Archaeological Excavation on land at Pineham, Zone H Northamptonshire September 2015 to May 2016: Assessment Report and Updated Project Design

Report No. 17/29

Author: Carol Simmonds

Illustrations: Carol Simmonds, Olly Dindol and Joanne Clawley

Project Manager: Anthony Maull and Mark Holmes
Site Code: ENN108160
NGR: SP 70533 58827

MOLA
Kent House
30 Billing Road
Northampton
NN1 5DQ 01604 809800
www.mola.org.uk
sparry@mola.org.uk

Archaeological Excavation on land at Pineham, Zone H Northamptonshire September 2015 to May 2016: Assessment Report and Updated Project Design

NHER code: PZH15

Accession number: ENN108160

Report No. 17/29

Quality control and sign off**:**

Issue No.	Date approved:	Checked by:	Verified by:	Approved by:	Reason for Issue:
1	06/04/2017	Claire Finn	Rob Atkins	Rob Atkins	Draft for client review
2	31/05/2017				Revised following client comment

Author: Carol Simmonds

Illustrations: Carol Simmonds, Olly Dindol and Joanne Clawley

MOLA
Kent House
30 Billing Road
Northampton
NN1 5DQ
01604 809 800
www.mola.org.uk
sparry@mola.org.uk

STAFF

Project Manager:	Anthony Maull Cert Arch
	Mark Holmes MA MCIfA
Team leaders:	Carol Simmonds BA PCIfA
	Jim Burke
	Chris Jones
Text:	Carol Simmonds BA PCIfA
Illustrations:	Olly Dindol BSc
	Joanne Clawley BA MSc
	Carol Simmonds
Fieldwork:	Emma Bayley BA
	Anja Borch-Nielsen
	Jim Burke
	Angel Carrera
	Laura Cogley BA
	Chloe Cronogue-Freeman BA
	Adam Douthwaite BA MA
	George Everest-Dine BA MA
	Jim Fairclough BA MA PCIfA
	Anne Foard-Colby Cert Ed
	Bartlowig Grzywoniak
	Guillaume Gutel BA MA
	Laura Gutel BA MA
	David Haynes
	Peter Haynes
	Luke Jarvis BA
	Chris Jones
	Piotr Kieca MA
	Konrad Lewek
	Adam Meadows BSc
	Judyta Mlynarska BA
	Ryszard Molenda
	Kamil Orzechoswki BA MA
	Chris Pennell BA
	Esther Poulus MSc
	Thomas Revell

	Anna Rojek BA
	Paul Sharrock BA MA
	Carol Simmonds
	Andrew Smith BA
	Paulina Starachowska MA
	Piotr Szczepanik BA
	James West BA MSc
	Kathrin Winzer MA
	Harry Young BA
	Adam Yates BA MCIfA
SUA pilot:	James Ladocha BA
Geology survey:	Steve Critchley BSc MSc
Metal detecting survey:	Steve Critchley
Worked flint:	Yvonne Wolframm-Murray BSc PhD
Prehistoric pottery:	Andy Chapman BSc MCIfA FSA
Roman pottery:	Alice Lyons BA MA MCIfA
Ceramic building material:	Pat Chapman BA CMS ACIfA
Querns:	Andy Chapman
Other finds:	Tora Hylton
Roman coins:	Susan Porter BA MA
Animal bone:	Adam Reid BSc MSc with contributions by Rebecca Gordon PhD
Archaeobotanical analysis:	Lisa Gray MSc MA ACIfA

OASIS REPORT FORM

PROJECT DETAILS	**Oasis No. molanort- 281086**
Project title	Archaeological excavation on land at Pineham Zone H, Northamptonshire, September 2015 to May 2016: Assessment report and updated project design
MOLA (Museum of London Archaeology) was commissioned to undertake a programme of archaeological excavation and strip, map and sample as mitigation on land at Pineham Zone H, Northamptonshire. The development area lies within a rich archaeological landscape in the Nene Valley. Four separate lengths of pit alignment were recorded across the excavation areas. Three of the pit alignments were aligned from a sinuous Bronze Age ditch which had been redefined and maintained on several occasions suggesting it was of significance in the landscape. The pit alignments can be viewed alongside similar alignments identified previously in the vicinity to represent a network of linear boundaries across the landscape. In the area of the boundary ditch was a pair of tightly crouched undated inhumation burials (HB2 and HB3). To the north of the boundary ditch, the remains of two sub-rectangular post-built structures were identified. The Iron Age and Roman peripheral activity represented part of a small farmstead in the south of the development with probable livestock enclosures in the excavation area. The main occupation areas may be to the south of the excavation area. A ring ditch was set within rectangular enclosure ditch. The enclosure encompassed over 2500 sq. metre. Within the enclosure were two large wells. The late Iron Age settlement was directly replaced from the 1st century AD by a set of enclosures and fields defined by ditches on a different alignment, which extended the settlement area to the north. In the northern part of the enclosure was a fragmentary child burial. A possible Saxon barrow was found to the south of the site, defined by a continuous ditch. It had an external diameter of c15.20m. There were no surviving internal features or burials within the ring ditch, but situated adjacent to it were seven inhumations, all but one of which were in shallow graves and one grave contained a knife and spearhead. Between the 5th and 9th centuries a field system comprising a set of conjoined enclosures or plots was constructed on the north-facing ridge line, encompassing an area of at least 3.51ha. The individual rectangular plots themselves were defined by ditches.	
Project type	Excavation
Site Status	None
Previous work	Geophysical survey and trial trenching
Current land use	Arable
Future work	Unknown
Monument type and period	Iron Age pit alignments, Iron Age and Roman enclosures, Saxon fields, ring ditch and burials, medieval cultivation
Significant finds	Pottery, human remains, Roman amulet, Saxon spearhead
PROJECT LOCATION	
County	Northamptonshire
Site address	South of Hall Farm, Kislingbury, Northampton
Postcode	NN4 9BX
OS co-ordinates	SP 70533 58827
Area (sq m/ha)	15ha (mitigation)
Height aOD	67m to 79m aOD
PROJECT CREATORS	
Organisation	MOLA
Project brief originator	Lesley-Ann Mather (NCC)
Project Design originator	MOLA Northampton
Director/Supervisor	Carol Simmonds, Jim Burke and Chris Jones
Project Manager	Anthony Maull and Mark Holmes (MOLA) with Nansi Rosenberg (Prospect Archaeology)
Sponsor or funding body	Prologis UK
PROJECT DATE	
Start date	September 2015
End date	May 2016

ARCHIVES	Location	Contents
Physical	MOLA code: PZH15 ENN107946 (evaluation) ENN108160 (Mitigation)	Pottery, animal bone, worked flint, metal objects, human skeletal remains
Paper		Site records comprising context registers, index sheets, context sheets, printouts of digital photographs, permatrace of plans and sections
Digital		DXF data (from GPS), digital photographs
BIBLIOGRAPHY	Journal/monograph, published or forthcoming, or unpublished client report (MOLA report)	
Title	Archaeological excavation on land at Pineham Zone H, Northamptonshire September 2015 to May 2016: Assessment report and updated project design	
Serial title & volume	17/29	
Author(s)	Carol Simmonds	
Page numbers	87	
Date	29/03/2017	

Contents

Figures

Tables

Appendix tables

Archaeological Excavation

on land at Pineham, Zone H

Northamptonshire:

Assessment Report and Updated Project Design

September 2015 to May 2016

Abstract

MOLA (Museum of London Archaeology) was commissioned to undertake a programme of archaeological excavation and strip, map and sample as mitigation on land at Pineham Zone H, Northamptonshire. The development area lies within a rich archaeological landscape in the Nene Valley.

Four separate lengths of pit alignment were recorded across the excavation areas. Three of the pit alignments were aligned from a sinuous Bronze Age ditch which had been redefined and maintained on several occasions suggesting it was of significance in the landscape. The pit alignments can be viewed alongside similar alignments identified previously in the vicinity to represent a network of linear boundaries across the landscape. In the area of the boundary ditch was a pair of tightly crouched undated inhumation burials (HB2 and HB3). To the north of the boundary ditch, the remains of two sub-rectangular post-built structures were identified.

The Iron Age and Roman peripheral activity represented part of a small farmstead in the south of the development with probable livestock enclosures in the excavation area. The main occupation areas may be to the south of the excavation area. A ring ditch set within rectangular enclosure ditch. The enclosure encompassed over 2500 sq. metre. Within the enclosure were two large wells. The late Iron Age settlement was directly replaced from the 1st century AD by a set of enclosures and fields defined by ditches on a different alignment, which extended the settlement area to the north. In the northern part of the enclosure was a fragmentary child burial.

A possible Saxon barrow was found to the south of the site, defined by a continuous ditch. It had an external diameter of *c*15.20m. There were no surviving internal features or burials within the ring ditch, but situated adjacent to it were seven inhumations, all but one of which were in shallow graves and one burial had a knife and spear head.

Between the 5th and 9th centuries a field system comprising a set of conjoined enclosures or plots was constructed on the north-facing ridge line, encompassing an area of at least 3.51ha. The individual rectangular plots themselves were defined by ditches.

1 INTRODUCTION

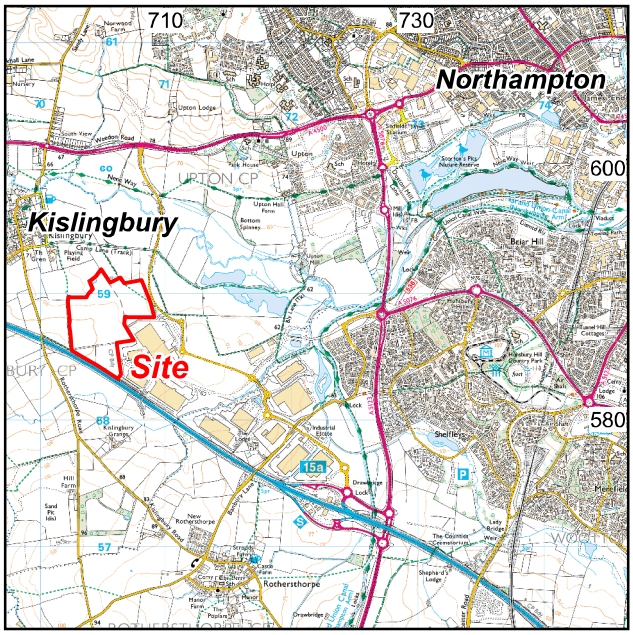
MOLA (Museum of London Archaeology) was commissioned by Prospect Archaeology, acting on behalf of Prologis UK Ltd (Midlands and North), to conduct archaeological mitigation works on land at Pineham Expansion Zone H on the western edge of Northampton (NGR SP 70533 58827; Fig 1).

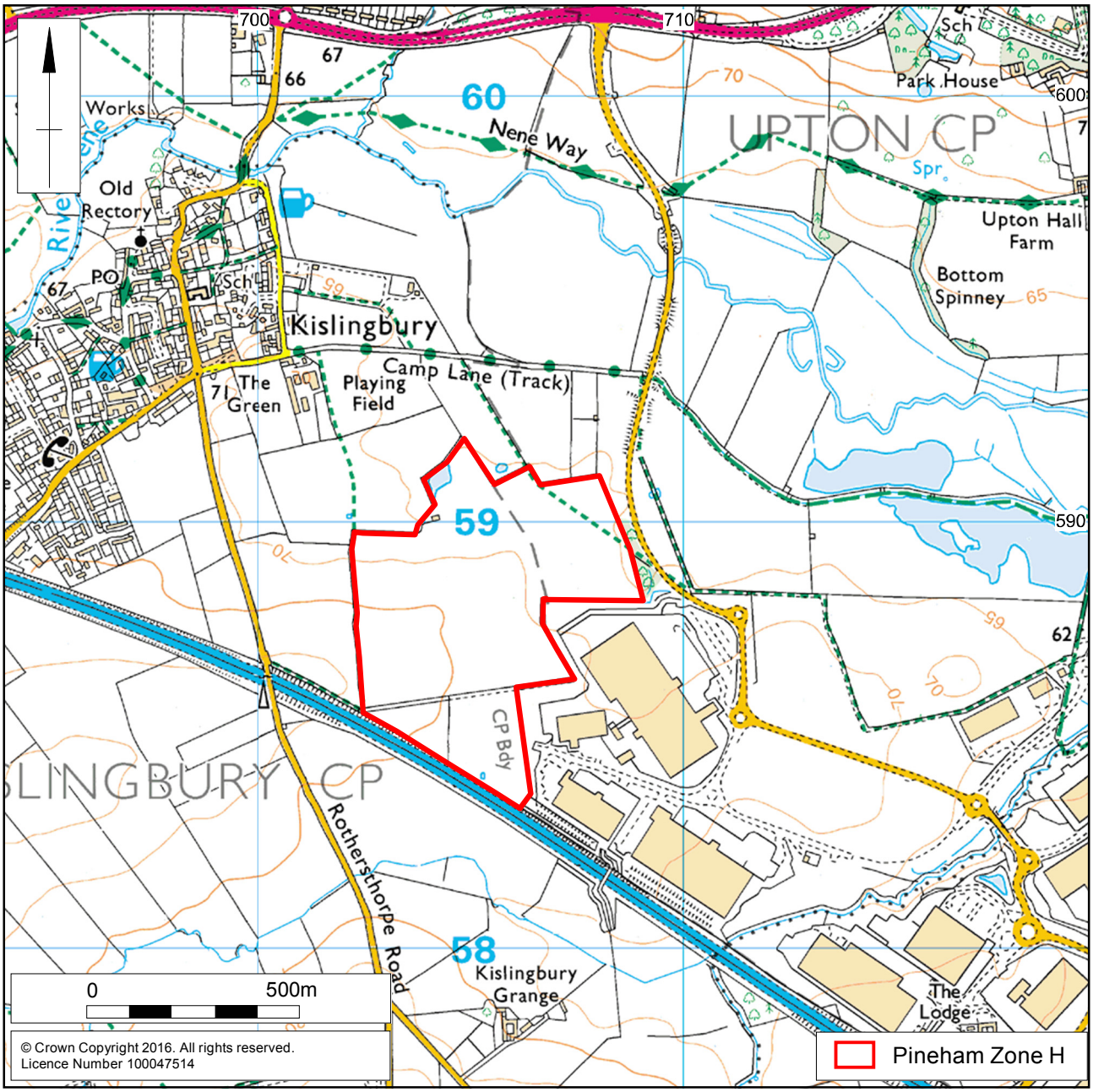
The development area lies within a rich archaeological landscape in the Nene Valley, with the majority of known data recorded during rescue and development-led archaeology over the past thirty years. The site lies to the west of the existing Pineham Business Park which has been subjected to archaeological works since 2006 (Brown 2007; Carlyle 2006 and ULAS 2015).

The mitigation phase comprised the archaeological excavation of *c*15ha of land across an area considered to have archaeological value. This value was previously indicated by a geophysical survey (Meadows *et al* 2014), which was later corroborated during spring 2015 by program of trial trenching evaluation. The results of this phase were summarised in an interim report (Simmonds 2015). The following mitigation phase uncovered an archaeological landscape which included four separate lengths of pit alignment; Iron Age, Roman and middle Saxon enclosures; and medieval open field system.

This document comprises an Assessment Report and Updated Project Design, which will combine the results of both the evaluation, where relevant, and the subsequent mitigation works. It will aim to present a brief summary of the archaeology field works and a discussion of post-excavation analysis which has so far been undertaken. It will also present a timetable for future analysis and reporting phases of the work, as well as a summary of the site's archaeological potential and recommendations for further work.

A Written Scheme of Investigation (WSI) for the mitigation works was produced by MOLA (MOLA 2015) in response to discussions between Prospect Archaeology and the Northamptonshire County Council Archaeological Advisor (NCCAA).





Scale 1:15,000 Site location and proposed trenches Fig 1

1.1 Location and topography

The development area was located west of the current extent of the Pineham Business Park on the western fringes of Northampton and to the south-east of Kislingbury. It comprised three fields of arable farmland set on a north-easterly slope from 67m to 79m aOD, encompassing 15ha (Fig 2). The three fields were separated by an access track, with the largest field to the north of it. The northern field has an irregular shape and was bounded on all sides by hedgerows. The remaining two fields were to the south of this track and were bounded by the M1 motorway to the south and separated from each other by a hedgerow. The present development area abuts the north-west side of the existing Pineham development.

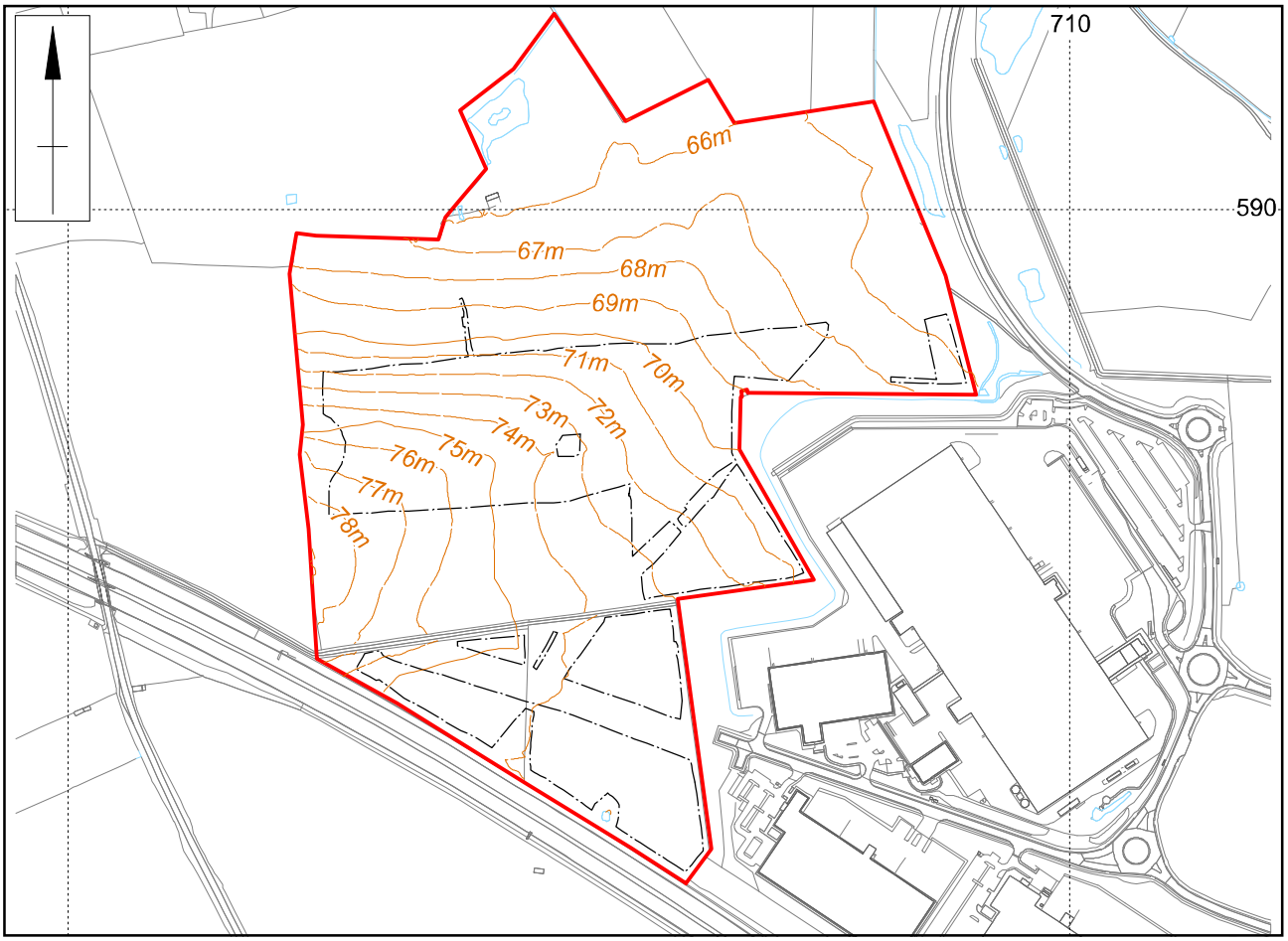
A number of physical constraints had to be considered during the works. The constraints included a High Pressure Gas pipeline and an active Cemex slurry pipe in the southern two fields (a disused Cemex slurry pipe was also present immediately to the north of the active pipeline). An overhead electric cable crossing the eastern side of the development area was diverted following the completion of the main site works. Other constraints included badger setts, particularly along the western and northern boundaries, and reptiles in the low-lying grass area in the northern part of the site. The development area was also flanked by public rights of way. Footpath KW10 was accessed from Rothersthorpe Road and then turned to follow the western boundary. Footpath KW9/LB12 traversed the north-eastern corner of the site. In the south-eastern field and adjacent to the motorway was a small pond.

1.2 Geology by Steve Critchley

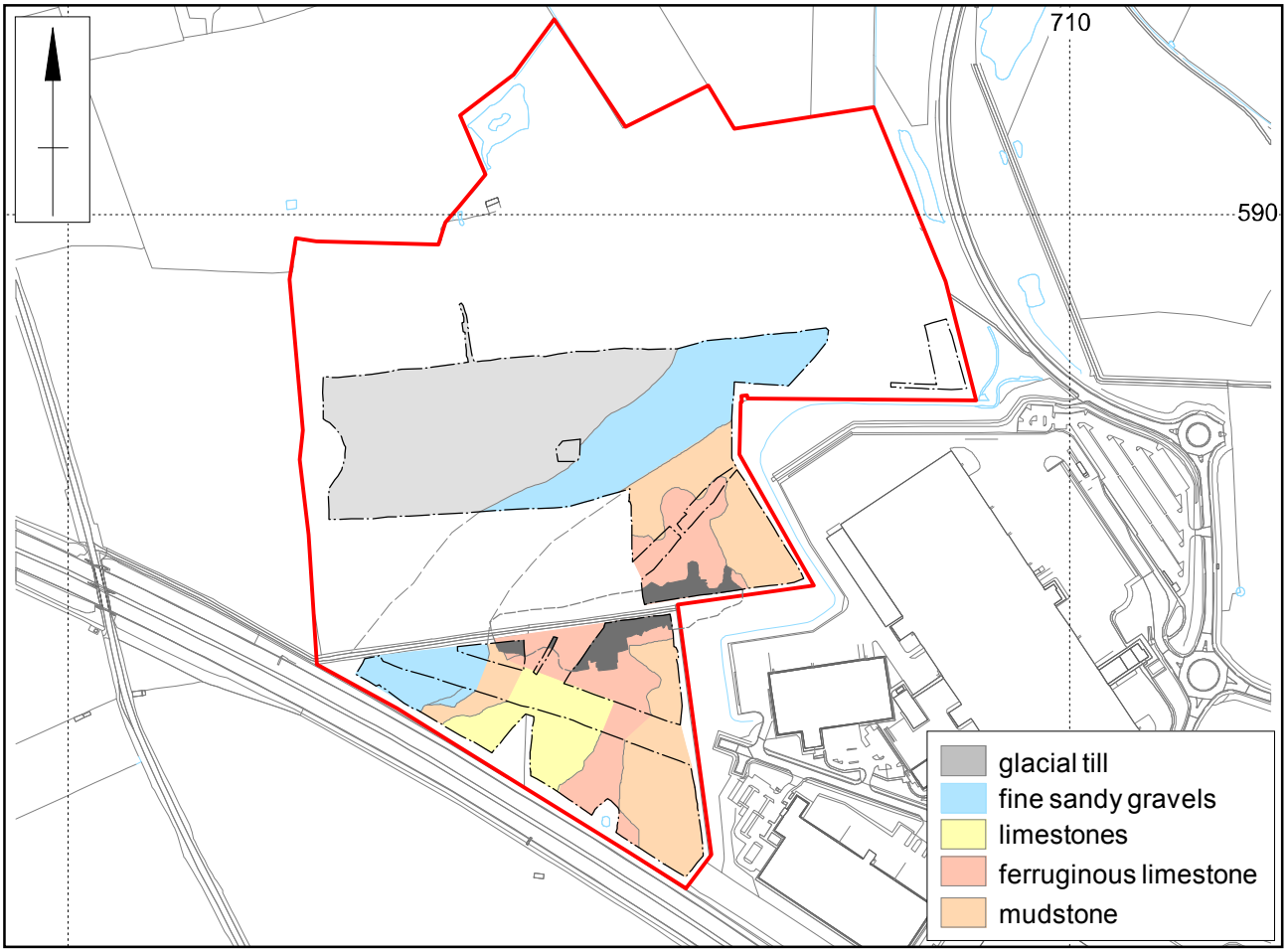
South of trackway

This area of excavation has exposed a layer of bedded sandy slightly ferruginous limestones, heavily disturbed by 19th- to 20th-century stone quarrying (Fig 3). The location has been chosen for exploitation because elsewhere the local geology is one of clays and sands. The area is mapped as being underlain by the Dyrham Formation of Lower Jurassic age.

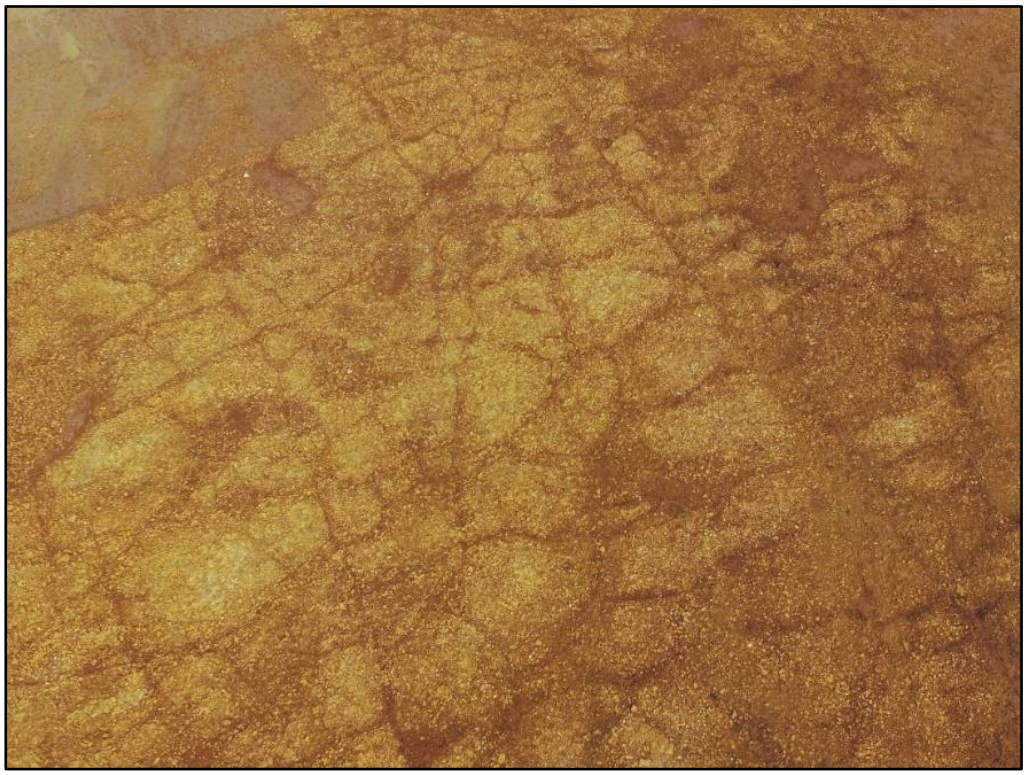
The Dyrham Formation is composed of a series of marine fossiliferous grey micaceous and sandy mudstones with impersistent and nodular beds of limestone. The limestone outcrops seen in the southern part of the excavation were an extensive area of flat bedded pale yellow brown fossiliferous rock seen in sections to be less than 1.0m in thickness underlain by grey to pale brown sandy mudstones. Generally a competent rock the limestone has been affected by periglacial thermal contraction cracking (Fig 4) forming a diffuse polygonal pattern of features now infilled with fine sandy clays and extensively seen over the excavated area where this rock has been exposed.



Scale 1:7,500 (A4) The topography of the site Fig 2



Scale 1:7,500 (A4) The geology of the site Fig 3



Periglacial thermal contraction cracking Fig 4

The hard cap rock overlying soft clay Fig 5

In excavated sections (Fig 5) the combination of a hard cap rock over soft clay shows the development of periglacial thermokarst proto-involutions utilising the thermal cracks as weak points to force the underlying clays (under hydrostatic load) into the limestone. Although there was some obvious disruption to the bedding of the limestone at these weak points, proper involutions did not form other than to produce a doming or ridging in the limestone surface. None of the latter features remain, having long been levelled by erosion and cultivation.

North of trackway

The Dyrham Formation limestone is present in the upper portion of the excavated area giving way downslope to a thick series of pale brown to grey brown occasionally ferruginous marine silty sandy mudstones with fine grained often pebbly sand layers. Toward the lower portion of the site within the north-east area, the rock head becomes increasingly buried under layers of yellow brown colluvium (Fig 3).

The remainder of the excavated area sloping up to the western boundary has exposed an increasing thickness of glacial till belonging the Mid Pleistocene, Wolston Formation, Oadby Till Member. These beds consisted of a stiff grey weathering to light brown clay with abundant rounded to irregular clasts of sandstones, limestones with minor flint and chalk, ranging up to 25cms of more in diameter. The boundary of these Tills was seen to form an irregular eroded edge around the mid-point of the excavated area running roughly north to south and marked in places by an irregular zone of fine sandy gravels.

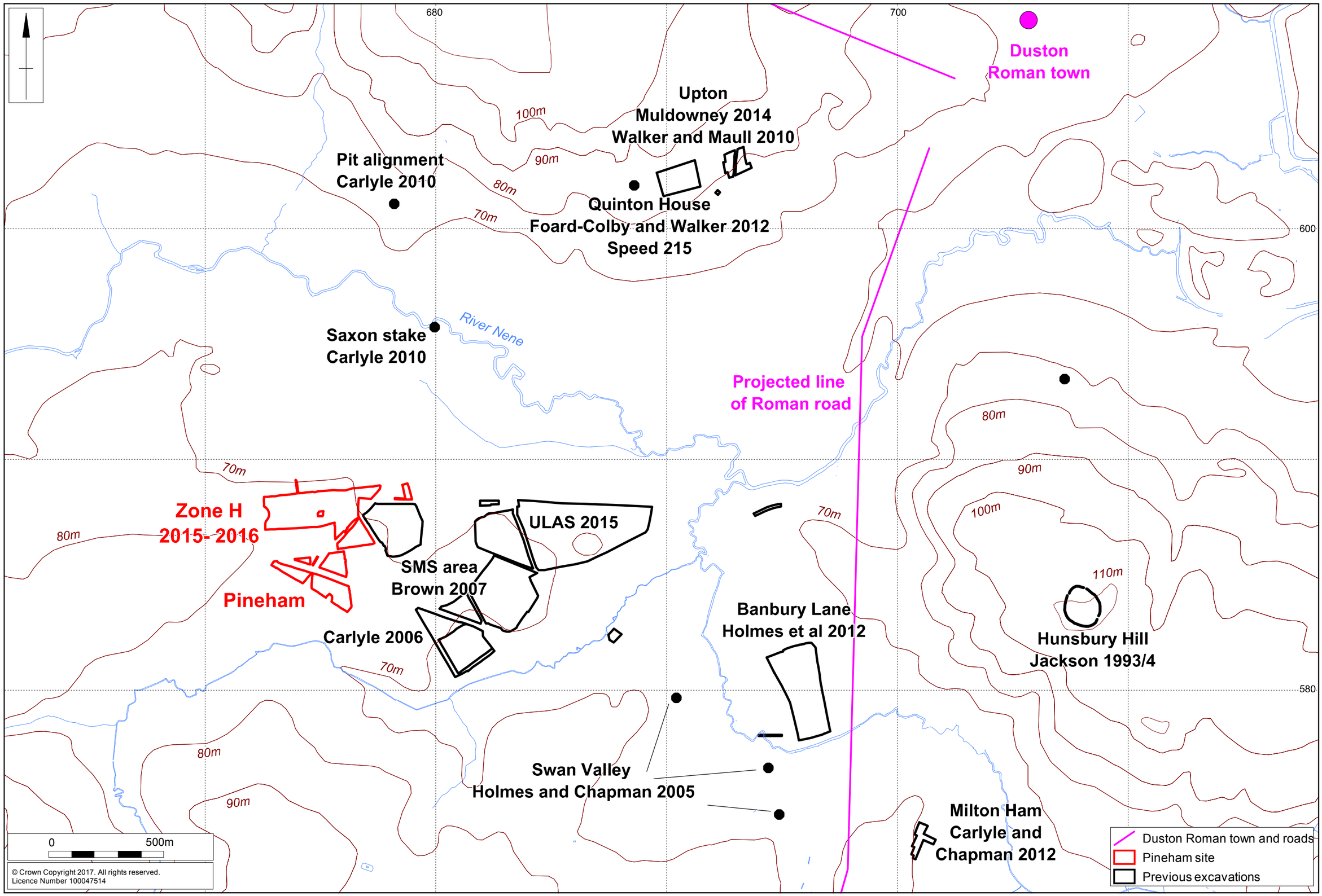
1.3 Historical and archaeological background

The Pineham Business Park lies on the western edge of the modern limits of Northampton, which over the past 30 years has been subject to extensive commercial and residential development. As part of this continuous development and expansion, a number of major archaeological interventions have been undertaken (Figs 6 and 7) revealing settlement and activity from prehistoric monuments to modern military installations. Both the valley base and upper slopes of the Nene Valley have been settled from the Neolithic onwards.

Summary of other excavations

Major archaeological interventions include the excavations in advance of the construction of the older Pineham development to the east (Brown 2007, Carlyle 2006 and ULAS 2015) and associated infrastructure of the Cross Valley Link Road (CVLR) (Carlyle 2010). Other pertinent parts of the landscape for this study are the works at Upton (Walker and Maull 2010, Speed 2015, Muldowney 2014, Foard-Colby and Walker 2010 and Mason 2011) and also the valley and the slopes of the western part of the Hunsbury ridge (Carlyle and Chapman 2012, Holmes *et al* 2012, Holmes and Chapman 2005, Bamford 1985). It is from this corpus of work that the following summary has been derived.

The area between the current excavations and those investigations undertaken during 2006/2007 was subject to desk-based assessment, geophysical survey (JSAC 1999 and 2000) and trial trenching (Pears 2005), but was excluded from the mitigation works owing to minimal remains being recorded.



Scale 1:15,000 (A3)

Major archaeological interventions Fig 6

Neolithic

During the Neolithic period the higher ground to the east of Pineham Zone H, was dominated by a causewayed enclosure at Briar Hill (Bamford 1985). The floodplain was also utilised for monument and burial. The most significant monument recorded in recent times was a triple-ditched circular monument and a mortuary deposit at Banbury Lane (Holmes *et al* 2012). The mortuary deposit of long bones and cranium fragments from *c*130 individuals were placed in a pit cut into the inner ring ditch. Radiocarbon dates from this bone deposit have produced a Middle Neolithic date. Lying 1km to the south-east of Banbury Lane, a total of three cremation pits of similar date were recovered from excavations at Milton Ham (Carlyle and Chapman 2012). Carlyle and Chapman note that the diversity of burial practice during the same time period was part of a wider shift in social change. This is against the backdrop of a documented move away from constructing large monuments such as causewayed enclosures to other new forms of monument.

Elsewhere scattered and low-key features of Neolithic date have been recorded. Of note are pits at Upton (Muldowney 2014) and Neolithic features at the Pineham residential development (ULAS 2015). During the excavations for the Roman settlement at Pineham (Carlyle 2006) residual scatters of flint tools and waste material hint at Neolithic and early Bronze Age occupation of the area.

Bronze Age and early to middle Iron Age

During the Bronze Age the higher ground was used for burial and monuments. At Pineham SMS2 there was a possible barrow and some associated burials. Neolithic and Bronze Age pits were also recorded during the ULAS excavations.

Amongst the more enigmatic features in the landscape were pit alignments, thought to have origins in the late Bronze Age/ early Iron Age and it has been suggested that they mark territorial boundaries. Generally, the middle segments of pit alignments have been found, although an example on the northern side of the valley, off South Meadow Road, had a group with a clear start/end point (Speed 2015). At this particular site the pits respected the position of a ditch, and projected towards a tributary of the River Nene. Its projected line meant that it would have followed the slope down and met the stream at a right angle. Other pit alignments are parallel to the River Nene and its tributaries, the most notable of which was an east to west line recorded at Upton (Walker and Maull 2010), Quinton House School (Foard-Colby and Walker 2010) and near the A45 (Carlyle 2010). If this group of pits were the same pit alignment it would have been at least 1.3km long along the top of the slope. There is also the suggestion that pit alignments were situated along boundaries in the surface geology (Chapman *et al* 2015). At Harlestone Quarry, Northamptonshire, the pit alignment follows the boundary between Northamptonshire Sand and Ironstone, and the mudstones.

The survival of dateable material is variable, although in recent years samples from two separate pit alignments suggest a use period of the late Bronze Age/ early to middle Iron Age. They are the pit alignments from Harlestone Quarry (Chapman *et al* 2015) and at Upton (Walker and Maull 2010).

Iron Age settlement

The area was extensively settled in the early to middle Iron Age, with a degree of socio-economic control perhaps exercised from Hunsbury Hillfort, *c*3.3km to the east. The hillfort was built in the early-middle Iron Age and was probably abandoned at some time in the late Iron Age (Jackson 1993/4). Several possibly contemporary Iron Age sites also occupied the Hunsbury ridge, including enclosures at Briar Hill (Bamford 1985).

