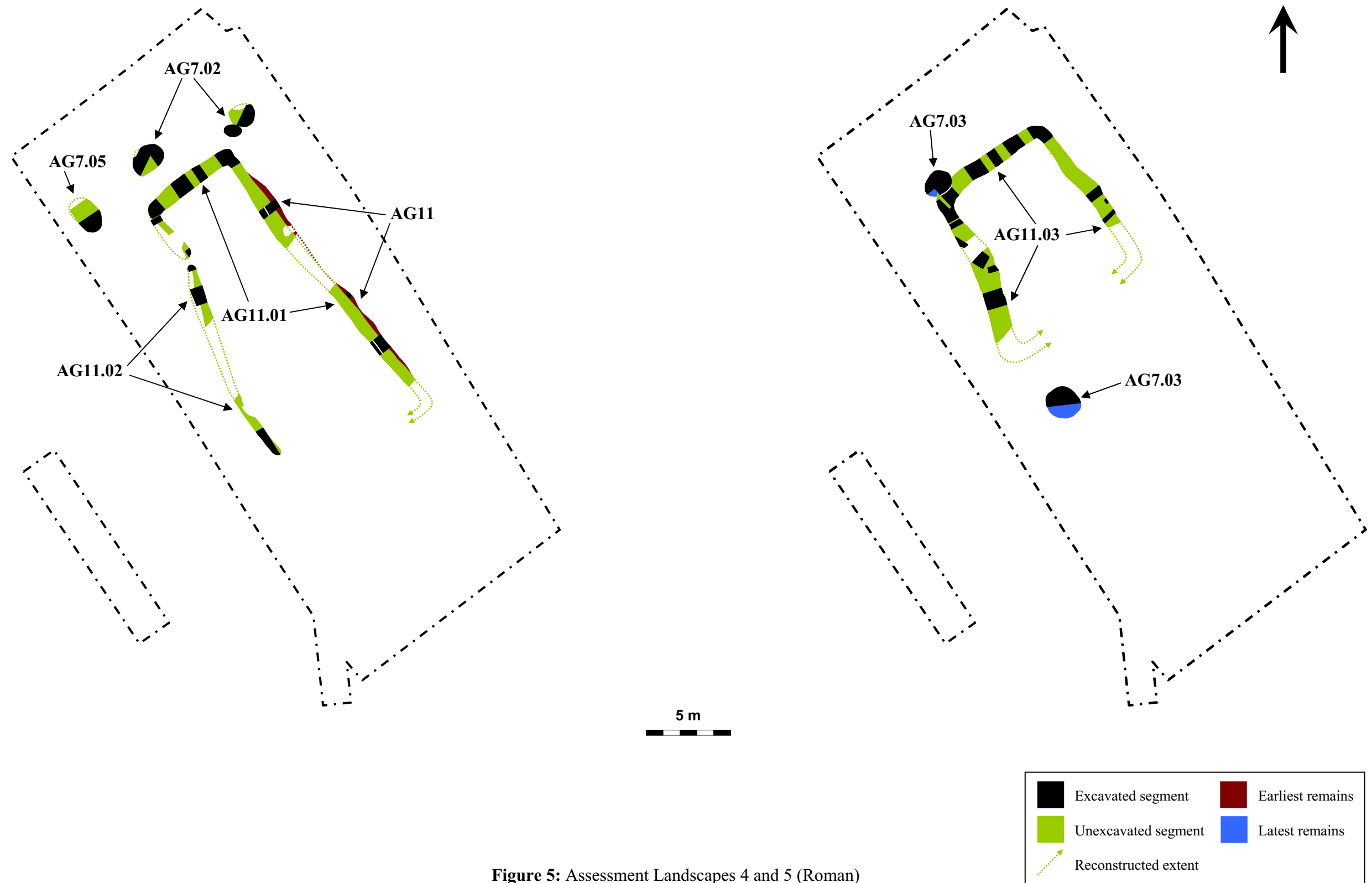
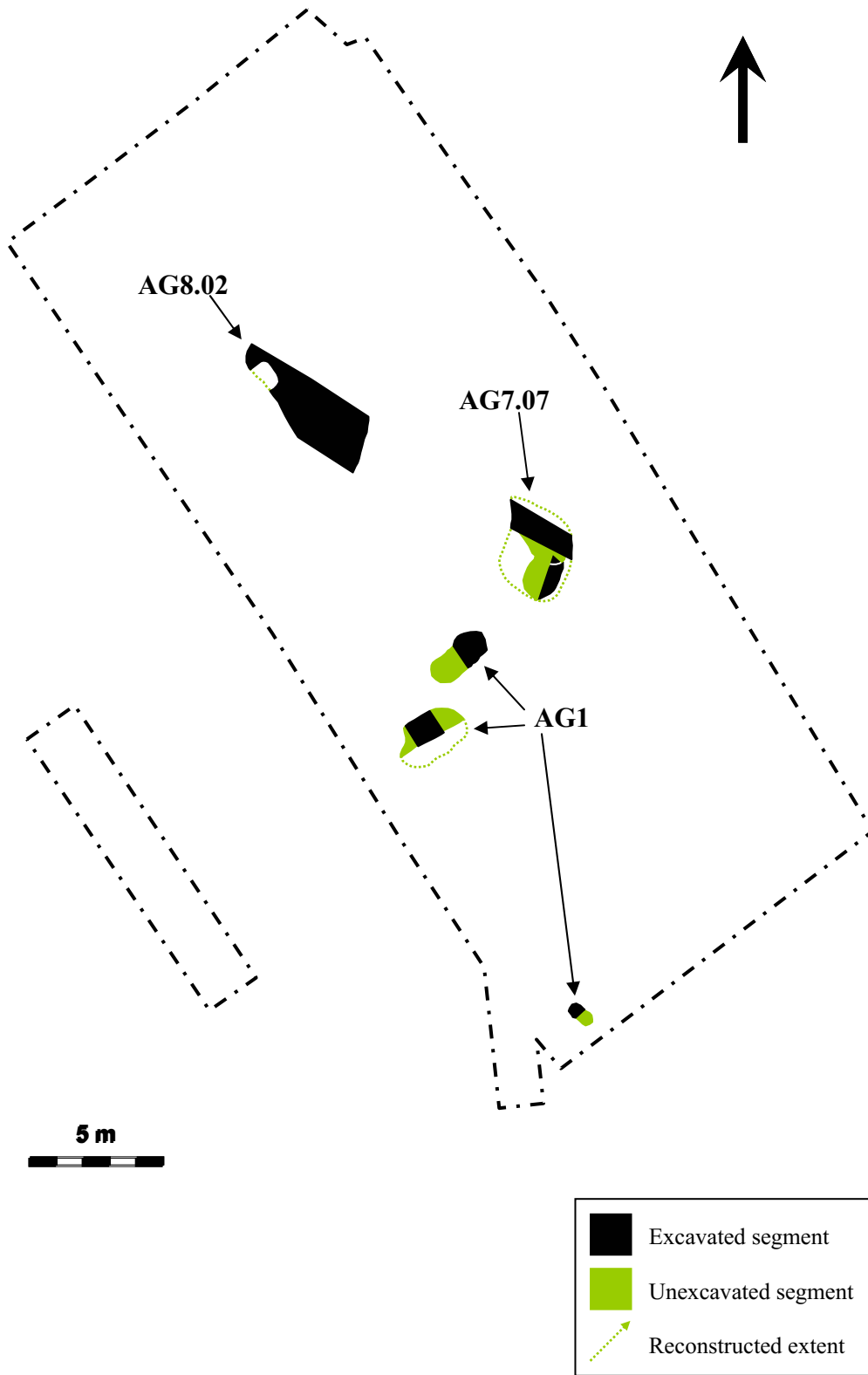


Figure 5: Assessment Landscapes 4 