ARCHAEOLOGICAL INVESTIGATIONS AT GARDEN HOUSE BANK, ACOMB, NORTHUMBERLAND

POST-EXCAVATION ASSESSMENT REPORT

DECEMBER 2017

PRE-CONSTRUCT ARCHAEOLOGY

Archaeological Investigations at Garden House Bank, Acomb, Northumberland

Post-Excavation Assessment Report

Central National Grid Reference: NY 9306 6635

Site Code: GLA 16

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1.1 An archaeological strip, map and record excavation was undertaken December 2016 to January 2017 by Pre-Construct Archaeology Limited on land at Garden House Bank, Acomb, Northumberland. The overall development site, centred at National Grid NY 9303 6626, comprised a roughly rectangular parcel of land covering *c*. 1.80 hectares located south of the village of Acomb and immediately west of Garden House Bank. The excavation area was situated within the northern part of the overall development site. Prior to commencement of the archaeological work the area comprised two fields separated by a mature hedgerow.

1.2 Avant Homes have been granted planning permission for residential development of the site (15/03825/FUL). The planning permission included a condition requiring archaeological work, specifically to undertake a strip, map and record excavation within the northern part of the overall development site and to undertake analysis, reporting, publication and archiving.

1.3 A geophysical survey undertaken at the site in 2015 identified magnetic anomalies suggestive of post-medieval agricultural features (ridge and furrow) across the site along with two linear magnetic anomalies suggestive of gullies or small ditches within the southern part of the overall development site. A subsequent trial trench evaluation undertaken in 2015 identified the presence of significant archaeological remains within the northern portion of the overall development site where part of a substantial feature interpreted as a possible corn-drying kiln was exposed. Although no datable material was recovered from the feature, its form and the composition of its fills suggested a potential medieval date. Trial trenches sited over the linear geophysical anomalies in the southern part of the site identified no archaeological remains of significance.

1.4 The scope of work for the archaeological strip, map and record excavation was set out in a specification compiled by Northumberland Conservation (NC ref; T1/3; 24286). A Written Scheme of Investigation (WSI) was prepared by AD Archaeology prior to commencement of the work and was approved by the Northumberland County Council Conservation Team. An irregular shaped area covering *c* 0.46 hectares within the northern portion of the overall development site was investigated prior to development. The aim of the work was to excavate and record any archaeological features or deposits within this area of archaeological potential identified by the trial trench evaluation.

1.5 Archaeological features recorded during the strip, map and record excavation have been placed within five broad phases of activity. Natural geological material (Phase 1) was exposed as the basal deposit across the area investigated.

1.6 The earliest activity (Phase 2) at the site comprised a shallow NW-SE aligned ditch that extended across the northern part of the site for a distance of *c*. 38m. This was overlain by a thick developed agricultural soil of presumed medieval and post-medieval origin and by a topsoil deposit. The orientation of this ditch also indicates a pre-medieval date as it was on a different alignment to the surrounding field boundaries and it is considered to be of possible Iron Age/Roman period date and may have formed part of a field or enclosure system.

1.7 Phase 3 represents medieval activity at the site and comprised a group of three corn-drying kilns recorded within the central and eastern parts of the site and two small pits. The central corn-drying kiln was a substantial feature, with a circular bowl measuring *c.* 3.50m in diameter with stakeholes lining the perimeter which would have housed timber uprights for the wattle and daub superstructure of the oven. Adjacent to the eastern limit of excavation was a similar feature which was partially exposed. Also in the eastern part of the excavation area was a substantial stone-lined corn-drying kiln. A large quantity of animal bones had been dumped within this feature once it had gone into disuse and the composition of the assemblage indicated it had been used to dispose of kitchen/butchery waste and animal carcasses after it fell into disuse. Alongside domesticates of cattle, sheep and pig, were horse, dog and cat bones. Part of a human arm bone was also discovered amongst this material.

1.8 A small assemblage of medieval pottery of 13th-to early 14th-century date was recovered from all of the corn-drying kilns, although this was from backfill deposits which had been dumped in the kilns when they had gone into disuse rather than primary deposits. Radiocarbon dates were obtained from two backfill deposits: 1040–1212 cal AD (SUERC-75906) from one of the features with stakeholes in the bowl and 1247–1382 cal AD (SUERC-75907) from the stone-lined pit.

1.9 Palaeoenvironmental samples processed from primary and backfill deposits of the corn driers produced significant well-preserved assemblages of charred plant macrofossils with cereal caryopses and weed seeds of arable taxa frequent and in some cases abundant in the residues. The broad array of cereals, weeds and non-cereal crops suggest that agricultural activities were fairly extensive. The cereal assemblages appear to suggest a mixed cropping regime, with oat and barley along with fewer occurrences of wheat and rye. Wood charcoal was also present and taxa identified include oak, hazel/alder, cherry/blackthorn willow/poplar, field maple, ash and birch. Oak was present in all of the assemblages while the other taxa were more sporadically represented.

1.10 A developed soil (Phase 4) was recorded extending across the site and overlay Phase 2 and 3 features and deposits. Topsoil (Phase 5) formed the existing ground surface.

1.11 This assessment of the data recovered from the investigations has concluded that the medieval remains are of regional significance and further analysis leading to publication will be required as detailed in the Written Scheme of Investigation.

2. INTRODUCTION

2.1 General Background

2.1.1 This report details the methodology and results of a strip, map and record excavation undertaken by Pre-Construct Archaeology Limited (PCA) between December 2016 and January 2017 on land to the east of Garden House Bank, Acomb, Northumberland. The central National Grid Reference for the site is NY 9306 6635 (Figure 1). The investigations were commissioned by DPL on behalf of Avant Homes with work being carried out ahead of the residential development of the site. The archaeological project was undertaken as a condition of the planning permission (ref. 15/03825/FUL) on the recommendation of Northumberland County Council Conservation Team (NCCCT) who provide archaeological advice to the Local Planning Authority (LPA) Northumberland County Council.

2.1.2 The initial phase of work undertaken at the site comprised a geophysical survey (AD Archaeology 2015a) which identified several linear anomalies within the southern part of the overall development site indicative of gullies or small ditches (Figure 4). The northern part of the site, which comprised a large part of the subsequent area of excavation, was not subject to geophysical survey. A subsequent trial trenching evaluation (AD Archaeology 2015b) was undertaken with eight trenches located across the site with trenches positioned to target the geophysical anomalies. No archaeological features of significance were identified within the southern and central parts of the site. A substantial pit with a heavily burnt, laid stone surface on its base was encountered within the northern part of the overall development site. This was considered likely to be a medieval corn drying kiln.

2.1.3 The archaeological remains exposed within the northern part of the development site were deemed to be of significance and further work was required as part of the planning permission (Figure 2). The area of further investigation was set out in a figure issued by NCCCT (2016) with the methodology for the work contained in a Written Scheme of Investigation (WSI) which was approved by NCCCT (AD Archaeology 2016).

2.1.4 The archaeological project herein described was designed according to the guidelines set out in Management of Research Projects in the Historic Environment (MoRPHE) (English Heritage 2006b). In line with MoRPHE guidelines, this Assessment Report sets out a formal review of the data collected during the fieldwork.

2.1.5 At the time of writing, the Site Archive, comprising written, drawn, and photographic records is housed at the Northern Office of PCA, Unit N19a Tursdale Business Park, Durham, DH6 5PG. When complete, the Site Archive will be deposited at the Great North Museum, Newcastle upon Tyne, under the site code GLA 16. The Online Access to the Index of Archaeological Investigations (OASIS) reference number for the project is: preconst1-293485.

2.2 Site Location and Description

2.2.1 The site lies to the north of the A69 on the northern side of the North Tyne valley, immediately to the south of the village of Acomb, Northumberland (Figure 1). The town of Hexham lies on the south side of the River Tyne, *c*. 2km to the south of the site. The overall development site is situated immediately west of Garden House Bank and at the time of the work comprised three pasture fields separated by mature hedgerows with mature trees and shrub along the eastern and western margins (NGR NY 9303 6626).

2.2.2 The area of the strip, map and record excavation was located within the northern part of the overall development site and comprised an irregular shaped parcel of land measuring up to 100m NE-SW by up to 30m NW-SE covering *c*. 0.44 hectares (Figure 2). The site is bounded to the east by Garden House Bank, to the west by a mature hedgerow and to the north combination of stone boundary walls and a fence forming the southern property boundaries for the Queens Arms Hotel and residential properties When the archaeological work commenced the excavation area comprised two pasture fields divided by a mature NW-SE aligned hedgerow.

2.3 Geology and Topography

2.3.1 The solid geology of the area is Stainmore Formation of the Upper Limestone Group formed in the Carboniferous Period (British Geological Survey website (BGS). Although the overlying superficial deposits are not mapped on the BGS website various boreholes recorded by the BGS that have been undertaken across the wider area indicate Glacial Till (glacially deposited clay with variable quantities of silt, sand and gravel) (Patrick Parsons, 2016).

2.3.2 Across overall development site there is a steep southwards slope, dropping away from the village of Acomb. At the location of the area of archaeological investigation within the north-eastern part of the overall development site, the land gradually sloped downwards from a maximum height of *c*. 75.53m AOD in the north-east to a minimum height of *c*. 67.95m AOD to the south-west.

2.3.3 The River Tyne flows eastwards just under 1km to the south of the site and the confluence of the Rivers North and South Tyne is located *c*. 1.2km to the west. The Birkey Burn, a tributary of the Tyne, flows *c*. 250m to the south of the excavation area and the Red Burn 300m to the north.

2.4 Planning Background

2.4.1 Avant Homes has been granted planning permission for residential development for 40 dwellings with associated access and landscaping (planning permission ref: 15/03825/FUL), on land at Garden House Lane, Acomb, Northumberland (Figure 3). The planning permission included a condition requiring archaeological work, specifically a strip, map and record excavation to expose and record significant archaeological remains identified by previous archaeological work within the north-eastern part of the overall development site.

2.4.2 The planning application (15/03825/FUL) for the residential development was granted subject to archaeological conditions:

> *A programme of archaeological work is required in accordance with the brief provided by Northumberland Conservation (NC ref T1/3; 24286 dated 14/1/16). The archaeological scheme shall comprise three stages of work. Each stage shall be completed and approved in writing by the Local Planning Authority before it can be discharged;*
>
> *a) No development or archaeological mitigation shall commence on site until a written scheme of investigation based on the brief has been submitted to and approved in writing by the Local Planning Authority;*
>
> *b) The archaeological recording scheme required by the brief must be completed in accordance with the approved written scheme of investigation.*
>
> *c) The programme of analysis, reporting, publication and archiving if required by the brief must be completed in accordance with the approved written scheme of investigation.*

2.4.3 The planning permission also had to comply with paragraphs 141 of the National Planning Policy Framework (NPPF 2012):

> Para. 141: *"Local planning authorities should make information about the significance of the historic environment gathered as part of plan-making or development management publicly accessible. They should also require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted"*

2.4.4 Justification for the condition within the planning permission was to comply with current planning policies that apply to the former Tynedale District are contained within the Tynedale LDF Core Strategy and the saved policies of the Tynedale District Wide Local Plan. Relevant saved policies are listed below:

> **Policy BE25:** *There will be a presumption in favour of the physical preservation in situ of Scheduled Ancient Monuments and other nationally important archaeological sites. Development, which would be detrimental to these sites or their settings, will not be permitted.*
>
> **Policy BE27:** *Development, which would be detrimental to regionally or locally important archaeological sites or their settings, will not be permitted unless the proposed development is considered to be of overriding regional importance and no alternative site is available.*

> **Policy BE28:** *Where it is not clear how important an archaeological site is, or where the impact of development proposal on an existing archaeological site is uncertain, the developer will be required to provide further information in the form of an archaeological assessment and , where such an assessment indicated that important archaeological remains may be affected, a full archaeological valuation.*
>
> **Policy BE29:** *Where sites or monument of archaeological importance would be affected by development, their preservation in situ is preferred. Where the site is not considered to be of sufficient importance to merit preservation in situ and development is subsequently permitted, planning permission will be subject to an archaeological condition, or a Planning Obligation will be sought, which will require the excavation and recording of the remains prior to or during the development. In such instance, publication of the findings will also be required.*

2.4.5 The northern part of the site lies within the Acomb Conservation Area. Conservation areas are 'areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance (Planning (Listed Buildings and conservation Areas) Act 1990, s69). The Acomb Conservation Area was designated in April 1991 and incorporates the buildings and back plots fronting onto Main Street, The Green and Garden House Bank.