At the base of the Hunsbury ridge and situated at the Swan Valley business park, *c*2km to the south-east of the site, were two enclosed settlements which had their origins in the early to middle Iron Age (Holmes and Chapman 2005). The enclosed settlements continued to be in use into the late Iron Age. A similar pattern of activity commencing in the early to middle Iron Age and developing further into the late Iron Age was at Pineham Barn (Brown 2007, Carlyle 2006 and ULAS 2015). Here settlement comprised ring ditches within a ditched enclosure with enclosures extending to the north.

Roman

A significant later Iron Age settlement focus at Duston probably replaced Hunsbury Hill fort as a centre for social/economic activity in the area (Friendship-Taylor 1999). It developed into a town in the Roman period although most of the site has been destroyed, principally by ironstone quarrying in the 19th century. Duston Roman town was located at a junction of roads from *Bannaventa* and *Lactodorum* (Towcester) and may have been a regionally important monetary trading zone. The Roman town is thought to have ceased to have been used sometime in the 4th century. The town had extra mural settlement on its western side comprising enclosures, track ways and boundary ditches (Walker and Maull 2010; Muldowney 2014). A small enclosed area of industrial and grain processing activity was also present.

At Pineham settlement shifted southwards away from the Iron Age occupation. The resulting Roman settlement (Settlement 2) had multiple roundhouses with evidence for maintenance and modification (Carlyle 2006).

Saxon and medieval

Post-Roman activity is less well defined and was more dispersed across the landscape. A Sunken Featured Building (SFB) was recorded during widening of the A45 with at least 60 loom weights north of the development area (Jackson *et al* 1969). The remains of a timber building, of 6th to 7th century date, was recorded west of the church at Upton. From the middle Saxon period settlement again became more nucleated. Kislingbury was extant prior to the Norman Conquest as recorded in the Domesday Book, where it is referred to as *Ceselingeberie.* At the time of the Domesday survey it had two manors which were later amalgamated into a single unit.

It has been suggested that the alluvial deposits covering the floodplain may be medieval and later in date (Carlyle 2010). Less than 1km to the north of the development area, and during flood attenuation works for CVLR, the tip of a hazel stake was recovered from a silted up palaeochannel. The hazel stake has a radiocarbon date of AD 7th to 8th century. At this point the alluvial silts were 2.8m thick.

Post-medieval

The parish of Kislingbury was enclosed in 1779 by Act of Parliament. The resulting field layout comprised small rectangular plots defined by hedges, trees and ditches. During the 19th and 20th centuries the fields were often amalgamated into larger plots of land.

Modern

During WWII the area around Pineham Barn (Brown 2007) was used as a bomb decoy installation and was levelled after the war to reinstate the land for agricultural use; this truncated the underlying archaeology. The M1 motorway, constructed during the 1950s and 1960s cut across the pre-existing field and road layout.

In more recent years the western side of Northampton has been rapidly expanded and the villages in this area including Kislingbury have also been subject to development and expansion.

710

590

Upton Valley Way N

Zone H
2015- 2016

SMS area
Brown 2007

ULAS 2015

ULAS 2015

Nectar Way

Carlyle 2006

Brown 2007

M1

Rothersthorpe Road

0 250m

Areas of excavation
geophysical survey 1999/2000
geophysical survey anomalies 1999-2000
Pit Alignment
Bronze Age, Iron Age, Roman and Saxon features

Scale 1:5,000 (A3)

Principal excavations and features across the Pineham landscape Fig 7

705

PA4

D2

Area

D1

SMS

BD1

HB2

HB3

PA2

BD1

Area A

PA1

track way

PA1

Area B

HB1

PA3

585

E2

RD2 &
HB4- HB10

M1

E1

RD1

0 100m

Development area (Zone H)
Excavation areas
Excavated sections
Pit Alignments (PA1, PA2, PA3 and PA4)
Late Bronze Age to Iron Age ditches
Middle to late Iron Age settlement
Roman settlement
Saxon fields, RD2 and burials
medieval cultivation strips
post-medieval and modern intrusion

Scale 1:2,500 (A3)

The areas of excavation and features Fig 8

1.4 Pineham Zone H: Previous archaeological work

A geophysical survey of the site was undertaken by MOLA Northampton in August 2014 (Meadows *et al* 2014; Fig 7). This identified anomalies consistent with two irregular pit alignments apparently associated with a possible ditched track or drove-way running east to west across the southern half of the northern field. A number of rectilinear enclosures were identified offset from the northern side of this possible route-way. Traces of other rectilinear enclosures and possible ditches were also identified in the survey in the southern fields.

A second phase of archaeological evaluation comprising the excavation of 84 trenches took place in the spring of 2015 by MOLA Northampton (NHER ENN107946; Simmonds 2015). The trial trenching clearly defined the extent of archaeological features located on the higher ground. The features comprised pit alignments thought to be of Iron Age date and a palimpsest of ditches forming enclosures and boundaries believed to originate in the Iron Age and Roman period and, in some cases, possibly continuing in use into the early Saxon period. The trenching exercise also identified smaller features such as gullies, postholes or small pits which were not visible on the geophysical survey.

The geophysical survey indicated that the pit alignments respected the position of an east to west aligned ditch, perhaps indicative of continuity from an earlier designed landscape.

The northern field during trial trenching, looking north-east Fig 9

The geophysical survey also found traces of former field boundary ditches and plough furrows associated with medieval or post-medieval cultivation systems. A small number of features associated with World War II use of the area were also identified as well as the location of a high pressure gas main and pressurized concrete slurry pipeline running south-east to north-west across the southern end of the development area.

1.5 Scope of mitigation works

The purpose of the archaeological works was to mitigate against the impact of the development on the archaeological deposits through preservation by record. A total of *c*15ha was machine stripped in two main areas (Fig 8).

The areas comprised:-

Excavation area: Areas A and B were separated by a modern trackway and covered the prehistoric/Roman settlement enclosures and Iron Age pit alignments (*c*7ha).

Strip, Map and Sample (SMS) area: Area covering the field boundaries (*c*8ha). The eastern portion of the SMS area was only partially stripped owing to the obstruction of an overhead electrical line. Following the completion of the main works the County Archaeological Advisor requested an extension to the north of the SMS to excavate a length of pit alignment.

1.6 Methodology

The archaeological mitigation works for the proposed development were designed and overseen by Nansi Rosenberg of Prospect Archaeology on behalf of Prologis. Management for MOLA was undertaken by Anthony Maull and Mark Holmes. The fieldwork for MOLA was led by Carol Simmonds, Jim Burke and Chris Jones. Monitoring of the programme of fieldwork was carried out by Lesley-Ann Mather, the County Archaeological Advisor (CAA) for Northamptonshire County Council. All works were conducted in accordance with the Chartered Institute for Archaeologists' *Code of Conduct* (CIfA 2014a), *Standard and Guidance for Archaeological Excavation* (CIfA 2014b), *Standard and Guidance for Archaeological Watching Brief* (CIfA 2014c), as well as Historic England's *Management of Research Projects in the Historic Environment* (HE 2015).

The excavation took place between September 2015 and May 2016. The overburden of topsoil and subsoil was machine excavated using 360 degree mechanical excavators under constant archaeological supervision (Fig 10). During the works a digital plan of all features and excavated sections was maintained by means of a Leica Viva Global Positioning System (GPS), although features were also hand planned to scale. Features were hand-excavated and recorded following standard MOLA procedures (MOLA 2014). The site data has been entered into a Microsoft Access database.

A total of 166 pits out of 199 pits that were recorded were 50% excavated, and of those half-sectioned approximately 40% were fully excavated. The rationale for 100% excavation was dependent on artefact retrieval and also if there were variations in the pit morphology. The number of pits to be fully excavated was agreed at meetings with the CAA and the consultant during the fieldwork. The human remains were uncovered, treated and recorded in accordance with a site specific Ministry of Justice (MoJ) burial licence.

2 RESEARCH OBJECTIVES

The purpose of the work is to determine and understand the nature, function and character of the archaeological site in its cultural and environmental setting.

The general aims of the investigation are to:

- Mitigate the potential impacts from the proposed development of the site through archaeological recording, analysis and dissemination;
- Refine the date, nature, character and extent of the activity on the development site;
- Recover artefacts to assist in the development of type series within the region;
- Recover palaeo-environmental remains to determine past local environmental conditions;
- Create an organised and indexed site archive, and to;
- Analyse, interpret and report on the findings from the fieldwork.

2.1 Research frameworks

Specific research objectives were drawn from national and regional research frameworks documents (Knight *et al* 2012, replacing Cooper 2006, EH 1997) and can be used to enhance our understanding of the Iron Age, and Roman activity on the site. Agendas relating to Saxon agricultural practices and dispersed settlement were also considered.

The specific research objectives highlighted in the WSI are as follows:

Iron Age

- Understanding the development of field systems land boundaries and how this relates to changes in the agrarian landscape 4.6.1
- What are the economic, social or political roles of pit alignments 4.6.2
- How may studies of the boundaries within, around and between settlements contribute to analysis of structured deposits 4.7.3
- Whether there is any evidence for agricultural intensification 4.8.1
- Contribute to understanding of the rural economy and diet 4.8.2
- Contribute to understanding the relationship between settlement patterns and agricultural changes 4.8.3

Roman

- The relationship between field and boundary systems to earlier systems of land allotment, and how these boundary networks developed over time 5.4.4
- Chart more closely the processes of agricultural intensification and expansion and the development of field systems 5.5.4

The area to the west of Northampton, within which Pineham falls, contains an increasing number of pit alignments, with known examples excavated at Upton (Walker and Maull 2010), St Crispins, and Harlestone Quarry (Chapman *et al* 2015) in addition to other examples identified from cropmarks and as yet unreported excavations in the Dallington area. The site was able to add to the growing corpus of data about these sites within a relatively small area. The works provided an opportunity to examine how these features may relate to each other and how geological and topographic factors may have influenced their location (watersheds, river courses, etc).

2.2 Site specific research objectives

More specific site-based objectives were to:

- Investigate the spatial extent, morphology and function of prehistoric, Iron Age, Roman and possible Saxon activity at Pineham;
- Establish the dating and function of the enclosures and ditches across the site;
- Establish the function of the ditches and enclosures at the south of the site;
- Establish if features found in the SMS area relate to settlement;
- Establish if any industrial or crop processing is taking place on site, and to;
- Define whether there is evidence for continuity or hiatus between the prehistoric, Iron Age and Roman phases.

The SMS area during excavation, looking east Fig 10

3 SUMMARY OF EXCAVATION RESULTS

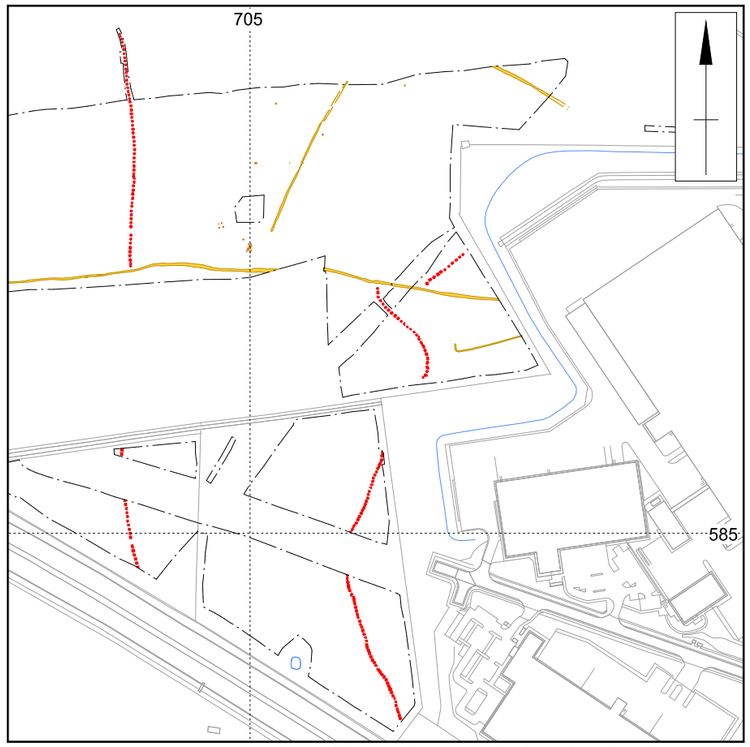
3.1 Site chronology

Archaeological features were encountered across all excavated areas, with the principal concentration in the southern part of the investigation area (Fig 11). The ditches and pits across the northern part (SMS area) of the site were of low density over a larger area. The archaeological remains primarily consist of enclosure ditches, ring ditches, ditches defining paddocks, at least 184 pits across four pit alignments as well as a scatter of other pits, postholes and other feature types including two wells and a substantial quarry pit.

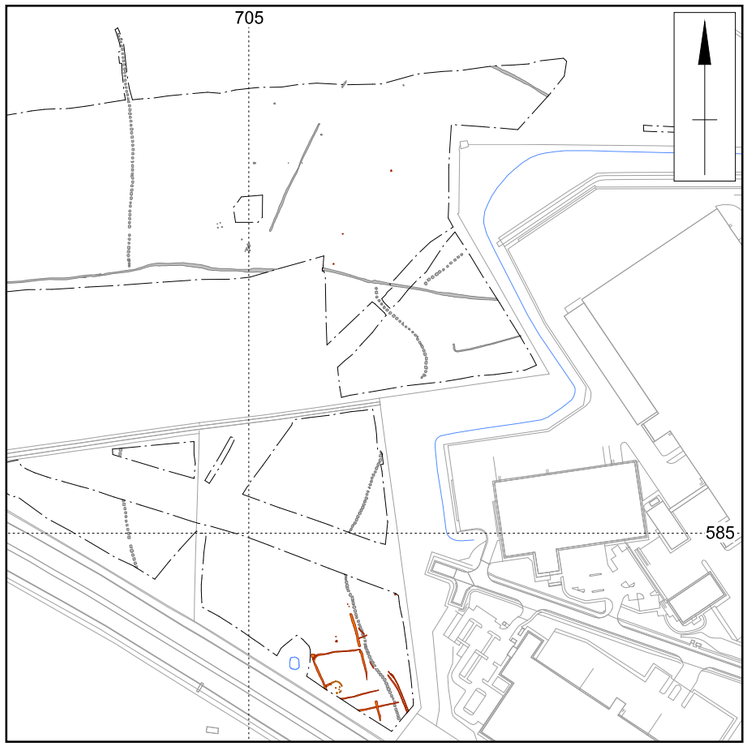
The following statement, Table 1 and Fig 11 summarise the general chronological development of the site. For the prehistoric period activity commences from the late Bronze Age /early Iron Age with the establishment of linear boundaries comprising a ditch and pit alignments. An enclosed settlement comprising one identifiable round house was present in the southern part of the site and probably formed a satellite enclosure to the main middle to late Iron Age settlement 0.5km to the east (Brown 2007, Carlyle 2006, ULAS 2015). Roman occupation continued in the same area as the Iron Age settlement perhaps suggesting continuity of use. The next significant identified land use was the development of conjoined enclosures located in the SMS in the 5th to 9th centuries AD. It is not clear at this stage whether the enclosures had Iron Age or Roman antecedents. Following the mid Anglo-Saxon period there was no evidence for use until the adoption of the ridge and furrow cultivation system in the medieval period. Parliamentary enclosure in 1779 redefined the agricultural landscape.

Table 1: Site chronology

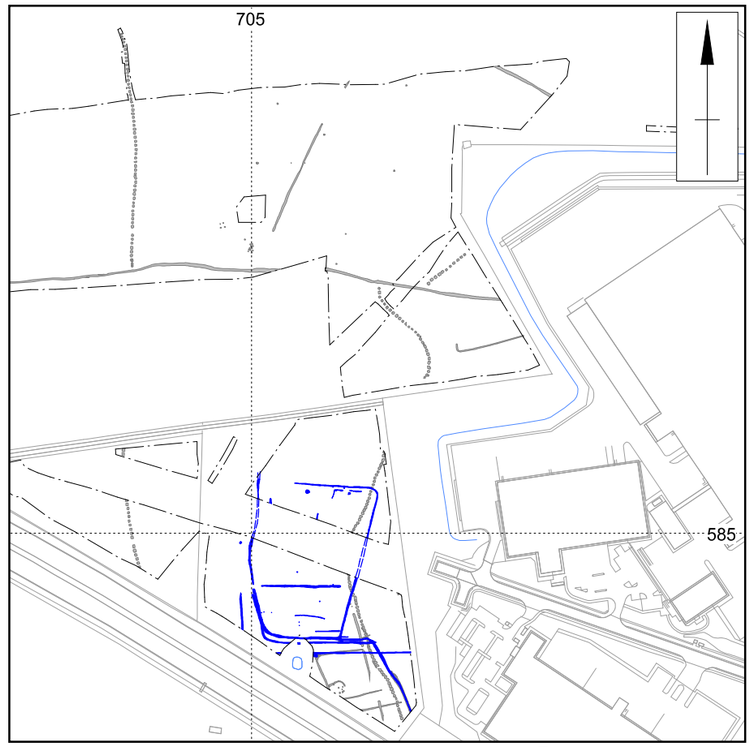
Phase	Date	Description
1	Late Bronze Age/ Iron Age	Sinuous boundary ditch (BD1)
		Four separate lengths of pit alignment (PA1, PA2, PA3 and PA4)
		Two perpendicular ditches
2	Iron Age	Settlement comprising ring ditch RD1 within enclosure and associated fields.
		Two adjacent inhumations (HB2 and HB3) post dating disuse of BD1
		Ditches
		Structures PHG1 and PHG2
3	Roman	Redefinition of enclosure and fields, wells, HB1
4	Saxon	Possible barrow (RD2) with burials (HB4, HB5, HB6, HB7, HB8, HB9 and HB10) outside of it
		Plots/ Enclosures (SMS)
5	Medieval	Ridge and furrow cultivation
6	Post-medieval	Field boundaries following enclosure



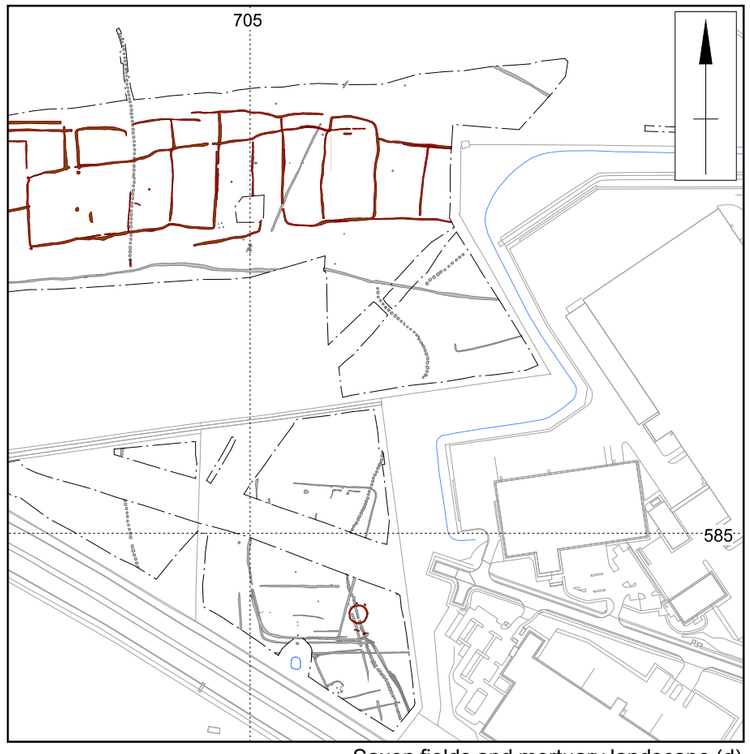
The early to middle Iron Age landscape (a)



Late Iron Age settlement (b)



Roman settlement (c)



Saxon fields and mortuary landscape (d)

medieval and post-medieval features (e)

0 250m

Scale 1:5000 (A3)

Phases of site development Fig 11

3.2 Period 1: Late Bronze Age to Iron Age

The boundary ditch

The earliest probable feature in the landscape was a sinuous ditch, at least 449m long extending westwards and eastwards beyond the limits of excavation (Fig 12). It had been maintained on at least one occasion. The ditch formed the focus of the early landscape as three of the four Pit Alignments (PA1, PA2 and PA4) respected its position, perhaps suggesting it was a significant feature in the landscape at the time of the excavation of the pits.

There is potential for obtaining scientific dates for the initial silting of the ditch as well as the final disuse. A fragment of antler was found in the basal fill of ditch [2209] in Trench 22 (Fig 13) and cut into the upper fill of the ditch was a crouched inhumation.

The western end of the boundary ditch, looking west Fig 12

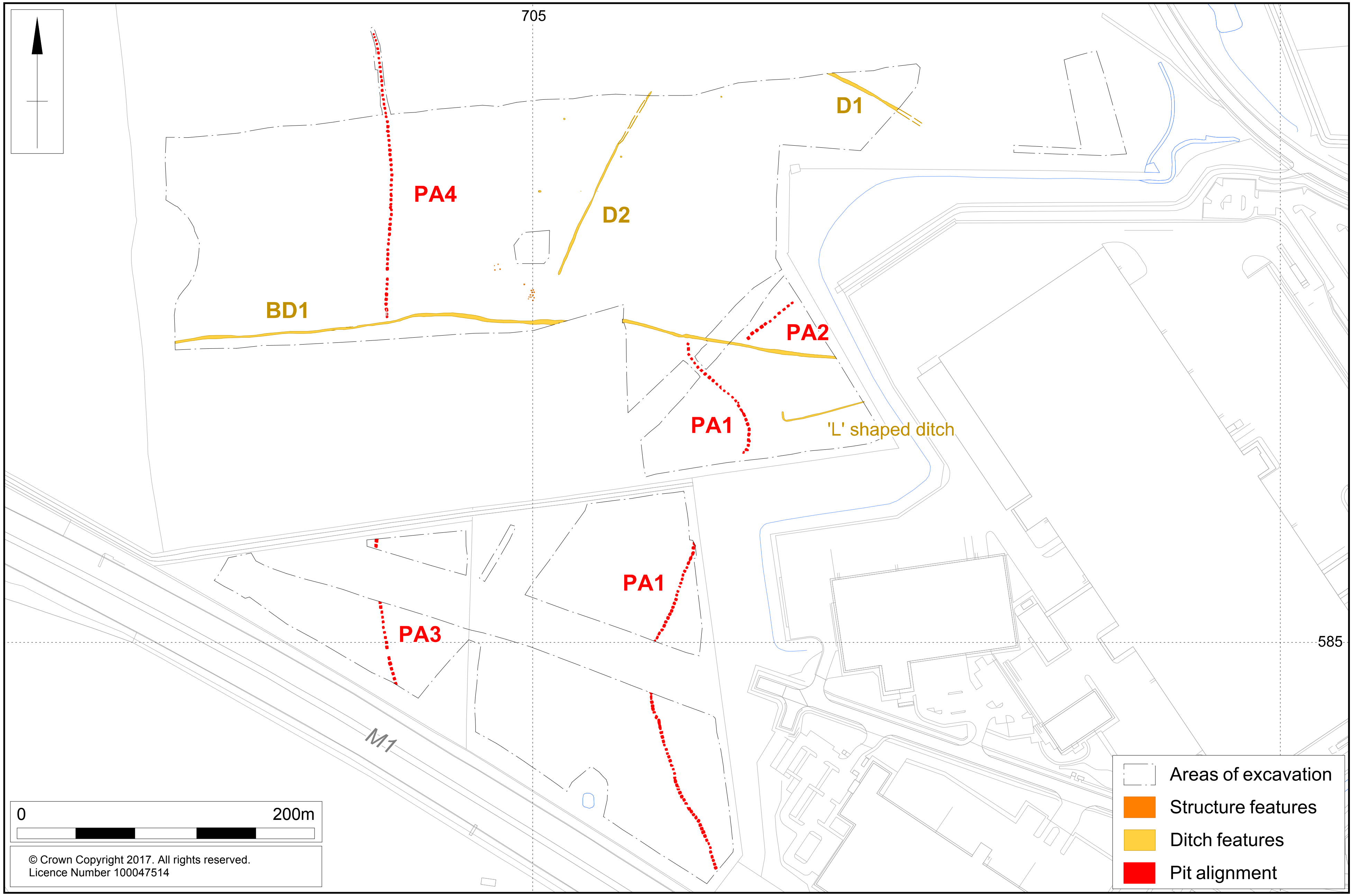
Boundary ditch, [2209], with antler, looking west Fig 13

Situated 37m to the south of the boundary ditch was a L-shaped ditch with its long axis aligned east to west. It was at least 63m long and extended eastwards beyond the limits of excavation.

Pit alignments

Four separate lengths of pit alignment (PA1, PA2, PA3 and PA4) were recorded during the archaeological works. Pit Alignments PA1, 2 and 4 all seemed to terminate up against the line of Boundary Ditch BD1. This perhaps may suggest that it was still a significant, contemporary feature in the landscape, and may have formed a focus for the pits. PA3 did not extent far enough to determine if it also was aligned off the ditch. This is a similar arrangement to a contemporary landscape recorded on the opposite side of the Nene valley at South Meadow Road in Upton, where a pit alignment terminated against a contemporary ditch (Speed 2015). Additionally the pit alignment followed the slope down to a tributary of the river Nene, which it met at a right angle.

The pits were generally square, or occasionally rectangular, with rounded eroded corners. A small proportion of the pits had sherds of pottery and worked flint. Bulk soil samples contained very low numbers of grains and rare fragments of cherry/plum charcoal.



Scale 1:3,500 (A4)

Late Bronze Age to Iron Age activity Fig 14

Pit Alignment PA1

Pit Alignment PA1 was a sinuous line of at least 108 pits extending north to south over a distance of 390m within Area A (Fig 15). It extended southwards beyond limit of excavation and development area. At its northern end, it ended, or began, at the Boundary Ditch BD1. To the south, the line of the pits was observed to follow a sharp curve around an area of tree root disturbance, perhaps suggesting that the trees which once stood there were considered significant in the landscape at the time of pit alignment construction.

Aerial view of the southern end of PA1, looking south Fig 15

Pit Alignment PA2

Pit Alignment PA2 comprised eleven pits, aligned south-west to north-east, totalling c.40m long (Fig 16). The pit alignment respects the boundary ditch BD1. The pit alignment stopped 4.4m short of the eastern edge of excavation, perhaps either suggesting that it was a short length of pit alignment or that there was a break in the pit alignment similar to a gap seen in PA3.

General view of PA1 and the junction of PA2 and the boundary ditch, looking south-east Fig 16

Pit Alignment PA3

Pit Alignment PA3 comprised a recorded total of 18 pits in the western part of Area B. It was aligned north to south and it is likely that a number of pits continued beneath the easement left for the gas and Cemex pipes. The total minimum length of the pit alignment was *c*100m. It did not continue to the boundary ditch.

Towards the southern portion of the pit alignment there was a clear gap of *c*4.0m between pits, similar to the gap identified in PA2.

Pit Alignment PA3 during excavation, looking north Fig 17

Pit Alignment PA4

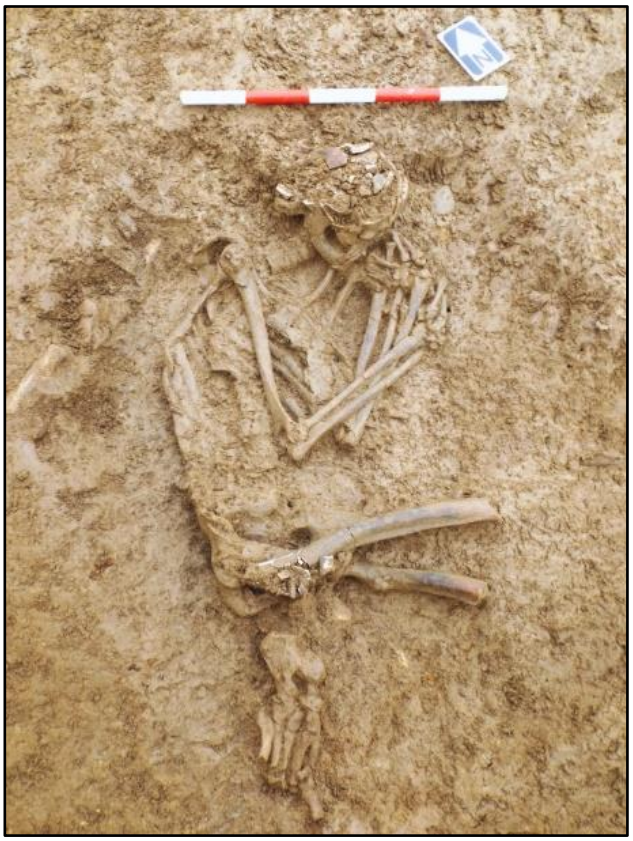
Pit Alignment PA4 was located in the western part of the SMS Area and unlike the other pit alignments, it was not visible on the geophysical survey results. This was due to being masked by strong positive magnetic signals of the open field system which in this area of the site contained darker cultural soils. The pit alignment PA4 projected northwards from BD1 and comprised 62 pits over a distance of 192m (Fig 18). It may have continued northwards outside of the proposed development area but the depth of overburden including colluvium (*c*1.0m) and the presence of large spoil heaps meant it could not be recorded further. Unlike the other pit alignments there was no obvious gap, instead the pits had been truncated by later ditches. Sherds of pottery suggest that the pit alignment may still have been open during the latter part of the middle Iron Age (see Chapman, Section 4.2, this report).

General view of Pit Alignment PA4, looking north Fig 18

Burials HB2 and HB3

In the area of the boundary ditch BD1 was a pair of tightly crouched inhumation burials (HB2 and HB3). Both were orientated north-east to south-west. HB2 was interred in the upper fill of the boundary ditch with no visible sign of a grave cut. HB3 was interred in an oval-shaped grave located *c*2.60m to the north of HB2.

It is obvious that the burials occurred after the disuse of this part of the boundary ditch although they cannot at this stage be firmly dated. Chinnock (Section 5.1 below) notes that a number of different periods utilised crouched burial as a funerary practice, including the Bronze Age, Iron Age and Anglo-Saxon periods.



Inhumation HB2, looking north-east Fig 19

Inhumation HB3, looking north-east Fig 20

Undated ditches in the SMS area

Two undated, but early, ditches (D1 and D2) were situated in the north-east of the site, aligned perpendicular to each other. Ditch D1 was aligned north-west to south-east and was at least 52m long. To the west, Ditch D2 was longer but shallower and more intermittent in its survival; it was also cut by later ditches. It had a projected length of *c*135m. The ditches did not have any datable material and their alignment is very different to other features within the excavated areas. However the alignment of ditch D2 is mirrored by a ditch situated 272m to the east in the 2006 SMS area (Brown 2007).

Post-built structures

To the north of the boundary ditch were the remains of two post-built structures (Structure 1 and Structure 2). Structure 1 comprised four posts arranged in a square, measuring roughly 2.6m square. There were no indications of post pipes or packing. Two sherds weighing 14g which were recovered from one of the postholes [9050]/(9049), have been provisionally assigned an early Iron Age date.

Structure 2 comprised a rectangular array of eleven post pits which were situated to the south of the enclosures (Fig 21). The structure was 7.5m long (north-east to south-west) by 3.8m wide. The majority of the post pits had vestiges of post pipes generally appearing as a rich organic deposit on one side of the post pit. A small amount of Iron Age pottery was recovered from two of the post pits.

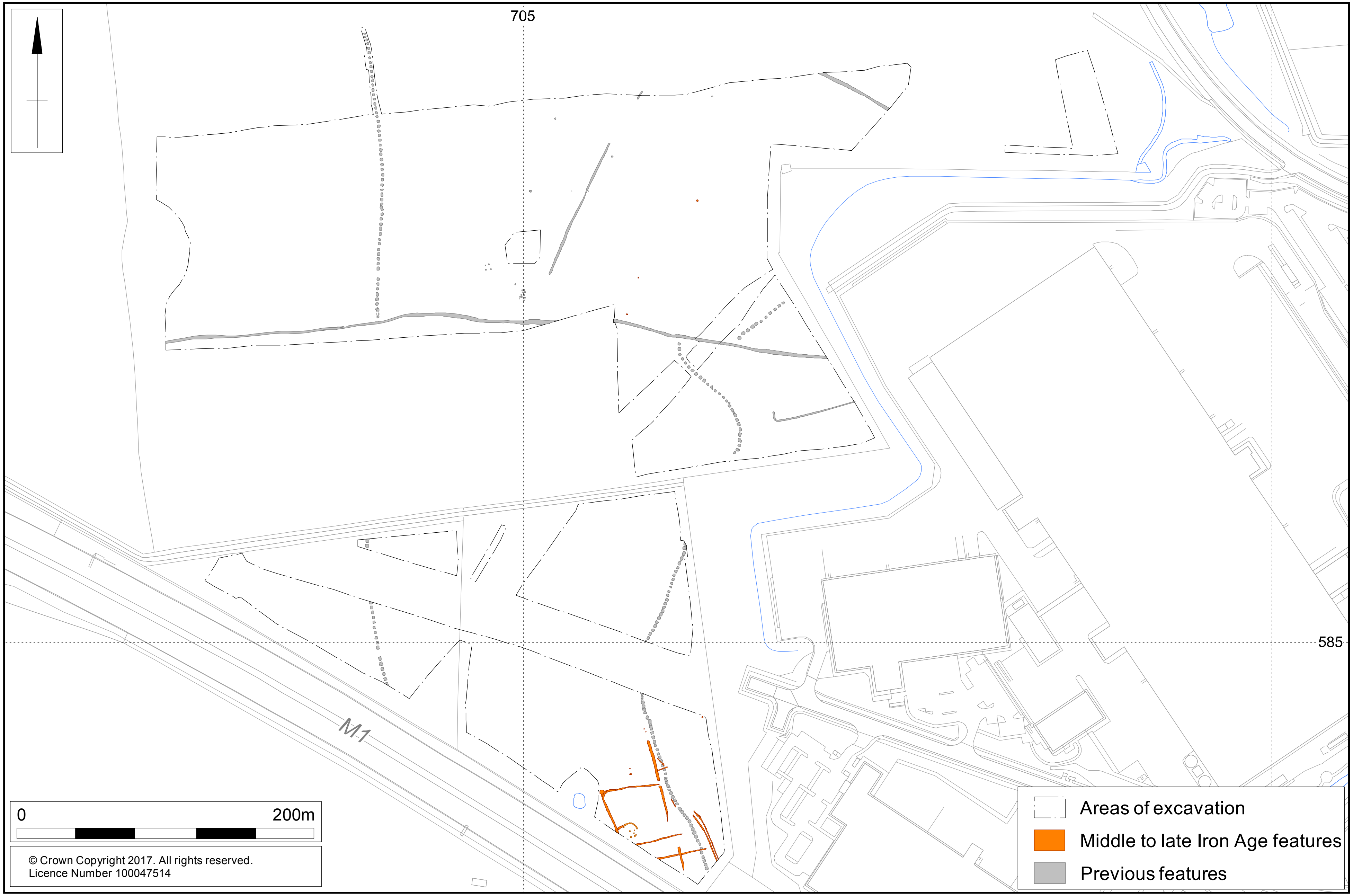
Structure 2 during excavation, looking north-west Fig 21

3.3 Period 2: Middle to late Iron Age settlement

Late Iron Age settlement was situated in the southern part of Area B and comprised a ring ditch (RD1) set within rectangular enclosure E1 (Fig 23). The enclosure, defined by a ditch, encompassed at least 2500 sq. metres, and aligned north-west to south-east, roughly perpendicular to PA1 to the east. The south-western corner had been disturbed by the construction of the M1 motorway. The eastern side of the enclosure had been truncated by later ditches. To the north and east of the enclosure were other ditches which may be related to Iron Age settlement activity.

The ring ditch RD1 (Figs 22 and 23) comprised a ditch with an internal diameter of 8.8m, an east facing entrance and was also open on its western side. There were three postholes which were internal to the ring ditch. From the ring ditch itself, a thick-walled storage jar of the early 1st century AD was recovered.