and 5 (Roman)





**Figure 6:** Assessment Landscape 6 (Roman)

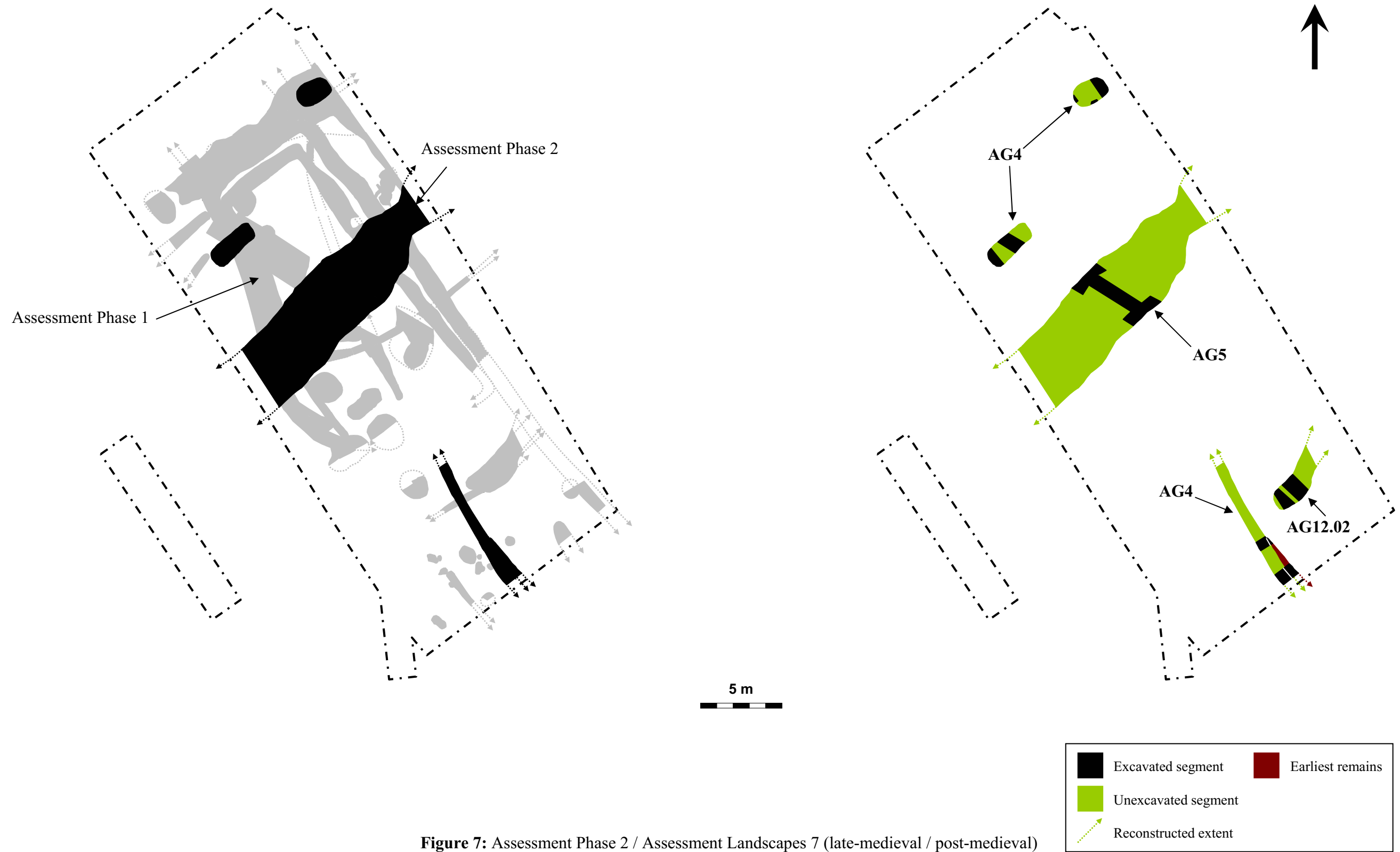