2.4.6 Following the archaeological evaluation of the site, NCCCT advised that archaeological mitigation in the northern portion of the site should take the form of a programme of 'strip and record' mitigation (NCCCT 2016). This requires that areas of development impact are stripped under archaeological supervision allowing the targeted excavation of a representative sample of archaeological features and deposits. A Written Scheme of Investigation (AD Archaeology 2016) was approved by NCCCT prior to commencement of work.

2.5 Archaeological and Historical Background

Information in this section is largely extracted from the Northumberland Historic Environment Record and the Acomb Conservation Area Character Appraisal (Tynedale Council 2009) and the research and writing of those responsible is acknowledged. Below is a summary of the archaeological and historical background. The Northumberland Environment Record entry numbers are distinguished by the HER prefix.

Prehistoric

2.5.1 Although no prehistoric activity has been identified within the near vicinity of the overall development site, it does lie within a wider landscape of prehistoric settlement and activity.

2.5.2 A large stone with Neolithic cup and ring markings was found *c.* 1km south-east of the site at Oakwood Farm, Acomb, near St John Lee (HER 8606). The HER entry notes that the stone might be part of a cist cover and is currently housed in the Church of St John Lee.

2.5.3 There are numerous HER entries relating to 19th- and mid-20th-century antiquarian discoveries of Bronze Age material and activity in the vicinity. These include accounts of Bronze Age burials *c*. 1.3km west of Acomb village along the eastern bank of the North Tyne. Several burials were identified during the construction of the Border Counties Railway in the 19th century including a crouched burial and associated pottery finds (HER 8562). There are also accounts in the mid-20th century of Bronze Age cist burials identified within an area of a former sand quarry (HER 8571 & HER 8577).

2.5.4 Further undated but probably prehistoric HER entries of enclosures identified by aerial photographs as cropmarks include two circular enclosures (HER 8622 & HER 8626) located *c*. 0.8km south-west of the site and a further enclosure (HER 8561) located *c*. 1.3km west of the site. The HER notes that the latter enclosure may have been partially destroyed by the former sand quarry.

Roman

2.5.5 The line of Hadrian's Wall, UNESCO transnational World Heritage Site, 'Frontiers of the Roman Empire', crosses the northern part of Acomb parish *c*. 3km to the north of the site.

2.5.6 Evidence of Roman period activity within the wider area is known from cropmarks on aerial photographs. Two Roman temporary camps (HER 23927 & HER 23928) are located *c*. 800m and *c*. 1km south-west of the site, respectively. Another possible temporary camp was located *c*. 1km west of the site (HER 8560), though this has now been destroyed by quarrying.

2.5.7 Two burials in stone coffins were found at Garden House Farm, *c*. 350m south of the site, and although undated are considered to be Roman or possibly later (HER 8609).

2.5.8 Individual find entries on the HER attributed to the Roman period within the wider area of the site include an iron spear found at Garden House Farm (HER 8608) and two finds of a Roman Altar and a stone inscribed with Roman text (HER 8567 & HER 8569), both of which are located at the Hermitage. The original locations of the latter two finds are uncertain.

Medieval

2.5.9 Very little is known about the size and composition of the medieval village of Acomb with the area probably characterised by small dispersed farmsteads. It is likely that the historic core of Acomb emerged as a settlement during the post-Norman conquest with the main settlement likely to be at St John Lee where a church has been present from at least the 14th century. The name Acomb is derived from Old English 'Acum', or at the oaks and is first mentioned in 1226 when describing a 'mill on or near Kirkeburn' - the original name for the Birkey Burn which flows a short distance to the south of the site midway between the village and St John Lee (Stan Beckensall 1975). There are numerous references to Acomb up to the later medieval period with most of these relating to land ownership and tithes (Tynedale Council 2009).

2.5.10 The 1810 Tithe Award depicts buildings fronting Main Street with narrow burgage plots to the rear, this being a typical village layout for the medieval period.

Post-medieval

2.5.11 The historic core of Acomb village developed rapidly during the post-medieval period due to a marked increase in industrial activity within the area. Lead mining began as early as the 16th century at nearby Fallowfield to the north (HER 8611) and Acomb Colliery, which produced household coal in the 19th century (HER 8164), was located to the west of the site. Acomb Mill (corn mill) is shown on the 1840 Tithe map and on Ordnance Survey mapping on the north side of the Birkey Burn, *c*. 200m to the south of the area of excavation.

2.5.12 Acomb village itself comprises predominantly late 18th-and 19th-century buildings with a number of these buildings within the Conservation Area being Grade II Listed. The medieval layout of the village remains fossilised in the surviving plan with narrow plots behind street front properties.

2.5.13 The site itself has remained as agricultural land and is first depicted in any detail on the 1840 Tithe Award map. Subsequent 19th- and 20th-century mapping evidence shows the development and expansion of buildings along Main Street, The Green and Garden House Bank and depicts the overall development site as largely unchanged.

Modern

2.5.14 Recent archaeological investigations at the site comprised geophysical survey (AD Archaeology 2015a) and an archaeological trial trench evaluation (AD Archaeology 2015b). The archaeological evaluation identified a substantial feature within the northern part of the overall development site which comprised a large and deep pit with a laid stone surface at the base, the upper surface of which was covered in soot indicating that this had been exposed directly to a heat source. This feature was interpreted as a possible corn-drying kiln of likely medieval date.

3. PROJECT AIMS AND RESEARCH OBJECTIVES

3.1 Project Aims

3.1.1 The archaeological investigations at the site were threat led, since the development had potential to disturb or destroy significant sub-surface archaeological remains of the medieval period, specifically remains identified by previous archaeological investigations within the north-eastern part of the development site.

3.1.2 The main aims of the strip, map and record excavation, as outlined in the project WSI were:

- to ascertain the type and function of the previously identified kilns and the methods of construction;
- to expose features and deposits identified by previous archaeological investigations and;
- to characterise the nature, extent, distribution and degree of survival of buried archaeological remains, specifically pertaining to the prehistoric and medieval periods;
- to assess the significance of buried archaeological remains.

3.1.3 The broad aim of the project was to record the heritage assets within the development site prior to their destruction. Additional aims of the project were:

- to compile a Site Archive consisting of all site and project documentary and photographic records, as well as all artefactual and palaeoenvironmental material recovered;
- to compile a report that contains an assessment of the nature and significance of all data categories, stratigraphic, artefactual, etc.

3.2 Research Objectives

3.2.1 Specific research objectives to be addressed by the project were formulated with reference to *Shared Visions: The North-East Regional Research Framework for the Historic Environment* (NERRF) (Petts and Gerrard 2006). The NERRF highlights the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions.

3.2.2 Given the results of the geophysical survey and subsequent archaeological evaluation (AD Archaeology 2015a & 2015b), the project was considered to have high potential to contribute to existing knowledge of the prehistoric and medieval periods at Acomb.

3.2.3 The following research priorities for the prehistoric period (I) within the NERRF research agenda and strategy were considered to be of particular relevance to this project:

- Ii. Chronology
- Iii. Settlement
- Iiv. Material Culture: general

3.2.4 The following research priorities for the Later Medieval period (MD) within the NERRF research agenda and strategy were considered to be of particular relevance to this project:

- MDi. Settlement
- MDvii. Medieval ceramics and other artefacts
- MDviii. Other medieval industries

3.2.5 In sum, the work had potential to contribute to key research priorities in the NERRF research agenda and strategy for both the prehistoric and the later medieval periods.

4. ARCHAEOLOGICAL METHODOLOGIES

4.1 Fieldwork

4.1.1 The area to be investigated was set out in a plan issued by NCCCT (2016). A WSI (AD Archaeology 2016) was approved by NCCCT prior to commencement of the archaeological work. The Northumberland Conservation Assistant County Archaeologist monitored the progress of the fieldwork during the excavation.

4.1.2 The fieldwork was undertaken in compliance with the codes and practice of the Chartered Institute for Archaeologist and the relevant CIfA standard (CIfA 2014a) and guidance document (CIfA 2014b&c). PCA is a CIfA 'Registered Organisation'. All fieldwork and post-excavation was also carried out in accordance with the *Yorkshire, the Humber & The North East: Regional Statement of Good Practice* (Yorkshire, The Humber and the North-East 2009).

4.1.3 The archaeological strip, map and record excavation comprised a roughly rectangular shaped area within the northern part of the overall development site which measured up to 100m NE-SW by up to 30m NW-SE (Figure 2). The excavation area was initially set out using a Leica Viva Smart Rover Global Navigation Satellite System (GNSS). The Smart Rover GNSS provides correct Ordnance Survey co-ordinates in real time, to an accuracy of 1cm. In the south-eastern part of the excavation area the limit of excavation was extended to the east for a small distance so that the full extent of a stone-lined corn-drying kiln could be exposed; it was not possible to expose the full extent of another kiln situated to the north due to the presence of mature trees.

4.1.4 All 'overburden', *ie*. topsoil and subsoil, was removed by tracked *c*. 20-tonne 360° excavator, using a wide toothless bucket, and stripped down to the natural sub-stratum. All machine excavation was undertaken under direct archaeological supervision.

4.1.5 All visible features were marked with spray paint as they were exposed by machine excavation. A Leica Viva Smart Rover Global Navigation Satellite System (GNSS) was used to map all observed remains and set out base lines for planning. No overall 'site survey grid' was set out.

4.1.6 The investigation of archaeological remains was by hand, with cleaning, examination and recording both in plan and in section, where appropriate. Cleaning was restricted to portions of probable and certain archaeological features identified during machine removal of overburden. Investigations followed the normal principals of stratigraphic excavation and were conducted in accordance with the methodology set out in PCA's site manual (PCA, 2009).

4.1.7 An adequate proportion of archaeological features were excavated by hand in order to determine their form and function, where possible. The following sampling policy applied to archaeological features:

- all kilns or other industrial features – 100%
- all short ditches/gullies and other short linear features – 40%, to include any ditch terminals
- linear/curvilinear features with a non-uniform fill – 10%
- linear/curvilinear features with a non-uniform fill – 5%
- terminal of ditches or other features – 100%
- all stratigraphic relationships (*ie*. intercutting features) – 100%
- pits and postholes – 100%, those over 0.5m – 50%

4.1.8 Sections excavated through archaeological features were located using the Smart Rover GNSS and recorded as appropriate, using a single context recording system utilising *pro forma* context recording sheets. Plans were drawn at 1:20 and sections at 1:10 or 1:20.

4.1.9 A detailed photographic record of the investigations was compiled using SLR cameras (35mm film black and white prints for archive purposes) and by digital photography, illustrating in both detail and general context the principal features and finds discovered. The photographic record also included 'working shots' to illustrate more generally the nature of the archaeological operation mounted. All record photographs included a legible graduated metric scale.

4.1.10 The Smart Rover GNSS was used to establish Temporary Bench Marks (TBMs) on the site. The height of all principal strata and features were calculated relative to Ordnance Datum using the TBMs and indicated on the appropriate plans and sections.

4.2 Post-excavation

4.2.1 The stratigraphic data generated by the project is represented by the written, drawn and photographic records. A total of 88 archaeological contexts were defined during the course of the archaeological investigations (Appendix 2). The contents of the paper and photographic elements of the Site Archive are quantified in Section 6. Post-excavation work involved checking and collating site records, grouping contexts and phasing the stratigraphic data (Appendix 1). The archaeological remains were assigned to five broad phases of activity. A written summary of the archaeological sequence was then compiled, as described below in Section 5.

4.2.2 The artefactual material recovered during the excavation comprised a small assemblage of medieval pottery (Appendix 5). Metal-working debris was recovered from environmental samples (Appendix 6). Faunal remains and a single human bone were also recovered (Appendices 7 and 8). Small fragments of fired clay were recovered from sample residues. This material was examined by a specialist but beyond identifying the material as probable daub, this assemblage could provide no further information.

4.2.3 The palaeoenvironmental sampling strategy of the project was to recover bulk samples where appropriate, from well-dated stratified deposits covering the main periods or phases of occupation and the range of feature types represented, with specific reference to the objectives of the excavation. To this end, 23 bulk samples were collected from deposits of probable prehistoric and medieval date and from these 16 bulk samples were selected for processing and assessment for palaeoenvironmental remains. An assessment report has been produced including a basic quantification of the recovered material and a statement of potential for further analysis and recommendations for such work (Appendix 9). Artefacts and faunal remains recovered during the processing of bulk samples were added to the hand collected material for assessment.

4.2.4 The complete Site Archive, in this case comprising the written, drawn and photographic records (including all material generated electronically during post-excavation) and the artefactual assemblage, will be packaged for long term curation.

4.2.5 In preparing the Site Archive for deposition, all relevant standards and guidelines documents referenced in the Archaeological Archives Forum guidelines document (Brown 2007; CIfA 2014e; Walker 1990) will be adhered to, in particular a well-established United Kingdom Institute for Conservation (UKIC) document (Walker, UKIC 1990) and an CIfA publication (CIfA 2014c). The depositional requirements of the body to which the Site Archive will be ultimately transferred will be met in full.