Ring Ditch RD1, looking south Fig 22



Scale 1:3,500 (A4)

Middle to late Iron Age settlement Fig 23

3.3 Period 3: Roman enclosures (mid 1st century AD – 3rd century AD)

Enclosure

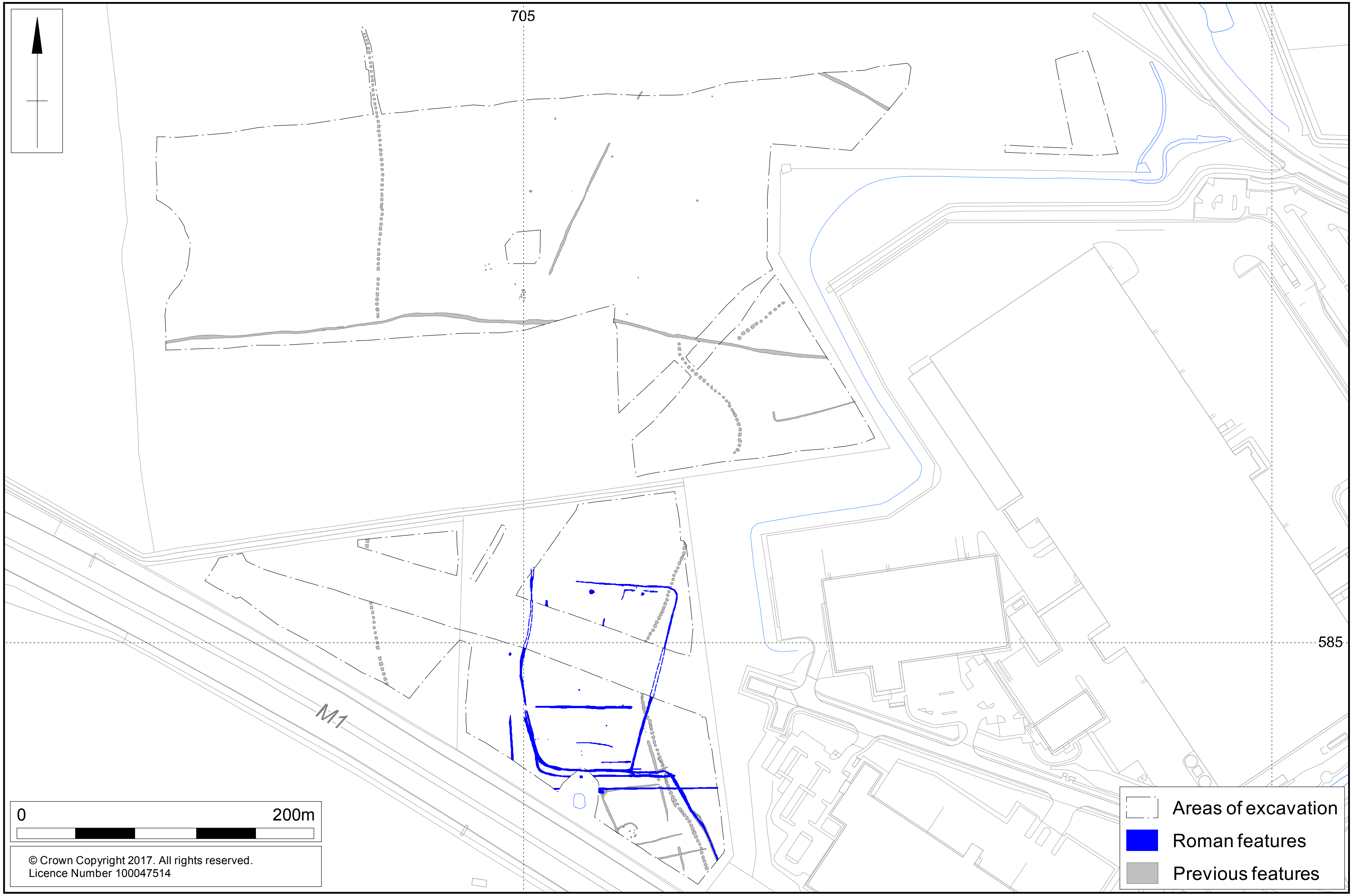
The late Iron Age settlement was directly replaced from the 1st century AD by a set of enclosures and fields defined by ditches on a different alignment (east to west) which extended the settlement area to the north. Only the western side of the enclosures survived, the northern side had been truncated by the post-medieval quarrying and the eastern side by modern development.

The enclosure (E2) was rectangular in plan, orientated east to west, and was defined by a ditch. It encompassed at least 1.6ha and was subdivided by ditches and gullies.

Within the enclosure were two large wells or watering holes [11166] and [11578]. The northernmost well [11166] was teardrop shaped (Fig 24) and situated in the northern part of the enclosures. A bulk soil sample <15> was very unproductive in terms of archaeo-botanical remains (Gray, Section 5.3). The southernmost one [11578] was more sub-rectangular in plan and its upper levels had been truncated by ditches.

The well [11166] fully excavated, looking west Fig 24

A later stage of activity comprised the cutting of a roughly north-west by south-east aligned ditch on the eastern side of the enclosure (Fig 25). This ditch replaced the original southern arm of enclosure, continuing due east, before turning sharply to the south-east to follow the alignment of the earlier Iron Age enclosure and the pit alignment.



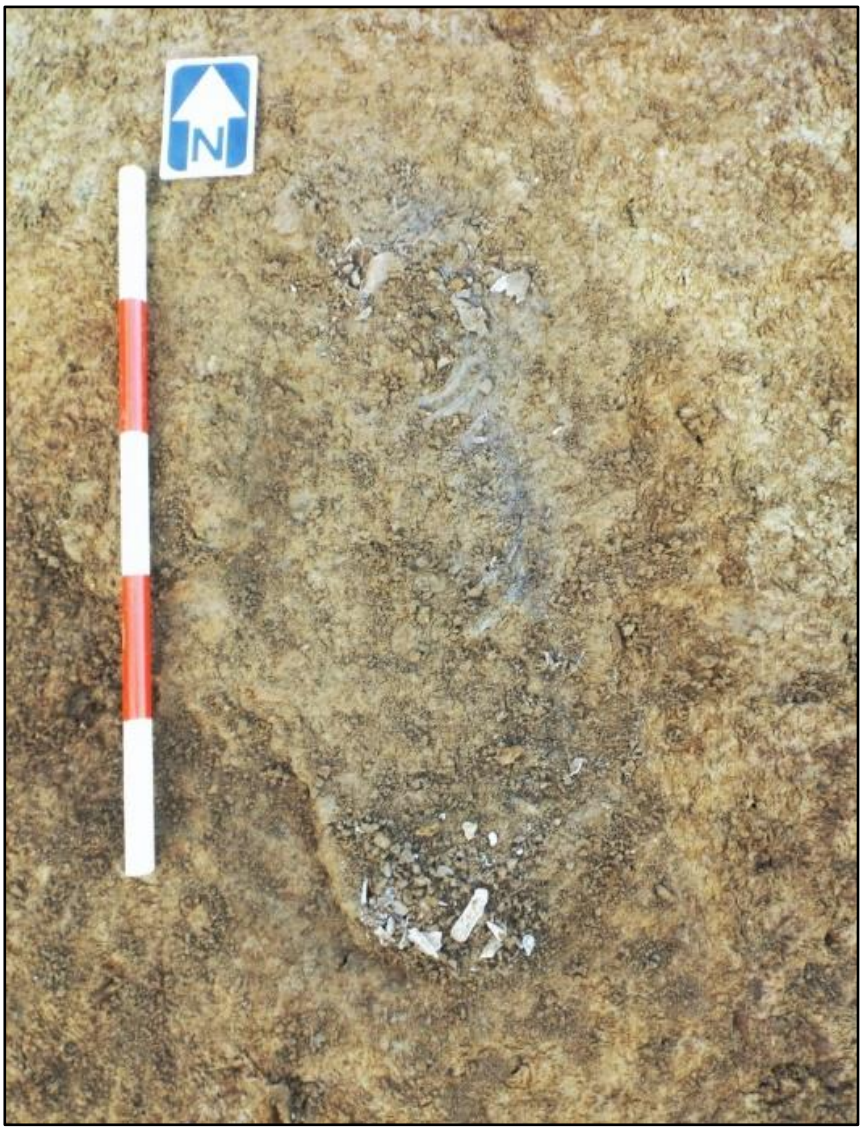
Scale 1:3,500 (A4)

Roman enclosures (mid 1st century Ad - 3rd century AD)

Fig 25

Burial

In the northern part of the enclosure was the grave of a child (HB1), orientated north to south. The skeletal remains were very fragmentary. Despite the lack of finds it is assumed to be Roman located as it is within the enclosure and away from other features.



Inhumation HB1, looking north Fig 26

3.4 Period 4: The Saxon landscape

The Ring Ditch RD2

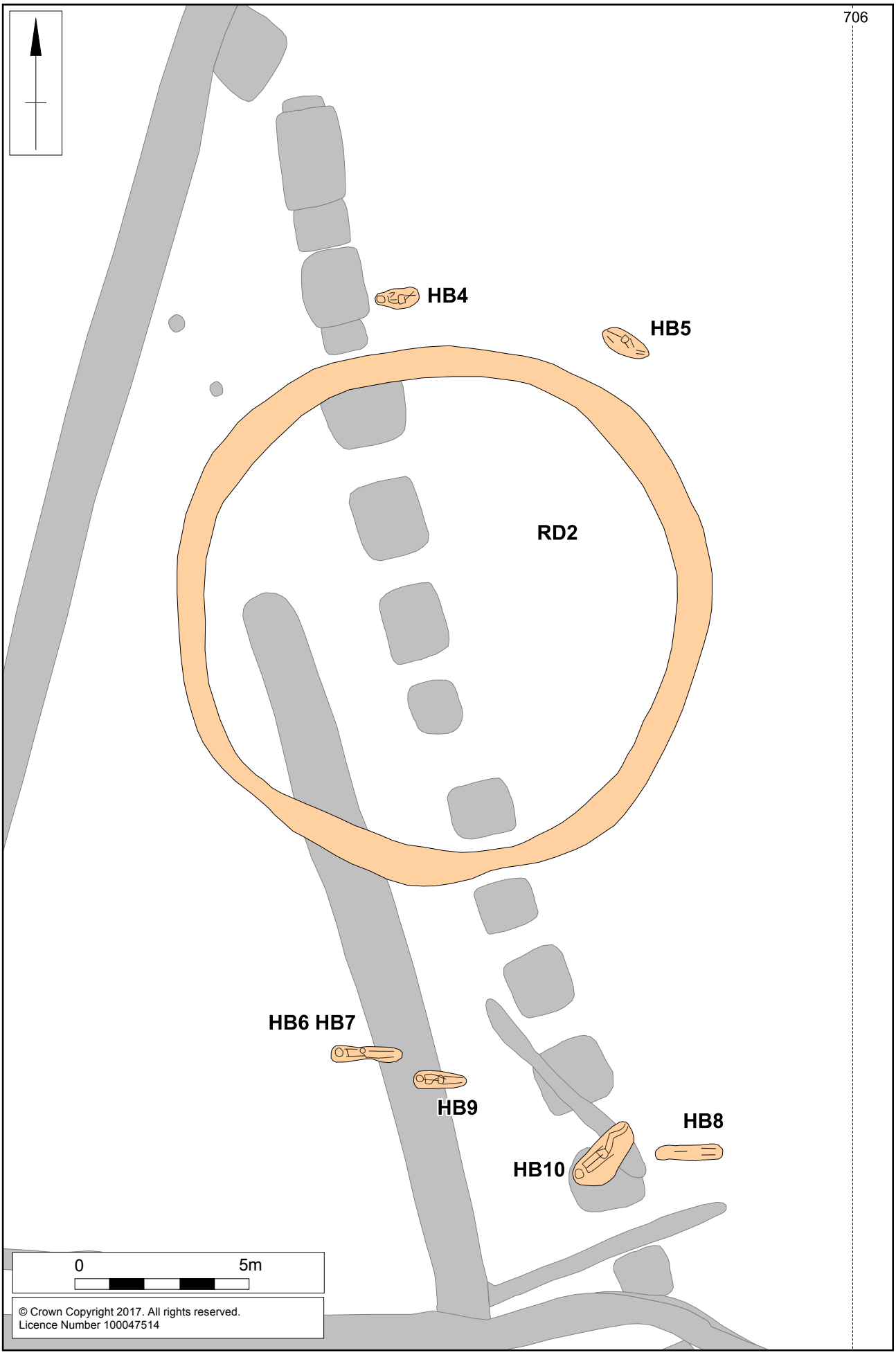
Occupying the south-east facing slope overlooking the Nene Valley and situated at *c*73.00m aOD was a ring ditch, RD2 (Figs 27 and 28). It had an external diameter of *c*15.20m and an internal diameter of *c*13.10m. It was defined by a continuous ditch measuring between 0.40m and 1.1m wide and 0.15m to 0.63m deep. There were no surviving internal features or burials within the ring ditch and any mound had been ploughed out. On its northern side the ring ditch clearly cuts a pit forming part of Pit Alignment PA1, demonstrating that the pit alignment had by this time ceased to function as a relevant landscape element.

The Ring Ditch RD2 and Pit Alignment PA1, looking south Fig 27

The burials

Respecting the position of the ring ditch and situated adjacent to it were seven inhumations (HB4, HB5, HB6, HB7, HB8, HB9 and HB10). Two of the inhumations were to the north (HB4 and HB5) while the remaining five were situated to the south (HB6, HB7, HB8, HB9 and HB10). The inhumations, placed within rectangular graves, varied in terms of condition and preservation. With the exception of HB10 the other inhumations were in shallow graves, and as such had been heavily affected by later ploughing, particularly HB4 where the lower legs had been removed by a furrow.

Inhumation HB10 had been buried in a grave, cut into the backfill of one of the pits for Pit Alignment PA1 and also a short length of ditch. It was an adult male in a supine position with legs flexed. The burial was also notable for its grave goods, a knife blade was positioned across the pelvic area and a spear head was to the south, near the head.



Scale 1:150 (A4)

RD2 and inhumations Fig 28

Inhumation HB10, looking south-west Fig 29

The middle Saxon enclosures

Between the 5th and 9th centuries, probably towards the latter end of that time frame, a field system comprising a set of conjoined enclosures or plots was constructed on the north facing ridge line, encompassing an area of at least 3.51ha. The individual rectangular plots themselves were north to south aligned and defined by ditches.

There were a minimum of three phases of enclosure. The initial smaller phase comprised ditches on the eastern side of the SMS area. These may have had Iron Age or Roman antecedents and perhaps marked the continuation of features from the 2006/7 SMS excavations to the east (Brown 2007). A small quantity of Saxon pottery was recovered from the initial phase probably as a product of final infilling. The main phase shifted the enclosures further to the west. There were at least nine plots, some of which had been modified at least once creating larger units. In general, the fills were homogenous soils although they were much darker and organic towards the western side of the enclosures. A similar pattern is suggested by initial analysis of the pottery which was derived from contexts across the ditch system. There was a greater concentration of material towards the western end. Two 'doughnut' shaped ceramic loom weights were also from this area. This suggests that the western side of the enclosures may have had a more domestic/working focus with livestock management concentrated in the eastern plots.

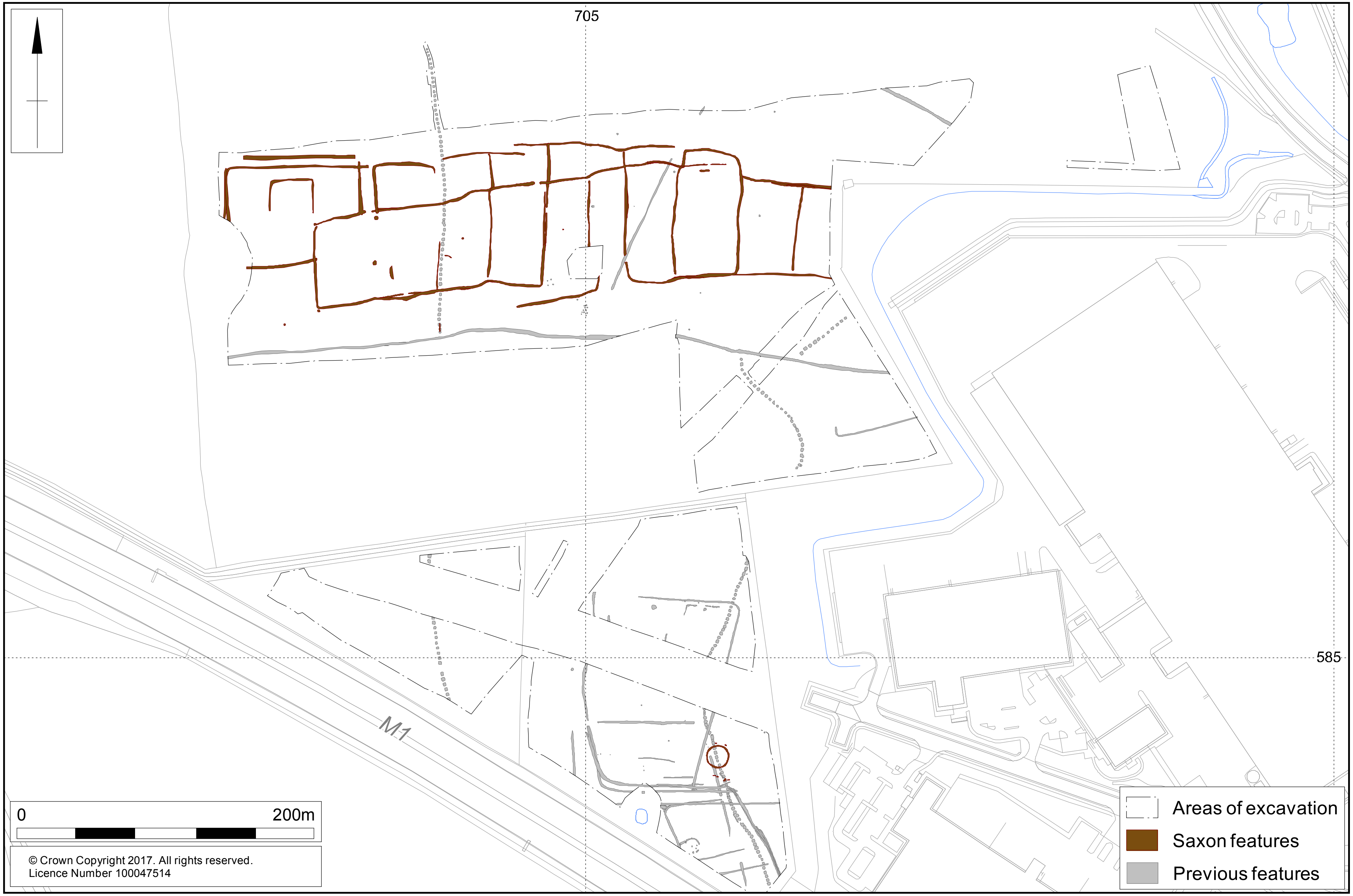


Fig 30 The Saxon field system

Scale 1:3,500 (A4)

3.5 Period 5: Medieval open field system

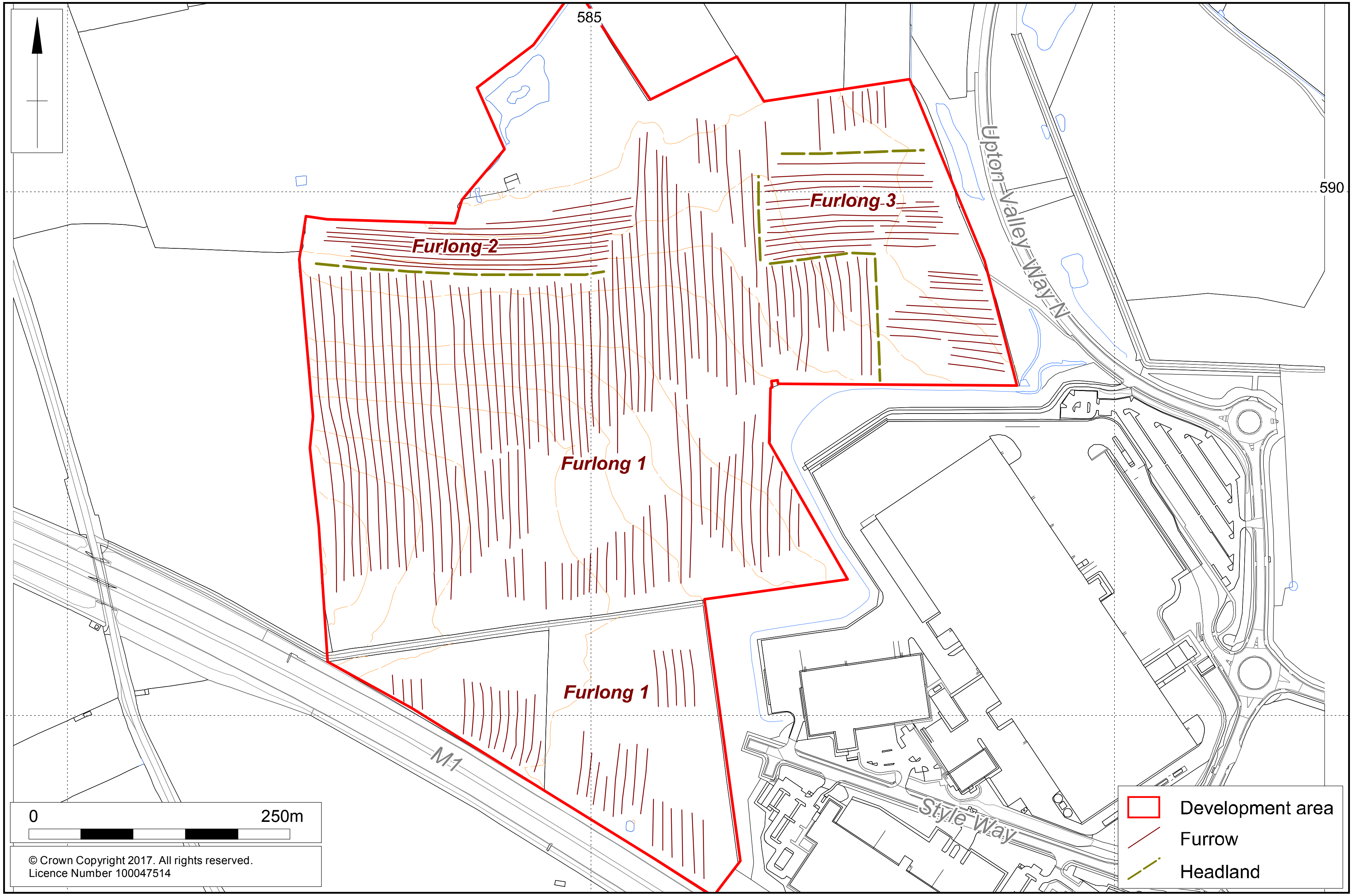
Open field system

The remnants of furrows were recorded during the geophysical survey, the trial trenching and subsequent excavation. The medieval open field system comprised the three distinct areas of furlongs with headlands often surviving as low earthwork banks (Figs 31 and 32).

The bulk of the development area had furrows aligned north to south, roughly perpendicular to the slope, and encompassed an area of c.24.75ha (Furlong 1). They were spaced at least 2m apart, averaged c.3.0m wide and 0.10m deep. The northern edge was defined by a headland which was still visible as a low earthwork bank.

Two other areas of furrows (Furlongs 2 and 3) were located to the north and east of Furlong 1. In general they were aligned east to west, spaced between 1.0m to 2.0m apart, and were 1.5m wide. The profiles were generally broad and shallow with fills of firm, light yellow-brown silty clay, occasional rounded flint nodules and occasional small rounded pebbles.

Aerial view of the SMS area, with Furlong 1, looking east-south-east Fig 31



Scale 1:5,000 (A4)

The medieval open field system

Fig 32

3.6 Period 6: Post-medieval fields and quarrying

Following parliamentary enclosure the open field system was replaced by small rectangular fields (Fig 34) which were generally aligned north to south. The boundaries were defined by ditches, as well as hedgerows and also by large trees.

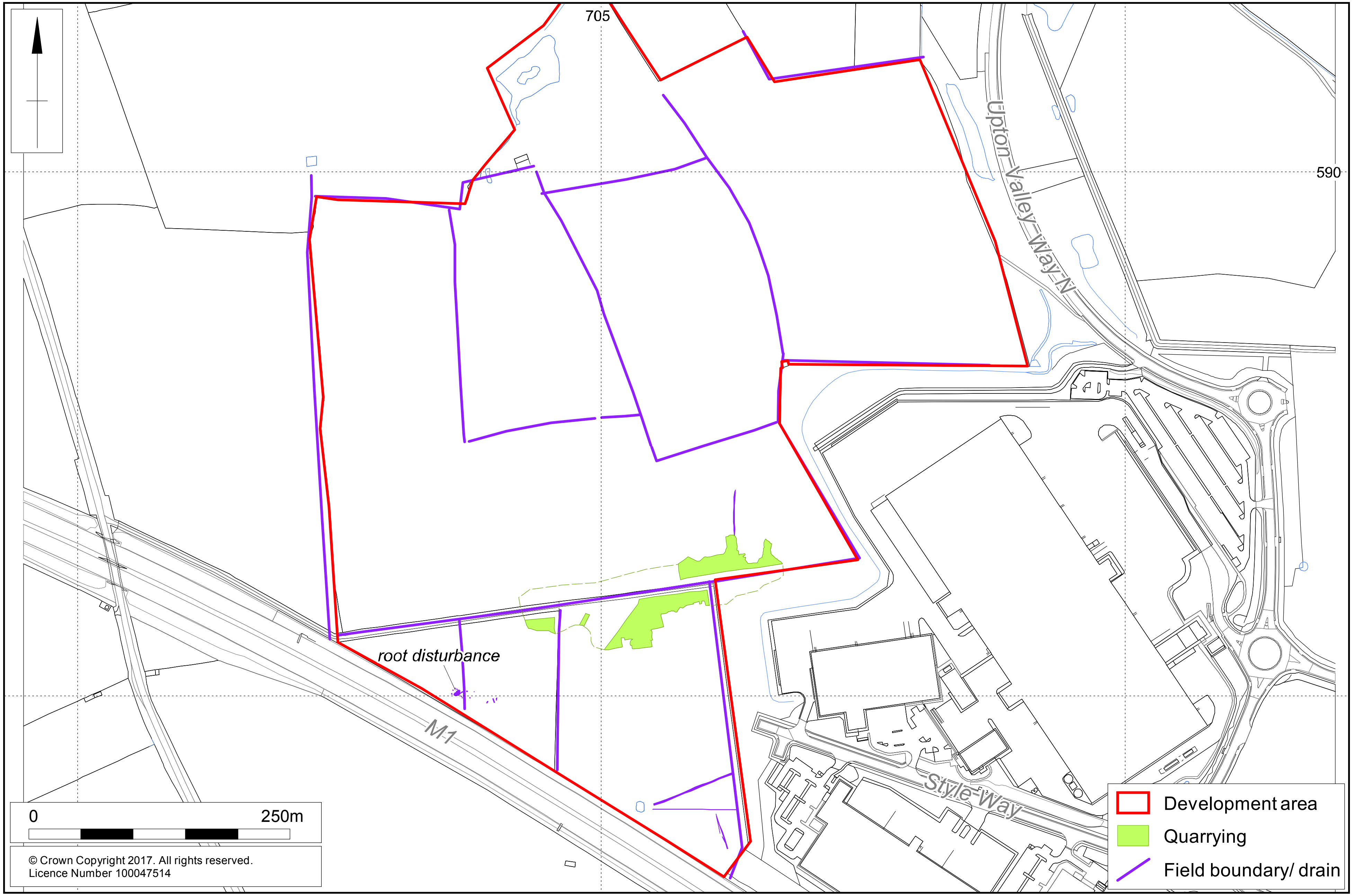
In the late 20th century the majority of the smaller fields were merged to create larger land blocks. Only a few of the trees remain in the landscape. Some of the relict boundaries were still present prior to excavation as subtle changes in topography as low earthwork banks. Plastic pipes to aid drainage had been put in the backfilled ditches (Fig 33).

Post-medieval field boundary, Trench 68, looking north-west Fig 33

From one of the backfilled ditches the metal head of a scythe/ billhook was recovered.

Quarrying

A large area of quarrying (QP1) encompassed a postulated area of at least 1.1ha, or 253m east to west and 75m north to south (Fig 34). It was irregular in plan and located in an area of ferruginous limestones. It was not recorded on the first edition Ordnance Survey map or subsequent mapping, perhaps suggesting that the ferruginous limestone close to the surface was extracted for local use prior to the start of the 19th century.



Scale 1:5,000 (A4)

Post-medieval fields and quarrying

Fig 34

4 THE FINDS

4.1 Worked flint by Yvonne Wolframm-Murray

Introduction

During the excavation in total 218 pieces of worked flint were recovered. They were unstratified or probably residual from later Iron Age, Roman and Saxon features.

Method

The majority of lithics were collected by hand during the excavation although a small number were recovered during the environmental sampling process. Each piece was macroscopically assessed and recorded onto an MS Access spreadsheet by type, condition, possible raw material and tool form.

Raw material and condition

The condition of the unstratified flint was poor with post-depositional damage consisting of frequent nicks and crushing of the edges. The artefacts recovered from features were generally in a good condition with occasional nicks to the edges. Patination was present on *c* 10% of the assemblage, which ranged from a thick white to mottled white or blue discolouration of the surface. One artefact was stained orange. A small portion, *c* 5%, of the flint had been accidently burnt, which showed through thermal fracturing and crazing. One artefact may have been heat treated to improve its workability, its cortex had a reddish discolouration.

The quality of raw material was good with the occasional poorer quality flint utilised. The flint was vitreous of mostly light to dark grey-brown or brown-grey colour, *c*11% of the assemblage was a grey or brown opaque or granular flint. A mostly light to mid, with occasional dark, brown or grey coloured cortex was present on two-thirds of the assemblage. The cortex was smooth and rolled. The raw material was likely to be derived from local river gravel deposits from the river Nene (Bamford 1985).

Assemblage composition

The worked flint comprises 218 pieces of hand excavated worked flint that comprises 144 flakes, 25 blades, five cores and three core fragments, 15 implements, six pieces with retouch, and 21 pieces of shatter or fragments. This is summarised below in Table 2.

The assemblage is dominated by waste flakes and blades. Of the 144 waste flakes, 36 are broken, and of the 25 blades, ten are broken. Five blades and flakes show signs of utilisation with small removals and one blade has sickle gloss along one edge. Miscellaneous retouch is present on two blades, three flakes and one shatter. There are five cores, which mostly produced flakes. The cores are relatively small with single striking platforms, which on two cores showed signs of preparation of the platform. One core has multiple striking platforms. There are also three core fragments, of which one is very burnt.

Retouched tool forms total 15, just under 10% of the assemblage. These include six scrapers, comprising three end scrapers, one end-and side scraper, one side scraper and one scraper fragment. The scrapers are fashioned of flakes that are abruptly to semi-abruptly retouched on the distal ends or lateral edges. One scraper has a flatter edge that may have been re-shaped. Another scraper was manufactured on an elongated flake.

Table 2: Quantification of worked flint

Description	Whole	Broken	Retouched	Burnt	Total
Flake	94	42	3	8	147
Blade	14	11	2	-	27
Fragment	-	5	-	1	6
Shatter	-	14	1	1	17
Cores	5	2	-	1	7
Scrapers	5	1	-	-	6
Arrowheads	1	2	-	-	3
Awl	3	-	-	-	3
Microlith	1	-	-	-	1
Denticulate	1	-	-	-	1
Total	**124**	**77**	**6**	**11**	**218**

Three arrowheads were also recovered, two leaf-shaped and one tanged. Both leaf-shaped arrowheads are of the oval sub-type. One was invasively retouched on one side whereas the other was bi-facially invasively retouched; the latter has both tips missing. The third arrowhead is a crude, functional tanged arrowhead, (Sutton sub-type) and the tang is formed through retouch of the base. Its tip is snapped, possibly due to utilisation.

The awls are fashioned on two flakes and one blade. The blade has its opportunistic shape modified and its end was probably broken through utilisation. The flakes have their proximal ends backed or notched to form the points, which also have been broken off through use.

The assemblage also included one possible plano-convex knife. This is manufactured from a patinated flake, possibly a large blade. In typical plano-convex knife cross-section, the ventral surface is flat and not modified, and in this case patinated. The dorsal surface has been invasively retouched to form a dome; this retouch is not patinated. Both ends are absent. A flake has near the proximal end several notches formed through retouch, a possible denticulate. One microlith was also recovered, this had one lateral edge and the distal end abruptly retouched (scalene point).

Discussion

The technological characteristics suggest a broadly Neolithic to late Neolithic/early Bronze Age date. There is also a Mesolithic and early Neolithic component. The microlith is typical of the late Mesolithic with its small geometric shape. The two leaf-shaped arrowheads are diagnostic of the early Neolithic. The scraper fashioned of the elongated flake is more common of the earlier Neolithic as are denticulate. Platform preparation or maintenance of cores is more prevalent in the earlier part of the Neolithic, notable in a core rejuvenation flake.

The tanged arrowhead is diagnostic of the late Neolithic/early Bronze Age and plano-convex knifes are more common at this date. Cores with multiple striking platforms are also more typical of the later Neolithic. The remaining scrapers can be broadly dated to the Neolithic to late Neolithic/early Bronze Age. The dominance of flakes over blades is also typical of the later date along with the broad and long cortical striking platforms or squat flakes. There was little evidence of the soft hammer struck flakes or blades.

Early prehistoric features have not been securely identified. One flake and one blade were recovered from an undated ditch which was aligned at a different angle to a

later field system and probably pre-dated them. The two pieces of flint are however not more precisely datable than to the late Neolithic/early Bronze Age. Also of note are two pits [11234] and [11239], which have the single largest concentration of flint within a context; contexts (11231), (11232) and (11327).

The tool types present in the assemblage indicate a number of activities were taking place, such as hunting in the case of the arrowheads, and hide processing or domestic activity as indicated by the scrapes and awls. The overall concentration of flints is of interest. The majority, over two-thirds, of the assemblage was recovered from a relatively small part of the site in the southernmost area adjacent to the Iron Age and Roman enclosure. This also coincides with the more stoney geology of the site. The assemblage bears some similarities to that recovered during previous excavations in 2006 (Carlyle 2006; Brown 2007) in date and composition, which included another leaf-shaped arrowhead and further scrapers.

4.2 The prehistoric pottery by Andy Chapman

A total of 5.7kg of pottery is from hand-built vessels of probable prehistoric date. This comes from 146 contexts at an average of 39g per context, with only 11 contexts producing in excess of 100g of pottery. The typical context group comprises between one and four/five sherds with a total weight of around 10-30g. The largest single group weighs 677g. Overall, the assemblage is highly fragmented with few diagnostic forms identifiable.

For the purposes of assessment, all of the larger context groups have been fully quantified to fabrics, but as many of the smaller groups have not been quantified it is not possible to provide a total sherd count or an average sherd weight for the entire assemblage or sub-groups within it.

In addition to quantification by fabric type, the characteristics of some of the larger groups have been described to provide a preliminary assessment of the likely date, although these should be treated as provisional until the full analysis has been completed. They are listed below within a combination of structure groups for the main linear boundary ditch and the lengths of pit alignment, and in two broader area groups, context numbers in the 9000s, covering an area of multiple ditched enclosures and discrete pits and postholes, and context numbers in the 11000s, which covers an area of Iron Age settlement including at least one roundhouse.

Fabrics

Fabric a: Shelly. Containing quantities of crushed fossil shell. Iron Age

Fabric b: Sandy & shelly. Containing quantities of crushed shell, as Fabric a, but a harder fabric containing sand, giving the sherds a harsh surface texture. Iron Age

Fabric c: Sandy. Containing sand and forming a hard fabric, giving the sherds a harsh surface texture. Iron Age and beyond?

Fabric d: Grog. Containing small rounded pellets of grog. Probably late Iron Age.

Fabric e: Ironstone & mica. A soft fabric containing a range of inclusions including small pieces of red ironstone, small rounded pellets of grog and mica. Probably late Iron Age.

Table 3: Quantification of prehistoric pottery

Context groups/ Structure groups	Total Weight (g)	No of contexts	Ave weight (g)/ context	Contexts > 100g (Max weight)
Linear boundary ditch	300g	6	50.0g	1 (150g)
Pit alignment PA1	1225g	38	32.2g	2 (138g)
Pit alignment PA2	0	0	0	0
Pit alignment PA3	105g	7	15.0g	0 (23g)
Pit alignment PA4	381g	13	29.3g	1 (167g)
Trenching	78g	9	8.7g	0 (35g)
Context Nos 9000s ditched enclosure system	400g	20	32.2	1 (400g)
Context Nos 11000s Iron Age enclosure	2970g	53	56.0g	6 (677g)
Totals	**5702g**	**146**	**39.1g**	**11 (677g)**

Table 4: Quantification by fabric type (weight)

Area/ Context group	All Fabrics	Fabric a Shelly	Fabric b Shelly/ sandy	Fabric c Sandy	Fabric d Grog	Fabric e Ironstone & mica
Linear boundary ditch	266g	210g (78.9%)	29g (10.9%)	27g (10.2%)	-	-
Pit alignment PA1	778g	167g (21.5%)	60g (7.7%)	531g (68.3%)	20g (2.57%)	
Pit alignment PA2	-	-	-	-	-	-
Pit alignment PA3	15g	-	15g (100%)	-	-	-
Pit alignment PA4	361g	220g (60.9%)	28g (3.6%)	113g (31.3%)	-	-
Trenching	59g	21g (35.6%)	3g (5.1%)	-	35g (59.1%)	-
Context Nos 9000s ditched enclosure	578g	58g (10.0%)	15g (2.6%)	95g (16.4%)	10g (1.7%)	400g (69.2%)
Context Nos 11000s Iron Age enclosure	2614g	467g (17.9%)	43g (1.6%)	1631g (62.4%)	225g (8.6%)	248g (9.5%)
Totals	**4608g**	**1143g**	**165g**	**2397g**	**255g**	**648g**
Percentages	-	**(24.8%)**	**(3.6%)**	**(52.0%)**	**(5.5%)**	**(14.1%)**

Fabrics and chronology

The quantification to fabric type (Table 4) applies to the proportion of the assemblage fully quantified, which comprises 81% of the total assemblage by weight.

Unusually for Northamptonshire, hard sandy fabrics (c) dominate the assemblage, forming 52% of the total by weight. Shelly fabrics (a), which normally dominate local Iron Age assemblages, form 25% of the total, with a further 3.6% from mixed shelly and sandy fabrics (b), another unusual feature.