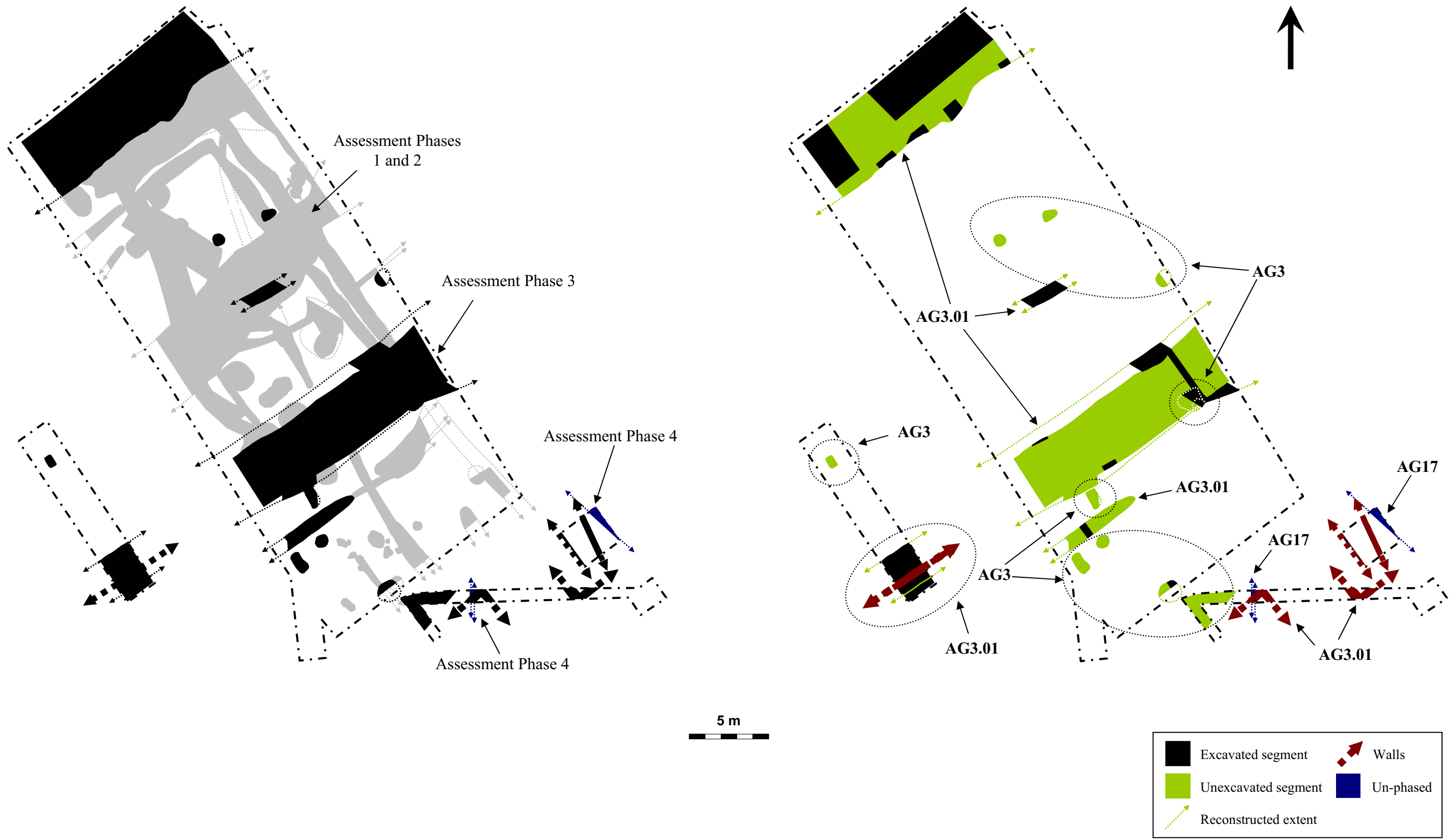


Figure 7: Assessment Phase 2 / Assessment Landscapes 7 (late-medieval / post-medieval)



**Figure 8:** Assessment Phase 3 / Assessment Landscape 8 (modern) and Phase 4 / Assessment Landscape 9 (un-phased)