4.2.6 At the time of writing the Site Archive is housed at the Northern Office of PCA, Unit N19a Tursdale Business Park, Durham, DH6 5PG. When complete, the Site Archive will be deposited with the Great North Museum, Newcastle upon Tyne, under the site code CLA 16. The Online Access to the Index of Archaeological Investigations (OASIS) reference number for the project is: preconst1-293485.

5. RESULTS: THE ARCHAEOLOGICAL SEQUENCE

During the investigations, separate stratigraphic entities were assigned unique and individual 'context' numbers, which are indicated in the following text as, for example, [100]. The archaeological sequence is described by placing stratigraphic sequences within broad phases, assigned on a site-wide basis in this case. An attempt has been made to add interpretation to the data, and correlate these phases with recognised historical and geological periods.

5.1 Phase 1: Natural Sub-stratum

5.1.1 Phase 1 represents natural geological material exposed across the site which generally comprised firm sandy clay [102] with occasional large patches of fine sand and large to medium sized sub-rounded boulders throughout.

5.1.2 The maximum height at which the natural sub-stratum was encountered was 75.71m AOD at the northern extent of the site, gradually sloping down towards the south where a minimum height of 67.90m AOD was recorded, reflecting the natural topography of the site.

5.2 Phase 2: ?Late Iron Age/Roman Period

5.2.1 A NW-SE aligned ditch was exposed across the northern part of the site for a maximum distance of 37.60m, continuing beyond the edges of excavation (Figure 5). Three slots were excavated across the ditch, [107], [110] and [113], which had a broad U-shaped profile. The ditch measured up to 1.53m wide and was up to 0.49m deep (Figure 6, Sections 2-5; Plates 1-3). Table 1 below summarises the dimensions of the ditch within each excavated slot:

Phase 2 Prehistoric Ditch				*m AOD*	
Cut	*Section*	*Width*	*Depth*	*Highest*	*Lowest*
107	2	1.26m	0.41m	74.55	74.05
107	3	1.20m	0.39m	74.40	74.01
110	4	1.27m	0.42m	73.17	72.70
113	5	1.51m	0.48m	74.00	73.42

Table 1: Dimensions of Phase 2 ditch

5.2.2 Three fills were recorded in slot [113] and two fills in slots [107] and [110], representing the natural infilling of the dicth. The deposits generally comprised sandy silt or silty sand with the exception of the clayey silt primary backfill [114] of slot [113]. Table 2 below summarises the dimensions for the fills within each slot:

Phase 2 Prehistoric ditch fills					*m AOD*	
Fill	*Cut*	*Section*	*Width*	*Thickness*	*Highest*	*Lowest*
105	107	2 & 3	1.26m	0.28m	74.55	74.37

106	107	2 & 3	0.90m	0.13m	74.37	74.12
108	110	4	1.26m	0.30m	73.17	73.09
109	110	4	0.62m	0.11m	72.94	72.81
111	113	5	1.51m	0.24m	74.00	73.84
112	113	5	1.18m	0.37m	73.82	73.67
114	113	5	0.37m	50mm	73.53	73.47

Table 2: Dimensions of Phase 2 ditch fills

5.2.3 Two palaeoenvironmental samples (Samples 2 & 3) were processed from fills [111] & [112], respectively. Sample <2>, [111] produced occasional cereal caryopses including possible oat, wheat, barley and possible rye, as well as arable weed taxa such as goosefoots, chickweed and bedstraw. Sample <3> [112] produced infrequent cereal caryopses only, for which no identifications could be provided due to their poor preservation. A few small fragments of unidentifiable charcoal were also recovered. The single grain of possible rye would be unusual in a prehistoric context, however, given the presence of significant evidence for post-deposition disturbances through root action, the grain may well be a contaminant associated with the more extensive medieval land use at the site.

5.2.4 The ditch was overlain by a thick developed agricultural soil of presumed medieval and post-medieval origin and by a topsoil deposit. The orientation of this ditch also indicates a pre-medieval date. This part of the site is located on an elevated position on the eastern side of the Tyne Valley and may represent part of a field or enclosure boundary of Iron Age/Roman period date.

5.3 Phase 3: Undated and Medieval

Corn-Drying Kilns [119], [127] & [135]

5.3.1 Three corn-drying kilns [119], [127] & [135] were recorded within the central portion and at the eastern edge of the area of excavation (Figure 5). The excavation area was extended to the east so that the full extent of kiln [119] could be exposed; it was not possible to expose the full extent of kiln [127] due to the presence of mature trees. The methods of construction and construction materials used differed for each kiln.

Corn-Drying Kiln [119]

5.3.2 Corn-drying kiln [119] was located at the eastern edge of the site (Figure 5) and comprised a circular stone-lined bowl with stone-lined linear extension to the north built forming a 'keyhole-shaped' feature in plan (Figure 9; Plates 11-14). The construction cut measured 6.32m NNW-SSE by up to 2.90m wide with external dimensions of the stone-lined bowl being 3.40m NNW-SSE by 2.90m wide (internal dimension *c*. 2m diameter) and up to 1.70m deep. The linear element measured up to 2.30m by 1.80m wide (internal dimension *c*. 1m wide) and sloped down steeply to the bowl. The northern end was stepped and irregular with

no stone lining present and beyond this the base of the cut sloped down from 1.20m deep to 1.50m deep at the intersection with the bowl. The maximum surviving height of the corn-drying kiln was 71.96m AOD and the base was encountered at a minimum height of 69.83m AOD. The stone lining [186] of the bowl was built with medium to large sub-round and sub-angular unworked stones. The walls were up to 1.30m high, surviving up to six random courses, and generally 0.50m wide and built near vertical but slightly wider at the base, with the exception of the southern portion of the wall which was 0.90m wide. The stone-lining of the linear extension survived up to eight courses and was constructed using small to medium sized sub-angular stone. No bonding material was observed and it is likely that a dry stone walling method of construction was used.

5.3.3 The base of the corn-drying kiln within the linear extension comprised a *c.* 0.30m thick stone slab surface [187] measuring 1.70m by 0.92m wide with the stone floor sloping down to the bowl, from a depth of 1m below present ground level in the north to 1.25m at the intersection with the bowl. This was built with medium to large sized unworked stones and stone slabs.

5.3.4 The earliest deposit encountered within the base of the bowl was a charcoal and ash deposit [192] which measured 1.26m north-south by 1.30m east-west and was up to 80mm thick and partially overlay the edge of floor surface [187]. The underlying natural sandy clay sub-stratum had a pinkish hue ndicating that at this location it had been directly exposed to high temperatures (Plate 16). A palaeoenvironmental sample taken this deposit (Sample 23) produced mainly charcoal fragments with just a few fragments of oat present (Appendix 9). Identifiable wood species comprised ash, cherry/blackthorn, oak and willow/poplar. Two of the willow/poplar fragments from this sample retained evidence for woodworm damage suggesting the wood may have been dead and dried for a significant time prior to charring.

5.3.5 Deposit [187] was overlain by two sandy clay deposits [190] and [191] which had a combined thickness of 80mm and represented consolidation associated with the construction of stone surface [188] (Figure 9, Section 12; Plate 15). A palaeoenvironmental sample (Sample 22) from the uppermost deposit [190] produced frequent cereal caryopses and weed seeds of arable taxa (Appendix 9). Oat and wheat were identified in the charred plant remains assemblage and the identifiable species present in the charcoal assemblage comprised oak, cherry/blackthorn and willow/poplar. The stone surface [188] recorded within the base of the bowl of the corn-drying kiln was up to 0.40m thick, measured *c.* 1.90m in diameter and was constructed using small to medium sub-angular stones. This entirety of this surface was charred and in places had a pinkish hue indicating that it had been directly exposed to high temperatures, with this being the location of the heat source of the oven. The stone surface [188] and associated consolidation deposits appear to represent a later repair or modification to the corn-drying kiln.

5.3.6 Two sandy silt backfill deposits [121] and [189] with a combined maximum thickness of 1.40m were recorded within the entirety of the corn-drying kiln (Figure 9; Sections 6 & 12). These deposits represent the use of the kiln as a refuse pit once the kin had gone into

disuse. The lowermost backfill [121] was up to 0.50m thick and two sherds of pottery of 13th- to early 14th-century date were recovered from this deposit (Appendix 5). A fragment of hazel/alder charcoal recovered from an environmental sample taken from this deposit produced an AMS date of 1247–1382 cal AD (SUERC-75907). Upper backfill [189] contained a large proportion of animal bone. The assemblage was dominated by cattle, mainly adult bones but with some juvenile elements present, and there was a slight prevalence towards meat bearing bones which could indicate the use of prime cuts of meat, suggesting consumption/kitchen waste rather than prime butchery (Appendix 7). Pigs form a minor part of the assemblage as do sheep/goat remains, the latter being unusual for the medieval period. A single deer bone was noted and the possible non-food taxa present were horse, dog and cat, with horse remains the most prevalent with the remains of at least three individuals present. The composition of the faunal remains assemblage indicates that corn-drying kiln [119] was probably used for disposing of kitchen/ butchery waste and animal carcasses after it fell into disuse, possibly to diminish odours associated with decomposition and deter scavengers. An unusual and surprising discovery was a single human bone amongst the animal remains. This was approximately one third of a humerus; heavy wear on the surface of the bone precluded the assessment of any superficial pathologies that may have originally been visible on the bone (Appendix 8). No morphological changes to the profile of the bone resulting from pathological causes, such as the deviation that may occur due to an unset broken arm, were apparent on the humerus either. Only the proximal shaft-midshaft region of the bone was still extant and it was in a poor condition, probably indicating that it was both redeposited and exposed to conditions that would have caused it to deteriorate before becoming part of the backfill within corn drying kiln. The circumstances behind this human bone becoming deposited in the kiln remain obscure.

5.3.7 Two palaeoenvironmental samples from backfill deposits [120] and [121] (Samples 8 & 9) were processed and each produced frequent cereal caryopses, with wheat and oat identified, and weed seeds of arable taxa (Appendix 9). Flax was also present in both samples; this crop may have been grown for its fibres or for the oil rich seed. Fill [121] also produced charcoal fragments with oak, hazel/alder cherry/blackthorn and field maple identified. Sample 8 from fill [120] produced four pieces of spheroidal hammerslag, this material indicative of secondary smithing of iron (Appendix 6).

Corn-drying kiln [127]

5.3.8 The western end of corn-drying kiln [127] was exposed at the eastern margin of the site *c.* 8m north of corn-drying kiln [119]; exposure of the full extent of the feature was not possible due to the presence of trees (Figure 5). The overall dimensions of the features as exposed were 3.30m NNE-SSW by 2.90m NNW-SSE with a maximum excavated depth of c. 1m. The highest surviving level of the feature was 72.77m AOD (Figure 7; Plates 5 & 6). The corn-drying kiln comprised a presumed to be circular or oval-shaped bowl exposed for a maximum distance of 3.30m NNE-SSW by 1.70m and up to 0.90m deep. At the western end was a short linear extension with rounded end measuring 1.60m by 1.60m which sloped

steeply down towards the bowl. The central portion of the bowl was stepped and had a central circular depression measuring *c.* 1.80m in diameter, with the base of this encountered at 72.01m AOD.

5.3.9 Truncating the natural sub-stratum around the edge of the bowl was a group of five stakeholes [129] (*c.* 0.10m diameter by up to 0.10m deep) and two postholes (up to 0.40m diameter by up to 0.48m deep) which were located either side of the liner portion (Plate 6). These features would have housed timber uprights of part of a wattle and daub super-structure which would have formed the roofed drying floor element of the corn drier.

5.3.10 The earliest deposit recorded within the base of the bowl of the corn-drying kiln comprised a dark brownish red burnt sandy silt deposit [126] up to 20mm thick (Figure 7, Section 7; Plate 7). This deposit probably represents the final use of the corn-drying kiln with the underlying natural sub-stratum within this area observed to have a pinkish hue indicating direct exposure to high temperatures.

5.3.11 The corn-drying kiln contained four backfill deposits with a maximum combined thickness of 0.88m; these generally comprised silty sand, [124], [123] & [122], with the exception of the primary clayey silt backfill [125] (Figure 7, Section 7; Plate 7). The corn-drying kiln once disused was probably then used as a refuse pit and of note is backfill deposit [123] which comprised burnt silty sand which may represent debris from some industrial or manufacturing process undertaken in the vicinity. A small assemblage of seven sherds of medieval pottery was recovered from backfill deposits [123] and [125]; this was of 13th-century date (Appendix 5).