It can be noted that in the linear boundary ditch and pit alignment PA4, shelly fabrics do dominate the assemblages, as would be expected for the Iron Age in Northamptonshire. In terms of form, the little evidence available has, on initial examination, suggested dates ranging from the early middle to the late Iron Age, for pottery from the linear ditch and the pit alignments. There are no sherds that can certainly be ascribed to the early Iron Age, but attributes such as dark grey burnished fabrics occur in both early and late Iron Age assemblages, and when characteristic decoration or forms are lacking it can be difficult to distinguish between them.

The current quantification for pit alignment PA1 includes the pit alignment and perhaps other nearby features, which may explain why this group has a majority of sandy ware (68%). In the surrounding area of Iron Age settlement, context numbers in the 11000s, there is a similar majority of sandy fabrics, at 62%. As indicated above, the typical Northamptonshire assemblage is dominated by shelly wares, and this excess of sandy wares does not have an obvious explanation. The only provisional interpretation that can be offered is that perhaps the Iron Age settlement largely dates to the late Iron Age, perhaps the later 1st century BC and the early decades of the 1st century AD, when there is a greater diversity of fabrics and vessel forms.

Fabric d, containing grog, makes up 5.5% of the total, with a particular concentration in the area of Iron Age settlement, context numbers in the 11000s, and indicates that activity continued into the late Iron, the 1st century BC and probably also the early decades of the 1st century AD.

Fabric e, containing ironstone, grog and mica. While it forms 14% of the total by weight, this is an anomaly, as it only occurs in four contexts, with posthole [9006] produced 400g from a single plain jar and a pit/posthole [11250] 188g from a single shouldered jar (see below). Although the vessels are quite crudely manufactured, and might be considered to date to the early or early middle Iron Age in terms of form, the unusual fabric, containing ironstone and mica seems more likely to date to the late Iron Age. The context of these deposits will need further consideration during the full analysis.

The area of ditched enclosures within the SMS area, has produced an assemblage containing a more equal balance of shelly (10%) to sandy fabrics (16%), with the totals biased by the presence of the single large group in fabric e, but the quantities of pottery are very small, although a upright round rim on a neckless jar from ditch [9626] probably dates to the late middle Iron Age (250-100BC). However, across this area there are features dating to the early-middle Saxon period, including an unmistakable Maxey ware bar-lug jar, and the Saxon assemblage is characterised by a hard sandy fabric. At full analysis it will be necessary to make comparisons between the Saxon and the supposed prehistoric sandy fabric to see if some of this material, particularly within the ditches of the enclosure/field system, may actually be of early-middle Saxon date.

The structural groups and significant context groups

Pit alignment PA4
Context 9297, pit 9299, weight 167g: The largest group from this pit alignment. A single jar in a coarse shelly fabric, neckless with upright, flat-topped rim. Mottled grey to red-brown surfaces. Late middle Iron Age (250-100BC).

Context 9300, pit 9302: A single sherd in a coarse sandy fabric, with remnant decoration comprising a horizontal incised line bordered by small impressed dots. Possibly late Iron Age curvilinear decoration (1st century BC).

Context numbers 9000s
Context 9625, ditch 9627: Upright rounded rim from a neckless jar, grey to grey-brown throughout of the late middle Iron Age (250-100BC).

Context numbers 11000s
Context 11401 Boundary Ditch 11403: A vessel containing dense large shell inclusions, very poorly preserved, crumbling and fragmenting. From a thick-walled vessel, 11mm thick, with a broad, 18mm wide, flat-topped, slightly concave, everted rim with deep, closely-spaced, fingertip impressions on the outer edge of the rim. Decorated rim might suggest an early middle Iron Age date (450-250BC).

Context 11476, Posthole 11478: very poorly preserved due to leaching of shell inclusions. Single vessel, oxidised surfaces. Could be early middle Iron Age or late Iron Age.

Context 11496, Ditch 11497: A small group containing sherds from a shelly (leached) grey bowl with smoothed surfaces of the late Iron Age but also an thin-walled everted rounded rim in a fine sandy fabric with brown surfaces, of the early to mid-1st century AD.

Context 11498, Ditch 11500: A single sherd of scored ware, brown inner surface, grey-black outer surface, in a sandy fabric. Scoring probably combed, but a little irregular. The sandy fabric and the combing suggest a late Iron Age date, 1st century BC.

Context 11499, Ditch 11500: A diverse group that includes a sherd of classic scored ware, but also a vessel in a fabric containing grog and ironstone and sherds from the rim of the thickwalled storage jar with oxidised surfaces, characteristic of the late pre-Roman Iron Age, the early 1st century AD.

Context 11576, Ditch 11578: A group comprising plain body sherds and part of a flat base in a hard sandy fabric, from perhaps two or three vessels with grey to grey-brown and dark red-grey surfaces, either smoothed or burnished. One small sherd has incised line decoration. There are also three sherds in a soft fabric containing grog, with oxidised orange surfaces. The presence of a fabric containing grog and sherds from a black bowl with burnished surfaces suggests a late Iron Age date, 1st century BC.

Context 11619, Posthole 11620: A small group, with 30 sherds weighing only 60g. There are sherds from the rounded rim of a small thin-walled vessel, and sherds from the neck of a similar vessel has burnished surfaces and three incised horizontal grooves. The decoration suggests a date in the early to mid-1st century AD.

Context 11652, Pit 11655 (PA1): A small group weighing only 80g, but includes both a late Iron Age grey burnished bowl and thin-walled, 4mm thick, upright rounded rim of the early-mid 1st century AD.

Context 11716, ring ditch 11718 (RD1): A thick-walled (11mm) plain body sherd in a fabric containing grog is probably from a storage jar of the early 1st century AD.

Context 11808, ditch 11812: a small group, weighing only 30g, but including a body sherd, grey with a burnished surface, and a marked carination. This is likely to date either to the early Iron Age or the late pre-Roman Iron Age, and it will be necessary to assess the context and related deposits to determine which is most likely.

Context 11890, pit 11892: A small group only weighing 45g, but the presence of some sherds from storage jars and a two sherds thinner-walled, uniformly grey with burnished surfaces indicates a late Iron Age date, 1st century BC. The shell has been fully leached from these sherds.

Fabric e
Context 9004, pit/posthole [9006]: Sherds from the flat base and plain body of a single medium sized jar. It has a grey core and mottled light brown to orange brown oxidised surfaces. The surface is hand-finished and is undulating and uneven.

Context 11249, pit 11250: Mainly sherds from a shouldered jar with an expanded flat-topped rim in a soft fabric, very similar to vessel from context (9004). Date uncertain, either early to early middle Iron or late Iron Age.

Context 11713, pit 11715 (PA1): A collection of small sherds, highly fragmented. A thin walled rim sherd in a fine sandy fabric containing some mica suggests a date into the early 1st century AD. Same for context (11714).

4.3 Roman pottery by Alice Lyons

Introduction

A total of 457 Iron Age and Roman pottery sherds, weighing 6917g (6.76 EVE) were recovered during this project. This material represents a minimum of 141 vessels. Although significantly abraded the pottery has an average sherd weight of 15g.

The pottery was recovered from four areas, the majority recovered from Area B, with most of the pottery found within a single well, also ditches (Table 5).

Table 5: The Roman pottery by area and feature type

Area	Sherd Count	Weight (g)	Weight (%)
Ditch (SMS)	10	36	-
Furrow (SMS)	1	5	-
Pit (SMS)	4	37	-
SMS Total	**15**	**78**	**1.12**
Ditch (TT)	2	51	-
TT Total	**2**	**51**	**0.74**
Ditch (B)	70	485	-
Gully (B)	5	37	-
Pit (B)	25	75	-
Subsoil (B)	1	40	-
Topsoil (B)	1	12	-
Well (B)	315	5967	-
Area B Total	**417**	**6616**	**95.65**

Area	Sherd Count	Weight (g)	Weight (%)
Ditch (B East)	23	172	-
Area B East Total	**23**	**172**	**2.49**
TOTAL	**457**	**6917**	**100.00**

Methodology

All of the pottery was analysed and recorded in accordance with the Study Group for Roman Pottery guidelines (Barclay *et al* 2016, 14-18). The total assemblage was studied and a catalogue was prepared (in archive). The sherds were examined using a hand lens (x10 magnification) and were divided into broad fabric groups defined on the basis of inclusion types present. The sherds were counted and weighed to the nearest whole gram and recorded by context. Decoration, residues and abrasion were also noted. MOLA curates the pottery and archive.

The Pottery

Coarse wares

A very few sherds of residual grog tempered reduced ware jar/bowl fragments of Iron Age type were recovered (0.46%). The majority of this assemblage is Romano-British in character and represented by locally produced utilitarian coarse ware vessels (82% by weight), most commonly undecorated globular jars (type 4.5) and straight-sided dishes (6.18 and 6.19). Northamptonshire was an early adopter of wheel made and kiln fired pottery production with many kilns known particularly in the east of the region (Johnson 1969; Swan 1984). In the vicinity of the site a pottery kiln has been recorded at Upton (Maull and Masters 2001,15), which is thought to have produced coarse reduced and grog-tempered white wares in the 2nd century AD and may have been the source of some of the earlier material within the Pineham assemblage. Evidence of pottery production was scarce within the assemblage, however, and was limited to two possible wasters found in Well [11166] (see below).

A small number of Shelly ware jar (type 4.5) and storage jar fragments (type 4.14) were found (6% by weight). Shelly wares are difficult to assign to source but may have originated from the Harrold kilns in Bedfordshire (Brown 1994) or the Nene Valley (Perrin 1999).

Locally produced Sandy red and white oxidised ware (some of which were grog tempered) beaker, flagon, jar/bowl and storage jar fragments were found in small numbers (4.2% of the assemblage by weight).

Fine wares

A small number of domestically produced Grey fine ware beaker fragments were found which are of early Roman type and colloquially referred to as ‘London-type’ wares (0.58% by weight). This fabric was made at several centres including the Nene Valley, which is the probable source of this material (Tyers 1996, 170-171).

Colour-coated fine wares are also well represented, most also originating from the Nene Valley industry (2.3% by weight). Folded beakers (type 3.3) are well represented which date between the mid-2nd and 3rd centuries AD.

A small quantity of central Gaulish samian was also found (0.4% by weight). This distinctive red glossy fabric is found in a limited range of dish (Dr 18r), bowl (Dr 37) and mortaria (Dr 45). The majority of this pottery dates to the 2nd century AD

(Webster 1996). It is extremely abraded with an average sherd weight of only 1.9g and is almost certainly residual within this assemblage.

A single fragment of late Roman red fine ware from the Hadham factory (0.27% by weight) was identified in the form of a globular jar (type 4.5). This distinctive material is generally an indicator of a 4th century date in this region.

Specialist wares
It is worthy of note that no amphora was found as part of this assemblage. Amphora are storage jars that were used to transport luxury goods around the Roman Empire (Tyers 1996, 87; Tomber and Dore 1998, 82-113).

Two mortaria or mixing bowls (Tyers 1996, 117-135) are present. One is a wall sided reeded example of Mancetter-Hartshill type (type 7.1), another was an Oxfordshire white ware example with a high bead and hooked flange (type 7.2).

Single examples of a cheese-press (Cool 2006, 96) and sieve (or perforated vessel) were also found.

Type Series

The Roman type series is based on one originally designed by Jude Plouviez (Suffolk Archaeological Unit) and adapted by the author in this case to reflect published Northamptonshire material (Timby 2007).

1. Flagon (miscellaneous)

2.1: Narrow mouthed jar (Tyers 1996, fig 219, C16.2)

3. Beaker (miscellaneous)

3.3: Folded beaker (Tyers 1996, fig 216, no 43)

4.4: Lid-seated medium mouthed jar (Timby 2007, fig 4.5, no 74, 75)

4.5: Globular medium mouthed jar (Timby 2007, fig 4.6, no

4.8: Globular jar with a bi-fid or pulley rim

4.13: Globular jar with an everted rim (Tyers 1996, fig. 232, no. IIF5-6)

4.14: Storage jar (miscellaneous)

5.3: Wide mouthed cordoned jar (Timby 2007, fig 45, no 83, 84)

6.15: Dish with out-turned rim (Tyers 1996, fig. 177, no 3B-C)

6.17: Straight-sided flanged dish (Tyers 1996, fig. 228, no 45.1f)

6.18: Straight-sided dish with a beaded rim (Tyers 1996, fig. 232, no IVH4-7)

6.19: Straight-sided dish (Tyers 1996, fig. 232, no IVJ2)

7.1: Mortaria, wall-sided and reeded (Mancetter-Hartshill type) (Tyers 1996, fig 119, no 6)

7.2: Mortaria with a high bead and hooked flange (Oxfordshire type) (Tyers 1996, fig 128, no M22.3)

9.1: Sieve

9.2: Cheese press

Table 6: The Roman pottery, listed in descending order of weight (%)

Fabric	Reference	Vessel Type	Sherd Count	Weight (g)	Weight (%)
Sandy grey ware: (SGW; SRW)	Timby 2007, GREY 1	Beaker (type 3.3). Bowl (type 6.15). Cheese press (type 9.2). Dish (type 6.17; 6.18, 6.19, 6.22). Jar (type 2.1, 4.4, 4.5, 4.8, 4.13, 5.3). Storage jar.	328	5690	82.26
Shelly ware: (STW)	Timby 2007, ROB SH	Jar (type 4.5). Storage jar (type 4.14)	47	400	5.79
Mancetter-Hartshill white ware: (MAN-HART)	Tyers 1996, 123-124	Mortaria (type 7.1)	1	226	3.27
Nene Valley colour coat: (NVCC)	Tyers 1996, 173-175	Beaker (type 3.3). Bowl (type 6.15). Dish (type 6.22). Flagon. Jar.	15	156	2.26
Oxidised wares with grog temper: (OW GROG; OW CHALK; OW FLINT)	Timby 2007, GR7	Flagon. Jar/bowl. Storage jar (type 4.5)	9	147	2.12
Sandy white ware: (SOW)	Timby 2007, WW2	Flagon. Jar (type 4.5).	14	84	1.21
Sandy red ware: (SREDW)	Timby 2007, OXID1	Beaker. Jar (type 4.4)	12	60	0.87
Fine grey ware: (GW FINE)	Timby 2007, GREY 6	Beaker (type 3.3)	10	40	0.58
Oxford white ware: (OXWW)	Tyers 1996, 129	Mortaria (type 7.2)	1	36	0.52
Grey ware with grog inclusions: (GW GROG)	Timby 2007, GR1	Jar/bowl	5	32	0.46
Samian: (SAM)	Tyers 1996, 105-116	Dish: Dr 18r; Dr 36. Mortaria; Dr 45	14	27	0.39
Hadham red slipped ware: (HAD RED W)	Tyers 1996, 168-169	Jar (type 4.5)	1	19	0.27
Total	**-**	**-**	**457**	**6917**	**100.00**

Well [11166]

A total of 315 sherds, weighing 5967g (6.04EVE) was recovered from well [11166], which represents 86% of the total site assemblage by weight. The pottery is significantly abraded with an average sherd weight of *c*19g. Pottery was recovered from six deposits within the well (Table 7) which can be seen to have been fairly rapidly back-filled in the mid-to-late 3rd century AD.

Table 7: Well [11166]. The pottery quantified by layer

Well deposit	Sherd Count	Weight (g)	Spot Date
11152	94	626	M/LC3
11153	20	280	MC2-C3
11155	69	1202	C3
11156	67	872	C3
11161	64	2983	M/LC3
11164	1	4	LC1-C4
Total	**315**	**5967**	**-**

The pottery found within the well included mostly locally produced utilitarian coarse wares that would have been used for food storage, food production and consumption, also a small number of non-local products. This was typical of a fairly affluent Roman household with access to both local and traded wares (Table 8).

It is also worthy of note that evidence of pottery production comprising two fragmentary vessels was recovered from well [11166]. These comprise the lower part of a cracked SGW globular jar with coarse rouletting on the shoulder (11161), and a SGW jar body sherd with a large air bubble found in deposit (11153). This material suggests there may have been a SGW pottery kiln in the vicinity of the site in the 3rd century AD.

Table 8: Well [11166]. The pottery fabrics, listed in descending order of weight (g)

Fabric	Vessel types	Sherd Count	Weight (g)
SGW. SRW	Beaker (Type 3.3). Bowl (type 6.15). Cheese press (type 9.2). Dish (types 6.17, 6.18, 6.19). Jar (Type 2.1, 4.5, 4.13, 5.3). Storage jar.	250	5069
STW	Jar (Type 4.5). Storage jar (Type 4.14).	12	288
MAN-HART	Mortaria (Type 7.1)	1	226
OW GROG	Jar. Storage jar.	3	100
NVCC	Flagon. Beaker (type 3.3). Bowl (type 6.15). Dish (type 6.19)	12	98
SOW	Flagon. Jar (Type 4.5)	7	43
GW FINE	Beaker (Type 3.3)	10	40
OXWW	Mortaria (Type 7.2)	1	36
SREDW	Beaker. Jar/bowl. Flagon.	5	27
GW GROG	Jar/bowl	3	20
SAM	Cup. Dish. Mortaria (Dr 45)	11	20
Total	**-**	**315**	**5967**

Summary

The Roman assemblage largely comprises pottery that was thrown down a single well in the mid to late 3rd century AD. This group of material consists of locally produced utilitarian coarse ware jars and dishes, supplemented by a small number of Nene Valley colour coated fine ware beakers and several specialist vessels including mortaria, a cheese press and sieve – a pattern of supply and use typical for the region and time (Timby 2007, 88-89). In addition, the presence of two waster sherds hint that pottery production may have been taking place close by. Any pottery not made on site would probably have been obtained at local markets, possibly from a small town such as Duston located only 1.5km to the north of the site at Pineham.

That this material is mostly 3rd century in date explains the small and severely abraded samian assemblage (possibly also the absence of amphora), which would no longer have been imported at this time and so would have been residual when this pottery was deposited.

As a small but well-recorded stratified group of material, this assemblage contributes to the growing corpus of Romano-British pottery from Northamptonshire which together provides a well understood ceramic sequence for the region. It also forms part of the Roman ceramic history found at Pineham, although it is significantly later in date than the largely early Roman pottery assemblage recovered from the trial trenching and previously reported on by Ed McSloy (2006).

4.4 Saxon and post-medieval pottery by Paul Blinkhorn

The pottery assemblage comprised 84 sherds with a total weight of 2016g. It consisted of a mixture of Iron Age, Romano-British, early/middle Anglo-Saxon and post-medieval wares. The Anglo-Saxon hand-built wares aside, the post-Roman material was recorded using the conventions of the Northamptonshire County Ceramic Type-Series (CTS). The pottery occurrence by number and weight of sherds per context by fabric type is shown in Table 9. Each date should be regarded as a terminus post quem.

Early/middle Anglo-Saxon

The early/middle Saxon assemblage comprised 45 sherds with a total weight of 1229g. The following fabric types were noted:

F1: Sandstone. Moderate to dense calcite-cemented sandstone up to 1mm, sparse angular calcareous material up to 5mm. 11 sherds, 364g.

F2: Granite. Sparse to moderate angular igneous rock fragments up to 3mm. 3 sherds, 30g.

F3: Fine Quartz. Moderate to dense sub-angular quartz < 0.1mm. 4 sherds, 21g.

F97: Maxey-type Ware, c AD650 – 850. 27 sherds, 814g.

A single sherd of residual Romano-British pottery (7g) also occurred in a context of this date. The range of Anglo-Saxon fabric types is fairly typical of sites in the region (eg. Gryspeerdt 1981). All the hand-built mineral-tempered wares (fabrics F1 – F3) are undecorated. The dating of Early Anglo-Saxon hand-built pottery is mainly reliant on the presence of decorated sherds, which are largely of 5th – 6th century date, with 7th century pottery being largely plain (Myres 1977, 1). However, it cannot be said with certainty that an assemblage which produces only plain sherds is of 7th century date. Usually, decorated hand-built pottery comprises just 5% or less of domestic assemblages, as was the case at Mucking, Essex (Hamerow 1993, 51). Given the

small size of this assemblage, it can only be given a broad early/middle Anglo-Saxon (5th – 9th century) date. It is also worthy of note that none of the mineral tempered pottery occurred in the same contexts as the Maxey Ware, suggesting that the two types represent different periods of activity at the site. Most of the assemblage of mineral-tempered pottery consisted of bodysherds, but a single, large rim-sherd occurred in context (9059) fill of pit [9060].

The assemblage of Maxey Ware is one of the largest from Northampton and its environs. Fourteen sherds were noted at Green St, Northampton (Blinkhorn 1999), but they represented just a single vessel. At Chalk Lane, Northampton, 77 sherds of fabric S3 shelly wares "reminiscent of Maxey Group III" wares occurred, but most of it occurred in late Saxon assemblages and the wares seem to be of such a date, and are early, hand-built St Neots type rather than Maxey Ware (Gryspeerdt 1981, 110). Further afield in the county, the only comparable assemblages, other than at the type site of Maxey (Addyman 1964), was from North Raunds (Blinkhorn 2007a), where there was a fairly substantial middle Saxon settlement, and the largest group (148 sherds) from the high-status administrative centre at Kings Meadow Lane, Higham Ferrers (Blinkhorn 2007b). Maxey Ware cannot be taken as an indicator of high status, however, but there seems little doubt that there was a fairly substantial middle Anglo-Saxon settlement with in the vicinity of these excavations at Pineham.

The Maxey Ware vessels are fairly typical of the tradition, being baggy, slightly rounded forms with simple upright rims and distinctive bar-lugs. Four of these occurred all apparently from different vessels. Some show evidence of external sooting, indicating that they may have been used for cooking, as is often the case.

Post-Medieval

The post-medieval assemblage comprised 33 sherds with a total weight of 721g. The following fabric types were noted:

F403: Midland Purple Ware, AD1450-1600. 4 sherds, 172g.

F407: Red Earthenwares, AD1450-1600. 1 sherd, 16g.

F409: Staffordshire Slipwares, AD1680-1750. 4 sherds, 72g.

F413: Manganese Glazed Ware, AD1680-1750. 3 sherds, 57g.

F426: Iron-Glazed Coarsewares, c late 17th – 18th century. 12 sherds, 279g

F1000: Miscellaneous 19th and 20th century Wares. 9 sherds, 125g.

A single sherd of residual Romano-British pottery (1g) also occurred in a context of this date. The range of fabric types is typical of sites in the region, and suggests that most of the post-medieval activity was of 18th – 19th century date.

Table 9: Pottery occurrence by number and weight (in g) of sherds from Saxon contexts by fabric type

	IA		RB		F1		F2		F3		F97		
Context	**No**	**Wt**	**No**	**Wt**	**No**	**Wt**	**No**	**Wt**	**No**	**Wt**	**No**	**Wt**	**Date**
9509	4	58	-	-	-	-			-	-	-	-	IA
3806	-	-	-	-	-	-	1	7	-	-	-	-	E/MSAX
9030	-	-	-	-	1	5	-	-	-	-	-	-	E/MSAX
9059	-	-	-	-	1	182	-	-	-	-	-	-	E/MSAX
9074	-	-	-	-	1	13	1	19	-	-	-	-	E/MSAX
9076	-	-	-	-	7	131	-	-	-	-	-	-	E/MSAX
9183	-	-	-	-	1	33	-	-	-	-	-	-	E/MSAX
9191	-	-	-	-	-	-	-	-	1	4	-	-	E/MSAX
9348	-	-	-	-	-	-	-	-	3	17	-	-	E/MSAX
9472	-	-	-	-	-	-	1	4	-	-	-	-	E/MSAX
9017	-	-	-	-	-	-	-	-	-	-	2	12	MSAX
9218	-	-	-	-	-	-	-	-	-	-	1	24	MSAX
9530	-	-	1	7	-	-	-	-	-	-	8	129	MSAX
9531	-	-	-	-	-	-	-	-	-	-	5	135	MSAX
9557	-	-	-	-	-	-	-	-	-	-	9	172	MSAX
9582	-	-	-	-	-	-	-	-	-	-	1	262	MSAX
9583	-	-	-	-	-	-	-	-	-	-	1	80	MSAX
Total	**4**	**58**	**1**	**7**	**11**	**364**	**3**	**30**	**4**	**21**	**27**	**814**	**-**

Table 10: Pottery occurrence by number and weight (in g) of sherds from post-medieval contexts by fabric type

	RB		F403		F407		F409		F426		F413		F1000		
Context	**No**	**Wt**	**No**	**Wt**	**No**	**Wt**	**No**	**Wt**	**No**	**Wt**	**No**	**Wt**	**No**	**Wt**	**Date**
6601	-	-	-	-	1	16	-	-			-	-	-	-	17thC
2101	-	-	-	-	-	-	-	-	1	34	-	-	-	-	18thC
3305	-	-	-	-	-	-	-	-	1	71	-	-	-	-	18thC
4001	-	-	-	-	-	-	-	-	1	33	-	-	-	-	18thC
4201	-	-	-	-	-	-	-	-	1	21	-	-	-	-	18thC
4501	-	-	-	-	-	-	-	-	1	19	-	-	-	-	18thC
5901	-	-	-	-	-	-	-	-	1	16	-	-	-	-	18thC
6401	-	-	-	-	-	-	-	-	1	9	-	-	-	-	18thC
3203	-	-	-	-	-	-	-	-			-	-	1	1	MOD
11196	-	-	3	76	-	-	2	18	4	55	-	-	5	66	MOD
11363	-	-	-	-	-	-	-	-	-	-	-	-	1	37	MOD
7701	-	-	-	-	-	-	-	-	-	-	-	-	1	19	MOD
9000	1	1	1	96	-	-	1	45	-	-	3	57	1	2	MOD
Tr33	-	-	-	-	-	-	1	9	-	-	-	-	-	-	U/S
Tr41	-	-	-	-	-	-			1	21	-	-	-	-	U/S
Total	**1**	**1**	**4**	**172**	**1**	**16**	**4**	**72**	**12**	**279**	**3**	**57**	**9**	**125**	**-**

4.5 Other finds by Tora Hylton

Introduction

The excavations produced a small group of 40 small finds dating from the Roman through to the post-medieval period. The range of artefacts is small; however the presence of Roman and Saxon finds attest to occupation. The site comprises three areas, SMS (to the north), Area A (to the north-east) and Area B (to the south). With the exception of nine unstratified finds of medieval and post-medieval date, all the finds were recovered from stratified deposits in Areas SMS and Area B. In addition finds from the trial trenching phase have been included (TT). No objects were recovered from Area A. Finds of Roman, Saxon and post-medieval date were recovered from both areas, 15 from a series of linear boundary ditches to the north (SMS) and 12 from ditches, pits and burials to the south (Area B). The Roman finds are represented by small personal items, while those of Saxon date allude to craft activities. Of intrinsic interest is the presence of a small group of Anglo-Saxon grave goods recovered from an inhumation cemetery.

Quantity of material

In total 40 individually recorded small finds were recovered, the majority were recovered by hand, while a small number were located with the use of a metal detector. The site produced no waterlogged deposits.

All the common materials are represented and the small finds may be quantified by material type as follows:

Table 11: Small finds quantified by material type

Material	TT	SMS	Area B	U/S
Copper alloy	2	2	6	8
Iron objects	2	8	3	-
Lead	-	1	-	1
Bone	-	1	2	-
Glass	-	1	-	-
Ceramic (loomweights)	-	2	-	-
Shale	-	-	1	-
Total	**4**	**15**	**12**	**9**

Data collection

All finds were recorded manually on site following MOLA guidelines. The position of all the finds was recorded by three-dimensional co-ordinates; in addition the finds recovered from burial deposits were recorded by drawn plan. All the small finds have been packaged according to UKIC standards (UKIC 1983). Twenty six objects were chosen for x-ray (12 iron and 14 copper alloy) and this not only provided a permanent record, but it aided identification and revealed technical details not previously visible. The x-rays were undertaken by Pieta Greaves of Drakon Heritage and conservation. No stabilisation has been carried out.

The small finds have been recorded on a database (ACCESS) and form a catalogue comprising, material type and object identifications, descriptions, together with

stratigraphic information. No detailed research has been undertaken at this stage; therefore the dates may be subject to modification.

Condition

The copper alloy is in a stable condition. The ironwork is in a reasonable state of preservation, but much of it encrusted in corrosion products. With the exception of a post-medieval scythe, all the iron work has been x-rayed by Pieta Greaves of Drakon Heritage and Conservation. This has not only provided a permanent record, but helped identification of the objects and highlighted features of interest. It is possible that two knife tangs preserve mineral organics (possibly wood), therefore further research may be required. The worked bone objects and the glass items are all in a good condition and require no further work. No waterlogged organic material was found.

Table 12: Small finds may be quantified by area and functional category

Functional category	Number			
	TT	SMS	Area B	U/S
Personal Possessions				
Costume and jewellery	1	1	4	1
Amulet	-	-	1	-
Equipment and furnishings				
Building equipment	-	-	-	-
Nails	1	1	-	-
Knives/blade	1	4	2	-
Misc. Tools	-	2	1	-
Tools – textile working	-	2	-	1
Horse furniture	-	1	-	-
Weapons	-	-	1	-
Coins	-	-	1	-
Miscellaneous and unidentified				
Copper alloy	1	1	2	6
Iron	-	-	-	-
Lead	-	1	-	1
Bone	-	1	-	-
Glass	-	1	-	-

Roman

In total four datable Roman finds were recovered, they include a coin, two brooches and a miniature axe. With the exception of an unstratified brooch from Area SMS, all the finds were recovered from Area B.

The copper-alloy coin was recovered from the fill of a boundary ditch (Area B). This still needs to be identified, but it is thought to date to the 3rd/4th century. There are two fragmentary copper alloy brooches; both are bow fragments and one retains two integral coils from the springs. Chronologically the earliest is a Late La Tene Type brooch (Nauheim) which dates to the mid to late 1st century AD. The other fragment is not easily datable and further research will be required.

Finally a miniature copper alloy axe measuring just 21mm in length and 15mm long the cutting edge was recovered from a pit. It is perforated for suspension and presumably would have served an amuletic function; further research is required. Other examples are known and they date from the late Bronze Age to the late Roman period.

Saxon Finds

Of particular interest is the presence of a small group of Anglo-Saxon grave goods recovered from a small inhumation cemetery sited to the south of the area of excavation (Area B). Two of the burials produced finds and these include a spear, two knives and a small copper-alloy oval buckle. The spear measures in excess of *c*390mm and typologically it represents a Swanton Type C3, the largest of the Anglo-Saxon leaf-shaped blades and a form which was developed in the 6th century but generally dates to the 7th century. The knives and the buckle represent typologically distinct Saxon forms, the knives have horizontal backs which angle down towards the tip of the blade and the buckle is small with a solid oval frame, pin and a vestige of the buckle plate.

Other identifiable Anglo-Saxon finds, include two ceramic loomweights for use on a warp-weighted loom, their presence alludes to occupation in the vicinity. The loomweights are complete and represent examples of Dunning's intermediate type for which a 7th-8th century has been suggested. It is worth noting that both the loomweights are furnished with a deep worn groove, a feature created during the suspension of the weight to the warp cord. In addition there is a bone ?awl, possibly for leather working.

Medieval/post-medieval Finds

The assemblage also includes medieval and post-medieval finds. A small number of these are stratified within post-medieval linear features, but the majority are unstratified and were recovered from furrows and topsoil. Medieval finds include a pin, mount and staple in copper alloy and the post-medieval finds are represented by a thimble, a figure-of-eight buckle and a scythe.

4.7 Querns and sharpening stones by Andy Chapman

From the fill (11153) of well [11166] there is a fragment (*c*.9%) from the circumference of an upper stone of a flat rotary quern (SF21), typical of the stones in use during the Roman period. The stone contains only quartz minerals, suggesting that it is New Red Sandstone, which occurs widely across central England. The stone is *c*.400mm in diameter. The upper surface and the circumference are worked smooth and retain dimpled tool marks. The stone is 65mm thick at the circumference but only 31mm thick 120mm in from the circumference, due to the deeply concave grinding surface, which is worn smooth although faint traces of dimpled tool marks survive.

From the fill (9623) of ditch [9624] there is rectangular-sectioned block of ironstone, dark red to red-purple in colour, SF 77, 88mm long (broken) by 72mm high and 65mm thick. The four surfaces and the surviving end have been roughly shaped, and the upper surface has been worn smooth along a flat facet 37mm wide. This suggests use as sharpening stone, as if it had been used as a rubbing stone on a saddle quern one of the broader faces would have been used. At the junction of the side and bottom face there is a linear groove, 70mm long, continuing beyond the broken end, and 7mm wide and 2mm deep with a curved profile. The surface of the groove is not heavily worn, but it may have been used for sharpening, perhaps bone

points. This stone can be regard as a *polissoir*, a stone fashioned and utilised as a sharpening stone for flat edges and points.

Small find SF83 is a burnt water-worn cobble and can be discarded.

4.8 Roman coins by Susan Porter

Two coins of Roman date (Table 13) were recovered from the excavations; both are of mid-later fourth century date. Small find 38 is excessively worn an no detail can be made out on either obverse or reverse, however size and general scrappy condition are suggestive of a later fourth century date. Small find 45 is in better condition and although the legend on the obverse does not survive beyond three letters [….]S PF [..] the remaining letters and style of portrait, diademed bust facing right along with the *Secvritas Reipvblicae* reverse identifies Valens as the emperor. The reverse is a typical issue of the period known to be minted between AD361-380 and depicts Victory running left holding wreath and palm.

Table 13: Summary of Roman coins

SF	Fill/ Cut/ Type	Ruler/Type	RIC no	Date/ Size	Details
38	11106/ 11107/ Enclosure ditch	Unknown	RIC :-	Date: 4th century	Obv: No surviving legend or image
		Denom: AE4		Weight: 0.21g	Rev: No surviving Legend or image
		Wear: EW/EW	Axis: -	Diameter: 15mm	Mint: Unknown
45	11057/ 11058/ Ditch	Valens	RIC: 9b, iii(b)	Date: AD364-378	Obv: [DN VALEN]S PF [AVG]
		Denom: AE3		Weight: 1.25g	Rev: [SECV]RITA[S REIPVBLIC]AE
		Wear: VW/W	Axis: 12	Diameter: 17mm	Mint: OF-II across field, Arles

4.9 The ceramic building material by Alice Lyons

Methodology

The CBM was counted and weighed, by form and fabric type and any complete dimensions measured (mm). Levels of abrasion, any evidence of re-use or burning were also recorded. This follows guide lines laid down by Archaeological Ceramic Building Materials Group (ACBMG 2002). The terminology used follows Brodribb (1987). MOLA curates the CBM and archive.

The Roman tile

A very small amount of fragmentary Roman tile was found during this project. Thirteen pieces (weighing 1330g) of shelly grog tempered undiagnostic roof tile were recovered from Gully [11137]. A single piece of sandy flint tempered tegula (weighing 240g) was found within ditch [9067]. The tile measured between 25-29mm thick, no other complete dimensions survived.

Both shelly and sandy fabrics have been found on the site previously and are typical of local production (Chapman 2006, p.23). This material could hint that a Roman building with a tiled roof once stood near-by, but perhaps it is more likely that these

fragments were brought to the site from another settlement, possibly from Duston Roman town, as hard-core to help maintain the drainage within the system of gullies and ditches.

Table 14: The Roman tile

Cut / fill / type	Area	Tile fabric	Tile type	Frag. count	Weight (g)	Dimen.
11137/ 11135/ Gully	B	STW Grog	Roof tile	13	1330	29mm thick
9067/ 9066 / Ditch	SMS	Sand and flint	Tegula	1	240	25mm thick

The post-medieval tile

A small amount of fragmentary post-medieval roof tile and brick was also found during this project. Five pieces, weighing 134g, were recovered from various features including a land drain and quarry. The sand tempered undiagnostic roof tile varied in width between 10.5 and 13mm, no other complete dimensions survived. The corner of a single sand tempered brick was also recovered. This material is extremely fragmentary with an average fragment weight of 27g.

Table 15: The post-medieval roof tile and brick

Cut / fill / type	Area	Tile fabric	Tile type	Frag. count	Weight (g)	Dimen.
11364/ 11363/ land drain	A	sand	roof tile	3	20	14mm thick
3701/ topsoil	37	sand	roof tile	1	62	13mm thick
3206/ 3203/ quarry	TT 32	sand	brick	1	31	X1 edge
6601/ topsoil	66	sand	roof tile	1	21	10.5mm thick

5 THE FAUNAL AND ENVIRONMENTAL EVIDENCE

5.1 Human remains by Chris Chinnock

Introduction

Excavations on land at Pineham Zone H, Northampton identified a total of ten inhumations across the development area (Figs 8, 19, 20, 26, 28 and 29). Two burials were present in the northern excavation area and a further seven were excavated in the southern area. The burials identified in the northern area have not been dated and most of the burials in the southern area are thought to be of Anglo-Saxon date on the grounds of their close association with an undated ring ditch. A single outlier in the north-eastern part of the southern area is of an uncertain date.

Nature of sample

The nine graves identified a total of ten individuals (HB1- HB10), one sub-adult and nine adult individuals. The two individuals (HB2 and HB3) present in the northern area were tightly flexed with the knees tucked into the chest. Both individuals were orientated north-east to south-west, with the heads at the north-eastern end. Neither burial had any associated grave goods, though one grave had been cut into the upper fill of a boundary ditch and has been identified as a target for radiocarbon dating.

Six graves (containing HB4 to HB10) were clustered around an undated ring ditch in the southern area. One grave contained the remains of an adult individual (HB6) buried with the partial remains of a second adult individual (HB7) on an east west orientation with the head at the western end. The remaining five graves contained single individuals, four of which were orientated east to west with the head at the west end and laid in a supine position. One of these graves (HB4) also contained an iron knife blade. The fifth individual (HB10) was orientated north-east to south-west with the legs slightly bent at the knee and the head at the south-western end. This individual had been buried with an iron spear head and an iron knife blade. There were some slight variations in burial position; one individual was possibly buried slightly on their left side, others displayed one or both arms crossed over the stomach.

An undated burial (HB1) was located in the southern excavation area and was orientated north to south, with the head at the northern end. Whilst fragmentary, the individual appeared to have been buried in a supine position.

Preservation and completeness

The skeletal remains were assessed for overall bone preservation and scored on a three point scale (Connell and Rauxloh 2007).

1) Bone surface in good condition with no erosion, fine surface detail such as coarse woven bone deposition would be clearly visible (if present).

2) Bone surface in moderate condition with some post-mortem erosion on long bone shafts but the margins of articular surfaces are eroded and some prominences are eroded.

3) Bone surface in poor condition with extensive post-mortem erosion resulting in pitted and eroded cortical surfaces

The levels of preservation and completeness were assessed for each inhumation excavated and the results proved to be poor to moderate. The completeness for each individual is shown as a percentage of the whole in Table 16.

Four individuals (4/10; 40%) were moderately well preserved and the remaining six (6/10; 60%) were classified as poorly preserved. Completeness was more variable ranging from 0-4.9% complete to 60-64.9% complete. Half of the excavated individuals (5/10; 50%) were represented by less than 10% of the skeleton (Table 16). The degree of fragmentation was especially high in this assemblage.

Table 16: Percentage completeness of each individual

Burial	Context	Completeness %
HB1	11170	0-4.9%
HB2	11284	60-64.9%
HB3	11289	45-49.9%
HB4	11469	10-14.9%
HB5	11472	5-9.9%
HB6	11540	5-9.9%
HB7	11544	5-9.9%
HB8	11548	0-4.9%
HB9	11571	15-19.9%
HB10	11827	50-54.9%

Methods

Inhumations

All skeletal remains were recorded onto an Oracle 9i (v9.2.0) relational database following Museum of London methodology (Connell and Rauxloh 2007; Powers 2008). This provided a full catalogue of the bones and teeth present, estimates of age and sex, measurements of cranial and post-cranial elements and observations of non-metric traits. Analysis conformed to current guidelines for the recording of human skeletal material (Brickley and McKinley 2004; Buikstra and Ubelaker 1994)

Where possible, observations of the dimorphic features of the skull and pelvis were used for sex estimation. Estimations of age and sex followed the categories outlined in Tables 17 and 18.

Table 17: Age categories

Category	Age group	Description
Subadult	perinatal	inter-uterine/neonate
	1–6 months	early post-neonatal infant
	7–11 months	later post-neonatal infant
	1–5 years	early childhood
	6–11 years	later childhood
	12–17 years	adolescence
Adult	18–25 years	young adult
	26–35 years	early middle adult
	36–45 years	later middle adult
	≥46 years	mature adult
Unclassified	adult	>18 years
	subadult	<18 years

Table 18: Biological sex categories

Sex
Male
Probable male
Intermediate
Probable female
Female

Adult age at death estimates employed a combination of pubic symphysis, auricular surface and sternal rib end morphology, in addition to dental attrition (Brothwell 1981; Iscan et al 1984; 1985; Lovejoy et al 1985; Brooks and Suchey 1990).

Individuals aged ≤18 years were classed as 'sub-adults'. Sub-adult age was estimated using a combination of long bone diaphyseal growth measurements, observations of the stage of epiphyseal fusion and tooth development and eruption (Moorrees et al 1963a; 1963b; Maresh 1970; Gustafson and Koch 1974; Scheuer and Black 2000).

Due to the high level of fragmentation and often poor preservation of the cortical bone, no stature estimations or indices could be calculated for any of the individuals in this assemblage.

Pathological bone changes, where present, were recorded onto the database and supplemented by digital photographs when necessary. Crude prevalence rates by individual and true prevalence rates by bones or joint were calculated where appropriate. The diagnosis of pathological conditions followed the procedures set out by Roberts and Connell (2004, 34). Full details of pathology locations, measurements and all other osteological data can be found in the site archive.

Prior to analysis three burials were identified as potential targets for radiocarbon date analysis. Individuals HB 2 (11285) and HB 3 (11290), both tightly flexed 'crouched' burials were chosen to determine their date but also to assist in the interpretation of a key boundary ditch into which one of the graves was cut. Additionally, one of the individuals HB 10 (11826) clustered around the undated ring ditch in the southern area was also selected to aid in the interpretation of those features. Sample selection was made with the aid of guidelines on the destructive sampling of human bone issued by the advisory panel on the archaeology of burials in England (APABE 2013). Each sample was fully recorded and photographed before being sent for analysis.

Results: Inhumations

Demographic Data

Of the total number of articulated individuals, 90% (9/10) were adult and 10% (1/10) were sub-adult (Table 14). It was possible to assign a biological sex to four adult individuals (4/9: 44.4%). The remaining five adults (5/9; 55.6%) could not be assigned to a biological sex category and were categorised as 'undetermined'. It was not possible to refine the ages of 55.6% (5/9) of the adult individuals and these were assigned to a generic 'adult' age category. The single sub-adult individual could only be described as 'sub-adult' (Table 19).

Table 19: Demographic profile by sex

	Sub adult	Male	Female	Undetermined	Total
Perinatal	-	-	-	-	**-**
1–6 months	-	-	-	-	**-**
7–11 months	-	-	-	-	**-**
1–5 years	-	-	-	-	**-**
6–11 years	-	-	-	-	**-**
12–17 years	-	-	-	-	**-**
Sub-adult	1	-	-	-	**1**
18–25 years	-	-	-	-	**-**
26–35 years	-	2	1	-	**3**
36–45 years	-	1	-	-	**1**
>46 years	-	-	-	-	**-**
Adult	-	-	-	5	**5**
Total	**1**	**3**	**1**	**5**	**10**

Non-metric traits

Cranial non-metric traits were observed in two individuals (Table 20). While some traits have been linked to familial groups and occupational activity, the precise significance of these attributes is not fully understood (Tyrell 2000). The data reflect morphological information and variation but cannot alone be used to determine relatedness.

Table 20: Cranial and post-cranial non-metric traits

Burial	Context	Non-metric trait
HB2	11284	Supraorbital Groove (Right)
HB7	11544	Lambdoid Bone
		Lambdoid Wormians (Right)
		Lambdoid Wormians (Left)

Palaeopathology

Dental disease

The dentition seven adults (87 permanent teeth) were observable at analysis.

The most prevalent form of dental disease was dental calculus, characterised by mineralised deposits of plaque adhered to the surfaces of the teeth. Six (6/9: 66.7%) adult individuals displayed calculus in their dentition; this amounted to 68 of the 87 observable teeth (78.2%). Analysis of the true prevalence rates by the number of teeth present showed a higher overall rate amongst males (54/59: 91.5%) than females (11/22: 50%). The disparity between the two figures reflects the small sample size, especially for the female group, which comprised a single individual.

Dental caries were present in the dentition of four adult individuals (4/9; 44.4%), three males and one individual of undetermined sex. Amongst the adult individuals, this amounted to a true prevalence rate of 9.2% (8/87). Enamel hypoplastic defects to the crown surface were present in two adult individuals (2/9: 22.2%). Periodontal (gum) disease was recorded in two (2/9: 22.2%) of the adult individuals.

Other dental pathology

Adult female HB9 (11571), displayed multiple wear facets on the labial surface of the anterior mandibular teeth; these were mirrored by facets on the lingual surface of the opposing maxillary teeth. This suggests the individual had a slight overbite with the maxillary teeth projecting slightly beyond the lower, mandibular teeth. No other abnormal wear was present in the dentition of this individual.

Adult individual HB6 (11540) displayed a fractured root to the apical third of the left maxillary second premolar. The tooth root was displaced slightly to the anterior and medial, though it had appeared to have healed with secondary dentine forming a callus around the fracture site, giving it a swollen appearance. Hillson has noted that in cases where the root alone has been broken, the pulp usually survives (Hillson 2005, 314). Unfortunately, very little remained of the skull from this individual and it was not possible to say whether the tooth fracture related to any facial trauma.

The same individual HB6 (11540) displayed abnormal dental wear to the mandibular left second incisor. Much of the lingual surface of the crown and root had been heavily worn to a polished surface. In order for this much of the root to have been affected, the individual must also have suffered from significant periodontal disease.

Infectious disease

Adult male HB2 (11284) displayed well-healed plaques of striated lamellar bone present on the anterior/distal diaphysis of the right femur. Adult male HB3 (11289) displayed well-healed plaques of striated lamellar bone on the posterior and medial side of mid-diaphysis of left tibia. These may be indications of non-specific infections or reactions to localised trauma. Waldron has noted that in the majority of cases the aetiology of isolated patches of periosteal new bone will never be determined and it would be better if the attempt were not made (2009, 117). Nevertheless, the slower blood circulation and lack of soft tissue covering make the tibiae more vulnerable to inflammation and infection (Roberts 2000, 148).

Trauma

Adult individual HB5 (11472) displayed significant pathological lesions on the distal part of the right humerus (Fig 35). Whilst the bone was extremely fragmentary, a sufficient number of pieces fit together to identify that the lesion was indicative of osteomyelitis, possible secondary to a severe comminuted fracture at the elbow joint. The proximal ends of the radius and ulna were not present in the assemblage. The bone was characterised by a large mass of well-healed new bone growth. Two large cloacae were present, one on the anterior and another on the posterior surface of the bone. Waldron has noted that the combination of cloacae, involucrum and sequestra is pathognomic of osteomyelitis (2009, 86). The high degree of fragmentation present in the skeleton of this individual precluded positive identification of the involucrum and sequestra, though secondary osteomyelitis is still considered the most likely diagnosis.

Whilst it remains difficult to say definitively, it appears likely that distal part of the humerus was subject to a severe comminuted fracture. The large amount of new bone growth surrounding the area has obscured much of the fracture site. Nevertheless, this injury may be described as a possible supracondylar fracture, where comminution, spiralling and angulation are common (MacRae 1999, 292-293). Injuries such as these can occur when falling onto and outstretched hand or associated trauma of the elbow. In this case, the severity of the injury, poor alignment, new bone growth and subsequent infection is likely to have resulted in restricted mobility of the joint, though it is clear that the individual did not die as a result of this injury.

Adult individual HB5 (11472), distal part of right humerus, anterior (left) and posterior (right) view (scale 3cm) Fig 35

Adult male HB10 (11827) displayed a well-healed oblique fracture to the mid diaphysis of the right tibia. Significant cortical thickening was present around the fracture site giving the mid-shaft diaphysis a swollen appearance. Fracture is thought to be the most likely diagnosis, though other possible diagnoses include infection (osteitis) or a neoplastic lesion. X-ray recommended for this bone in order to determine the precise nature of the lesion.

Joint disease
One of the more commonly observed types of pathology in the post cranial skeleton of archaeological, as well as modern, populations is joint disease. The degeneration of joints resulting from biomechanical factors, activity or trauma may lead to pain and disability with potential hardships suffered (Rogers 2000, 163).

Spinal joint disease
Due to the poor levels of preservation throughout the assemblage, spinal joint disease was only observed in two adult male individuals (HB2 (11284), HB10 (11827), 2/9; 22.2%). Both individuals were aged 36-45 years at the time of death. Schmorl's nodes, osteoporosis, osteophytes and intervertebral disc disease were present in adult male (11284). Osteoporosis was noted in the vertebrae of adult male (11827).

Discussion

A total of ten individuals were recovered from nine graves, with the double burial of an adult individual and the partial remains of a second possible adult accounting for the slight disparity. Poor preservation precluded accurate sex and/or age estimations in a number of cases. Despite the high degree of fragmentation a number of pathological conditions were noted throughout the assemblage.

Whilst definitive dating is not yet available, the graves could be arranged into three broad groups:

The two undated individuals. HB2 and HB3. buried in the northern excavation area comprised two adult male individuals buried in a crouched position. Both displayed dental disease in the form of calculus, caries, enamel hypoplasia and periodontitis. One of the individuals displayed spinal joint disease, which comprised: Schmorl's nodes, osteoporosis, osteophytes and intervertebral disc disease. Both individuals displayed new bone growth indicative of non-specific infection. As undated burials it remains difficult to compare these individuals to those excavated at other sites. Crouched burials can occur in several periods including the Bronze Age, Iron Age and Anglo-Saxon periods.

A single undated burial (HB1) in the north-eastern part of the southern area contained the remains of a sub-adult individual. The alignment of the burial, north to south, marks it out from both the burials in the northern area and those clustered around the undated ring ditch to the south. No further osteological data was available for this individual.

The remains of seven individuals (HB4 to HB10) were present in six graves, which were closely associated with an undated ring ditch. One adult male and one adult female were identified in this group; the biological sex of the remainder could not be identified. Similarly, five of the individuals could not be accurately aged and were described as 'adult'. The dentition present within this group displayed evidence for calculus, caries and periodontitis, though unlike the pair of individuals in the northern area, no evidence of enamel hypoplasia was present. Osteoporosis was identified in the spine of one individual.

A single adult individual displayed a fractured tooth root. The cause of the fracture is not clear, it is possible that the tooth had been damaged as a consequence of trauma to the face, accidental or otherwise. However, none of the facial bones had survived to confirm or deny this theory. The same individual displayed abnormal wear and polishing to one of their lower incisors, perhaps indicative of the use of the tooth as a tool or 'third hand'. Similar wear patterns have been noted in the remains of Anglo-Saxon individuals recently excavated in North Yorkshire (Caffell *pers comm*). Further evidence of tooth-tool use during the Anglo-Saxon period in Britain has been identified at Southam (Chinnock forthcoming) and discussed in detail by Cruwys *et al* (1992). Due to the fragmentary and poorly preserved nature of this individual, little more could be said, though it does provide a useful comparison for other sites from this period.

Two adult individuals displayed evidence of trauma. This comprised a well-healed comminuted fracture to the distal humerus of an adult individual and a well-healed oblique fracture to the tibia of an adult male. Neither injury could be determined to be indicative of interpersonal violence, though it is perhaps of note that the adult male with the healed fracture to the lower leg had been buried with a spear and knife.

Despite the highly fragmentary remains, osteological analysis has identified that the individuals buried at Pineham display a wide variety of pathological conditions much of which, such as the non-specific infection, spinal joint disease and fractures may be attributed to a strenuous lifestyle. At this stage only the burials in the southern area, centered on the undated ring ditch, have been broadly dated to the Anglo-Saxon period. The remainder of the burials remain undated. Though the assemblages are small some slight differences were noted between the groups. The individuals buried in the northern excavation area displayed hypoplastic enamel defects in the dentition, whereas the 'Anglo-Saxon' group did not. This suggests that the former may have endured periods of arrested growth during childhood.

The burial of an adult individual contained the partial remains (skull, upper limb) of a second possible adult individual. It is not clear whether these pieces of human bone were deliberate deposits and part of the burial, or whether they represent the opportunistic secondary deposit of remains disturbed from an earlier grave. Furthermore, whilst the partial and poorly preserved remains were described as 'possible adult', it remains possible that they relate to a sub-adult individual buried alongside the adult.

The notion of monument reuse by, particularly, Anglo-Saxon burial sites is not new and several instances have previously been recorded (Williams 1997). The preferred monument appears to have been round barrows though sites, both domestic and religious, from the prehistoric and Roman periods have been recorded (*ibid*.). Excavations at Tansor Crossroads, Northamptonshire, identified a Neolithic mortuary enclosure that had become a focus for Anglo-Saxon burial (Chapman 1997). Similarly, excavations at Stanton, Suffolk, identified a Bronze Age barrow, which had been used as a focus for over 70 Anglo-Saxon burials (Clements 2015).

5.2 Animal bone

by Adam Reid, with contributions by Rebecca Gordon

A total of 2,449 animal bone fragments were hand collected from 226 different contexts during the course of excavation. This material was assessed to determine the level of preservation, the taxa present and to inform on the potential for further work.

All material was washed prior to analysis. Identifiable bones were noted, and were examined for signs of butchery and the state of epiphyseal fusion. The state of preservation of each bone fragment was rated on a scale of 1 to 5, where 1 is equivalent to excellent preservation and 5 very poor (Lyman 1994). Identifications took place with the aid of the MOLA Northampton reference collection and Hillson (1992). Toothwear data was collected using the methodology of Grant (1982) and the state epiphyseal fusion was used to estimate age at death following guidelines set out by Silver (1969).

Due to the anatomical similarities between the two species, all ovicaprid specimens were grouped as sheep/goat, unless possible to differentiate between the two using Boessneck *et al.* (1964) and Payne's (1985) criteria. Specimens that could not be positively identified were attributed, where possible, to categories including large mammal (cattle, horse), medium mammal (sheep/goat, pig, large dog), and small mammal (small dog, cat, rabbit).

Due to time constraints the material was assessed by Adam Reid and quantified by Rebecca Gordon. The majority of the text was written by Adam Reid with supplementary additions by Rebecca Gordon. Only hand-collected material was included in the assessment, therefore, the bones and teeth from smaller species will be underrepresented.

Preservation and taphonomy

The general state of preservation of the material was poor to very poor and the assemblage was highly fragmented (Table 21). Much of the material demonstrated evidence of weathering and surface abrasion, which would suggest that some specimens may have been exposed, or partially exposed, for some time prior to burial.

There was no evidence of canid toothmarks on the remains. This is not surprising given the highly fragmented nature of the assemblage and the poor preservation. The preservation conditions may have also contributed to the lack of notable butchery evidence on the remains. Butchery marks were noted on a total of six specimens from six different contexts. One red deer antler fragment recovered from ditch (9531) displayed butchery marks indicating its use as a raw material. Evidence of burning was low. Eleven fragments of burnt bone were observed in the hand collected material. All of these fragments were unidentifiable mammals or bone fragments; four were burnt and seven were calcined.

Identification and quantification

Positive identification to genus level was possible for 390 (16%) of the fragments. The results of the identifications are presented below (Table 22). The majority of the identified remains were recovered from undated contexts. The amount of identified specimens from dated features was too small to allow for comparison between the phases.

The three main domestic animals (cattle, sheep/goat and pig), made up 87% of the assemblage, with cattle remains the most abundant (51%) followed by sheep remains (28%). A relatively high proportion of horse remains were noted (10%) and

they outnumbered pig remains (8%). Two fragments of dog bone and a single fragment from a cat bone were recovered. The data suggests that cattle were the primary meat source, which was supplemented with sheep/goat and pig. There appears to have been an increase in the consumption of sheep/goat by the middle Saxon period (Table 22). However, due to the small sample size this evidence should be considered with caution.

Fragments of red deer antler were recovered from contexts (9531) and (11775) and several fragments of a single fallow deer antler were found in context (9641). A fragment of roe deer tibia was recovered from context (9572). The presence of these animals suggests that wild resources and their raw materials were exploited on a small scale.

There was limited diversity in the assemblage and no fish or amphibian remains were present, although this may be because animal bones from sieved samples were not included. Bird remains were recovered from contexts (9183) and (9025) and a single vole specimen was found in context (3904).

Body part representation

Due to the high level of fragmentation it was difficult to comment on the body part representation (Table 23). Cranial elements (i.e. teeth) were better represented than post-cranial elements, except for metapodials and phalanges. This is probably because teeth have a higher survival rate and metapodials and phalanges are dense elements and are therefore less susceptible to post-depositional destruction. The range of elements tentatively suggests that the whole animal was present on site, which is indicative of food waste from local livestock.

Ageing and fusion

Two cattle and two sheep/goat mandibles provided tooth ware evidence for ageing. Two cattle mandibles recovered from (9035) and (9627) were senile (8 years or older). A sheep/goat mandible from ditch (9317) was 4-6 years old and another from ditch (9636) was 2-3 years old.

Epiphyseal fusion data was available for 23 cattle, four sheep/goat and two pig bones recovered across the site. Other animals with fusion data included horse, dog and cat. The ageing data was too limited to provide a clear indication about animal husbandry practice on site.

Measurements

Metrical data was recorded for one cattle and sheep/goat metacarpal.

Potential and Significance

The animal bone assemblage from Pineham is relatively small with a low proportion of remains from datable features. Unfortunately, due to the lack of fusion and tooth wear data it will only be possible to reconstruct mortality profiles for cattle. Measurement data is too limited to compare the size and shape differences of animals over time.

The range of animals suggests that the site is typical of rural assemblages recorded in Northamptonshire and has little to no national significance (Orr 1974, Jones 1978 and Maltby 2003). However, the assemblage will add to the body of faunal data from the Northampton region.

Table 21: Preservation rating for identified specimens (all phases, hand collected)

State of preservation	1 Excellent	2 Good	3 Moderate	4 Poor	5 Very Poor
No. of specimens	-	0	0	695	484

Table 22: Identified taxa by phase

Taxon	IA	LIA-RB	RB	E-m Sax	Mid Sax	Mod	Undat	Total
Cattle	1		21	9	17		152	**200**
Sheep/goat			1	1	33		73	**108**
Pig			2		1		28	**31**
Horse		3	4				34	**41**
Dog				1			1	**2**
Cat			1					**1**
Vole							1	**1**
Fallow deer*							1	**1**
Roe deer							1	**1**
Red deer*					2		2	**4**
M bird				1			3	**4**
L bird							1	**1**
S mam					1		4	**5**
M mam	1		5	4	50	1	167	**228**
L mam		2	29	10	21	1	323	**386**
Indet	4	43	213	27	38		1110	**1435**
Total	**6**	**48**	**276**	**53**	**163**	**2**	**1901**	**2449**

** denotes the presence of antler fragments. Key: IA - Iron Age, LIA-RB - late Iron Age to Roman, e-m Sax - early to middle Saxon, mid Sax - middle Saxon, mod – modern and undat - undated*

Table 23: Identified fragments by element (all phases, hand collected)

Species/ anatomy	Cattle	Sheep/goat	Pig	Horse	Dog	Cat	Roe Deer
Astragalus	6	-	-	2	-	-	-
Calcaneus	-	-	-	1	-	-	-
Femur	-	3	-	-	-	1	-
Horn core	11	4	-	-	-	-	-
Humerus	11	1	1	1	1	-	-
Metacarpal	10	5	-	6	-	-	-
Metapodial	4	3	-	4	-	-	-
Metatarsal	13	3	-	1	-	-	-
Pelvis	4	-	1	-	-	-	-
Phalanx	17	2	1	3	-	-	-
Radius	8	4	3	-	1	-	-
Scapula	7	4	2	2	-	-	-
Talus	1	-	-	-	-	-	-
Tibia	7	6	4	2	-	-	1
Tooth (loose)	69	46	15	12	-	-	-
Total	**168**	**81**	**27**	**34**	**2**	**1**	**1**

5.3 Archaeo-botanical remains by Lisa Gray

Forty-four samples (Table 24) from excavations at Pineham Zone H were presented for analysis. The excavation revealed features dating from the Bronze Age to possible Saxon that consisted of pit alignments, a maintained Bronze Age ditch, inhumation burials, possible Iron Age and Roman pastoral activity a ring ditch and a possible Saxon barrow.

This report will consider these research questions while listing the plant macro-remains, address these research questions and supply any further information the archaeobotanical remains will give with regards diet, human activities feature function and the environment.

Methodology

Recovery

These samples were processed by flotation using a 1mm and 0.3mm mesh sieve. Once with the author they were examined under a low-powered stereo microscope with magnifications ranging from 10x to 40x. Each flot was completely scanned.

Table 24: Samples Selected for Archaeobotanical Analysis

Sample	Area	Litres	Fill	Cut	Feature Type	Feature No.	Date
15	XS	40	11164	11166	Well	Well	RB
16	XS	10	11171	11172	Burial	HB1	UD
17	XS	40	11014	11016	Pit	PA1	IA
18	XS?	20	11225	11226	Pit/PH	-	UD
20	SMS	20	9005	9006	PH	-	IA
21	SMS	20	9007	9008	Pit	-	UD
22	SMS	40	9062	9063	Pit	-	UD
23	SMS	20	9082	9089	PP	Structure ST2	UD
24	SMS	10	9084	9089	PP	Structure ST2	UD
25	SMS	20	9192	9194	Ditch	-	SAX
26	SMS	40	9228	9229	Ditch	-	UD / SAX?
27	XS	30	11249	11250	PH/pit	-	IA
28	SMS	20	9449	9451	Ditch	-	UD but possibly Saxon
29	SMS	20	9516	9518	Pit	-	UD
30	SMS	20	9517	9518	Pit	-	UD
31	SMS	40	9531	9533	Ditch	-	SAX
32	SMS	40	9627	9629	Ditch	-	IA
33	SMS	20	9100	9101	PH	Structure ST2	UD
34	SMS	40	9623	9624	Ditch	-	IA
35	XN	40	11284	11285	Burial	HB2	UD
36	XN	20	11289	11290	Burial	HB3	UD
37	SMS	40	9638	9640	Ditch	-	IA
38	XN	40	11381	11383	Pit	-	IA
39	XN	20	11382	11383	Pit	PA1	IA
40	SMS	40	9641	9643	Pit	-	IA
41	XS	40	11468	11470	Burial	HB4	SAX
42	XS	50	11471	11473	Burial	HB5	SAX
43	XS	20	11476	11478	PH	-	IA?
45	XS	40	11539	11541	Burial	HB6	SAX
46	XS	50	11549	11547	Burial	HB8	SAX
47	XS	40	11570	11472	Burial	HB9	SAX
48	XS	20	11499	11500	Ditch	-	IA
49	XS	40	11634	11636	terminal	RD1	IA
50	XS	40	11637	11639	terminal	RD1	IA
51	XS	40	11644	11645	Ditch	-	IA
52	XS	20	11657	11660	Pit	PA1	IA
53	XS	20	11658	11660	Pit	PA1	IA
54	XS	40	11713	11715	Pit	-	IA
55	XS	20	11698	11609	PH	RD1	IA
56	XS	10	11740	11741	PH	RD1	IA
57	XS	10	11742	11743	PH	RD1	IA
58	XS	40	11736	11647	Ditch terminal	-	IA?
59	XS	80	11826	11828	Burial	HB10	SAX

Key: PH = post hole, RH = round house, PP = Posthole pipe, IA = Iron Age, LI = Late Iron Age, RB = Romano-British, SAX = Saxon ,UD = Undated

Identification and Recording

Seeds, Chaff, Grains.

Identification of these plant remains was made using modern reference material (author's own and the seed reference collection at the Institute of Archaeology, University College London) and reference manuals (such as Beijerinck 1947 and Cappers et al. 2006). Whole and embryo ends of grains were counted. Charcoal flecks too small to identify, uncharred root/rhizome fragments, waterlogged wood and stem/leaf fragments and faunal remains were given estimated levels of abundance as follows:- + =1-10, ++ =11-50, +++ = 51-150, ++++ = 151-250 and +++++ = >250.

Plant nomenclature for non-cereal plant remains comes from Stace (2010), for cereals from Jacomet (2006) and botanical terms from Cappers (2006). The correct botanical terms are used in the tables and in the text, the term 'seed' replaces correct botanical terminology to avoid confusion.

Charcoal

Only fragments of charred wood larger than 4mm2 (sieve mesh aperture size) or roundwood or twigs larger than 2mm2 were selected for identification. The reason for this size selection was based on observations made by charcoal specialists that fragments larger than this size are easier to break to reveal the cross-sections and diagnostic features necessary for identification (Asouti 2006, 31; Smart and Hoffman, 1988, 178-179). When fragments have been broken to reveal anatomy, they have been wrapped in foil to keep those fragments intact so they can be counted.

Charcoal identifications were made using modern reference slides (author's own) and anatomical guides, Hather 2000, InsideWood 2004, Schoch et al. 2004 and Wheeler 2011.

Results (see tables A1 to A12 in the Appendix)

Type and Quality of Preservation

The least productive area was Area XN where only four samples were presented for analysis. These samples contained low numbers of charred cereal grains, charcoal and dried waterlogged seeds. Area XS produced 25 samples for analysis. All had low or no counted items per litre of sampled soil. Sample <56> (Iron Age PH from RH [11741] (Appendix, Table A6) produced the highest number with 1.2 counted items per litre of sampled soil. Charred cereal grains, chaff, seeds, identifiable charcoal, dried waterlogged seeds and modern seeds were present in low numbers in the samples from this area. Area SMS produced sixteen samples for analysis and these were, on average, more productive than those from areas XN and XS with four samples producing over two counted items per litre of sampled soil. The most productive sample at Pineham was from this area, sample <37> (Iron Age ditch [9640]) (Appendix, tables A5 and A8).

Twenty-two samples were dated as Iron Age and possible Iron Age. This period produced the most productive sample at Pineham, ditch sample <37> [9640] and the next most productive one sample <34> (ditch [9624]) (Appendix: tables A4 and A8,). Samples from this period contained charred cereal grains, chaff, seeds, charcoal, dried waterlogged plant remains and modern seeds.

Only one Roman sample was presented for analysis, sample <15> (well [11166]) (Appendix: Table A7) and this was very unproductive containing only charcoal flecks too small to identify, abundant fragments of uncharred root/rhizomes and low number of modern grass-type (*Poaceae*) stem/leaf fragments.

Ten samples were dated as Saxon or possible Saxon. The most productive sample was ditch sample <31> [9533] (Appendix: tables A4 and A11,) that produced 4.5 counted items per litre of sampled soil. Most of these were cereal grains. Samples from this period contained charred grains, chaff, seeds, identifiable charcoal, dried waterlogged plant remains and modern seeds.

Ten samples were undated at the time of writing. Sample <16> (HB1 [11172]) (Appendix: tables A3 and A12,) was represented by a glass tube with plant material in it rather than as a flot. These undated samples contained less than one counted item per litre of samples soil or none. They produced low numbers of charred cereal grains, charred seeds, identifiable charcoal and dried waterlogged plant remains.

Most of the plant macro-remain preservation in samples from each area and period was by charring. A low number of uncharred, dried, anaerobically preserved, seeds were found in samples from areas SMS and XS and these were round in a range of feature types in Iron Age, Saxon and undated samples. These samples, as was the case for most of the samples, contained moderate to abundant modern root/rhizome fragments so it is possible that these seeds are intrusive. This possibility is heightened by the modern plant remains in samples <39> (XN Iron Age Pit [11383]), <41> (Saxon HB4 [11470]), <42> (Saxon HB5 [11473]), <43> (Iron Age? PH [11478]), <49> (XS Iron Age RH [11636]) and <50> (Iron Age RH [11639]) (Appendix: tables A1, A3, A6, A8, A11). One modern wild cabbage/mustard (*Brassica/Sinapis sp*.) was found in sample and fragments of sycamore (*Acer pseudoplanatus*) key were found in the other samples.

The number of counted charred and uncharred plant macro-remains in the samples per litre of sampled soil is low with values ranging from zero to six per litre for each sample. The highest number of items per litre of sampled soil were found in an Iron Age sample from area SMS, sample <37> (ditch [9640]) (Appendix: tables A5 and A8,) and this sample did contain the highest number of charred plant-remains of all the samples examined. But, these were still spread within a 40L soil sample rather than from any discrete part of the feature like, say a basal deposit or hearth. For all samples, the likelihood of the plant remains being general background waste entering the features in back fill, is strong and will be discussed in the discussion on page 87.

The quality of the charred plant remains was generally poor with many grains damaged by charring and fragmentation.

Plant Macro-Remains

Flecks of charred wood (<4mm Ø) were present in abundance in most samples. Fragments of identifiable size were found in 19 samples (seed tables 25, 26, and 27 below). No fragments of charcoal of identifiable size were found in the one Romano-British sample (<15> well [11166]).

The Iron Age samples (Table 26) produced fragments of cherry/plum (*Prunus cereasus/avium*), oak (*Quercus sp*.), hazel (*Corylus avellana*) and birch-type (*Betulaceae*) wood. None were roundwood or twigs. All were fragments of stem-wood. Fragments of cherry/plum and oak were the most frequent.

Table 25: Charcoal in the Iron Age Samples

Sample		17	20	32	34	37	38
Area		XS	SMS	SMS	SMS	SMS	XN
Fill		11014	9005	9627	9623	9638	11381
Cut		11016	9006	9629	9624	9640	11383
Feature Type		Pit	PH	Ditch	Ditch	Ditch	Pit
Feature No.		PA1	-	-	-	-	PA1
Prunus cerasus/ avium	cherry/ plum	2	-	-	2	1	2
Quercus sp.	oak	-	1	5	-	8	-
Corylus avellana L.	hazel	-	3	-	-	-	-
Betulaceae (indeterminate)	birch family	-	-	-	1	-	-
Indeterminate		-	-	-	-	-	-

Sample		49	54	55	56	57	43
Area		XS	XS	XS	XS	XS	XS
Fill		11634	11713	11608	11740	11742	11476
Cut		11636	11715	11609	11741	11743	11478
Feature Type		Term.	Pit	PH	PH	PH	PH
Feature No.		RD1	PA1	RD1	RD1	RD1	-
Prunus cerasus/ avium	cherry/ plum	-	5	3	-	-	13
Quercus sp.	oak	2	-	-	-	1	14
Corylus avellana L.	hazel	-	-	-	-	-	-
Betulaceae (indeterminate)	birch family	-	-	-	-	-	-
Indeterminate		-	-	-	1	-	-

Key: PH = post hole, RD- ring ditch

The Saxon samples (Table 26) produced fragments of cherry/plum (*Prunus cereasus/avium*), oak (*Quercus sp.*) and willow/poplar (*Salix/Populus sp*.) wood. None were roundwood or twigs. All were fragments of stem-wood. Fragments of oak were the most frequent.

Table 26: Charcoal in the Saxon and possibly Saxon Samples

Sample		25	31	26	28
Area		SMS	SMS	SMS	SMS
Fill		9192	9531	9228	9449
Cut		9194	9533	9229	9451
Feature Type		Ditch	Ditch	Ditch	Ditch
Prunus cerasus/avium	cherry/ plum	-	5	4	-
Quercus sp.	oak	5	-	8	137
Salix/Populus sp.	willlow/ poplar	-	-	2	-

The Undated samples (Table 27) produced fragments of cherry/plum (*Prunus cereasus/avium*) and oak (*Quercus sp.)* wood. None were roundwood or twigs. All were fragments of stem-wood. Fragments of cherry/plum and oak were the most frequent.

Table 27: Charcoal in the Undated Samples

Sample		**23**	**29**	**30**
Area		**SMS**	**SMS**	**SMS**
Fill		**9082**	**9516**	**9517**
Cut		**9089**	**9518**	**9518**
Feature Type		**PP**	**Pit**	**Pit**
Feature No.		**Structure ST2**	**-**	-
Prunus cerasus/avium	cherry/ plum	3	1	-
Quercus sp.	oak	-	1	2

Key: PP = Posthole pipe

It is not possible to distinguish between *Q.robur* and *Q.petraea* microscopically (Hather 2000, 11) or between many species cherry/ plum *Prunus sp.* (Schoch et al 2004).

The aside from the charcoal the most frequent charred plant remain type were cereal grains. None were found in the sample from the Roman well [11166] (sample <15>).

For all samples containing grain, free-threshing wheat (*Triticum aestivum/ durum/ turgidum*) grains were the most frequent. It is not possible to distinguish bread/club/rivet wheat (*T.aestivum/ durum/ turgidum*) grains on grain morphology alone (Raus et al. 2005, 420, citing Jacomet 1987 and Maier 1996). The largest assemblages were in samples <37> (Iron Age Ditch [9640]) (Table 28) and <31> (Saxon Ditch [9533]) (Table 31).

The Iron Age ditches (Table 28) produced grains of wheat, barley, oat (*Avena sp*.) and rye (*Secale cereale*). One of these wheat grains had a sprout groove from a germinated embryo. This was found in sample <34> (Iron Age Ditch [9624]) and grains like these are associated with corn drying and storage (van der Veen 1989, 304; van der Veen 2014, 5) but it would be unwise to place much significance on this one sprouted grain.

Table 28: Cereal Grains in the Iron Age Samples – Ditches

Sample		32	34	37
Area		SMS	SMS	SMS
Fill		9627	9623	9638
Cut		9629	9624	9640
Avena sp.	oat	-	-	7
Hordeum sp.	barley	-	-	5
Hordeum distichon/vulgare L. (straight grain)	poorly preserved barley	1	38	7
Hordeum distichon/vulgare L. (hulled straight grain)	2 or 6 rowed hulled barley	-	-	3
Secale cereale L.	rye	-	4	6
Triticum sp.	wheat	2	9	9
Triticum sp. (sprout groove)	germinated wheat	-	1	-
Triticum aestivum//durum/turdigum L (grain)	bread wheat	1	61	145
Grain tissue		-	++	-

Key to Estimated Quantities: ++ =11-50 items,

Iron Age pit alignment

The Iron Age pits (Table 29) were much less productive, containing very low numbers of grains of bread/club/rivet wheat, rye and poorly preserved barley grains.