5.3.12 A palaeoenvironmental sample taken from basal fill [126] (Sample 14) produced oat grains as well as flax and legumes, possible pea and vetches, which are likely to have been cultivated for both human and animal consumption (Appendix 9). Backfill deposits [122], [123], [124] & [125] Samples 10, 11, 12 & 13, respectively) contained a range of cereals (oat, barley, wheat), as well as flax, possible pea and vetches and arable weeds. Only Sample 10 from deposit [122] contained charcoal; oak, birch and hazel/alder were identified. A sample of hazel/alder charcoal submitted for radiocarbon dating produced an AMS date of 1247–1382 cal AD (SUERC-75907).

Corn-drying kiln [135]

5.3.13 Corn-drying kiln [135] was located within the central part of the site and comprised a sub-oval shaped cut which measured 4.70m NW-SE by 3.50m NE-SW (Figure 5). Off-set to the east was a circular bowl with a flat base that measured *c.* 3.50m in diameter and was up to 1.26m deep and the cut was slightly elongated to the west; the sides of the cut were generally irregular but steeply sloping. The maximum and minimum heights of the kiln were 70.62m AOD and 69.28m AOD, respectively (Figure 8; Plates 9 & 10). This feature had been partially excavated during the earlier evaluation of the site.

5.3.14 Located around the perimeter of the eastern side of the bowl was a group of stakeholes measuring up to 0.12m diameter by up to 0.15m deep and on the northern side a posthole measuring 0.26m diameter by 50mm deep (Group 117) (Figure 8; post-excavation plan). These would have housed timber uprights for the wattle and daub super-structure of the drying floor and oven.

5.3.15 Located centrally within the bowl of the corn-drying kiln was a substantial posthole [177] which measured *c.* 0.62m diameter and 0.46m deep (Figure 8 post-excavation plan & Section 10; Plate 10). It contained two sandy clay backfills [176/182] and [174] from which a single piece of daub was recovered. This posthole may have held a central timber to support the domed wattle and daub oven structure during construction; once the structure had been built and the clay dried, then presumably the timber would have been removed. A palaeoenvironmental sample was taken from its lower backfill [174] (Sample 21) and cereal caryopses and weed seeds of arable taxa were frequent in this deposit. Oat and barley with some wheat and rye were identified (Appendix 9). The sample also produced a significant assemblage of metal-working residue; *c.* 200 pieces of flake hammerscale and 20 pieces of spheroidal hammerslag the total weight of which was 12 grams (Appendix 6). The ratio of micro-residue types is more indicative of secondary, rather than primary iron smithing. Secondary smithing of iron was the type of work commonly undertaken by village or itinerant blacksmiths and farriers. The amount of smithing micro-residues recovered is perhaps more suggestive of a one-off smithing event, perhaps the manufacture or repair of some in-situ ironwork, rather than longer term activities at a village forge. The material may represent waste that had been swept up and used as backfill in the nearest convenient pit following this event.

5.3.16 Posthole [177] was directly overlain by a 0.10m thick burnt deposit that comprised ashy sandy clay and sand [142/173] which may represent the last use of the kiln prior to the construction of a later stone surface [134], described below (Figure 8 mid-excavation plan). A palaeoenvironmental sample (Sample 19) taken from this deposit produced a similar cereal caryopses and weed seeds assemblage to Sample 21 (Appendix 9).

5.3.17 A stone slab surface [134] directly overlay burnt deposit [142/173] within the central area of the corn-drying kiln bowl (Figure 8 mid-excavation plan; Plate 9). It was built using unworked medium to large stone slabs and had dimensions of 2.10m east-west by 2.60m north-south, encountered at maximum and minimum heights of 69.71m AOD and 69.38m AOD, respectively. The stone surface probably represents a later repair or modification to the corn-drying kiln, similar to the floor in kiln [119].

5.3.18 Three deposits [138], [133] and [132] comprising various compositions of clay silt and sand backfilled corn-drying kiln [135] (Figure 8, Section 10; Plate 8). Three sherds of pottery of early 13th-century date were recovered from primary backfill [138] and two sherds of pottery of 13th-century date were recovered from secondary backfill [133] along with a single sheep/goat bone (Appendix 5).

5.3.19 Three palaeoenvironmental samples (Samples 15, 16 & 17) were taken from the backfill deposits [132], [133] & [138]. All three contained frequent and cereal caryopses and weed seeds of arable taxa and again oat and barley caryopses with some wheat and rye were present. A sample of charred grain from backfill [133] was submitted for radiocarbon dating and this produced an AMS date of 1040–1212 cal AD (SUERC-75906). Only the sample from backfill [133] produced charcoal; oak and willow/poplar were identified. The samples also produced evidence for possible iron smithing; Sample 15 from fill [132] two small fragments of possible iron smithing slag; Sample 17 from backfill [138] two fragments of iron oxide/possible flake hammerscale; and Sample 19 from fill [142] three flakes of iron oxide/possible flake hammerscale and one small fragment of undiagnostic slag.

Pits

5.3.20 A rectangular shaped pit [103] which measured 2.30m east-west by 1.10m north-south and up to 0.32m deep was located towards the northern end of the excavation area (Figure 5). This was recorded at a maximum height of 74.92m AOD (Figure 10, Section 1: Plate 4). Three sherds of pottery were recovered from its single silty sand backfill [101]; one sherd was of possible 12th-century date with the remaining two sherds dating to the 13th century (Appendix 5).

5.3.21 A small circular pit [115] recorded within the south-eastern part of the excavation area measured *c.* 0.70m by up to 0.12m deep and was encountered at a maximum height of 69.66m AOD (Figure 10, Section 8). It contained a single ashy silt backfill [116] from which no datable material was recovered.

5.4 Phase 4: Subsoil

5.4.1 A deposit of clayey silty sand [104] up to 0.40m thick was recorded extending across the site directly overlying Phase 2 and 3 features (Figure 6, Section 2; Plate 1). A single sherd of 13th-century pottery was recovered from this deposit which probably represents a developed agricultural soil of medieval and post-medieval origin.

5.5 Phase 5: Modern

5.5.1 The Phase 4 sub-soil was directly overlain by topsoil [100] up to 0.30m thick. All topsoil had a developed turf line, this forming the existing ground surface of the fields when the work was conducted.

6. STRATIGRAPHIC DATA

6.1 Paper Records

6.1.1 The paper element of the Site Archive is as follows:

Item	No.	Sheets
Context register	1	3
Context/Group Sheets	88	88
Section register	1	1
Section drawings	12	12
Plans	14	16

Table 6.1: Contents of the paper archive

6.2 Photographic Records

6.2.1 The photographic element of the Site Archive is as follows:

Item	No.	Sheets
Monochrome print registers	1	
Monochrome prints		
Monochrome Negatives		
Digital photograph registers	1	4
Digital photographs	100	N/A

Table 6.2: Contents of the photographic archive

6.3 Site Archive

6.3.1 The complete Site Archive, including the paper and photographic records, is currently housed at the PCA Northern Regional Office.

6.3.2 The Site Archive will be deposited at the Great North Museum, Newcastle upon Tyne, under the site code GLA 16, for permanent storage and the detailed requirements of the repository will be met prior to deposition.

7. SUMMARY DISCUSSION OF THE ARCHAEOLOGICAL FINDINGS

7.1 Phase 1: Natural Sub-stratum

7.1.1 The level at which the natural sub-stratum was encountered across the area of excavation, 75.71m AOD in the northern extent of the site gradually sloping down to 67.90m AOD towards the south, reflecting the natural topography of the area. The natural geological material exposed across the site comprised glacially deposited clay with variable quantities of silt, sand and gravel. This glacial till overlies the solid geology of Stainmoor Formation of the Upper limestone Group in this area.

7.2 Phase 2: ?Late Iron Age/Roman Period

7.2.1 Phase 2 activity at the site is represented by a single NW-SE aligned ditch that extended across the northern part of the site for a distance of nearly 38m, continuing beyond the edges of excavation. This was overlain by a thick developed agricultural soil of presumed medieval and post-medieval origin and by a topsoil deposit. The orientation of this ditch indicates a pre-medieval date as it was on a different alignment to the surrounding field boundaries.

7.2.2 Samples taken from the ditch fills produced infrequent and poorly-preserved charred plant macrofossils. Occasional cereal caryopses were recovered including possible oat, wheat, barley and possible rye, as well as arable weed taxa such as goosefoots, chickweed and bedstraw. The barley grains were morphologically consistent with a hulled variety, however, in the absence of twisted grain or diagnostic chaff no further identifications could be provided. Due to poor preservation of the wheat caryopses, inherent variability within the genus and the absence of diagnostic chaff, no further identification could be provided. A single grain, identified as possible rye is unusual in this prehistoric context however there was significant evidence for post-deposition disturbances through root action and it is therefore plausible that the grain is a contaminant associated with the more extensive medieval land use at the site. The samples did produce material that could be submitted for AMS dating; however dating material from such a small assemblage within a potentially slow filling feature such as a ditch may not provide a clear date for the feature itself and this, along with the evidence for post-depositional disturbance, means that dating this material is not recommended.

7.2.3 This ditch may represent part of a field or enclosure boundary of Iron Age/Roman period date, located on this elevated position on the eastern side of the Tyne Valley. Evidence of possible activity of this period within the wider area comes from cropmarks visible on aerial photographs *c.* 0.8km south-west of the site. A circular enclosure HER 8622 may be the remains of a settlement or enclosure for animals and be of Iron Age or Romano-British date. The function and date of the other cropmark (HER 8626), a circular enclosure about 25m across, is unknown. An aerial photograph taken in 1949 shows an enclosure visible as a cropmark about 1.3km to the west of Acomb. No features were visible inside the enclosure and it may

have been used for keeping livestock rather than as a settlement (HER 8561). There are no traces of this enclosure on the ground and part of it may now have been quarried away.

7.3 Phase 3: Medieval

7.3.1 Medieval period activity was encountered at the site in the form of three well-preserved corn-drying kilns which contained significant palaeoenvironmental assemblages. The size and construction methods for corn-drying kilns [127] and [135] were broadly similar and each had postholes and stakeholes located around the perimeter of the bowls. Kiln [135] was sub-oval in plan and measured 4.70m NW-SE by 3.50m NE-SW comprising a large circular bowl *c.* 3.50m in diameter and up to 1.26m deep off-set to the east with an elongated linear projected from the bowl to the west, the possible function of this is described below. The full extent of kiln [127] was not exposed within the excavation area; the maximum exposed dimensions were 3.30m NNE-SSW by 2.90m NNW-SSE with a maximum excavated depth of *c.* 1m. It contained a presumed to be circular or oval-shaped bowl exposed for a maximum distance of 3.30m NNE-SSW, with a short projection to the west which sloped steeply down towards the bowl. The central portion of the bowl was stepped and had a central circular depression measuring *c.* 1.80m in diameter by 1.70m and up to 0.90m deep. The stakeholes were evenly spaced and would have housed vertical driven stakes that probably tapered to a dome and strengthened with horizontal withies and covered with clay. This structure would have incorporated the drying floor constructed above the base of the bowl of the kiln. Small pieces of fired clay were recovered from corn-drying kiln [135] which probably originated from the clay super-structure. A stone surface on the floor of the bowl of kiln [135] directly overlay a centrally located posthole suggesting that the floor was a later addition. This may have housed a substantial timber post which formed a central support for the domed wattle and daub super-structure of the kiln during construction, the post being removed once the structure was complete and the clay had dried. Corn-drying kiln [119] was of notably different construction and in plan was similar to corn-driers described in the literature as 'keyhole shaped' (e.g. Monk and Kelleher 2005). It measured 6.32m NNW-SSE by up to 2.90m wide with external dimensions of the stone-lined bowl being 3.40m NNW-SSE by 2.90m wide (internal dimension *c.* 2m diameter) and up to 1.70m deep. The linear element measured up to 2.30m by 1.80m wide (internal dimension *c.* 1m wide) and sloped down steeply to the bowl. The northern end was stepped and irregular with no stone lining present and beyond this the base of the cut sloped down from 1.20m deep to 1.50m deep at the intersection with the bowl. This had a substantial stone-lining forming the walls of the bowl and linear projection to the north and a stone slab floor surface. A large quantity of stone rubble was present in the backfill material deposited in the kiln once it had gone into disuse, which may have originated from the superstructure of the drying oven.

7.3.2 The basal deposits recorded in corn-drying kilns [127] and [135] generally contained relatively high quantities of burnt material and probably represent the last use of the kilns prior to their abandonment with the overlying deposits representing backfilling once abandoned. A charcoal and ash deposit in base of kiln [119] was overlain by clay

consolidation and levelling deposit for a stone slab floor surface which represents a later repair or modification of the feature. The backfill deposits within this corn dryer, as well as containing stone rubble from the superstructure, included a large quantity of animal bone, discussed below.