Table 29: Cereal Grains in the Iron Age Pits

Sample		38	39	52	54
Area		XN	XN	XS	XS
Fill		11381	11382	11657	11713
Cut		11383	11383	11660	11715
Feature Type		Pit	Pit	Pit	Pit
Feature No.		PA1	PA1	PA1	PA1
Hordeum distichon/ vulgare L. (straight grain)	poorly preserved barley	-	-	1	-
Hordeum/ Triticum sp.	barley/ wheat	-	-	-	1
Secale cereale L.	rye	1	-	-	-
Triticum aestivum/ durum/ turdigum L (grain)	bread wheat	-	1	2	-
Very poorly preserved indeterminate grains		-	1	-	-
Grain tissue		-	+	-	-

Key to Estimated Quantities: + =1-10 items

Ring Ditch RD1

The cereal grains in the Iron Age samples from RD1 were also very low in number (Table 30). The same types of grains were present with most poorly preserved.

Table 30: Cereal Grains in the Iron Age Ring Ditch RD1

Sample		**49**	**55**	**56**	**57**
Fill		**11634**	**11608**	**11740**	**11742**
Cut		**11636**	**11609**	**11741**	**11743**
Feature Type		**terminal**	**PH**	**PH**	**PH**
Feature No.		**RD1**	**RD1**	**RD1**	**RD1**
Hordeum distichon/ vulgare L. (straight grain)	poorly preserved barley	-	-	2	-
Hordeum distichon/ vulgare L. (hulled straight grain)	2 or 6 rowed hulled barley	-	1	-	1
Hordeum/ Triticum sp.	barley/wheat	-	-	-	-
Secale/ Triticum sp	rye/wheat	-	2	-	-
Triticum cf. *spelta* L.	spelt	1	-	-	-
Triticum aestivum/ durum/ turdigum L (grain)	bread wheat	-	1	-	-

Sample <31> (ditch [9533]) produced a large and varied charred assemblage dominated by bread/club/rivet wheat grains and poorly preserved barley grains (Table 31). Also present were grains of rye and a possible spelt grain. The two possibly Saxon features also contained bread/club/rivet wheat and poorly preserved barley grains.

Table 31: Cereal Grains in the Saxon and possibly Saxon samples.

Sample		**31**	**26**	**28**
Fill		**9531**	**9228**	**9449**
Cut		**9533**	**9229**	**9451**
Feature Type		**Ditch**	**Ditch**	**Ditch**
Avena sp.	oat	-	6	-
Hordeum distichon/ vulgare L. (straight grain)	poorly preserved barley	24	*22*	5
Secale cereale L.	rye	2	-	-
Triticum cf. *spelta* L.	spelt	1	-	-
Triticum sp.	wheat	11	*6*	-
Triticum aestivum/ durum/ turdigum L (grain)	bread wheat	108	50	11
Very poorly preserved indeterminate grains		27	-	-
Grain tissue		+++	-	-

Key to Estimated Quantities: +++ = 51-150

The charred cereal grains in the undated samples were present in low numbers (Table 32). Grains of oat, poorly preserved barley, poorly preserved wheat and bread/club/rivet wheat.

Table 32: Cereal Grains in the Undated Samples

Sample		16	22	29	30	35
Area		XS	SMS	SMS	SMS	XN
Fill		11171	9062	9516	9517	11284
Cut		11172	9063	9518	9518	11285
Feature Type		Burial	Pit	Pit	Pit	Burial
Feature No.		HB1	-	-	-	HB2
Avena sp.	oat	-	-	1	-	-
Hordeum distichon/ vulgare L. (straight grain)	poorly preserved barley	-	1	7	3	-
Triticum sp.	wheat	-	-	-	-	1
Triticum aestivum/ durum/ turdigum L (grain)	bread wheat	1	-	6	9	-

Charred cereal chaff was present but only present in low numbers in five samples (Table 33). One spelt spikelet base was found in sample <56> (Iron Age RH [11741]). One spelt glume base was found in sample <42> (Saxon HB5 [11473]). Low numbers of grass/cereal stem fragments were found in samples <28> (Saxon? Ditch 9451]), <37> and <57> (Iron Age PH [11743]).

Table 33: Charred Cereal Chaff in Samples

Date		IA	IA	IA	SAX	SAX?
Sample		37	56	57	42	28
Area		SMS	XS	XS	XS	SMS
Fill		9638	11740	11742	11471	9449
Cut		9640	11741	11743	11473	9451
Feature Type		Ditch	PH	PH	Burial	Ditch
Feature No.		-	RD1	RD1	HB5	-
Triticum spelta L. (spikelet base)	spelt	-	1	-	-	-
Triticum spelta L. (glume base)	spelt	-	-	-	1	-
Indeterminate cereal/ grass (Poaceae) -stem fragments		3	-	1	-	2

Charred seeds were found in ten samples (Table 34). Cereal grains outnumbered the weeds seeds in all samples. In samples <28> (Saxon? Ditch [9451]), <37> (Iron Age Ditch [9640]) and <56> (Iron Age RD1 [11741]) the most frequently occurring seeds were those of the segetal stinking chamomile (Anthemis cotula) and cotyledons of vetch/tare/vetchling/pea (Vicia/Lathyrus/Pisum sp.). These seeds were found in samples <26>, <28>, <29>, <31>, <34> and <37>. The next most frequent seeds were those of the goosefoot (Chenopodiaceae) family, mostly those of poorly preserved orache (Atriplex sp.).

Table 34: Charred Seeds in the Samples

Period		IA	IA	IA	IA	IA	IA	IA	SAX	SAX?	SAX?	UD
Sample		20	34	37	49	52	54	56	31	26	28	29
Area		SMS	SMS	SMS	XS	XS	XS	XS	SMS	SMS	SMS	SMS
Fill		9005	9623	9638	11634	11657	11713	11740	9531	9228	9449	9516
Cut		9006	9624	9640	11636	11660	11715	11741	9533	9229	9451	9518
Feature Type		PH	Ditch	Ditch	Term.	Pit	Pit	PH	Ditch	Ditch	Ditch	Pit
Feature No.					RD1	PA1	PA1	RD1				
Galium aparine L. (fruit)	cleavers	-	-	-	-	-	-	-	-	-	3	-
Euphrasia/ Odontites sp.(seed)	eyebright/ bartsia	-	-	1	-	-	-	-	-	-	-	-
Anthemis cotula L. (fruit)	Stinking chamomile	-	-	16	-	-	-	-	1	1	3	1
Eleocharis palustris/ uniglumis (fruit)	spike-rush	-	-	1	-	-	1	-	-	-	-	-
Bromus sp. (fruit)	brome	-	-	3	-	-	-	1	-	-	-	-
Vicia sp. (seed)	vetch	-	-	2	-	-	-	-	-	-	-	-
Vicia/ Lathyrus/ Pisum sp. (cotyledons)	vetch/ tare/ vetchling/ pea	-	3	19	-	-	-	-	-	-	-	-
Vicia/ Pisum sp. (cotyledons)	vetch/ pea	-	2	-	-	-	-	-	-	-	-	-
cf. *Vicia* sp. (seed)	vetch	-	-	-	-	-	-	-	-	-	-	-
cf. *Vicia faba* L. (seed)	broad bean	-	1	-	-	-	-	-	-	-	-	-
Trifolium sp.(seed)	clover	-	-	-	1	-	-	-	-	1	-	-
Medicago/ Trifolium sp. (seed)	medick /clover	-	-	-	-	-	-	1	-	-	-	-
Plantago lanceolata L. (seed)	ribwort plantain	-	-	2	-	-	-	-	-	1	1	-

Period		IA	IA	IA	IA	IA	IA	IA	SAX	SAX?	SAX?	UD
Sample		20	34	37	49	52	54	56	31	26	28	29
Area		SMS	SMS	SMS	XS	XS	XS	XS	SMS	SMS	SMS	SMS
Fill		9005	9623	9638	11634	11657	11713	11740	9531	9228	9449	9516
Cut		9006	9624	9640	11636	11660	11715	11741	9533	9229	9451	9518
Feature Type		PH	Ditch	Ditch	Term.	Pit	Pit	PH	Ditch	Ditch	Ditch	Pit
Feature No.					RD1	PA1	PA1	RD1				
Plantago sp. (seed)	plantain	-	-	-	-	1	-	-	-	1	-	-
Corylus avellana L. (fruit 'nutshell')	hazel	8	-	-	-	-	-	-	-	-	-	-
Polygonum aviculare L. (fruit)	knotgrass	-	-	-	-	-	-	-	-	-	2	-
Fallopia convolvulus (L.) A.Love (fruit)	black bindweed	-	-	3	-	-	-	-	1	-	-	-
Rumex acetosa/ crispus/ obtusifolius (fruit)	common / curled/ broad-leaved dock	-	-	4	-	-	-	1	-	-	-	-
cf. *Agrostemma githago* L. (seed)	corncockle	-	-	-	-	-	-	-	-	-	1	-
Atriplex hastata/ patula (fruit)	spearleaved/ common orache	-	-	-	-	-	-	-	-	-	15	-
Chenopodium/ Atriplex sp. (fruit)	goosefoot/ orache	-	-	-	-	-	-	-	-	-	16	-
Poaceae (seed fragments)	grass family	-	-	-	-	-	-	4	-	-	-	-

Table 35: Dried Waterlogged Seeds in the Iron Age Samples

Sample		**27**	**34**	**37**	**40**	**49**	**50**	**54**	**56**	**57**	**58**
Area		**XS**	**SMS**	**SMS**	**SMS**	**XS**	**XS**	**XS**	**XS**	**XS**	**XS**
Fill		**11249**	**9623**	**9638**	**9641**	**11634**	**11637**	**11713**	**11740**	**11742**	**11736**
Cut		**11250**	**9624**	**9640**	**9643**	**11636**	**11639**	**11715**	**11741**	**11743**	**11647**
Feature Type		**PH/ Pit**	**Ditch**	**Ditch**	**Pit**	**terminal**	**-**	**Pit**	**PH**	**PH**	**Ditch term.**
Feature No.		-	-	-	-	**RD1**	**RD1**	**-**	**RD1**	**RD1**	**-**
Sambucus nigra L. (fruit endocarp fragment)	elderberry	1	-	-	-	-	--	-	-	-	-
Fumaria offincinalis L. (testa fragments)	common fumitory	-	-	1	-	-	-	-	-	-	-
Rubus fruticosus/ idaeus (fruit)	blackberry / raspberry	-	-	1	-	-	-	-	-	-	-
Betula pubescens Ehrh (bract)	downy birch	1	-	5	-	-	-	-	-	-	1
Betula sp. (fruit)	birch	-	-	6	1	1	2	5	2	2	1
Rumex acetosa/ crispus/ obtusifolius (fruit)	common/ curled/ broad-leaved dock	-	1	-	-	-	-	-	-	-	-

The only evidence of a cultivated legume was one poorly preserved broad bean (Vicia faba) in sample <34> (Iron Age Ditch [9624]) (Appendix, tables A2 and A4,).

Eight fragments of charred hazel nutshell were found in sample <20> (Iron Age PH [9006]) (Appendix tables A2 and A8)

For the uncharred, dried waterlogged plant remains (see tables 36, 37 and 38 below) one needs to consider that although only the tough seed coats have survived as happens with waterlogged preservation it is still possible that these plant remains are intrusive. The most frequently occurring dried waterlogged items are fruits and bracts of birch (*Betula sp*.) that could easily be wind transported into the sampled soil during excavation. Other dried waterlogged seeds are those of ruderals with robust testas that tend to survive changing levels of preservation. No dried waterlogged seeds were found in the Romano-British sample.

Table 36: Dried Waterlogged Remains in the Saxon and possible Saxon samples

Sample		**41**	**42**	**59**	**28**
Area		**XS**	**XS**	**XS**	**SMS**
Fill		**11468**	**11471**	**11826**	**9449**
Cut		**11470**	**11473**	**11828**	**9451**
Feature Type		**Burial**	**Burial**	**Burial**	**Ditch**
Feature No.		**HB4**	**HB5**	**HB10**	**-**
Solanum nigrum L. (seed)	black nightshade	-	-	-	1
Urtica dioica L.(fruit)	stinging nettle	-	-	-	3
Betula sp. (fruit)	birch	-	1	2	-
Atriplex prostrata/ patula (fruit)	spearleaved/ common orache	-	1	-	-
Atriplex/ Chenopodium sp. (fruit)	orache/ goosefoot	1	-	-	-

Table 37: Dried Waterlogged Remains in the Undated samples.

Sample		**22**	**23**	**29**
Area		**SMS**	**SMS**	**SMS**
Fill		**9062**	**9082**	**9516**
Cut		**9063**	**9089**	**9518**
Feature Type		**Pit**	**PP**	**Pit**
Feature No.		-	**Structure ST2**	**-**
Betula pubescens Ehrh (bract)	downy birch	1	1	-
Atriplex prostrata/ patula (fruit)	spearleaved/ common orache	-	-	1

Faunal Remains (Appendix tables A1 to A2,)

This is not a zooarchaeological report so the general type and quantity of faunal remains is all that shall be reported on. Terrestrial mollusca were present, in low to moderate numbers in samples <25> to <38> with most found in samples <25> (Saxon ditch [9194]), <26> (Saxon? ditch [9229]) and <29> (Undated pit [9518]). Earthworm cocoons were seen in samples <17> (Iron Age pit [11016) , <23> (SMS Undated PP Structure ST2 [9089]), <25> (Saxon ditch [9194], <27> (Iron Age posthole/pit [11250]), <36> (Undated burial HB2 [11285]) and <37> (Iron Age ditch [9640]). Low numbers of indeterminate uncharred bone fragments were found in <26> (Saxon? ditch [9229]), <31> (Saxon ditch [9533]), <32> (Iron Age ditch [9629]), <34> (SMS Iron Age ditch [9624]) and <35> (Undated burial HB2 [11285]). Low numbers of indeterminate charred bone fragments were found in sample <34> (SMS Iron Age ditch [9624]).

Inorganic Remains

Each flot had a magnet passed through it and no magnetic fragments were present. No other artefactual inorganic remains were found.

Discussion

Taphonomy

In this section possibility of stratigraphic movement of plant macro-remains in the samples due to bioturbation will be examined. The significance of the type and quality of plant macro-remain preservation will also be considered.

Modern root/rhizome fragments, terrestrial mollusca and earthworm cocoons were present in these samples suggesting that bioturbation and stratigraphic movement of plant remains is possible. Worm action can carry small items such as seeds and small stones up to a metre down into the soil (Canti 2003, 143). In samples where the number of counted items per litre of sampled soil is very low the significance of very low numbers of charred plant remains should be queried where stratigraphic movement in samples where bioturbation is evident. This is the case for many of these samples.

The quality of preservation of the charred plant remains varied. And the number of counted items per litre of sampled soil was low (Appendix, tables A1 to A2).

Most were plant remains were identifiable to species but even they were very vacuoled and often fragmentary that can mean they have been damaged by being moved about in re-worked and back-filled deposits. A recent study of intrusion and residuality in the archaeobotanical record for southern and central England (Pelling et al. 2015) has highlighted the problem of assigning charred plant remains such as these to the dated contexts they were taken from because it is possible that these durable charred plant remains survived being moved between contexts by human action and bioturbation so cannot be properly interpreted unless radiocarbon dates are gained from the plant macro-remains themselves. That is the only way to secure a genuine date for the charred plant macro-remains that are low in number relative to the amount of soil sampled (Pelling et al. 2015, 96).

The samples taken from human burials (Appendix Table A3) appear to contain a low number of charred plant remains that are general background waste entering the sampled deposits in backfill. The Romano-British Well sample <15> (XS [11166]) (Appendix Table A7) contained nothing other than uncharred root/rhizome fragments and charcoal flecks. Samples from pits were also relatively unproductive producing low numbers of charcoal, charred grains and lower numbers of charred seeds. The

samples from post holes (Appendix Table A2) have accumulated slightly more identifiable charcoal fragments than previously mentioned features and one Iron Age sample, sample <20> (SMS PH [9006]), contained the only hazelnut fragments found in these samples. The roundhouse samples (Appendix Table A6) were similarly unproductive but Iron Age sample <56> (RH [11741]) did produce a small but interesting assemblages consisting of three weed seeds, one spelt spikelet base and two straight barley grains. Of the twelve ditch samples (Appendix tables A4 and A5) seven are similar in composition to the previously mentioned samples but samples Saxon? <26>, Saxon?<28>, Saxon<31>, Iron Age<34> and Iron Age <37> did contain the largest assemblages of charred wheat and barley grains of all samples presented for analysis but still with less than ten counted items per litre of sampled soil.

The significance of charred plant remains being present means that human activity has created changes to plant material. Charring occurs when plant material is heated under reducing conditions where oxygen is largely excluded leaving a carbon skeleton resistant to decay (Boardman and Jones 1990, 2; EH 2011, 17). These conditions can occur in a charcoal clamp, the centre of a bonfire or pit or in an oven or when a building burns down with the roof excluding the oxygen from the fire (Reynolds, 1979, 57). In this case the charred assemblages appear to be evidence of cereal processing or drying prior to storage. The poor quality of many of the cereal grain means that the higher number of grains to seeds and chaff should not be considered significant. These mostly thinly spread small assemblages could be remnants of differentially preserved plant remains so not true examples of the type of cereal processing activity carried out here. It is possible that these charred plant remains come from period of intense activity when consumption and storage of cereal as taking place.

Evidence for Diet and Crop Husbandry

All of the cereals in the samples are common in Iron Age and Roman samples in this region (Parks 2012, 30 & 31). The seeds of stinking chamomile (*Anthemis cotula*) samples Saxon? ditch<26>, Saxon? ditch<28>, Undated pit <29>, Saxon ditch<31>, Iron Age ditch<34> and Iron Age ditch <37>. and common spike-rush (Eleocharis palustris) in Iron Age sample <37> could be evidence of the cultivation of damp, clayey marginal soil, a trend observed for the Early Roman period in the east of England (Parks 2012, 32).

6 SUMMARY OF POTENTIAL AND RECOMMENDATIONS FOR FUTURE WORK

6.1 Archaeological features

The information from the site will add to the corpus of knowledge regarding the late Bronze Age to Saxon periods within the area of Pineham and the wider region. The excavation unexpectedly identified Saxon features which raise questions about the early medieval use of the upper slopes of the Nene Valley.

Further analysis of the written record, stratigraphic relationships and finds evidence has the potential to refine the developmental sequence of activity within the site.

This phase of excavation works denotes the represents the latest archaeological investigations across the southern edge of the Nene Valley. Combining this excavation with the as yet unpublished work on the remainder of the Pineham excavations to the east has the potential to synthesize data and construct a landscape narrative.

Late Bronze Age/Iron Age boundaries

Four separate lengths of pit alignment were recorded across the excavation areas (PA1, PA2, PA3 and PA4). Three of the pit alignments (PA1, PA2 and PA4) respected the position of a sinuous ditch (BD1) which extended across the site and eastwards into the 2006 excavations (Fig 7; Brown 2007). Geophysical survey and trial trenching to the east of the 2006 works indicate that the ditch may have terminated c280m east of the eastern boundary of Zone H (JSAC 1999, JSAC 2000, Pears 2005). The ditch had been redefined and maintained on several occasions suggesting it was of significance in the landscape.

The pit alignments identified during the 2015/2016 works, together with those recorded at Upton (Walker and Maull 2010, Muldowney 2014), and to the north of Northampton at Harlestone Quarry (Chapman *et al* 2015) and Dallington Gateway (MOLA forthcoming) represent a network of linear boundaries across the landscape. Thought to be late Bronze Age/ early Iron Age in origin the pits are usually poorly dated, being largely aceramic. A sample from a pit at Harlestone yielded a radiocarbon C14 date of 1060-920 CAL BC (late Bronze Age) although it is suggested that this may be residual (Chapman *et al* 2015). The pits at Pineham yielded 1,711g of pottery of Iron Age date as well as worked flint. It is anticipated that if suitable samples can be obtained for C14 dating, the origin and use of the pit alignments at Pineham can be refined. Ideally, radiocarbon dates from each of the primary deposits of the three pit alignments (PA1, PA2 and PA4) respecting BD1 and one from the basal fill of BD1 itself would be of importance in trying to understand the role and date of boundaries in this landscape.

Iron Age and Roman settlement

The Iron Age and Roman activity recorded during the 2015/2016 excavation seems to have recorded part of a small farmstead with most of the features in the excavation being livestock enclosures and related boundary ditches which continued beyond the excavation to the south and south-east. Further work will be needed to analyse the form, function and spatial distribution of the features. It contrasts with the very busy, intercutting Iron Age and Roman settlement 400m to the south-west of Zone H which was excavated by Northamptonshire Archaeology (Carlyle 2006).

Saxon

The survival of a possible Saxon barrow and related inhumations was unexpected as these features were not identified within the evaluation trenches. Further work will

need to be done to clarify the relationship between the barrow and inhumations as well as the other Saxon remains recorded during previous excavations.

Ditches defining rectilinear enclosures across the SMS were initially thought to represent Iron Age/Roman fields and enclosures. The evaluation suggested that there was some Saxon occupation on the western side of the SMS area but the excavations have revealed conjoined rectilinear enclosures, encompassing 3.51ha. In form and layout they are similar to those enclosures recorded at West Fen Road/ Ashwells, Ely (Mudd and Webster 2011). Further work will be needed to analyse the form, function and spatial distribution of the features.

Medieval and later

No further stratigraphic work on the medieval and later remains on the site are required but the final report will put the site into its wider context on the periphery of medieval settlement.

6.2 The worked flint

For further work it would be of interest to investigate the distribution of the flint in the southern area within features and to determine if early prehistoric pits or tree throws may be present.

Photographs of the worked flint tools will also be taken for illustration purposes.

6.3 Iron Age pottery

While the pottery has been considered within some of the structural groups, particularly the pit alignments and the related linear boundary ditch, given the diversity of other feature types represented, the contexts currently grouped within context number ranges in the 9000s and the 11000s need to be allocated to structural groups to enable the further analysis of the pottery, and those provisionally allocated to pit alignment PA1 need to be checked to establish exactly which features are producing the small quantities of late Iron Age pottery.

All of the assemblage should be fully quantified to fabric by sherd and weight. All of the significant context group should be re-examined. Within the area of the possible early-middle Saxon ditch system, contexts in the 9000s, it will be necessary to compare the fabrics of the hand-built possible prehistoric material with the fabrics of early-middle Saxon pottery from the western end of this area.

Given the poor quality of the assemblage, there will be only a few diagnostic sherds worthy of illustration, and as most of these are decorated sherds, a photographic record should be sufficient.

Given the poor potential of the pottery assemblage to define dates of activity, it is suggested that there will need to be a programme of radiocarbon dating to define the dates for all the major feature groups, apart from the single area of late Iron Age occupation, where the overall balance of the assemblage is strongly indicative of a late Iron Age date.

6.4 Roman pottery

Limited further work is necessary. If the project proceeds to publication the pottery report may need to be revised and an illustration catalogue prepared.

6.5 Saxon Pottery

Aside from the illustration of two vessels no further work on this assemblage is required. However provision will be made to put the site into its local context.

6.6 Other finds

No further work is recommended on this assemblage.

6.7 Ceramic building material

This is a small fragmentary assemblage with no potential for further analysis.

6.8 Human remains

Three distinct groups of as yet undated inhumations were found across the site, isolated burial HB1, two crouched inhumations HB2 and HB3 and seven inhumations appearing to respect the position of a ring ditch RD2. The northern most group comprised two adult crouched burials (HB2 and HB3), of which HB2 lay in the upper fill of BD1. It is likely that by association HB2 and HB3 are prehistoric in date, as BD1 dates to the late Bronze Age to Iron Age, but the date of its disuse is unknown. It is likely these people were inhabitants of the new middle to late Iron Age settlement established at the far southern extent of the site. It is also likely the late Bronze Age and Iron Age boundary and pit alignments were backfilled by inhabitants of the settlement as the land had changed use (this explains why middle to late Iron Age pottery was recovered from them. These crouched burials may therefore have been a closure/ritual deposit located in an important former boundary ditch near to/adjacent to the junction of it and PA1. The middle to late Iron Age to Roman settlement lay more than 100m to the south. The distance from the crouched burials and their related settlement is unusual, but can be explained by their important location.

Iron Age burials are very rarely found in Northamptonshire (not including Belgic period burials), with only five definite ones recorded, and all originating in pits within their related settlement. Three were found at Tywell (Jackson 1975, 60), and single burials at Great Houghton (Chapman 2001) and Wilby Way (Thomas and Enright 2003, 30). It is possible others were found at Hunsbury Hill (Kidd 2004, 60) and Wollaston (Andy Chapman *pers comm*). Only the single burials from Wilby Way and Great Houghton were radiocarbon dated. If the two Pineham crouched burials date to the middle to late Iron Age they would be the only examples in the county which had not only been interred respectively in a ditch and a grave but also the only ones located away from 'their' settlement. Their placing is likely to be significant within a probably ritually important/symbolic location. The lack of grave goods with the two crouched burials itself was a common attribute in burials of this period although nearly half of graves were accompanied by objects (Whimster 1981, 16-21). In Northamptonshire only the Great Houghton burial (Chapman 2001) had any objects with her (a lead torc) and only one of the eight middle to late Iron Age inhumations from Bedfordshire had grave goods which comprised a probably deliberately placed group of pottery (Luke 2016, 189).

It is important to note that the lack of burials in this period was true not only of Northampton but across the region and beyond *e.g.* only eight yet have been found in Bedfordshire (Rob Atkins *pers comm*). The number of middle and late Iron Age burials recorded in the archaeological record does not reflect the population level for most of the period, as indicated by the size and quantity of known settlements and hillforts (Madgwick 2008). This is true of most of the country where formal burial was not the preferred funerary practice (Cunliffe 1991, 506). The Pineham burials and their location were therefore extremely unusual and significant. The rarity of these

burials and their location needs consideration in a regional and national context; obtaining a C14 date for HB2 is essential for the comparison.

The group of seven inhumations were situated on the northern and southern side of a ring ditch which may have been a ploughed out barrow, although currently its origin is unknown. It is possible that the ring ditch may represent an earlier monument around which the graves were cut. Ritual and belief during the early medieval period is highlighted as being of specific interest in the regional research agenda for the East Midlands (Knight *et al* 2012, 82). Furthermore, research objective 6B identifies the landscape settings of early medieval burial sites as requiring further assessment (*ibid*, 83). This small group has the potential to directly address this issue and will add to the regional corpus of data for early medieval burials associated with earlier settlement and funerary sites.

The orientation of the group around RD2, currently undated, and the absence of significant grave goods may suggest that the small cemetery may relate to the Christian tradition. One individual (HB10) on the south side of the ring ditch was buried on a slightly different alignment and had been buried with a spear (dated as 6th to 7th century), which conversely may suggest a more Pagan funerary rite. Present day Northamptonshire was within the Mercian kingdom in the 7th century. The pagan King Penda allowed Christian missionaries to begin preaching in Mercia in AD 653 and in 655 Peada took the throne, becoming the first Christian king. A blending of the two funerary traditions at Pineham is also possible should the cemetery date to the transitional period around the 7th and 8th centuries AD. Consideration should be given to the possibility that this small group reflects an early Christian or transitional period cemetery associated with the undated ring ditch. The size of the cemetery is possibly significant as most conversion period open-ground burial grounds were small and contained few people (Blair 2005, 238).

It is therefore recommended that, in addition to the individual buried with the spear and knife (HB10), a second individual from this group be targeted for radiocarbon date analysis, but one (HB4) from the northern side of the ring ditch. Should this theory that this was a conversion period cemetery be proven to be correct then then it would represent one of few cemeteries dated to this period from the region.

Recent excavation of a small Anglo-Saxon period cemetery at Southam, Warwickshire was identified as an early transitional Christian period cemetery only after selective radiocarbon dates confirmed the original theory and as such were deemed an appropriate and successful undertaking (Chinnock forthcoming). This cemetery included one grave containing a knife and a bead.

Two instances of traumatic bone fractures were identified within the assemblage. One was present across multiple small fragments of and would not be suitable for X-ray imaging. However, the second example from individual (11827), which comprised a well-healed fracture to the tibia of an adult male individual, could be x-rayed. It is recommended that this take place to more accurately describe the injury.

The differentiation between Viking and Anglo-Saxon cemeteries is also highlighted in the regional research agenda *(*Knight *et al* 2012, 82). Unfortunately due to the poor preservation of the assemblage and paucity of available material it is not deemed appropriate for all these individuals to be destructively sampled for the purpose of stable isotope analysis.

6.9 Animal bone

It is recommended that once the phasing has been finalised the bones from undated features are reanalysed in light of the revised phasing to allow for a more thorough interpretation of the remains. The animal bones from sieved samples should be recorded to account for the presence of smaller species and bones. In addition, the data should be compared with other contemporary sites in the region (i.e. Raunds West End and Barton Seagrave) to see how the site fits within the wider economy.

6.10 Archaeo-botanical remains

No further work needs to be done on the archaeo-botanical remains from Zone H. However the remains will need to be put into the wider landscape context.

6.11 Scientific dating

There are recommendations for eight radiocarbon dates to be taken:

Two dates are proposed from BD1 to try and date this important boundary ditch (see Section 6.1 above). The proposal comprise the C14 dating of the antler bone from the basal fill of the linear boundary ditch (BD1; [2209]) which has the potential to provide a date of primary silting of the ditch. Crouched inhumation (HB2) interred in the upper fill of BD1 could date its final disuse. If of Iron Age date this burial will one of a rare number found in the county (see Section 6.8 above). A radiocarbon date from HB2 would also date crouched burial HB3 by association.

It is proposed that the primary deposits from the three pit alignments (PA1, PA2 and PA4), which respects BD1, be radiocarbon dated. The importance of understanding pit alignments and boundaries have been noted in Section 6.1 (above).

Two radiocarbon dates are proposed from two Saxon burials (HB4 and HB10) from two different areas of the suggested Saxon burial ground. It is hoped that dates from these burials will inform us whether the burials to the north and south of putative ring ditch were contemporary and may help identify if they are pagan or Christian (see Section 6.8).

The fill of the undated ring ditch should also be radiocarbon dated. The ring ditch had been the focus of the postulated Saxon cemetery and may have been a Saxon barrow. If this was the case it would be the first from Northamptonshire and an important addition to the relatively few recorded barrows of this date in the region (such as the barrow excavated at Partney, Lincolnshire (Thompson 1954)).

7 REVIEW OF GENERAL RESEARCH OBJECTIVES

7.1 General objectives

The following general objectives were highlighted.

- Mitigate the potential impacts from the proposed development of the site through archaeological recording, analysis and dissemination;
- Refining the date, nature, character and extent of the activity on the development site;
- Recovering artefacts to assist in the development of type series within the region;
- Recovering palaeo-environmental remains to determine past local environmental conditions;
- Creating an organised and indexed site archive;
- Analyse, interpret and report on the findings from the fieldwork.

The archaeological works have succeeded in providing the baseline evidence to enable the fulfilment of the general objectives. The programme of assessment works already undertaken and the proposed future work will fully realise the objectives.

7.2 Specific objectives

These objectives were recorded in Section 2.1 (above) and derive from the WSI.

Understanding the development of field systems land boundaries and how this relates to changes in the agrarian landscape 4.6.1

Land boundaries recorded in the excavation came from different periods. Only three late Bronze Age/Iron Age ditches were found (BD, D1 and D2) in the northern part of the site. BD1 may have been associated with three pit alignments (PA1, PA2 and PA4). The importance of these boundaries has been recorded in Section 6.1 (above) and it is proposed that radiocarbon dates be taken (see Section 6.9). These land boundaries can be compared with significant excavations directly to the east in Pineham (Carlyle 2006; Brown 2007 and ULAS 2015) and nearby excavations at Upton to the north-east (Fig 6).

The Pineham pit alignments contained mid to late Iron Age pottery (see Chapman, Section 4.2). Presumably these were deposited here when the new mid/late Iron Age settlement 100m to the south was established and these pits were backfilled for safety and/or farming reasons. The pottery recovered suggests that it was long-lived settlement, which started in the mid to late Iron Age and continued into the late Roman (Figs 23 and 25).

The mid to late Iron Age settlement/field systems were only partly within the excavation and were recorded over a *c*150m by 100m area. Features continued to the south and possibly the south-east beyond the excavations. The Iron Age remains were in the same location and its ditches on the same alignment as the former pit alignment PA1. Settlements and field systems excavated 400m to more than 1km to the east (Carlyle 2006; Brown 2007 and ULAS 2015) were on the same alignments (Fig 7).

Most of a sub-rectangular enclosure, at least 2500 sq. metres in size, was in the site with a ring ditch RD1 located adjacent to its western side by the excavation baulk. Internal postholes survived within RD1. The relative small quantity of artefacts (see below) recovered suggest that the enclosures and boundaries surrounding the ring ditch were mainly agricultural in origin. Presumably the main domestic occupation lay just beyond the excavation area to the south and south-east. The enclosure may have sub-divisions but no isolated features were within it. A few boundary ditches lay to the east of the enclosure, and fragments of ditches directly to the north-east. A handful of pits lay outside the enclosure to the north. The quantity of features was not dense and there were minimal intercutting of features. This suggests that there were few changes in the plan and possibly not large scale occupation/activity in this area. The enclosure and system seems to suggest pastoral farming dominated this part of the settlement.

The settlement was reorganised in the Roman period with field systems extending over *c*200m by 150m within the excavation area. This was far more extensive an area than the Iron Age phase. The density of features had not altered between the two periods with relatively few intercutting Roman features in the settlement. A large sub-rectangular enclosure (E2) dominated the settlement in the excavation area, but no significant land boundaries were found relating to it (Fig 25). There was no evidence of Roman structures within the site. There was a well (or watering hole) which was backfilled in the 3rd century. The feature types on the site suggests pastoral farming continued to be dominant.

What are the economic, social or political roles of pit alignments 4.6.2

The economic, social or political roles of pit alignments are probably best studied as a landscape group in conjunction with those sites already published. Three of the four pit alignments at Pineham appear to respect the position of a long boundary ditch (BD1; see Section 6.1 above). The identification of four separate lengths of pit alignment across the excavation can be compared with other pit alignments found in the immediate area e.g. at Upton less than 2km to the north and north-east (Carlyle 2010, Walker and Maull 2010 and Muldowney 2013; see Section 6.1 above).

Pit alignments are thought to be a phenomenon of the late Bronze Age and early Iron Age landscape where they are thought to form primary landscape boundaries (McAree 2005, 16). Pit alignments are not uncommon with 136 recorded in the county as of 1999 (Kidd 1999, 5). The Pineham examples fits in with most other examples of being on permeable geologies of the Nene Valley (Kidd 2004, 52). Pit alignments normally run for several hundred metres and may have defined an area such as at nearby Wollaston, 4km to the north, where a co-axial pit alignment system covered an area of about 2.5km^2 was laid out during the LBA/EIA (Kidd 1999, 6).

How may studies of the boundaries within, around and between settlements contribute to analysis of structured deposits 4.7.3

A small quantity of artefacts was recovered from the boundaries with only 108 Iron Age and Roman pottery sherds recovered from all ditches and gullies within the site. This contrasts to the quantity recovered from the Roman well (see Lyons, Section 4.3 especially Table 5). There was no evidence for structured backfill/silting deposits with most of the ditches backfilled with a single deposit.

There is therefore extremely limited evidence for structured deposits.

Whether there is any evidence for agricultural intensification 4.8.1

Analysis of the results of the excavation along with the other investigations should contribute to the understanding of the changing nature of rural late Iron Age and Roman settlement and field systems within the southern part of the site. In particular, analysis of the animal bone from dated contexts, where a moderate quantity was recovered (see Reid, Section 5.2) will help with this question. This assemblage will be compared with faunal remains from adjacent contemporary sites in Pineham and Upton. This will set the results in a landscape and showing any similarities or differences across the Iron Age and Roman periods. The study of layout of the settlements will also help address this question. When the environment assessment report has been written this may help answer this question further.

Contribute to understanding of the rural economy and diet 4.8.2

The analysis of the small to medium-sized animal bone assemblage may help further refine the understanding of animal husbandry practices in the Iron Age and Roman periods. This especially true is the faunal remains are compared with assemblages from other Pineham and the Upton settlement sites.

Contribute to understanding the relationship between settlement patterns and agricultural changes 4.8.3

The wider studies of the Pineham landscape will help understand settlement patterns. There have been several significant excavations within 3km of the site (Figs 6 and 7). Around half of these excavations have been published with the others presently as grey literature reports. Pineham will therefore help contribute in understanding this regional framework question.

Roman

The relationship between field and boundary systems to earlier systems of land allotment, and how these boundary networks developed over time 5.4.4

The Roman field and boundary system at Pineham expanded northwards beyond the mid-late Iron Age field system. The Iron Age and Roman field and boundary ditches were on the same alignments as the earlier pit alignments and BD1 within the site. It is important that this is not overemphasised as the Roman enclosure E2 cut through pit alignment PA1 implying that the Romans (and Iron Age inhabitants) had not respected these earlier possible boundaries, only their alignment.

Chart more closely the processes of agricultural intensification and expansion and the development of field systems 5.5.4

Analysis of the results of the excavation along with the other investigations should contribute to the understanding of the changing nature of Roman settlement and field systems within the southern part of the site. In particular, the full analysis of the animal bone assemblage, where a moderate quantity was recovered (see Reid, Section 5.2) will help with this question. This assemblage will be compared with faunal remains from adjacent contemporary sites in Pineham and Upton. This will set the results in a landscape and showing any similarities or differences across the Roman periods. The study of layout of the settlements will also help address this question. When the environment assessment report has been written this may help answer this question further.

7.3 Site specific research objectives

In Section 2.2 (above in page 16) there were six site specific research objectives recorded.

Recover palaeo-environmental remains to determine past local environmental conditions

Unfortunately no waterlogged deposits were sampled so no plant macro-remains from contexts where bioturbation was unlikely were found. This means that no direct evidence of past environments was found archaeobotanically.

However, the absence of mineralised plant remains or large numbers of dried waterlogged edible fruit seed assemblages means that there is no evidence for cess disposal at the site. Although stratigraphically uncertain the dried -waterlogged plant remains are typical of plants from ruderal, nutrient rich environments.

The charcoal and charred seeds all come from plants native to the British Isles but as charred plant remains can be transported for many miles so may not indicate local conditions.

Investigate the spatial extent, morphology and function of prehistoric, Iron Age, Roman and possible Saxon activity at Pineham

There was a clear juxtaposition of the form and position of late Bronze Age and early Iron Age boundaries. Two forms of boundary marker were recorded comprising ditches and pit alignments. In the late Bronze Age/Iron Age three boundary ditches (BD1, D1 and D2) were only located in the northern half of the site. By contrast but respecting these ditches were four probably contemporary pit alignments which were found across the site. This in contrast to the area excavated to the east (Brown 2007; Carlyle 2006) where boundaries were generally defined by ditches. The pit alignments and ditches were spaced fairly evenly, c 150m or so apart, suggesting order and planning of the features. The pit alignments and ditches clearly sit within a wider landscape of prehistoric boundaries on either side of the River Nene. Further analysis of the landscape and context of these boundaries will likely raise additional questions as to layout and type of boundary marker.

The mid to late Iron Age to Roman settlement and field system of a farmstead lay at the far southern extent of the site and this was nearly entirely in a different area to the above boundaries. Only PA1 of the former boundaries were in the same location and it was cut by the mid to late Iron Age ditches. There was therefore a dislocation and change of activity/use of the site. The pit alignment and ditches were backfilled in this period (see above). The two crouched inhumations with one (HB2) at the top of former BD1 ditch were presumably from this settlement and were deliberately (and symbolically) buried as a closure deposit (see Section 6.8 above). The middle Iron Age and Roman settlement largely comprised enclosures and field boundaries with only a single Iron Age ring ditch (RD1) just within the excavation area. Only one probable Roman human burial was found and it lay just with the northern boundary of E2.

The early and/or middle Saxon burial ground of eight individuals was within the southern extent of the site, arranged around a possible former barrow which cut the Roman field system. A single burial contained datable 6th-or 7th-century grave goods. The probable middle Saxon field system was located at the far northern extent of the site only, over 100m to the north of the Roman field system and earlier Saxon burial ground. An east to west aligned linear field system comprised up to ten regular, similarly sized sub-rectangular fields/enclosures and these continued in both directions beyond the excavation area. Its eastern extent was recorded for a further

150m in earlier excavations (Fig 7; Brown 2007). Entranceways in this system, some funnel shaped, suggest a strong pastoral element. The small quantity of artefacts suggest that whilst domestic occupation was close by, it did not lie within the excavation area.

Establishing the dating and function of the enclosures and ditches across the site.

Layout of the three main periods of occupation/activity areas were largely in different parts of the site (see above). The lack of intercutting has meant that phasing the different areas has been relatively easy. Where features were undated they could therefore be dated by association. The modest quantity of pottery has allowed a general date to be associated to features. It has been recommended that the precise dating for the important late Bronze Age ditch (BD1) be established by radiocarbon dating its primary fill and probable latest deposit (a crouched burial). The charred grains, seeds and chaff can be radiocarbon dated as can the fragments of cherry/plum, hazel and willow/poplar charcoal.

The only function the archaeobotanical assemblages can give for the ditches and enclosures is waste disposal. It is more likely that soil in which charred plant remains had become embedded was used to backfill the features and that the charred plant remains are general background waste.

The layout of the enclosures including entranceways and boundary ditches suggests that the middle Iron Age to Roman enclosures and the middle Saxon field system were both dominated by pastoral farming. This suggestion has been recorded above in objectives in Section 7.2 above as well as the above site specific research framework questions. It is also important to note the lack of pottery of Iron Age and Roman pottery (457 sherds weighing 6kg) recovered from the enclosures which suggests that the enclosures were largely agriculturally based. A large percentage of this collection was retrieved from a 3rd-century well at the south-eastern extent of the site, which was presumably not taken far from occupation. Only four datable Roman small finds (a coin, two brooches and a miniature axe) were found. The artefactural evidence suggests that the related occupation of the site was probably just beyond the excavation area to the south or south-east. The large scale domestic occupation 400m to the east (Carlyle 2006) was therefore likely to be the neighbouring settlement.

The middle Saxon fields are more extensive than was thought during the evaluation stage. Only 84 Saxon pottery sherds recovered which also strongly suggests that the occupation area was outside the excavation.

Establishing if any industrial or crop processing is taking place on site.

Crop processing is evident in the presence of crop weeds and chaff among the grains in the charred assemblages. If the archaeobotanical data is considered in isolation from any doubts about differential preservation and stratigraphic movement these appear to be grains of free-threshing wheat and 2-rowed barley accompanied by waste from fine sieving prior to drying, storage or milling. The find of fragments of quern stone seems to support this. This is the same for the Iron Age and Saxon periods. There is no archaeobotanical information to provide about the period. No evidence of iron-working in the form of hammerscale was found in any of these samples.

There is evidence for some small scale bone working on site. There was also limited artefactual evidence for grinding with only two fragments of quern or rubbing stones recovered across the excavation areas.

The only clear evidence of industrial activity was the post-medieval quarry pit, encompassing c1ha, which straddled the track way. However, this quarry pit does not appear on the 1st edition or subsequent Ordnance Survey mapping perhaps suggesting it was in use for an amount of time between enclosure and the production of the 1st edition OS. The pottery from the backfill of the quarry suggests an 18th to 19th-century date for disuse. Further documentary research will be undertaken.

Defining whether there is evidence for continuity or hiatus between the prehistoric, Iron Age and Roman phases.

Further work on the stratigraphic and spatial relationships of the remains is required along with further analysis of the distribution of artefactual material.

Updated research objectives

A number of further research objectives that could not have been anticipated prior to the start of the project have been identified following the assessment of the results of the excavation. All have been related to the appropriate section of the regional research agenda for the East Midlands (Knight *et al* 2012).

Iron Age and Roman settlement

Assess the evidence for the evolution of settlement hierarchies (Research Objective 4E)

The Pineham area has been subject to a number of archaeological interventions within the last 15 years, therefore looking at the current site in relation to previously published material should contribute to the understanding of the wider settlement patterns in the local area for both the Iron Age and Roman periods. However, the principal difficulty with this approach is that the bulk of the earlier excavations have only been reported on to assessment stage and therefore results are preliminary.

Investigate the landscape context of rural settlements (Research Objective 5H)

The western and northern edges of Northampton set within this portion of the Nene Valley have been subject to extensive investigation in advance of development. There is therefore the potential to put the Iron Age and Roman settlement at Pineham into a wider landscape context.

Saxon

Elucidate the chronology and demography of the Roman to Anglo Saxon transition period (Research Objective 6A)

The inhumations situated around RD2 are all thought to be Saxon. Further work on the burials and associated grave goods will be required, and it is suggested that two burials (HB4 and HB10) are radiocarbon dated to substantiate this. Only one burial was dated by a spearhead and a knife to the 6th to 7th century. It is presently uncertain whether this was a pagan or a Christian conversion period cemetery.

If the cemetery was of pagan origin, its use of a former Roman settlement can be compared with several nearby sites including Wootton Villa, Northampton, and Oundle, Northamptonshire (Chapman *et al* 2004; Maull and Masters 2005). If the Pineham cemetery dates to the Christian conversion period it can also be compared to other sites including Great Houghton, Northamptonshire (Chapman 2001). Here a group of 23 inhumation burials, all aligned west to-east, and without grave goods, formed the southern part of a cemetery of unknown extent. A single radiocarbon date indicates that it was a Christian cemetery dating to the second half of the 7th century.

Assess the landscape settings of Anglo-Saxon burial sites (Research Objective 6B)

The presence of a ring ditch, which may be the ploughed out remains of a barrow, together with Saxon inhumations respecting its position, represent an opportunity to research Saxon burial practices.

Historically, publications referring to Saxon burial practices focus on the monuments, cemeteries, burials and grave goods as opposed to the landscape context (Knight *et al* 2012). The ring ditch and burials at Pineham have the potential to add to the corpus of work and put the burials into a wider context.

Review the evidence for developing settlement hierarchies (Research Objective 6C)

Although the evaluation had tentatively identified Saxon occupation in the northern part of the development area the excavations identified the potential for larger scale occupation defined by enclosures similar in form to those at West Fen Road/ Ashwells site, Ely (Mudd and Webster 2011, Mortimer *et al* 2005). The excavations at Pineham recovered evidence of middle Saxon occupation, although there is little evidence for buildings. Further work comprising stratigraphic, and artefactual analysis may elucidate form and function.

Medieval and post-medieval

Investigate the development of the open-field system and medieval woodland management (*Research Objective 7I)*

The development area straddles the parochial boundary between Kislingbury and Upton with the bulk lying in the former parish. In recent years, a considerable amount of work has been undertaken in advance of development that has recorded the form of the open field system. This work includes the geophysical survey undertaken on the site (Meadows *et al* 2014) prior to trial trenching and excavation. Thus, there is the potential to reconstruct the form of the open field system within the development area.

Identify agricultural improvements of the sixteenth to eighteenth centuries: (Research Objective 8E)

The parish of Kislingbury was enclosed in 1779 and the open field system was divided into rectangular fields defined by ditches, hedges and trees. The layout followed a similar orientation to the preceding open field system. Since enclosure the smaller fields were merged into larger parcels of land. The former ditched boundaries were also later used as the base to house pipes to help drain the soils of ground water.

8 REPORTING, PUBLICATION AND ARCHIVE

8.1 Reporting and publication

A full site report will be prepared by MOLA. This will be submitted to the Historic Environment Record and deposited with the Archaeological Data Service (ADS). Provision will be made for publication as a monograph for wider dissemination. It is also proposed that an article will be submitted to the journal of the Northamptonshire Archaeological Society.

The proposed structure of the report is as follows:

1 Introduction

2 Background

- 2.1 Location and topography
- 2.2 Geology
- 2.3 Historical and archaeological background

3 Objectives, methodology and summary of site chronology

- 3.1 Objectives and methodology
- 3.2 Summary of site chronology

4 Prehistoric activity

5 The Iron Age settlement

7 The Roman enclosures

8 The Saxon enclosures

9 Discussion

Bibliography

Each section will be accompanied by appropriate illustrations. The introductory sections will include figures showing the location of the site and its topographic and geological context. Within the narrative text illustrations will include overall phase plans, detailed drawings of individual features or feature groups, photographs and finds illustrations. The discussion will include figures showing the archaeological context of the works in relation to other archaeological investigations discussed in the text and other figures as necessary.

Archive

A microfilm copy of the site archive and the site narrative will be made to RCHME standards and submitted to the National Archaeological Record. The archive will comprise all written, drawn and photographic records, and all material finds and processed sample residues recovered from the trial trench evaluation and excavation phases. All records and finds generated by the excavation will be compiled in a structured archive in accordance with the guidelines of Brown (2011), the MGC (1992), the SMA (1993), the CIfA (2014d), the UKIC (1983), Walker (1990), Mather (2014) and the CIfA (2014d). Site details will be entered onto the OASIS online database.

8.2 Quantification of site records

Table 38: Quantification of site records

Type	Quantity - evaluation	Quantity-excavation
Plans and sections	19 sheets; 72	12 sheets;126
Registers		
Contexts (+ TT logs)	471	1584
Monochrome negatives	10 sheets	41 sheets
Digital photograph contact sheets	315 photos	1755 photos

A Microsoft Access database has also been generated from the site data.

Quantification of the finds and palaeoenvironmental evidence

Table 39: Quantification of finds and palaeoenvironmental evidence

Material	Quantity
Iron Age pottery	5,700g
Roman pottery	6,917g
Saxon pottery	2,016g
Post-medieval pottery	721g
Worked flint	218 pieces
CBM	1,570g
Querns/ worked stone	2 worked stones
Coins, small finds	2 Roman coins
Human remains	10 inhumations
Animal bone	2,449 fragments
Flots, charcoal	x 54 samples, 1660 ltrs
	of which 11 were from trial trenching
Miscellaneous	-

9 RESOURCES AND PROGRAMMING

Work completed

All work on the consolidation of the site achieve, artefactual and ecofactual processing, basic site phasing, the assessment evaluation of finds and ecofacts, preparation of assessment reports and updated project design have been completed.

Future works

In order to fulfil the potential of the archaeological features and the artefactual and ecofactual assemblages set out in Chapter 7, a programme of future works will be undertaken. This will maximise the potential of the archaeological resource to fulfil the research objectives set out in Chapter 8, and will lead to the production of a final report that will form the basis of the publication.

Table 40: Task list

	Tasks	Personnel
1	Introduction and background	Carol Simmonds
2	Structural site narrative	Carol Simmonds
3	Prehistoric pottery	Andy Chapman
4	Roman pottery	Alice Lyons
5	Anglo-Saxon and medieval pottery	Paul Blinkhorn
6	The querns and millstones	Andy Chapman and Steve Critchley
7	Other finds	Tora Hylton and Ian Meadows
8	Ecofactual evidence	Lisa Gray
9	Charcoal	tbc
10	C14 and other scientific testing	Beta Analytic
11	Animal bone	MOLA
12	Illustrations	MOLA drawing office
13	Integration of specialist reports	Carol Simmonds
14	Report digest and discussion	Carol Simmonds
15	Editing	Mark Holmes and Rob Atkins
16	Publication	MOLA
17	Preparation of research archive	Theodora Anastasiadou

Programme

The programme will commence once the Assessment Report and Updated Project Design has been approved by the County Archaeological Advisor to Northamptonshire County Council.

Table 41: Post-excavation analysis programme

Task/ *month*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												

BIBLIOGRAPHY

Addyman, P V, 1964 A Dark Age Settlement at Maxey, *Northants Medieval Archaeology*, **8**, 20-73

APABE 2013 *Science and the dead: A guideline for the destructive sampling of archaeological human remains for scientific analysis*, Advisory Panel of the Archaeology of Burials in England, Historic England

Asouti, E, 2006 *Factors affecting the formation of an archaeological wood charcoal assemblage*, http://pcwww.liv.ac.uk/~easouti/methodology_application.htm, retrieved on 2/2/2017

Bakels, C, 1999 Archaeobotanical investigations in the Aisne valley, northern France, from the Neolithic up to the early Middle Ages, *Vegetation History and Archaeobotany* **8**:71-77

Bakels, C, 2005 Crops produced in the Southern Netherlands and Northern France during the early medieval period: a comparison, *Vegetation history and Archaeobotany* **14**, 394-399

Bamford, H M, 1985 *Briar Hill excavation 1974-8,* Northampton Development Corporation Archaeological Monograph, **3**

Barclay, A, Knight, D, Booth, P, Evans, J, Brown, D H, and Wood, I, 2016 *A Standard for Pottery Studies in Archaeology,* Prehistoric Ceramics Research Group, Study Group for Roman Pottery (Historic England)

Beijerinck, W, 1947 *Zadenatlas der Nederlandsche Flora*

Blair, J, 2005 *The Church in Anglo-Saxon society*, Oxford University Press

Blinkhorn, P, 2007a The Pottery from Langham Road and Burystead, in M Audouy and A Chapman 2007 *Raunds The origin and growth of a midland village AD450-1500: Excavations in North Raunds, Northamptonshire, 1977-87,* Oxbow Books

Blinkhorn, P, 2007b Late medieval pottery kilns in A Hardy, B M Charles and R J Williams, 2007, *Death and Taxes: The archaeology of a Middle Saxon estate centre at Higham Ferrers Northamptonshire*, Oxford Archaeology Monograph, 100-111

Blinkhorn, P, 1999 Middle and Late Saxon Pottery in A Chapman, 1999, Excavation of the Town Defences at Green Street, Northampton, 1995-6, *Northamptonshire Archaeology*, **28**, 55-7

Boardman, S, and Jones, G, 1990 Experiments on the Effect of Charring on Cereal Plant Components, *Journal of Archaeological Science* **17**, 1-11

Boessneck, J, Müller, H-H, and Teichert, M, 1964 Osteologische Unterscheidungmerkmale zwischen Schaf (*Ovis aries* Linné) und Ziege (*Capra hircus* Linné), *Kühn-Archiv, Bd, **78***, H.1-2

Brickley, M and McKinley, J, 2004 *Guidelines to the Standards for recording Human Remains*, CIfA Professional Practice Paper, **7**

BGS 2017 http://www.bgs.ac.uk/geoindex/ British Geological Survey

Brodribb, G, 1987 *Roman brick and tile,* Gloucester

Brothwell, D, 1981 *Digging up Bones,* London

Brooks, S T, and Suchey, J M, 1990 Skeletal Age Determination Based on the Os Pubis: a comparison of the Ascadi-Nemeskeri and Suchey-Brooks methods*, Human Evolution,* **5**, 227–38

Brown, A, 1994 A Romano-British shell-gritted pottery and tile manufacturing site at Harrold, Bedfordshire, *Bedfordshire Archaeol,* **21**, 19–107

Brown, D H, 2011 *Archaeological Archives a guide to best practice in creation, compilation, transfer and curation*, Archaeological Archives Forum

Brown, J, 2007 *The Industrial Infrastructure Strip, Map and Sample Areas at Pineham Barn, Upton, Northampton, 2006-7*, Northamptonshire Archaeology report, **07/66**

Buikstra, J and Ubelaker, D, (eds.) 1994 Standards for data collection from human skeletal remains, *Arkansas Archaeological Survey Research Series,* **44**

Canti, M G, 2003 Earthworm Activity and Archaeological Stratigraphy: A Review of Products and Processes, *Journal of Archaeological Science* **30**, 135-148

Cappers, R T J, Bekker, R M, and Jans, J E A, 2006 *Digitale Zadenatlas*

Carlyle, S, 2006 *Archaeological excavation at Pineham North, Upton, Northampton, July to October 2006, Settlement 2,* Northamptonshire Archaeology report, **06/177**

Carlyle, S 2010, An Iron Age pit alignment near Upton, Northampton, *Northamptonshire Archaeology,* **36**, 75-87

Carlyle, S, and Chapman, A, 2012 Neolithic cremation burials at Milton Ham, Northampton, *Northamptonshire Archaeology*, **37**, 29-36

Chapman, A, 1997 The excavation of Neolithic and Medieval mounds at Tansor Crossroads, Northamptonshire 1995, *Northamptonshire Archaeological Journal*, **27**

Chapman, A, 2001 Excavation of an Iron Age Settlement and a Middle Saxon Cemetery at Great Houghton, Northampton, 1996 *Northamptonshire Archaeology* **29**, 1-41

Chapman, A, Thorne, A, and Upson-Smith, T, 2005 A Roman villa and an Anglo-Saxon burial at Wootton villa *Northamptonshire Archaeology* **33**, 79-112

Chapman, A, Foard, A, and Clarke, J, 2015 E*xcavation of a Bronze Age and early Iron Age landscape at Harlestone Quarry, Northamptonshire, 2007- 2014,* MOLA Northampton report, **15/111**

Chinnock, C, forthcoming The human bone, in S Egan forthcoming *Archaeological mitigation of land at Banbury Road, Southam, Warwickshire,* MOLA report

CIfA 2014a *Code of Conduct,* Chartered Institute for Archaeologists

CIfA 2014b *Standard and Guidance for Archaeological Excavation,* Chartered Institute for Archaeologists

CIfA 2014c *Standard and Guidance for Archaeological Watching Brief,* Chartered Institute for Archaeologists

CIfA 2014d *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives,* Chartered Institute for Archaeologists

Clements, P, 2015 *Archaeological excavation on land adjacent to Upthorpe Road, Stanton, Suffolk: Assessment and updated project design*, MOLA Northampton **15/72**

Connell, B and Rauxloh, P, 2003 *A rapid method for recording human skeletal data*, Second Edition revised 2007 Powers, N (ed)

Cool, H E M, 2006 *Eating and Drinking in Roman Britain,* Cambridge University Press

Cooper, N, 2006 *The Archaeology of the East Midlands: an archaeological resource assessment and research agenda,* University of Leicester

Cruwys, E, Robb, N, D and Smith, B, G, N 1992 Anterior tooth notches: An Anglo-Saxon case study, *Journal of Palaeopathology*, **4/3**

Cunliffe, B, 1991 *Iron Age communities in Britain* (3rd edition), London

EH 1997 *English Heritage Archaeology Division Research Agenda,* English Heritage (unpublished draft)

EH 2011 *Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation* English Heritage (second edition)

Foard-Colby, A, and Walker, C, 2010 Iron Age settlement and medieval features at Quinton House School, Upton, *Northamptonshire Archaeology,* **36**, 53-73

Friendship-Taylor, R M, 1999 *Late La Tène Pottery of the Nene and Welland Valleys of Northamptonshire: with particular reference to Channel-rim Jars,* Brit Archaeol Rep Brit Ser, **280**, Oxford

Gustafson, G. and Koch, G, 1974, Age estimation up to 16 years of age based on dental development, *Odontologisk Revy* **25**, 297-306

Grant, A, 1982 The use of toothwear as a guide to the age of domestic ungulates, B Wilson, C Grigson, and S Payne 1982 (eds) *Aging and sexing animal bones from archaeological sites,* BAR British Series, **109**, 91-108

Gryspeerdt, M, 1981 The Pottery in J H Williams, 1981, Excavations in Chalk Lane, Northampton, *Northamptonshire Archaeology*, **16**, 87-135

Hamerow, H F, 1993 *Excavations at Mucking Volume 2: The Anglo-Saxon Settlement,* English Heritage Archaeological Report, **22**

Hastorf, C.A. and Popper, V.S. Current Palaeobotany

Hather, J G, 2000 *The Identification of Northern European Woods*

HE 2015 *Management of Research Projects in the Historic Environment (MoRPHE),* Historic England

Hillson, S, 2005 *Teeth*, Cambridge University Press

Hillson, S, 1992 *Mammal Bones and Teeth: An Introductory Guide to Methods of Identification*, UCL Institute of Archaeology Publications

Holmes, M, and Chapman, P, 2005 Iron Age Settlement at Swan Valley Business Park, near Rothersthorpe, Northampton, *Northamptonshire Archaeology* **33**, 19-46

Holmes, M, Yates, A, Chapman, A, and Wolframm-Murray, Y, 2012 A Middle Neolithic enclosure and mortuary deposit at Banbury Lane, Northampton: an interim report, *Northamptonshire Archaeology*, **37**, 19-28

Inside Wood, 2004- onwards, http://insidewood.lib.ncsu.edu/search (10th and 11th December 2014)

Iscan, M Y, Loth, S R, and Wright, R K, 1984 Age estimation from the rib by phase analysis: white males, *Journal of Forensic Science,* **29**, 1094-1104

Iscan, M Y, Loth, S R, and Wright, R K, 1985 Age estimation from the rib by phase analysis: white females, *Journal of Forensic Science* **30**, 853-863

Jackson, DA, 1975 An Iron Age site at Tywell, Northamptonshire *Northamptonshire Archaeology,* **10**, 31-93

Jackson, D A, 1993/4 Iron Age and Anglo-Saxon settlement and activity around Hunsbury Hillfort, Northampton, *Northamptonshire Archaeol,* **31**, 137-141

Jackson, D A, Harding D W and Myers J N L, 1969 The Iron Age and Anglo-Saxon site at Upton, Northants, *The Antiquaries Journal*, **49**, 202-21

Jacomet, S, 1987 *Prähistoriche Getreidefunde*

Jacomet, S, 2006 Identification of cereal remains from archaeological sites - second edition

JSAC 1999 *Geophysical Survey Report of Upton, Northamptonshire*, John Samuels Archaeological Consultants report **99/100**

JSAC 2000 *Geophysical Survey Report of Upton, Northamptonshire Pt II*, John Samuels Archaeological Consultants report **2000/97**

Johnson, D E, 1969 Romano-British pottery kilns near Northampton, *The Antiquaries Journal,* **49**, 75-97

Jones, R, 1978 Appendix II: The animal bones, in D A Jackson and T M Ambrose, Excavations at Wakerley, Northants, 1972-1975, *Britannia*, **9**, 324-342

Luke, M, 2016 *Close to the loop: landscape and settlement evolution beside the Biddenham Loop, west of Bedford,* East Anglian Archaeology, **156**

Kerney, M P, and Cameron, R A D, 1979 *Land Snails of Britain and North-West Europe*

Kidd, A, 1999 East Midlands regional research frameworks Northamptonshire: The first millennium BC, a resource assessment, https://www.le.ac.uk/ulas/publications/documents/19nh1stmill_000.pdf

Kidd, S, 2004 'Northamptonshire in the first millennium BC' in M Tingle (ed) *The archaeology of Northamptonshire*, Northamptonshire Archaeological Society, 44-62

Knight, D, Vyner, B, and Allen, C, 2012 *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands,* Nottingham Archaeology Monographs, **6**

Lovejoy, C O, Meindl, R S, Pryzbeck, T R and Mensforth, R P, 1985 Chronological metamorphosis of the auricular surface of the ilium: a new method for the determination of adult skeletal age at death, *American Journal of Physical Anthropology*, **68,** 15-28

Lyman, R L, 1994 *Vertebrate Taphonomy,* Cambridge University Press

McAree, D, 2005 A pit alignment at Warth Park, Raunds *Northamptonshire Archaeology,* **33,** 9-18

McRae, R, 1999 *Pocketbook of orthopaedics and fractures*, Edinburgh

McSloy, E, 2006 Iron Age and Roman Pottery in S Carlyle, 2006, *Archaeological Excavation at Pineham North, Upton, Northampton July to October 2006,* Northamptonshire Archaeology report, **06/177**

Madgwick, R, 2008 Patterns in the modification of animal and human bones in Iron Age Wessex: revisiting the excarnation debate. *In O* Davis, N Sharples and K Waddington, (eds.) *Changing Perspectives on the First Millennium BC: Proceedings of the Iron Age Research Student Seminar 2006*, Oxbow, 99-118

Maier, U, 1996 Morphological studies of free-threshing wheat ears from a Neolithic site in southwest Germany, and the history of the naked wheats, *Vegetation History and Archaeobotany*, **5**, 39-55.

Maresh, M M, 1970 Measurements from roentgenograms, in R W McCammon (ed), *Human Growth and Development,* Springfield, 157–200

Mason, P, 2011 *Archaeological evaluation at Upton Park, Weedon Road, Northampton January to March 2011,* Northamptonshire Archaeology report*,* **11/72**

Maltby, M, 2003 Animal bone, In A Thomas and D Enright, 2003 The excavation of an Iron Age settlement at Wilby Way, Great Doddington, *Northamptonshire Archaeology,* **31,** 15-69

Maull, A, and Masters P, 2001 *Archaeological Investigations at Upton, Northampton South West District,* Northamptonshire Archaeology report

Maull, A, and Masters, P, 2005 Excavation of a Roman farmstead on land west of Glapthorn Road, Oundle, Northamptonshire, 1999 – 2001, *Northamptonshire Archaeology* **33**, 47-78

Mather, L, 2014 *Northamptonshire Archaeological Archives Standard*, Northamptonshire Archaeological Resource Centre

Meadows, A, Walford, J, and Simmonds, C, 2014 *Geophysical survey on land at Pineham Expansion Zone H, Northampton, Northamptonshire,* MOLA Northampton report, **14/200**

Millet, M, Revell, L, and Moore, A, (eds) 2014 *The Oxford Handbook of Roman Britain* (Forthcoming) Online Publication Date: October 2014

MOLA 2014 *Archaeological Fieldwork Manual,* Museum of London Archaeology

MOLA 2015 *Written Scheme of Investigation for a programme of Archaeological Excavation and Strip Map and Sample, land at Pineham (Zone H), Northampton,* MOLA Northampton

Moorrees, C F A, Fanning, E A, and Hunt, E E Jr, 1963a Formation and resorption of three deciduous teeth in children, *American Journal of Physical Anthropology,* **21**, 205–13

Moorrees, C F A, Fanning, E A, and Hunt, E E Jr, 1963b Age variation of formation stages for ten permanent teeth, *Journal of Dental Research,* **42(6)**, 1490–1502

MGC 1992 *Standards in the Museum, Care of Archaeological Collections,* Museums and Galleries Commission

Mudd, A, and Webster, M, 2011 *Iron Age and Middle Saxon Settlements at West Fen Road, Ely, Cambridgeshire: The Consortium Site*, BAR British series, **538**

Muldowney, L, 2014 *Archaeological excavation at Weedon Road, Upton: Assessment Report and Updated Project Design*, **13/128**

Myres, J N L, 1977 *A Corpus of Anglo-Saxon Pottery of the Pagan Period*, Cambridge

Orr, C, 1974 The animal bones, In J H Williams 1974 Two Iron Age sites in Northampton, *Northampton Development Corporation Archaeological Monograph*, **1**, 43

Parks, K, 2012 *Iron Age and Roman Arable Practice in the East of England, Vol 1*, Unpublished Thesis submitted for the degree of Doctor of Philosophy at the University of Leicester

Payne, S, 1985 Morphological distinctions between the mandibular teeth of young sheep, *Ovis*, and goats, *Capra, Journal of Archaeological Science,* **12**, 139-147

Pears, B, 2005 *Archaeological Evaluation at Pineham North, Upton, Northamptonshire, March 2005*, Northamptonshire Archaeology **05/81**

Pelling, R, Campbell, G, Carruthers, W, Hunter, K, and Marshall, P, 2015 Exploring contamination (intrusion and residuality) in the archaeobotanical record: case studies from central and southern England, *Vegetation History and Archaeobotany* **24**: 85-99

Perrin, J R, 1999 Roman Pottery from Excavations at and near to the Roman Small Town of Durobrivae, Water Newton, Cambridgeshire 1956-58, *Journal of Roman Pottery Studies,* **8**

Powers, N (ed), 2008 *Human Osteology Method Statement*, Museum of London on-line publication

Raus, M-P, Bouby L, Py V. and Cazes J-P, 2005 An 11th century A.D. burnt granary at La Gravette, south-western France: preliminary archaeobotanical results, *Vegetation History and Archaeobotany*, **14**, 416-426

Reynolds, P, 1979 *The Iron Age Farm: The Butser*

Roberts, C, 2000 Infectious disease in biocultural perspective: past, present and future work, in Britain in Cox and Mays (eds) *Human Osteology In Archaeology and Forensic Science*, 145–162

Roberts, C, and Connell, B, 2004 Palaeopathology, in M Brickley and J McKinley (eds), *Guidelines to the Standards for Recording Human Remains,* Chartered Institute for Archaeologists, Occasional Paper, **7**

Rogers, J, 2000 *The palaeopathology of joint disease*, in M Cox and S Mays (eds) 2000, *Human osteology in archaeology and forensic science*, London, Greenwich Medical Media, 163-82

Scheuer, L and Black, S, 2000 *Developmental Juvenile Osteology,* Academic Press

Schoch, W, Heller, I, Schweingruber, FH, Kienast F, 2004 *Wood Anatomy of Central European Species* Retrieved 10th and 11th December 2014 from the World Wide Web:http://www.woodanatomy.ch/

Silver, I, 1969 The ageing of domestic animals, In D Brothwell and E Higgs, 1969 *Science in archaeology: a survey of progress and research,* Thames and Hudson, 283-302

Simmonds, C, 2015 *Archaeological trial trenching on land at Pineham, Zone H, Northamptonshire, Interim Statement May 2015,* MOLA Northampton report, **15/120**

Smart, T L, and Hoffman, E S, 1988 Environmental Interpretation of Archaeological Charcoal, in Hastorf, C A, and Popper, V S, *Current Palaeobotany*

SMA 1993 *Selection, retention and dispersal of archaeological collections*, Society of Museum Archaeologists

Speed, G, 2015 A Pit Alignment, Iron Age settlement and Roman cultivation trenches west of South Meadow Road, Upton, Northampton, *Northamptonshire Archaeology,* **38**, 53-71

Stace, C, 2010 *New flora of the British Isles*, 3rd Edition

Swan, V, 1984 *The Pottery Kilns of Roman Britain,* Her Majesty's Stationary Office (available online at www.romankilns.net, last viewed 22/03/2017)

Thomas, A, and Enright, D, 2003 Excavation of an Iron Age settlement at Wilby Way, Great Doddington, *Northamptonshire Archaeology,* **31**, 15-69

Thompson, FH 1954 Anglo-Saxon discoveries at Partney, Lincolnshire, *The Antiquaries Journal*, **34 (3-4)**, 229-232

Timby, J, 2007 The Iron Age and Roman Pottery in A Mudd, 2007, *Iron Age and Roman settlement on the Northamptonshire uplands*: *Archaeological Work on the A43 Towcestar to M40 Road Improvement Scheme in Northamptonshire and Oxfordshire*, Northamptonshire County Council, 88-118

Tomber, R and Dore, J, 1998 *The National Roman Fabric Reference Collection: A Handbook,* MoLAS

Tyers, P, 1996 *Roman Pottery in Britain*, Batsford

Tyrell, A, 2000 Skeletal non-metric traits and the assessment of inter- and intra-population diversity: past problems and future potential, in M Cox and S Mays, 2000 *Human osteology in archaeology and forensic science*, Greenwich Medical Media, 289-306

Van der Veen, M, 1989 Charred Grain Assemblages from Roman-Period Corn Driers in Britain, *Archaeological Journal*, **146**, 302-319

Van der Veen, M, 2014 Arable Farming, Horticulture, and Food: Expansion, Innovation, and Diversity in Roman Britain, in M Millet, L Revell and A Moore

UKIC 1983 *Guidelines for the Presentation of Excavation Archives for Long Term Storage, Guidelines,* **2,** United Kingdom Institute for Conservation

ULAS 2015 https://ulasnews.wordpress.com/2015/04/20/archaeologists-return-to-pineham-northamptonshire/ University of Leicester Archaeology Service

Waldron, T, 2009 *Palaeopathology*, Cambridge University Press

Walker, K, 1990 *Guidelines for the preparation of excavation archives for long term storage,* United Kingdom Chartered Institute for Conservation

Walker, C, and Maull, A, 2010 Iron Age and Roman settlement at Upton, Northampton, *Northamptonshire Archaeology*, **36**, 9-52

Webster, P, 1996 Roman Samian Pottery in Britain, *Practical Handbook in Archaeology,* **13**, Council for British Archaeology

Whimster, R, 1981 *Burial practices in the Iron Age: a discussion and gazetteer of the evidence c700BC-AD43,* BAR British Series*,* **90**

Williams H, M, R 1997 Ancient landscapes and the dead: the reuse of prehistoric and Roman monuments as early Anglo-Saxon burial sites, *Medieval Archaeology*, **41**

MOLA

V1 29 March 2017
V2 31 May 2017

APPENDIX – Additional Archaeo-botannical tables

Key to Estimated Quantities for tables A1- A12: + =1-10 items, ++ =11-50 items, +++ = 51-150, ++++ = 151-250., +++++ = >250

Table A1: Contents of flots from all Pits

Sample		**17**	**18**	**21**	**22**	**27**	**29**	**30**	**39**	**40**	**52**	**53**	**54**
Area		**XS**	**XS?**	**SMS**	**SMS**	**XS**	**SMS**	**SMS**	**XN**	**SMS**	**XS**	**XS**	**XS**
Fill		**11014**	**11225**	**9007**	**9062**	**11249**	**9516**	**9517**	**11382**	**9641**	**11657**	**11658**	**11713**
Cut		**11016**	**11226**	**9008**	**9063**	**11250**	**9518**	**9518**	**11383**	**9643**	**11660**	**11660**	**11715**
Feature Type		**Pit**	**Pit/ PH**	**Pit**	**Pit**	**PH/ Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**
Feature No.		**PA**	**-**	-	-	-	-	-	**PA**	**-**	-	-	-
Sample volume (litres)		**40**	**20**	**20**	**40**	**30**	**20**	**20**	**20**	**40**	**20**	**20**	**40**
Flot Volume (ml)		**5**	**10**	**50**	**10**	**30**	**15**	**5**	**10**	**5**	**2**	**5**	**30**
Percentage scanned		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Counted items per litre of sampled soil		**<1**	**0**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1`**	**0**	**<1**
						Charred Cereals (Grains)							
Avena sp.	oat	-	-	-	-	-	1	-	-	-	-	-	-
Hordeum distichon/ vulgare L. (straight grain)	barley	-	-	-	1	-	7	3	-	-	1	-	-
Hordeum/ Triticum sp.	barley/wheat	-	-	-	-	-	-	-	-	-	-	-	1
Triticum aestivum/ durum/ turdigum L.	bread/club/rivet wheat	-	-	-	-	-	6	9	1	-	2	-	-
Very poorly preserved indeterminate grains		-	-	-	-	-	-	-	1	-	-	-	-
Grain tissue		-	-	-	-	-	-	-	1	-	-	-	-
						Charred Seeds							
Anthemis cotula L. (fruit)	stinking chamomile	-	-	-	-	-	1	-	-	-	-	-	-
Eleocharis palustris/uniglumis (fruit)	spike-rush	-	-	-	-	-	-	-	-	-	-	-	1
Plantago sp. (seed)	plantain	-	-	-	-	-	-	-	-	-	1	-	-
						Charcoal							
Quercus sp.	oak	-	-	13	-	-	1	2	-	-	-	-	-
Prunus cerasus/avium	cherry/plum	2	-	-	-	-	1	-	-	-	-	-	5
<4mm Ø wood fragments		++++	+++++	+++++	+++++	+++++	+++++	-	+++	+++++	++	++	+++++
						Dried Waterlogged Plant Remains							
Sambucus nigra L. (fruit endocarp fragment)	elderberry	-	-	-	-	1	-	-	-	-	-	-	-
Betula pubescens Ehrh (bract)	downy birch	-	-	-	1	1	-	-	-	-	-	-	-