7.3.3 A small assemblage of medieval pottery was recovered from all of the corn-drying kilns, though this was from backfill rather than primary deposits (Appendix 5). The assemblage from corn-dryer [119] is of 13th-to early 14th-century date and the assemblages from [127] and [135] are of 13th-century date. The sherds are broadly speaking of known regional types but do not form a cohesive group. There were only three form sherds, the rest were featureless body sherds. A base and rim from corn driers [119] and [135] are relatively large vessel fragments, which suggests they have not travelled far and may have been used, and broken, on site, particularly the rim. The rest possibly derive from manure spreading. The form of one jar rim is known in the region, but not on vessels made in such a gritty fabric.

7.3.4 Radiocarbon dates were obtained from two backfill deposits (Appendix 9). A sample of charred grain from the secondary backfill of [135] produced an AMS date of 1040–1212 cal AD (SUERC-75906). A fragment of hazel/alder charcoal form the lowermost backfill of corn-dryer [119] produced an AMS date of 1247–1382 cal AD (SUERC-75907).

7.3.5 The upper backfill of stone-lined kiln [119] contained a large proportion of animal bone. The assemblage was dominated by cattle, mainly adult bones but with some juvenile elements present, and there was a slight prevalence towards meat bearing bones which could indicate the use of prime cuts of meat, suggesting consumption/kitchen waste rather than prime butchery (Appendix 7). Pigs form a minor part of the assemblage as do sheep/goat remains, the latter being unusual for the medieval period. A single deer bone was noted and the possible non-food taxa present were horse, dog and cat, with horse remains the most prevalent with the remains of at least three individuals present. The composition of the faunal remains assemblage indicates that the feature was probably used for disposing of kitchen/ butchery waste and animal carcasses after it fell into disuse, possibly to diminish odours associated with decomposition and deter scavengers. An unusual and surprising discovery was a single human bone, around one third of a humerus, amongst the animal remains (Appendix 8). This was in poor condition, probably indicating that it was both redeposited and exposed to conditions that would have caused it to deteriorate before becoming part of the backfill within corn drying kiln. The circumstances behind this human bone becoming deposited in the kiln remain obscure.

7.3.6 Palaeoenvironmental samples processed from primary and backfill deposits of the corn driers produced a significant assemblage of charred plant macrofossils with cereal caryopses and weed seeds of arable taxa frequent and in some cases abundant in the residues. The broad array of cereals, weeds and non-cereal crops suggest that agricultural activities were fairly extensive. The cereal assemblages appear to suggest a mixed cropping regime, which is comparable with that noted at other sites with corn-driers (O'Meara and Hall

2014; Jackson *et al* 2015, Vitolo and Adams 2017) and is likely to reflect cultivation to limit the impact of crop failure. The cereal assemblage comprised oat and barley caryopses with fewer occurrences of wheat and rye. It is currently unclear whether the oat caryopses are of the wild or cultivated variety as no diagnostic floret bases were recorded. All of the barley grains were consistent with hulled barley and occasional twisted grains suggests the presence of at least some 6-row hulled barley. Many of the wheat grains appear morphologically consistent with a free-threshing bread-type wheat (*Triticum* cf. *aestivum* sl.) and the presence of some wheat rachis should assist in confirming/refining the wheat identification. Rye grains were tentatively identified. No sprouted cereal grains or detached coleoptiles were noted during the assessment. Non-cereal crops were not a prominent component of the assemblages, however, flax including the cultivated flax/linseed, were recorded in five samples relating to each of the corn-drying kilns. This crop may have been grown for its fibres or for the oil rich seed. Legumes, including possible pea and vetches were also present in low quantities in many of the samples and are likely to have been cultivated for both human and animal consumption. Weed seeds were frequent to abundant in many of the samples with a diverse array of arable weed taxa represented, the vast majority of which can occur in a range of ecological habitats. Stinking mayweed, for example is typically associated with cultivation of heavy clay soils. It is often associated with free-threshing wheat and expansion of cultivation onto heavier clay soils. Initial indications are that wheat was not a very prominent crop at this site and its presence may therefore be associated with another crop. The occurrence of knapweed is interesting as one of the species within this group, cornflower, is a common occurrence amongst rye in mainland Europe (Huntley & Stallibrass 1995). Wild food resources may also be represented in the weed seed assemblage as many of these plants provide edible leafy greens in addition to their association with crop. Charred elder seeds and hazel nut shell fragments may also derive from gathered foods but since they are edible to animals and birds as well as humans their presence in low quantities here should be treated with caution.

7.3.7 Initial indications are that, in the absence of sprouted grain or chaff, the kilns were not used in the brewing process for halting the malt (as is commonly evident in Roman examples) or to assist dehusking. The absence of significant quantities of chaff suggests the grain had been processed to some extent however the large assemblage of weeds indicates that this process was not entirely complete and the remains do not represent the final 'clean' grain product. Similar palaeoenvironmental evidence was recovered from recently excavated corn driers at East Rainton, Sunderland, Tyne and Wear (PCA 2107).

7.3.8 Small quantities of wood charcoal were present in each of the flots and recovered from the residues of 11 medieval samples, five of which contained 11-30 fragments and one sample, contained >31 fragments. Taxa identified include oak, hazel/alder, cherry/blackthorn willow/poplar, field maple, ash and birch. Oak was present in all of the assemblages while the other taxa were more sporadically represented. A sample taken from the basal ashy deposit of corn-drier [119] provided the largest assemblage of charcoal (>100 fragments)

with roundwood of both ash and cherry/blackthorn also noted. Two of the willow/poplar fragments from this sample also retained evidence for woodworm damage suggesting the wood may have been dead and dried for a significant time prior to charring.

7.3.9 The corn-drying kilns recorded at the site were located away from the core of the medieval settlement of Acomb; this location selected to minimise the risk of fire. Corn-drying kilns were particularly needed in areas where harvesting crops in damp conditions was necessary with the basic function of the kilns to remove the moisture from the harvested crop using an indirect heat source before the storage or processing of the grain. Drying of grain after harvest was necessary as undried grain would clog up the grooves on the grinding surface of millstones, particularly in the case of oats which are a fatty grain. Drying also aided the removal of the hard husk of oats. Drying of seed to be stored for planting was necessary to prevent fungal infection. Oats (and barley) cakes were a major element in the subsistence diet until the late eighteenth century (Prince 1986, 106-07). Corn driers were ubiquitous in Scotland up to the eighteenth century (Gibson 1989, 219-20) with farms using their own kilns or larger examples designed for communal use (Whyte and Whyte 1991, 19, 44-45; Whyte 1995, 137).

7.3.10 Corn-drying kilns have been recorded across the region, although many of these have been heavily truncated as they are often situated in fields subject to instance ploughing regimes in the post-medieval period. Most excavated examples in the region have only the basal elements surviving. The preservation of the corn-drying kilns at Acomb is considered to be exceptional for the region. Recent excavations in the region have identified corn-drying kilns at lowland sites at Dinnington, Northumberland (Jackson 2017) and at two sites in Cumbria; Low Crosby (Jackson *et al.* 2015) and Cumwhinton (Railton 2014). The three medieval kilns encountered at Dinnington were located within backlots of the medieval village. The best preserved, a 'keyhole' kiln with bowl, flue and firepit, produced a small number of oat grains. A nearby waste pit produced significant quantities of grain, one of which produced an AMS date of cal AD 985-1149. The other two kilns were less well preserved; the later of these two kilns produced a radiocarbon date of cal AD 1222–1285.

7.3.11 The basic way in which a corn drying kiln has traditionally been assumed to function was to light a fire at the mouth of a covered flue along which the hot air was drawn to enter the kiln bowl below a raised floor, usually constructed with wood, with the grain placed on the floor on a bed of straw or other material (Gibson 1989, 219). This ensured that the grain would be dried gently by hot air rather than an intense heat which could potentially destroy seed crop. Most archaeologically excavated examples of corn-drying kilns basically comprise a bowl, flue and a heat source, although not all three elements always survive plough truncation. The evidence from the Acomb examples however suggests that the fire may have been placed on the base of the bowls underneath the drying floor. Excavated examples do vary greatly in shape, size and the materials used in their construction, however the scarcity of excavated examples with firm dating evidence has to date made it impossible to establish a typology. A study of these structures in Ireland has looked at evidence from various

examples of excavated corn-drying kilns, their archaeobotanical remains, along with practical experiments including tests on reconstructed kilns to propose ideas regarding how corn-drying kilns functioned (Monk and Kelleher 2005). Various types of corn-drying kilns were included in this study in various states of preservation and were defined by their shapes; these included keyhole kilns, L-shaped or comma shaped kilns and 'waisted' forms or figure-of-eight and dumb-bell-shaped kilns. Here broad parallels can be seen in the kilns at Acomb however there are some key differences. For the majority of the Irish examples, there was evidence of a heat source located at the entrance to the flues, formed by a shallow scoop or fire pit, with the flue itself level and narrowing towards the bowl of the kiln. One of two kilns excavated at Capo in the Grampian region of Scotland, Kiln A, had a round bowl *c*. 2.8 m in diameter with a short, wide flue 1.5m long (Gibson 1989). There was however abundant evidence that this had functioned as a flue.

7.3.12 In contrast, the short linear projections in all three Acomb examples sloped steeply downwards towards the bowl with no evidence of narrowing and no evidence of a heat source recorded near the entrances to these features. While the absence of an external heat source could be the result of truncation, with ploughing having removed all evidence of a shallow fire pit, the shape and profile of the linear extensions along with evidence for burning within the bowls suggests a different interpretation of how these kilns functioned. Each had an area on the floor of the bowl that had been exposed to extremely high temperatures; this was defined by an area of heat affected clay in kiln [127] and areas of heat-affected stones in the slab floor of [119] and [135]. Similar evidence has been discovered at another recently excavated site at East Rainton, Sunderland, Tyne and Wear where four corn-drying kilns were excavated (PCA 2107). All four corn-drying kilns recorded at the site had a similar pear-shaped construction cut, although their construction methods, size and the materials used differed significantly. One of the corn-driers had a dry stone lining and two examples had evenly-spaced postholes and stakeholes located around the perimeter of the bowls very similar to the Acomb examples. As with the Acomb corn driers, three of the East Rainton examples had clear evidence for heat being placed on the base of the bowls below the drying floor. Linear projections leading from the bowls of these kilns may have served the purpose of simply providing access into the deep bowls of the kilns; every example either sloped down or stepped down towards the bowl and there was indication of any burning or soot deposits along their length.

7.3.13 Excavation of a substantial stone-lined corn drying kiln at Kilnsey Green, North Yorkshire in the uplands of the Yorkshire Dales revealed two phases of use (Johnson *et al.* 2008). A 'keyhole' kiln with circular bowl, linear flue and circular external fire pit had been modified by the construction of a squared bowl inside the original square one; this later bowl was the actual fire pit and the drying floor would have been set above the fire on an upper storey.

7.3.14 An historical description of corn drying in Wales dating from 1898 provides documentary evidence for this method of drying corn with the heat directly below the drying floor:

Our forefathers prepared corn by means of the brenau (quem) and odyngrasu (drying kiln). At first the mills had no drying-kilns attached to them, all the corn being dried at home. The last odyngrasu in use in this parish ... was worked as late as 1845 ... The shape and the build of this ancient apparatus was certainly primitive. On gently-sloping ground a hollow, three yards long, two yards wide, and two deep, was cut similar in shape to a cladd tato [i.e. potato clamp]. Two planks were placed at right-angles to each other, their ends resting on the surface outside the hollow. These served to support the sticks which were placed regularly over the kiln until it was covered. Over the whole clean straw was laid, upon which the corn was placed to be dried. Underneath all this and at the lower end of the kiln, the fire was placed, so that the heat and smoke went under the straw contrivance above. One man looked after the fire, which was generally of furze and brushwood. He always kept by him a tub of water, and a straw-wisp or a mop, to regulate the force of the fire. He kept moving the corn continually to obtain even drying, with a short-toothed wooden rake, and when ready it was raked off the straw into a large canvas, and was then fit for the mill. Instead of straw some covered the kiln with what was called earthen rawn, earthen odyn (kiln cloth or hair cloth) (Price 1898).

7.3.15 The medieval settlement of Acomb was located to the north of the excavated area with the corn-drying kilns located well away from the settlement focus to minimise the risk of fire. This is the typical location of corn-drying kilns and recent exposure of such industrial agricultural features may be a direct result of the current expansion of residential development taking place adjacent to rural villages and towns with medieval origins. Unlike some examples of corn driers located in upland areas, many of these lowland driers discovered on the edges of medieval villages had been subject to plough truncation resulting in poor preservation.

7.3.16 It is probable that the historic core of Acomb emerged as a recognisable settlement during the post-Norman Conquest period, although the focus of population was then probably at St John Lee where there had been a church since at least the fourteenth-century (Tynedale Council 2009). The south facing slope and sheltered hollows, together with the presence of the Red Burn and numerous spring points, provided a range of attractive advantages that would have encouraged cultivation and settlement in Acomb. The early settlement would have suffered during the post-Conquest 'Harrying of the North' where widespread massacre and destruction led to most of the land being laid waste and depopulated. The name Acomb is derived from Old English 'Acum', or at the oaks, and is first mentioned in 1226 when describing a 'mill on or near Kirkeburn' - the original name for the Birkey Burn (Stan Beckensall 1975).The post-Conquest village was probably severely damaged and rebuilt in the twelfth, thirteenth and fourteenth centuries as a consequence of border wars and raids, which removed any evidence of a Norman settlement. It is noted in the History of Northumberland that the village was ravaged in 1315, and in about 1467 it was burnt by a marauding party. The pottery assemblage and initial AMS dates indicate that the corn driers were in use during the 11th to 14th centuries.

7.3.17 The construction and maintenance of these kilns would probably have required significant investment, with perhaps only one in use at any time, and it is likely that these structures were used communally. The contemporary medieval water mill is likely to have been located in the very near vicinity to the kilns. The Birkey Burn flows a short distance to the south of the site midway between the Acomb and St John Lee. The present mill building (a listed building List entry Number 1044847) is located *c*. 250m to the south of the area of excavation (Figure 2). This dates from the early 18th century, but it is considered likely that this was the location of the medieval mill. This extant structure is shown on Armstrong's map of 1769 and the 1840 Tithe map (Figure 11).

7.2 Phase 4: Subsoil

7.2.1 Subsoil extended across the site and directly overlay all Phase 2 and 3 features; this probably developed during the later part of the medieval and post-medieval periods when the site was turned over to agricultural use. The majority of the area of excavation was not subject to geophysical survey, but furrows detected across the remainder of the site demonstrated that the site had been subject to ploughing (AD Archaeology 2015a). The wavelength of 4m to 6m probably represents narrow rig cultivation of post-medieval date. The ridge and furrow also runs parallel to the existing field boundaries again suggesting it probably relates to the later enclosure of the land in the post-medieval period.

8. SIGNIFICANCE OF THE PROJECT DATA AND SUMMARY OF POTENTIAL FOR FURTHER ANALYSIS

8.1 This assessment of the data recovered from the investigations has concluded that the medieval remains recorded at Acomb are of regional significance and further analysis leading to publication will be required as detailed in the WSI. The state of preservation of the Acomb corn-drying kilns is considered to be excellent; the majority of similar structures recorded in the lowlands of this region have generally been heavily truncated by later agricultural activity. The scarcity of excavated examples with firm dating evidence has to date made it impossible to establish a typology for corn drying kilns. However the examples excavated here at Acomb and at East Rainton, Tyne and Wear, have the potential to provide information about the chronological development of these structures through the use of AMS dating as two distinct types of driers (with wattle and daub superstructures and stone-lined bowls) were excavated at both sites. The palaeoenvironmental remains recovered from the site are considered to be of regional significance.

8.2 The Acomb archaeological investigations have made a significant contribution to archaeological knowledge of the late prehistoric and medieval periods. In terms of NERRF research priorities for the medieval period (MD) are considered to be relevant to the project in advance of the fieldwork it can be concluded that the excavation has contributed to each of these to some extent: Ii. Chonology; Iii. Settlement; Iiv. Material Culture: general; Ivi. Material Culture: ceramics; MDi. Settlement; MDvii. Medieval ceramics and other artifacts; MDviii. Other medieval industries.

8.3 Charred plant macrofossils from the site were generally well preserved and abundant with a high diversity of taxa, both weeds and crops, represented. The NERRF states the importance of collecting more environmental data from rural sites which should be a priority (MDi: Settlement). The Society for Medieval Archaeology has also given the increased study of environmental material a high priority (SMA 1987, 5, I.D.ii) noting that further research into faunal assemblages will improve our knowledge of patterns of consumption, husbandry practices and breeding patterns, and that routine analysis of plant macrofossils would reveal more detail about consumption and agricultural practices (Petts and Gerrard 2006). Botanical assemblages of charred plant macrofossils and charcoal from rural medieval sites are underrepresented in the north-east of England when compared with those from larger urban centres (Huntley and Stallibrass 1995, Hall and Huntley 2007, Huntley 2010). Sites with medieval grain drying kilns are spread across the region and include East Rainton, Sunderland (Vitolo and Adams 2017), Peter Gate, Cumwhinton and Low Crosby in Cumbria (O'Meara and Hall 2014; Jackson *et al* 2015) and Hoddom, Dumfriesshire (Holden 2006) for which botanical analysis have been undertaken. There are however, very few assemblages from medieval rural or small town sites in this central region of Northumberland and instead the focus has centred on Roman sites within the area.

8.4 The material recovered from Acomb is therefore considered to be of regional significance and will add to the wider body of evidence for such material recovered from rural areas. Assemblages from the three kilns present the opportunity for comparisons to be drawn between the features at the current site and with those from other sites across the region. The broad array of cereals, weeds and non-cereal crops suggest that agricultural activities were fairly extensive and analysis of the assemblages has potential to shed light on the range of activities and where these may have taken place. More specifically the associated weed assemblages have potential to reveal at least some of the soil types being cultivated and may reveal information regarding crop husbandry techniques and timings.

8.5 The samples also hold potential to explore possible uses of the drying kilns. Initial indications are that, in the absence of sprouted grain or chaff, the kilns were not used in the brewing process for halting the malt (as is commonly evident in Roman examples) or to assist dehusking. The absence of significant quantities of chaff suggests the grain had been processed to some extent however the large assemblage of weeds indicates that this process was not entirely complete and the remains do not represent the final 'clean' grain product. It remains to be determined (if possible) whether they were used to dry grain for storage or as part of the milling process. Further analysis and quantification will shed light on the ratios of grain to weeds to chaff and the sizes of weed represented which will further assist this discussion.

8.6 The wood charcoal assemblage form Acomb is also of significance as there is a lack of charcoal data for the region as a whole and more particularly in the immediate surrounds of the site as shown in maps of the region by Huntley (2010). The NERRF highlights a gap in the evidence on landscape and environment in this area of the country for the medieval period. The report highlights the need for detailed analysis of charcoal assemblages both to identify tree species and to look at the evidence for woodland management. A few charcoal assemblages arising from excavations carried out in Northumberland and Teesside have been analysed and reported on (*e.g.* Donaldson 1976; McCullagh 2000; Huntley 2005) and they can provide material for comparison, although the lack of charcoal data from the region is significant (Huntley 2010). The assemblages of wood charcoal from corn-drier [119] can contribute information regarding the range of taxa used for fuel and may reveal information regarding the types of fuel wood represented (whether predominantly from round wood for example), possible fuel wood collecting strategies and the vegetation habitats from which they derive. It is also plausible that some of the wood charcoal originates from wattle used in the kiln construction although establishing this is unlikely to be possible from the charcoal assemblage alone. Of the three charcoal rich assemblages from this kiln, sample <22> [190] and sample <23> [192] were thought during excavation to represent fuel from the last use of the feature. This is supported by the almost complete absence of plant macrofossils which are so prominent in all other deposits. Analysis will also clarify whether the current assemblages mirror those from other corn-driers such as Peter Gate (O'Meara and Hall

2014) and Collfryn (Britnell 1984) which both contain numerous different taxa or whether a more restricted range of taxa are evident suggesting targeted fuel collection.

8.7 It is therefore considered that the findings require further analysis leading to the publication of a paper in an academic outlet, to form a permanent record of the investigations. Limited further analytical work is considered necessary on the relevant archaeological data, as discussed below, and the final paper is required to place the findings in a broader archaeological context.

8.8 No further analytical work is required on the stratigraphic data with the exception of attempting to establish a chronology for the corn driers. A range of charred material from each of the corn-drying kilns should be submitted for radiocarbon dating; material will be selected from primary and backfill deposits with the aim of establishing the use and disuse of each features. Where possible it is recommended that two different taxa are submitted from individual contexts to establish internal consistency. In tandem with AMS dates to be obtained from the East Rainton examples, it may be possible to construct a chronology for the two different types of corn dries present at both sites.

8.9 Analysis of charred plant macrofossils and wood charcoal should be undertaken with the following research aims and questions in mind:

<u>Charred Plant Macrofossils</u>

- Characterise the composition of the plant macrofossil assemblage.
- Does assemblage composition differ between kilns?
- Characterise the nature of the arable economy at the site during the medieval land-use
- Do the weed taxa provide evidence for the types of land under cultivation?
- Do the arable weeds provide evidence for cultivation practices?
- Is there evidence for other vegetation habitats being exploited?
- How does the assemblage compare with other contemporary sites within the region and particularly those with medieval grain-drying kilns?
- Does the assemblage provide evidence for the role of the kiln in crop processing or storage?

<u>Charcoal</u>

- Determine the range of woody taxa and size of fuel wood represented.
- Characterise the vegetation environments from which fuel was sourced
- How does the assemblage compare to contemporary charcoal assemblages from the region, particularly from drying kilns?

8.10 It is recommended that full analysis, involving sorting, identification and quantification of charred plant macrofossils, is carried out on 12 samples containing >50 moderate to well preserved individuals (see below for sample selection). If plant remains are particularly abundant it may be necessary to examine a representative subsample. The analysis will address the research aims and questions outlined above.

Corn-drier [119] (samples <8> [120], <9> [121] <22> [190])

Corn-drier [127] (samples <10> [122], <11> [123], <12> [124], <14> [126])

Corn-drier [135] (samples <15> [132], <16> [133] and <17> [138] and samples <19> [142] and <21> [174] from posthole [177] within the kiln)

8.11 It is recommended that three samples from feature [119] are fully analysed (see sample selection below). This analysis will involve identification of up to one hundred charcoal fragments from each sample, where available, and preparation of a report suitable for publication.

Corn-drier [119] (samples <9> [121] <22> [190], <23> [192])

8.12 No further analytical work is required on the pottery, metal-working debris, faunal remains or human bone, however publication reports should be prepared for each assemblage.

8.13 The proposed academic outlet is the *Archaeologia Aeliana* and pending agreement, will incorporate the results of recent archaeological investigations at East Rainton, Sunderland, where similar medieval corn-drying kilns were recorded. The publication report/paper would, as a minimum, contain the following:

- ***Abstract***: an introductory paragraph summarising the publication, particularly the main archaeological periods represented and the main findings and their significance.
- ***Introduction***: including the site location, and setting out the overall background to the work and the main methodologies employed.
- ***Geological and topographical background***: detailing the geology and topography of the site.
- ***Archaeological background***: setting the results in local and regional context, with particular focus on the medieval period comparing and contrasting recently excavated medieval sites within northern Britain associated with the processing of agricultural products.
- ***Excavated evidence***: core section of the paper detailing the project results and including a synthesised description of the recorded evidence, including the artefactual and ecofactual material recovered.
- ***Discussion***: proposing an interpretation of the archaeological remains based on the excavated features and the artefactual and ecofactual evidence. This will include

some consideration of medieval agriculture, economy, environment and milling practices.

- ***Illustrations***: including site location plan, location plan of the excavated areas, plans and section drawings of excavated features, interpretative and reconstruction plans, historic maps and photographs.