Sample		17	18	21	22	27	29	30	39	40	52	53	54
Area		**XS**	**XS?**	**SMS**	**SMS**	**XS**	**SMS**	**SMS**	**XN**	**SMS**	**XS**	**XS**	**XS**
Fill		**11014**	**11225**	**9007**	**9062**	**11249**	**9516**	**9517**	**11382**	**9641**	**11657**	**11658**	**11713**
Cut		**11016**	**11226**	**9008**	**9063**	**11250**	**9518**	**9518**	**11383**	**9643**	**11660**	**11660**	**11715**
Feature Type		**Pit**	**Pit/ PH**	**Pit**	**Pit**	**PH/ Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**	**Pit**
Feature No.		**PA**	**-**	-	-	-	-	-	**PA**	**-**	-	-	-
Betula sp. (fruit)	birch	-	-	-	-	-	-	-	-	1	-	-	5
Atriplex sp.(fruit)	orache	-	-	-	-	-	1	-	-	-	-	-	-
Dicotyledonous leaf fragment		-	-	-	-	-	+	-	-	-	-	-	+++++
Root/rhizome fragments		+++++	+++++	+++++	+++++	+++++	+++++	-	+++++	+++++	+++	++++	-
Modern grass stem and leaf		-	-	+++	-	-	++	-	-	-	-	-	-
Modern moss		-	+++++	-	+++	+++	-	-	+++	-	-	-	-
Modern Seeds													
Brassica/Sinapis sp. (seed)	wild cabbage/mustard	-	-	-	-	-	-	-	1	-	-	-	-
Ratios													
Glume bases: Glume wheat grains		0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0
Weed Seeds: Grains		0:0	0:0	0:0	0:1	0:0	1:14	0:12	0:2	0:0	1:3	0:0	1:1
Fauna													
Terrestrial mollusca		-	-	-	-	+	++++	+	++	-	+	+	-
Earthworm cocoons		+	-	-	-	+	-	-	-	-	+	-	-

Table A2: Contents of flots from all Postholes and Post Pipes

Sample		**20**	**23**	**24**	**55**	**57**
Area		**SMS**	**SMS**	**SMS**	**XS**	**XS**
Fill		**9005**	**9082**	**9084**	**11608**	**11742**
Cut		**9006**	**9089**	**9089**	**11609**	**11743**
Feature Type		**PH**	**PP**	**PP**	**PH**	**PH**
Feature No.		-	**ST2**	**ST2**	**-**	-
Sample volume (L.)		**20**	**20**	**10**	**20**	**10**
Flot Volume (ml)		**5**	**5**	**5**	**5**	**5**
Percentage scanned		**100%**	**100%**	**100%**	**100%**	**100%**
Counted items per litre of sampled soil		**<1**	**<1**	**0**	**<1**	**<1**
	Charred Cereals (Grains)					
Hordeum distichon/vulgare L. (hulled straight grain)	barley	-	-	-	1	1
Secale/Triticum sp.	rye/wheat	1	-	-	2	-
Triticum aestivum//durum/turdigum	bread wheat	-	-	-	1	-
	Charred Cereal Chaff					
Indeterminate cereal/grass (Poaceae) -stem fragments		-	-	-	-	1
	Charred Seeds					
Corylus avellana L. (fruit 'nutshell')	hazel	8	-	-	-	-
	Charcoal					
Quercus sp.	oak	1	-	-	-	1
Prunus cerasus/avium	cherry/plum	-	3	-	3	-
Corylus avellana L. (fruit 'nutshell')	hazel	3	-	-	-	-
<4mm Ø wood fragments		+++++	+++++	+++++	+++++	++
	Dried Waterlogged Plant Remains					
Betula pubescens Ehrh (bract)	downy birch	-	1	-	-	-
Betula sp. (fruit)	birch	-	-	-	**-**	2
Dicotyledonous leaf fragment		+	+	-	**-**	**-**
Root/rhizome fragments		+++++	+++++	+++++	+++++	+++++
Modern grass stem and leaf		+++	-	-	-	-
Modern moss		-	++	++	-	-
	Ratios					
Glume bases: Glume wheat grains		0:0	0:0	0:0	0:0	0:0
Weed Seeds: Grains		0:0	0:0	0:0	0:4	0:1
	Fauna					
Terrestrial mollusca		**-**	**-**	**-**	-	+
Earthworm cocoons		-	+	-	+	-

Table A3: Contents of flots from all Burials

Sample		**16**	**35**	**36**	**41**	**42**	**45**	**46**	**47**	**59**
Area		**XS**	**XN**	**XN**	**XS**	**XS**	**XS**	**XS**	**XS**	**XS**
Fill		**11171**	**11284**	**11289**	**11468**	**11471**	**11539**	**11549**	**11570**	**11826**
Cut		**11172**	**11285**	**11290**	**11470**	**11473**	**11541**	**11547**	**11472**	**11828**
Feature No.		**HB1**	**HB2**	**HB3**	**HB4**	**HB5**	**HB6**	**HB8**	**HB9**	**HB10**
Sample volume (L.)		**10**	**40**	**20**	**40**	**50**	**40**	**50**	**40**	**80**
Flot Volume (ml)		**no flot**	**30**	**5**	**30**	**30**	**40**	**25**	**25**	**20**
Percentage scanned		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Counted items per litre of sampled soil		**<1**	**<1**	**0**	**<1**	**<1**	**0**	**0**	**0**	**0**
					Charred Cereals (Grains)					
Triticum sp.		-	1	-	-	-	-	-	-	-
Triticum aestivum/durum/turdigum L (grain)	bread/club/rivet wheat	1	-	-	-	-	-	-	-	-
					Charred Cereal Chaff					
Triticum spelta L. (glume base)	spelt	-	-	-	-	1	-	-	-	-
					Charcoal					
<4mm Ø wood fragments		-	**+++++**	+++	++++	+++	++	-	++	+++
					Dried Waterlogged Plant Remains					
Betula sp. (fruit)	birch	-	**-**	-	-	1	-	-	-	2
Atriplex prostrata/patula (fruit)	spearleaved/ common orache	**-**	**-**	-	-	1	-	-	-	-
Atriplex/Chenopodium sp. (fruit)	orache/ goosefoot	**-**	**-**	-	1	-	-	-	-	-
Dicotyledonous leaf fragment		-	**-**	-	-	++++	+	-	-	-
Root/rhizome fragments		-	+++++	+++++	+++++	++++	+++++	+++++	+++++	+++++
Modern grass stem and leaf		-	-	-	-	-	-	++	-	-
Modern moss		-	+	-	-	-	+++	-	-	-
					Modern Seeds					
Acer pseudoplanatus (key frags)	sycamore	-	-	-	-	4	-	-	-	-
					Ratios					
Glume bases: Glume wheat grains		0:0	0:0	0:0	0:0	1:0	0:0	0:0	0:0	0:0
Weed Seeds: Grains		0:1	0:1	0:0	0:0	0:0	0:0	0:0	0:0	0:0
					Fauna					
Terrestrial mollusca		**-**	+	++	-	-	-	-	-	-
Earthworm cocoons		-	-	+	-	+	-	-	-	-
Uncharred bone fragments		-	+	-	-	-	+++++	+++	+++	++
Charred bone		-	-	-	-	+	-	-	-	-

Table A4: Content of flots from all Ditches in Area SMS– samples <25> to <34>

Sample		25	26	28	31	32	34
Fill		9192	9228	9449	9531	9627	9623
Cut		9194	9229	9451	9533	9629	9624
Sample volume (L.)		20	40	20	40	40	40
Flot Volume (ml)		20	50	20	30		75
Counted items per litre of sampled soil		<1	3	10	5	<1	3
Charred Cereal Grains							
Avena sp.	oat	-	6	-	-	-	-
Hordeum distichon/vulgare L. (straight grain)	barley	-	22	5	24	1	38
Secale cereale L.	rye	-	-	-	2	-	4
Triticum cf. *spelta* L.	spelt	-	-	-	1	-	-
Triticum sp.	wheat	-	*6*	-	11	2	9
Triticum sp. (sprout groove)	wheat	-	-	-	-	-	1
Triticum aestivum//durum/turdigum L (grain)	bread wheat	-	50	11	108	1	61
Very poorly preserved indeterminate grains		-	-	-	27	-	-
Grain tissue		-	-	-	+++	-	++
Charred Cereal Chaff							
Indeterminate cereal/grass (Poaceae) -stem fragments		-	-	2	-	-	-
Charred Seeds							
Galium aparine L. (fruit)	cleavers	-	-	3	-	-	-
Anthemis cotula L. (fruit)	stinking chamomile	-	1	3	1	-	-
Vicia/Lathyrus/Pisum sp. (cotyledons)	vetch/tare/vetchling/pea	-	-	-	-	-	3
Vicia/Pisum sp. (cotyledons)	vetch/pea	-	-	-	-	-	2
cf. *Vicia faba* L. (seed)	broad bean	-	-	-	-	-	1
Trifolium sp.	clover	-	1	-	-	-	-
Plantago lanceolata L.	ribwort plantain	-	1	1	-	-	-
Plantago sp.	plantain	-	1	-	-	-	-
Polygonum aviculare L. (fruit)	knotgrass	-	-	2	-	-	-
Fallopia convolvulus (L.) A.Love (fruit)	black bindweed	-	-	-	1	-	-
cf. *Agrostemma githago* L. (seed)	corncockle	-	-	1	-	-	-
Atriplex sp. (fruit)	orache	-	-	15	-	-	-
Chenopodium/Atriplex sp, (fruit)	orache/goosefoot	-	-	16	-	-	-
Charcoal							
Quercus sp.	oak	5	8	137	-	5	-
Prunus cerasus/avium	cherry/plum	-	4	-	5	-	2
Salix/Populus sp.	willow/poplar	-	2	-	-	-	-
Betulaceae (indeterminate)	birch family	-	-	-	-	-	1

Sample		25	26	28	31	32	34
Fill		9192	9228	9449	9531	9627	9623
Cut		9194	9229	9451	9533	9629	9624
<4mm Ø wood fragments		+++++	+++++	+++++	+++++	+++++	+++++
Dried Waterlogged Plant Remains							
Solanum nigrum L. (seed)	black nightshade	-	-	1	-	-	-
Urtica dioica L.(fruit)	stinging nettle	-	-	3	-	-	-
Rumex acetosa/crispus/obtusifolius	common/curled/broad-leaved dock	-	-	-	-	-	1
Root/rhizome fragments		+++++	++++	++++	+++	+++++	+++++
Modern grass stem and leaf		-	-	-	-	++	-
Modern moss		-	++	++	+	-	++
Ratios							
Glume bases: Glume wheat grains		0:0	0:0	0:0	0:1	0:0	0:0
Weed Seeds: Grains		0:0	1:6	3:1	1:81.5	0:6	1:17
Fauna							
Terrestrial mollusca		+++	+++	++	+	+	+
Earthworm cocoons		+	-	-	-	-	-
Uncharred bone fragments		-	+	-	+	+	+
Charred bone		-	-	-	-	-	+

Table A5: Content of flots from all Ditches – samples <37> and <38>

Sample		37	38
Area		SMS	XN
Fill		9639	9638
Cut		9640	9640
Sample volume (L.)		40	40
Flot Volume (ml)		150	25
Counted items per litre of sampled soil		6	<1
Charred Cereal Grains			
Avena sp.	oat	7	-
Hordeum sp.	barley	5	-
Hordeum distichon/vulgare L. (straight grain)	barley	7	-
Hordeum distichon/vulgare L. (hulled straight grain)	barley	3	-
Secale cereale L.	rye	6	1
Triticum sp.	wheat	9	-
Triticum aestivum//durum/turdigum L (grain)	bread wheat	145	-
Charred Chaff			
Indeterminate cereal/grass (Poaceae) -stem fragments		3	-
Charred Seeds			
Euphrasia/Odontites sp.	eyebright/ bartsia	1	-
Anthemis cotula L. (fruit)	Stinking chamomile	16	-
Eleocharis palustris/uniglumis	spike-rush	1	-
Bromus sp. (fruit)	brome	3	-
Vicia sp.	vetch/tare/vetchling/pea	2	-
Vicia/Lathyrus/Pisum sp. (cotyledons)	vetch/tare/vetchling/pea	19	-
Plantago lanceolata L.	ribwort	*2*	-
Fallopia convolvulus (L.) A.Love (fruit)	black bindweed	3	-
Rumex acetosa/crispus/obtusifolius	common/curled/broad-leaved dock	4	-
Charcoal			
Quercus sp.	oak	8	-
Prunus cerasus/avium	cherry/plum	1	2
<4mm Ø wood fragments		+++++	++++
Dried Waterlogged Plant Remains			
Fumaria officinalis L. (testa fragments)	Common fumitory	1	-
Rubus fruticosus/idaeus (fruit)	blackberry/raspberry	1	-
Betula pubescens Ehrh (bract)	downy birch	5	-

Sample		**37**	**38**
Area		**SMS**	**XN**
Fill		**9639**	**9638**
Cut		**9640**	**9640**
Sample volume (L.)		**40**	**40**
Flot Volume (ml)		**150**	**25**
Counted items per litre of sampled soil		**6**	**<1**
Betula sp. (fruit)	birch	6	-
Dicotyledonous leaf fragment		+++	-
Root/rhizome fragments		+++++	++++
Modern grass stem and leaf		-	-
Modern moss		++	+++
Ratios			
Glume bases: Glume wheat grains		0:0	0:0
Weed Seeds: Grains		1:3	0:1
Fauna			
Terrestrial mollusca		+	++
Earthworm cocoons		+	-

Table A6: Content of flots from Roundhouse Samples

Sample		49	50	55	56	57
Area		XS	XS	XS	XS	XS
Fill		11634	11637	11608	11740	11742
Cut		11636	11639	11609	11741	11743
Feature Type		Term.	-	PH	PH	PH
Feature No.		RD1	RD1	RD1	RD1	RD1
Sample volume (L.)		40	40	20	10	10
Flot Volume (ml)		25	5	5	5	5
Counted items per litre of sampled soil		<1	<1	0	1.2	<1
Charred Cereals (Grains)						
Hordeum distichon/vulgare L. (straight grain)	2- and 6-rowed barley	-	-	-	2	-
Hordeum distichon/vulgare L. (hulled straight grain)	barley	-	-	1	-	1
Secale/Triticum sp	rye/wheat	-	-	2	-	-
Triticum cf. *spelta* L.	spelt	1	-	-	-	-
Triticum aestivum//durum/turdigum L (grain)	bread wheat	-	-	1	-	-
Charred Cereal Chaff						
Triticum spelta L. (spikelet base)	spelt	-	-	-	1	-
Indeterminate cereal/grass (Poaceae)-stem fragments		-	-	-	-	1
Charred Seeds						
Bromus sp. (fruit)	brome	-	-	-	1	-
Trifolium sp.(seed)	clover	1	-	-	-	-
Medicago/ Trifolium sp. (seed)	medick/clover	-	-	-	1	-
Rumex acetosa/ crispus/ obtusifolius (fruit)	common/ curled/ broad-leaved dock	-	-	-	1	-
Poaceae (grass seed fragments)		-	-	-	4	-
Charcoal						
Prunus cerasus/ avium	cherry/plum	-	-	3	-	-
Quercus sp.	oak	2	-	-	-	1
Indeterminate		-	-	-	1	-
<4mm Ø wood fragments		+++	-	+++++	++++	++
Dried Waterlogged Plant Remains						
Betula sp. (fruit)	birch	1	2	-	2	2
Dicotyledonous leaf fragment		2	-	-	-	-
Root/rhizome fragments		+++++	+++++	+++++	+++++	+++++
Modern Seeds						
Acer pseudoplanatus (key frags)	Sycamore	1	1	-	-	-

Sample	49	50	55	56	57
Area	XS	XS	XS	XS	XS
Fill	11634	11637	11608	11740	11742
Cut	11636	11639	11609	11741	11743
Feature Type	Term.	-	PH	PH	PH
Feature No.	RD1	RD1	RD1	RD1	RD1
Ratios					
Glume bases:Glume wheat grains	0:1	0:0	0:0	0:0	0:0
Weed Seeds: Grains	1:1	0:0	0:4	7:2	0:1
Fauna					
Terrestrial mollusca	-	-	-	-	+
Earthworm cocoons	-	-	+	-	-

Table A7: Contents of flot from a Romano-British Well

Sample	15
Area	XS
Fill	11164
Cut	11166
Feature Type	Well
Feature No.	Well
Sample volume (L.)	40
Flot Volume (ml)	15
Percentage scanned	100%
Counted items per litre of sampled soil	0
Charcoal	
<4mm Ø wood fragments	+++++
Dried Waterlogged Plant Remains	
Root/rhizome fragments	+++++
Modern grass (Poaceae) stem and leaf	+

Table A8: Contents of Environmental Samples from Iron Age Samples <17> to <39>

Sample		17	20	27	32	34	37	38	39
Area		**XS**	**SMS**	**XS**	**SMS**	**SMS**	**SMS**	**XN**	**XN**
Fill		**11014**	**9005**	**11249**	**9627**	**9623**	**9638**	**11381**	**11382**
Cut		**11016**	**9006**	**11250**	**9629**	**9624**	**9640**	**11383**	**11383**
Feature Type		**Pit**	**PH**	**PH/Pit**	**Ditch**	**Ditch**	**Ditch**	**Pit**	**Pit**
Feature No.		**PA**	**-**	-	**20**	**-**	-	**PA**	**PA**
Sample volume (L.)		**40**	**20**	**30**	**40**	**40**	**40**	**40**	**20**
Flot Volume (ml)		**5**	**5**	**30**		**75**	**150**	**25**	**10**
Counted items per litre of sampled soil		**0**	**<1**	**<1**	**<1**	**3**	**6**	**<1**	**<1**
Charred Cereals (Grains)									
Avena sp.	oat	-	-	-	-	-	7	-	-
Hordeum sp.	very poorly preserved barley	-	-	-	-	-	5	-	-
Hordeum distichon/vulgare L. (straight grain)	poorly preserved barley	-	-	-	1	38	7	-	-
Hordeum distichon/vulgare L. (hulled straight grain)	2- or 6- rowed barley	-	-	-	-	-	3	-	-
Secale cereale L.	rye	-	-	-	-	4	6	1	-
Secale/Triticum sp	rye/wheat	-	1	-	-	-	-	-	-
Triticum sp.	very poorly preserved wheat	-	-	-	2	9	9	-	-
Triticum sp. (sprout groove)	germinated wheat	-	-	-	-	1	-	-	-
Triticum aestivum//durum/turdigum L	bread/club/rivet wheat	-	-	-	1	61	145	-	1
Very poorly preserved indeterminate grains		-	-	-	-	-	-	-	1
Grain tissue		-	-	-	-	++	-	-	+
Charred Cereal Chaff									
Indeterminate cereal/grass (Poaceae) -stem fragments		-	-	-	-	-	3	-	-
Charred Seeds									
Euphrasia/Odontites sp.(seed)	eyebright/ bartsia	-	-	-	-	-	1	-	-
Anthemis cotula L. (fruit)	Stinking chamomile	-	-	-	-	-	16	-	-
Eleocharis palustris/uniglumis (fruit)	spike-rush	-	-	-	-	-	1	-	-
Bromus sp. (fruit)	brome	-	-	-	-	-	3	-	-
Vicia sp. (seed)	vetch	-	-	-	-	-	2	-	-
Vicia/Lathyrus/Pisum sp. (cotyledons)	vetch/tare/vetchling/pea	-	-	-	-	3	19	-	-
Vicia/Pisum sp. (cotyledons)	vetch/pea	-	-	-	-	2	-	-	-
cf. *Vicia faba* L. (seed)	broad bean	-	-	-	-	1	-	-	-
Plantago lanceolata L. (seed)	ribwort plantain	-	-	-	-	-	2	-	-
Plantago sp. (seed)	plantain	-	-	-	-	-	-	-	-
Corylus avellana L. (fruit 'nutshell')	hazel	-	8	-	-	-	-	-	-
Fallopia convolvulus (L.) A.Love (fruit)	black bindweed	-	-	-	-	-	3	-	-

Sample		17	20	27	32	34	37	38	39
Area		XS	SMS	XS	SMS	SMS	SMS	XN	XN
Fill		11014	9005	11249	9627	9623	9638	11381	11382
Cut		11016	9006	11250	9629	9624	9640	11383	11383
Feature Type		Pit	PH	PH/Pit	Ditch	Ditch	Ditch	Pit	Pit
Feature No.		PA	-	-	20	-	-	PA	PA
Rumex acetosa/crispus/obtusifolius (fruit)	common/curled/broad-leaved dock	-	-	-	-	-	4	-	-
Charcoal									
Prunus cerasus/avium	cherry/plum	2	-	-	-	2	1	2	-
Quercus sp.	oak	-	1	-	5	-	8	-	-
Corylus avellana L. (fruit 'nutshell')	hazel	-	3	-	-	-	-	-	-
Betulaceae (indeterminate)	birch family	-	-	-	-	1	-	-	-
<4mm Ø wood fragments		++++	+++++	+++++	+++++	+++++	+++++	++++	+++
Dried Waterlogged Plant Remains									
Sambucus nigra L. (fruit endocarp fragment)	elderberry	-	-	1	-	-	-	-	-
Fumaria officinalis L. (testa fragments)	common fumitory	-	-	-	-	-	1	-	-
Rubus fruticosus/idaeus (fruit)	blackberry/raspberry	-	-	-	-	-	1	-	-
Betula pubescens Ehrh (bract)	downy birch	-	-	1	-	-	5	-	-
Betula sp. (fruit)	birch	-	-	-	-	-	6	-	-
Rumex acetosa/crispus/obtusifolius (fruit)	common/curled/broad-leaved dock	-	-	-	-	1	-	-	-
Dicotyledonous leaf fragments		-	+	-	-	-	+	-	-
Root/rhizome fragments		+++++	+++++	+++++	+++++	+++++	+++++	++++	+++++
Modern grass stem and leaf		-	+++	-	++	-	-	-	-
Modern moss		-	-	+++	-	++	++	+++	+++
Modern Seeds									
Brassica/Sinapis sp. (seed)	wild cabbage/mustard	-	-	-	-	-	-	-	1
Ratios									
Glume bases:Glume wheat grains		0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0
Weed Seeds: Grains		0:0	8:1	0:0	0:4	6:113	51:182	0:1	0:2
Fauna									
Terrestrial mollusca		-	-	+	+	+	+	++	++
Cecilioides acicula (Müller)		-	-	-	-	-	-	++	++
Earthworm cocoons		+	-	+	-	-	+	-	-
Uncharred bone fragments		-	-	-	+	+	-	-	-
Charred bone		-	-	-	-	+	-	-	-

Table A9: Contents of Environmental Samples from Iron Age Samples <40> to <54>

Sample		40	43	48	49	50	51	52	53	54
Area		**SMS**	**XS**	**XS**	**XS**	**XS**	**XS**	**XS**	**XS**	**XS**
Fill		**9641**	**11476**	**14999**	**11634**	**11637**	**11644**	**11657**	**11658**	**11713**
Cut		**9643**	**11478**	**11500**	**11636**	**11639**	**11645**	**11660**	**11660**	**11715**
Feature Type		**Pit**	**PH**		**Term.**	**-**	**Ditch**	**Pit**	**Pit**	**Pit**
Feature No.		**-**	**-**	**Ditch**	**RD1**	**RD1**	**-**	-	-	-
Sample volume (L.)		**40**	**20**	**20**	**40**	**40**	**40**	**20**	**20**	**40**
Flot Volume (ml)		**5**	**40**	**10**	**25**	**5**	**10**	**2**	**5**	**30**
Counted items per litre of sampled soil		**<1**	**0**	**0%**	**<1**	**<1**	**0**	**<1`**	**0**	**<1**
		Charred Cereals (Grains)								
Hordeum distichon/ vulgare L. (straight grain)	poorly preserved barley	-	-	-	-	-	-	1	-	-
Hordeum/Triticum sp.	barley/ wheat	-	-	-	-	-	-	-	-	1
Triticum cf. *spelta* L.	spelt	-	-	-	1	-	-	-	-	-
Triticum aestivum/ durum/ turdigum L	bread/ club/ rivet wheat	-	-	-	-	-	-	2	-	-
		Charred Seeds								
Eleocharis palustris/uniglumis (fruit)	spike-rush	-	-	-	-	-	-	-	-	1
Trifolium sp.(seed)	clover	-	-	-	1	-	-	-	-	-
Plantago sp. (seed)	plantain	-	-	-	-	-	-	1	-	-
		Charcoal								
Prunus cerasus/avium	cherry/plum	-	13	-	-	-	-	-	-	5
Quercus sp.	oak	-	14	-	2	-	-	-	-	-
<4mm Ø wood fragments		+++++	+++++	-	+++	-	-	++	++	+++++
		Dried Waterlogged Plant Remains								
Betula sp. (fruit)	birch	1	-	-	1	2	-	-	-	5
Dicotyledonous leaf fragments		-	-	-	++	-	-	-	-	5
Root/rhizome fragments		+++++	-	+++++	+++++	+++++	+++	+++	++++	-
Modern grass stem and leaf		-	-	+++	-	-	-	-	-	-
Modern moss		-	++	-	-	-	-	-	-	-
		Modern Seeds								
Acer pseudoplanatus (key frags)	sycamore	-	6	-	1	1	-	-	-	-
		Ratios								
Glume bases: Glume wheat grains		0:0	0:0	0:0	0:1	0:0	0:0	0:0	0:0	0:0
Weed Seeds: Grains		0:0	0:0	0:0	1:1	0:0	0:0	1:3	0:0	1:1
		Fauna								
Terrestrial mollusca		-	-	-	-	-	-	+	+	-
Earthworm cocoons		-	-	-	-	-	-	+	-	-
Charred bone		-	+	-	-	-	-	-	-	-

Table A10: Contents of Environmental Samples from Iron Age Samples <55> to <58>

Sample		55	56	57	43	58
Area		XS	XS	XS	XS	XS
Fill		11608	11740	11742	11476	11736
Cut		11609	11741	11743	11478	11647
Feature Type		PH	PH	PH	PH	Term.
Feature No.		RD1	RD1	RD1	-	-
Sample volume (L.)		20	10	10	20	40
Flot Volume (ml)		5	5	5	40	10
Counted items per litre of sampled soil		0	1.2	<1	0	<1
	Charred Cereals (Grains)					
Hordeum distichon/vulgare L. (straight grain)	poorly preserved barley	-	2	-	-	-
Hordeum distichon/vulgare L. (hulled straight grain)	2- or 6- rowed barley	1	-	1	-	-
Secale/Triticum sp	rye/wheat	2	-	-	-	-
Triticum aestivum//durum/ turdigum L	bread/club/rivet wheat	1	-	-	-	-
	Charred Cereal Chaff					
Triticum spelta L. (spikelet base)	spelt	-	1	-	-	-
Indeterminate cereal/grass (Poaceae) -stem fragments		-	-	1	-	-
	Charred Seeds					
Bromus sp. (fruit)	brome	-	1	-	-	-
Medicago/Trifolium sp. (seed)	medick/clover	-	1	-	-	-
Rumex acetosa/crispus/ obtusifolius (fruit)	common/curled/broad-leaved dock	-	1	-	-	-
Poaceae (seed fragments)		-	4	-	-	-
	Charcoal					
Prunus cerasus/avium	cherry/plum	3	-	-	13	-
Quercus sp.	oak	-	-	1	14	-
Indeterminate		-	1	-	-	-
<4mm Ø wood fragments		+++++	++++	++	+++++	+++
	Dried Waterlogged Plant Remains					
Betula pubescens Ehrh (bract)	downy birch	-	-	-	-	1
Betula sp. (fruit)	birch	-	2	2	-	1
Dicotyledonous leaf fragments		-	-	-	-	+
Root/rhizome fragments		+++++	+++++	+++++	-	+++++
Modern moss		-	-	-	++	-
	Modern Seeds					
Acer pseudoplanatus (key frags)	sycamore	-	-	-	6	-

Sample	55	56	57	43	58
Area	XS	XS	XS	XS	XS
Fill	11608	11740	11742	11476	11736
Cut	11609	11741	11743	11478	11647
Feature Type	PH	PH	PH	PH	Term.
Feature No.	RD1	RD1	RD1	-	-
Ratios					
Glume bases: Glume wheat grains	0:0	0:0	0:0	0:0	0:0
Weed Seeds: Grains	0:4	3.5:1	0:1	0:0	0:0
Fauna					
Terrestrial mollusca	-	-	+	-	-
Earthworm cocoons	+	-	-	-	-
Charred bone	-	-	-	+	-

Table A11: Contents of Environmental Samples from Saxon features.

Sample		25	26	28	31	41	42	45	46	47	59
Area		SMS	SMS	SMS	SMS	XS	XS	XS	XS	XS	XS
Fill		9192	9228	9449	9531	11468	11471	11539	11549	11570	11826
Cut		9194	9229	9451	9533	11470	11473	11541	11547	11472	11828
Feature Type		Ditch	Ditch	Ditch	Ditch	Burial	Burial	Burial	Burial	Burial	Burial
Feature No.		-	-	-	-	HB4	HB5	HB6	HB8	HB9	HB10
Sample volume (L.)		20	40	20	40	40	50	40	50	40	80
Flot Volume (ml)		20	50	20	30	30	30	40	25	25	20
Counted items per litre of sampled soil		0	2	<3	4.5	<1	<1	0	0	0	0
Charred Cereals (Grains)											
Avena sp.	oat	-	6	-	-	-	-	-	-	-	-
Hordeum distichon/vulgare L. (straight grain)	2 or 6 rowed barley	-	22	5	24	-	-	-	-	-	-
Secale cereale L.	rye	-	-	-	2	-	-	-	-	-	-
Triticum cf. *spelta* L.	spelt	-	-	-	1	-	-	-	-	-	-
Triticum sp.	very poorly preserved wheat	-	6	-	11	-	-	-	-	-	-
Triticum aestivum//durum/turdigum L.	bread wheat	-	50	11	108	-	-	-	-	-	-
Very poorly preserved indeterminate grains		-	-	-	27	-	-	-	-	-	-
Grain tissue		-	-	-	+++	-	-	-	-	-	-
Charred Cereal Chaff											
Triticum spelta L. (glume base)	spelt	-	-	-	-	-	1	-	-	-	-
Indeterminate cereal/grass (Poaceae) -stem fragments		-	-	2	-	-	-	-	-	-	-
Charred Seeds											
Galium aparine L. (fruit)	cleavers	-	-	3	-	-	-	-	-	-	-
Anthemis cotula L. (fruit)	stinking chamomile	-	1	3	1	-	-	-	-	-	-
Trifolium sp.(seed)	clover	-	1	-	-	-	-	-	-	-	-
Plantago lanceolata L. (seed)	ribwort plantain	-	1	1	-	-	-	-	-	-	-
Plantago sp. (seed)	plantain	-	1	-	-	-	-	-	-	-	-
Polygonum aviculare L. (fruit)	knotgrass	-	-	2	-	-	-	-	-	-	-
Fallopia convolvulus (L.) A.Love (fruit)	black bindweed	-	-	-	1	-	-	-	-	-	-
cf. *Agrostemma githago* L. (seed)	corncockle	-	-	1	-	-	-	-	-	-	-
Atriplex hastata/patula (fruit)	spearleaved/ common orache	-	-	15	-	-	-	-	-	-	-

Chenopodium/Atriplex sp. (fruit)	goosefoot/orache	-	-	16	-	-	-	-	-	-	-
				Charcoal							
Prunus cerasus/avium	cherry/plum	-	4	-	5	-	-	-	-	-	-
Quercus sp.	oak	5	8	137	-	-	-	-	-	-	-
Salix/Populus sp.	willlow/poplar	-	2	-	-	-	-	-	-	-	-
<4mm Ø wood fragments		+++++	+++++	+++++	+++++	++++	+++	++	-	++	+++
				Dried Waterlogged Plant Remains							
Solanum nigrum L. (seed)	black nightshade	-	-	1	-	-	-	-	-	-	-
Urtica dioica L.(fruit)	stinging nettle	-	-	3	-	-	-	-	-	-	-
Betula sp. (fruit)	birch	-	-	-	-	-	1	-	-	-	2
Atriplex prostrata/patula (fruit)	spearleaved/ common orache	-	-	-	-	-	1	-	-	-	-
Atriplex/Chenopodium sp. (fruit)	orache/goosefoot	-	-	-	-	1	-	-	-	-	-
Dicotyledonous leaf fragment		-	-	-	-	-	+	+	-	-	-
Root/rhizome fragments		+++++	++++	++++	+++	+++++	++++	+++++	+++++	+++++	+++++
Modern grass stem and leaf		-	-	-	-	-	-	-	++	-	-
Modern moss		-	++	++	+	-	-	+++	-	-	-
				Modern Seeds							
Acer pseudoplanatus (key frags)	sycamore	-	-	-	-	-	4	-	-	-	-
				Ratios							
Glume bases: Glume wheat grains		0:0	0:0	0:0	0:1	0:0	1:0	0:0	0:0	0:0	0:0
Weed Seeds: Grains		0:0	1:21	3.5:1	1:86.5	0:0	0:0	0:0	0:0	0:0	0:0
				Fauna							
Terrestrial mollusca		+++	+++	++	+	-	-	-	-	-	-
Earthworm cocoons		+	-	-	-	-	+	-	-	-	-
Uncharred bone fragments		-	+	-	+	-	-	+++++	+++	+++	++
Charred bone		-	-	-	-	-	+	-	-	-	-

Table A12: Contents of Environmental Samples from Undated Features

Sample		16	18	21	22	23	24	29	30	35	36
Area		XS	XS?	SMS	SMS	SMS	SMS	SMS	SMS	XN	XN
Fill		11171	11225	9007	9062	9082	9084	9516	9517	11284	11289
Cut		11172	11226	9008	9063	9089	9089	9518	9518	11285	11290
Feature Type		Burial	Pit/PH	Pit	Pit	PP	PP	Pit	Pit	Burial	Burial
Feature No.		HB1				ST2	ST2			HB2	HB3
Sample volume (L.)		10	20	20	40	20	10	20	20	40	20
Flot Volume (ml)		no flot	10	50	10	5	5	15	5	30	
Counted items per litre of sampled soil		<1	0	0	<1	<1	0	<1	<1	<1	0
Charred Cereals (Grains)											
Avena sp.	oat	-	-	-	-	-	-	1	-	-	-
Hordeum distichon/vulgare L. (straight grain)	2-6-rowed barley	-	-	-	1	-	-	7	3	-	-
Triticum sp.	wheat	-	-	-	-	-	-	-	-	1	-
Triticum aestivum//durum/turdigum L (grain)	bread wheat	1	-	-	-	-	-	6	9	-	-
Charred Seeds											
Anthemis cotula L. (fruit)	stinking chamomile	-	-	-	-	-	-	1	-	-	-
Charcoal											
Prunus cerasus/avium	cherry/ plum	-	-	-	-	3	-	1	-	-	-
Quercus sp.	oak	-	-	13	-	-	-	1	2	-	-
<4mm Ø wood fragments		-	+++++	+++++	+++++	+++++	+++++	+++++	-	+++++	+++
Dried Waterlogged Plant Remains											
Betula pubescens Ehrh (bract)	downy birch	-	-	-	1	1	-	-	-	-	-
Atriplex prostrata/patula (fruit)	spearleaved/ common orache	-	-	-	-	-	-	1	-	-	-
Dicotyledenous leaf fragment		-	-	-	-	1	-	1	-	-	-
Root/rhizome fragments	+++++	-	+++++	+++++	+++++	+++++	+++++	+++++	-	+++++	+++++
Modern grass stem and leaf		-	-	+++	-	-	-	++	-	-	-
Modern moss		-	+++++	-	+++	++	++	-	-	+	-
Ratios											
Glume bases:Glume wheat grains		0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0
Weed Seeds: Grains		0:1	0:0	0:0	0:1	0:0	0:0	1:14	0:12	0:1	0:0
Fauna											
Terrestrial mollusca		-	-	-	-	-	-	4	+	+	+
Cecilioides acicula (Muller)		-	-	-	-	-	-	-	-	-	++
Earthworm cocoons		-	-	-	-	+	-	-	-	-	+
Uncharred bone fragments		-	-	-	-	-	-	-	-	+	-

Excavation of Pit Alignment PA3 in progress, looking north

MOLA
Kent House
30 Billing Road
Northampton
NN1 5DQ
01604 809 800
www.mola.org.uk
sparry@mola.org.uk