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10. ACKNOWLEDGEMENTS AND CREDITS

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PCA Credits

Project management: Jennifer Proctor

Fieldwork: Aaron Goode and Scott Vance (Site Supervisors), Brian Perks, Richard Cramp, Derek Moscrop

Post-excavation management: Jennifer Proctor

Report: Aaron Goode

Illustrations: Hayley Baxter

Faunal remains: Karen Deighton

Human bone: James Langthorne

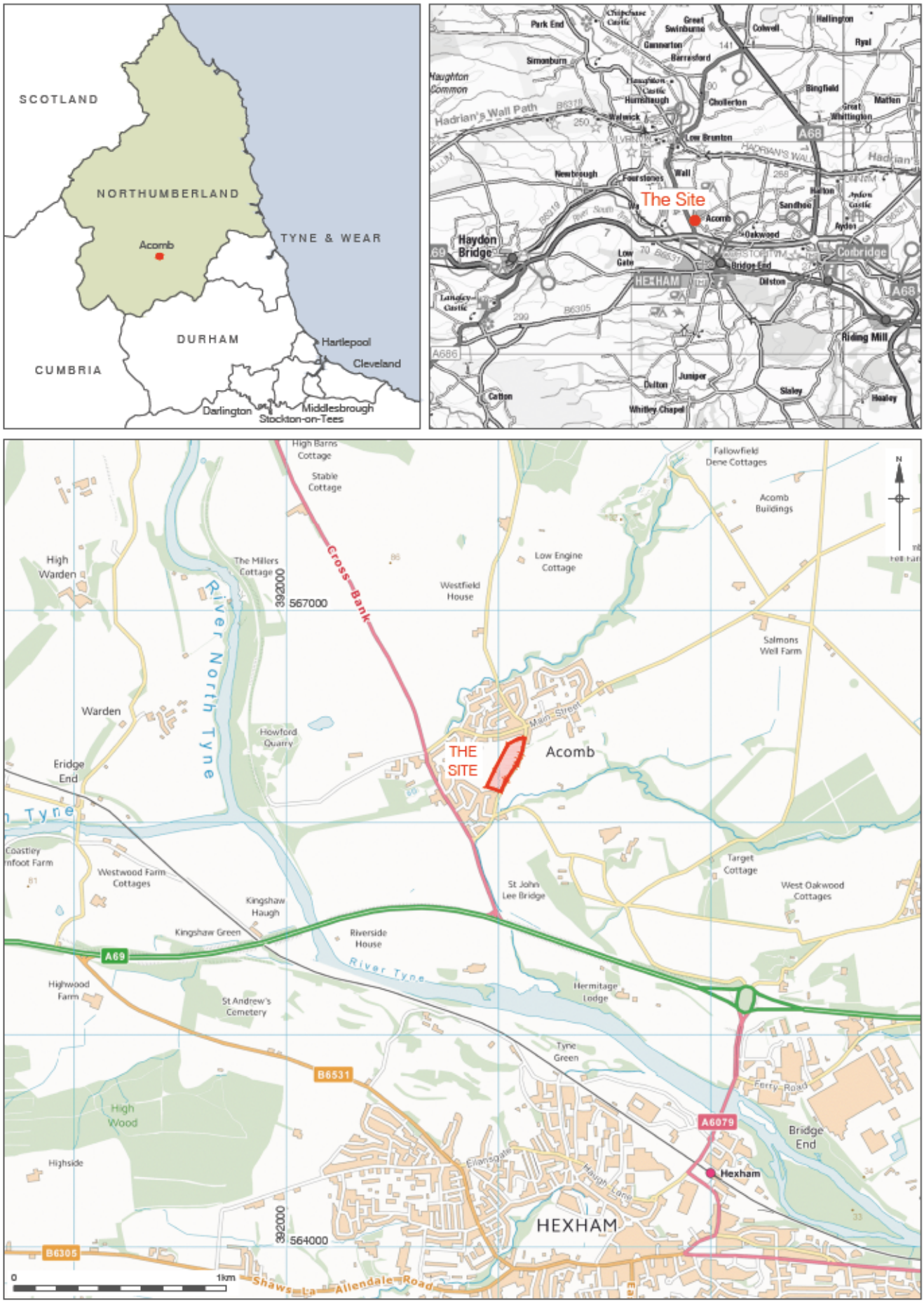
Other Credits

Metal-working debris: Rod Mackenzie

Pottery: Jenny Vaughan (NCAS)

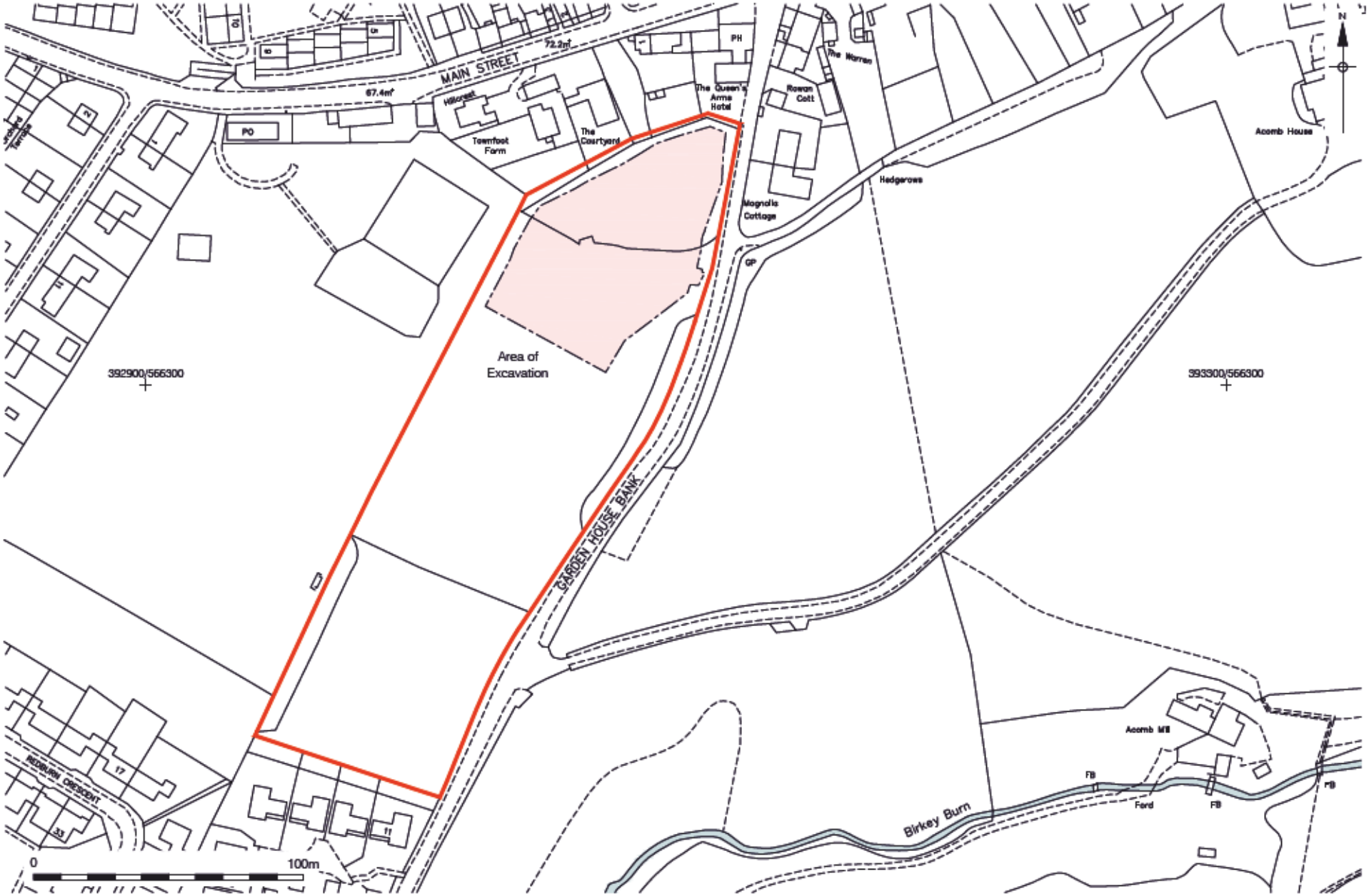
Palaeoenvironmental remains: L. Allott (QUEST)

APPENDIX 1: FIGURES



21/03/17 HB

Figure 1
Site Location
1:2,000,000; 250,000 & 25,000 at A4



21/03/17 HB

Figure 2
Trench Location
1:2,000 at A4

Based on Proposed Plan ACO_ARCH supplied by Avant Homes, November 2016

11/07/17 HB

Figure 3
Excavation Area
overlain onto Proposed Development
1:1,250 at A4

Based on Geophysical Survey supplied by AD Archaeology, September 2015

21/03/17 HB

Figure 4
Archaeological features
overlain onto Geophysical Survey
1:1,250 at A4

N

S1
pit [103]

S2
S3
ditch [107]

S5
ditch [113]

S4
ditch [110]

S7
corn drying kiln [127]

S6
corn drying kiln [119]
S12

S10
corn drying kiln [135]

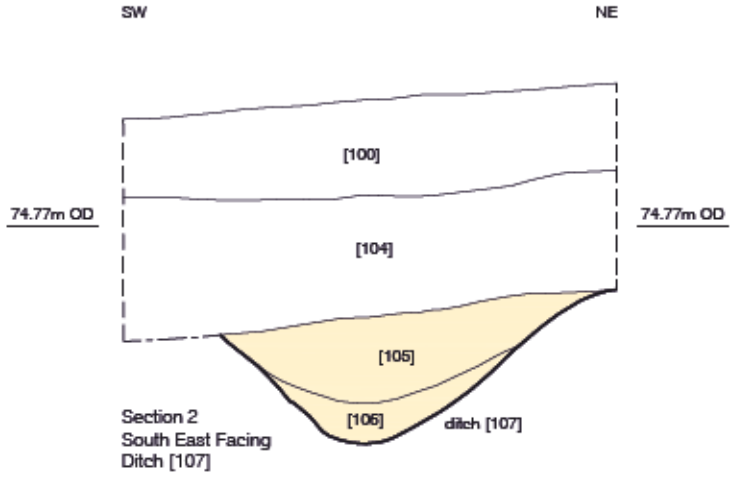
S8
pit [116]

Phase 2 Prehistoric
Phase 3 Medieval
Excavated

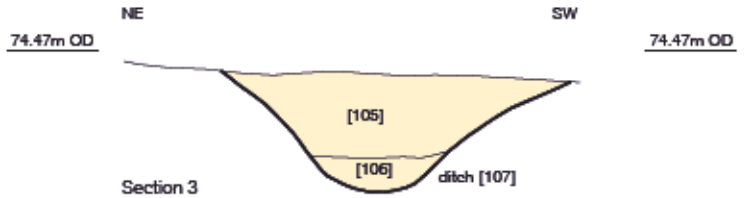
0 10m

21/03/17 HB

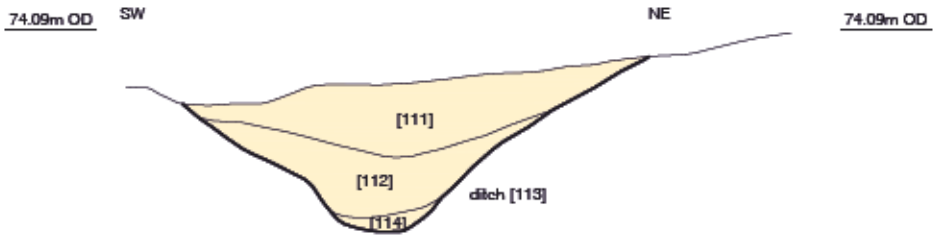
Figure 5
Plan of All Features
1:200 at A3



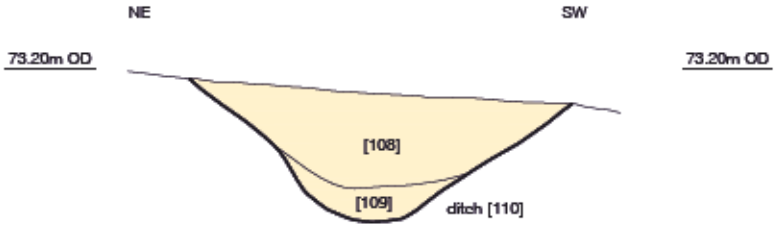
Section 2
South East Facing
Ditch [107]



Section 3
North West Facing
Ditch [107]



Section 5
South East Facing
Ditch [113]



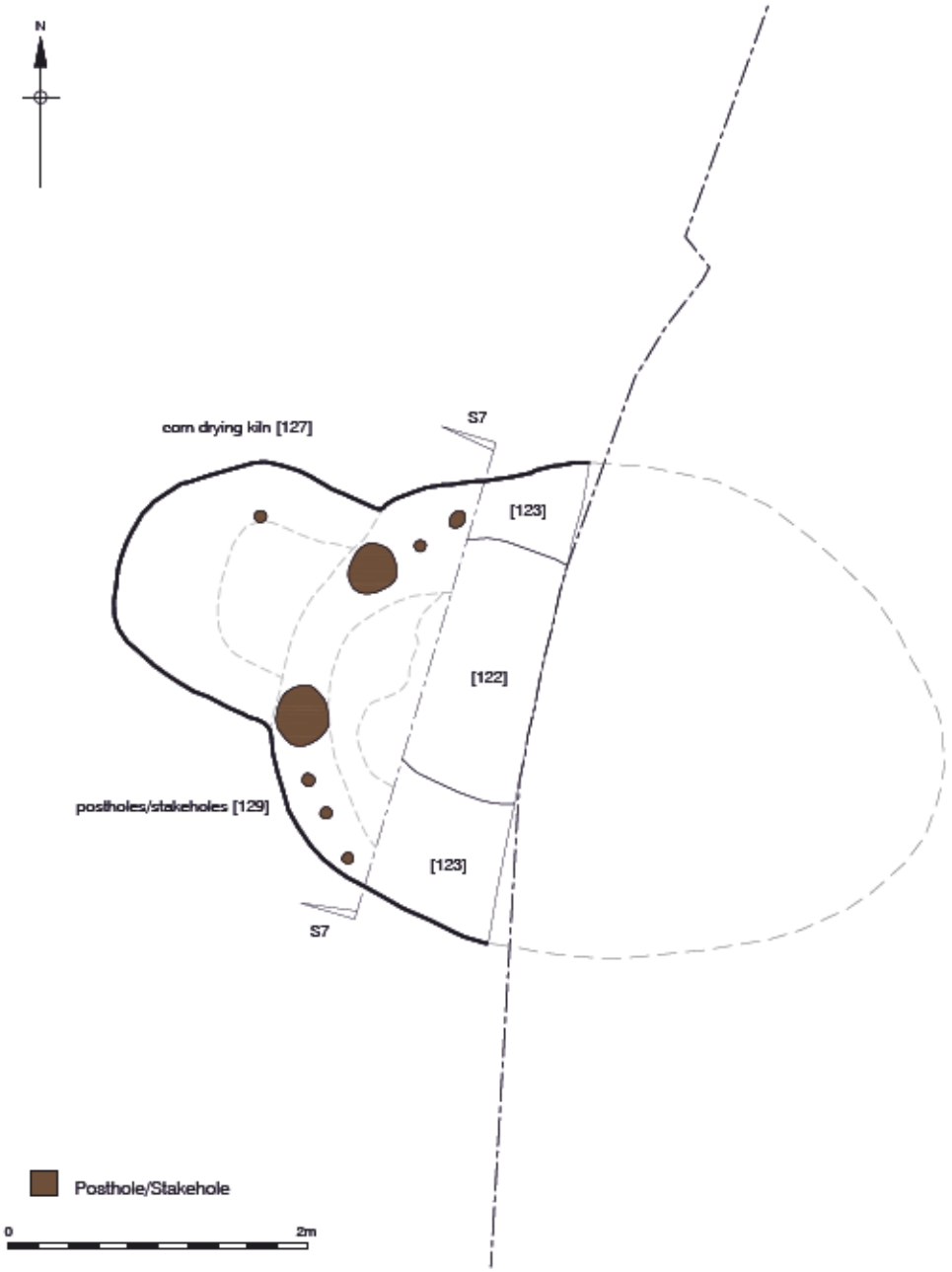
Section 4
North West Facing
Ditch [110]

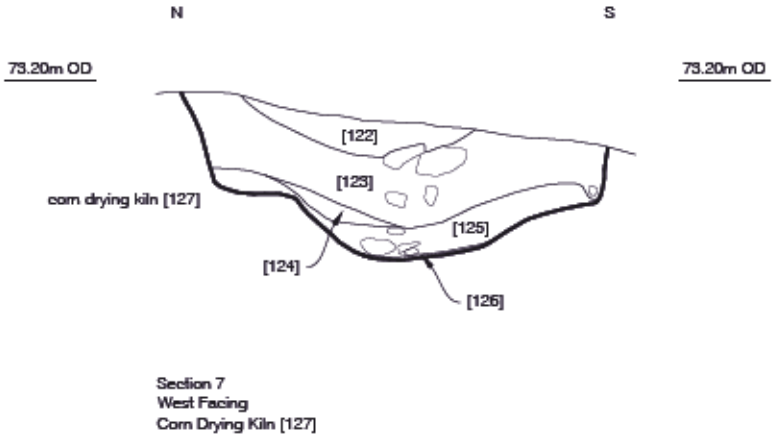
Phase 2 Prehistoric

0 1m

21/03/17 HB

Figure 6
Sections through Prehistoric Ditch
1:25 at A4

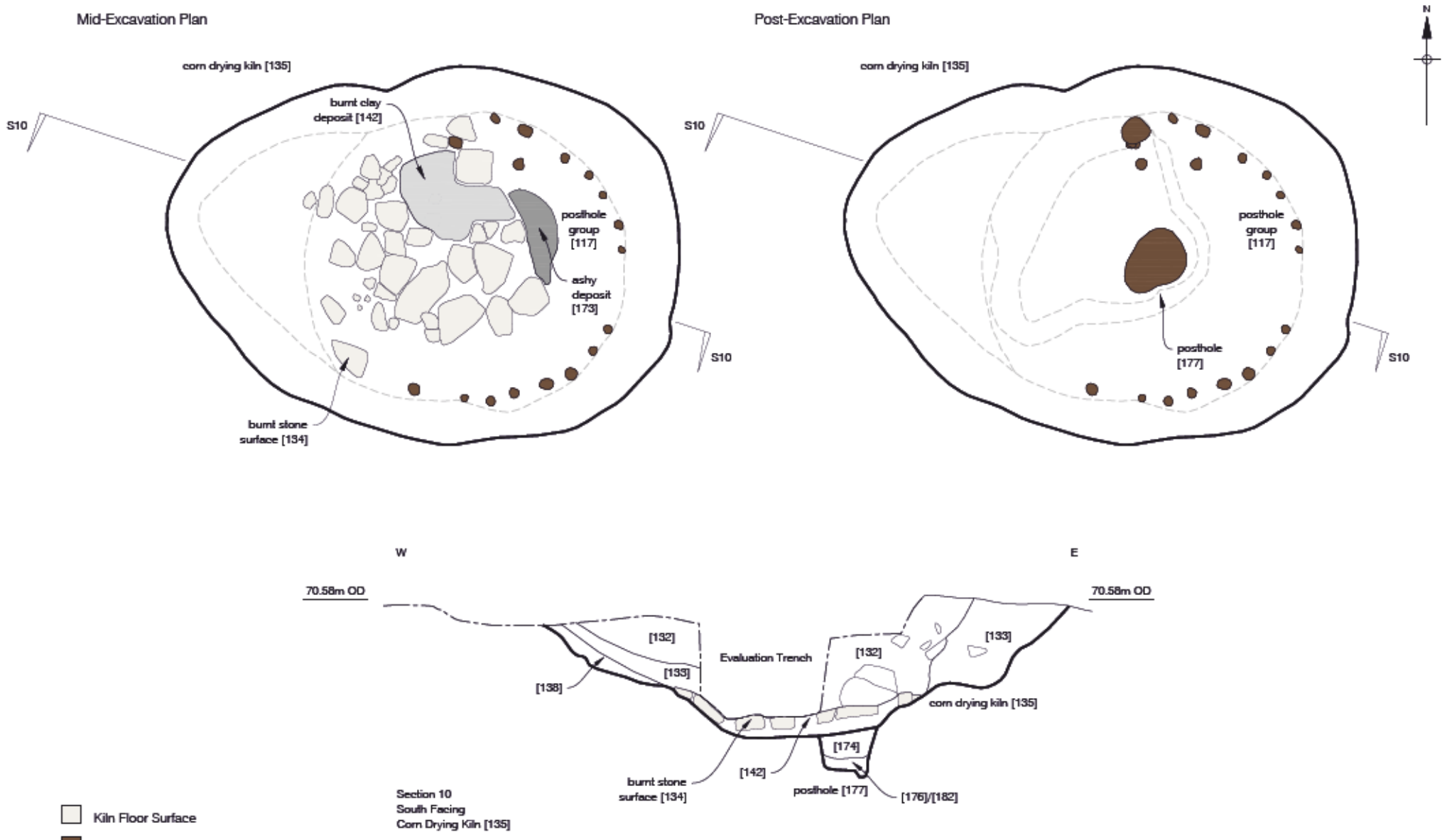




Section 7
West Facing
Corn Drying Kiln [127]

21/03/17 HB

Figure 7
Detailed Plan & Section of Corn Drying Kiln [127]
1:50 at A4



21/03/17 HB

Figure 8
Detailed Plan & Section of Corn Drying Kiln [135]
1:50 at A4

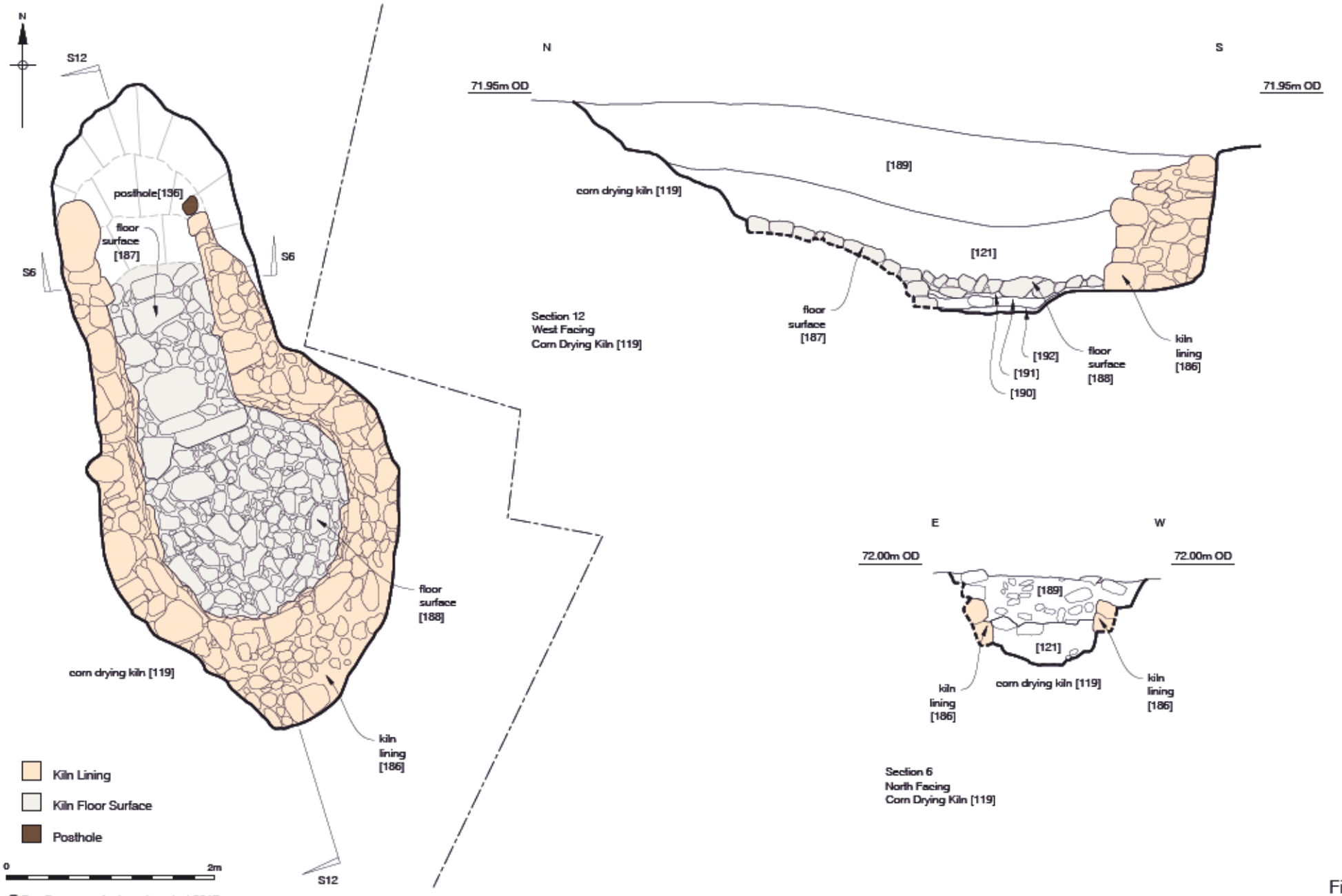


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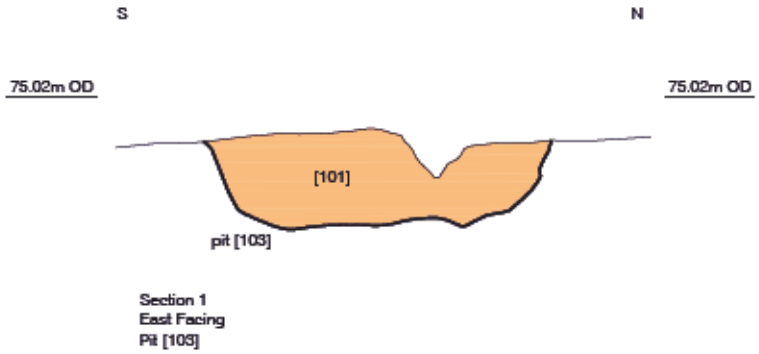
Figure 9
Detailed Plan & Sections of Corn Drying Kiln [119]
1:50 at A4



Section 1
East Facing
Pit [103]

Section 8
South East Facing
Pit [116]

Phase 3 Medieval

0 1m

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Figure 10
Sections through Medieval Pits
1:25 at A4

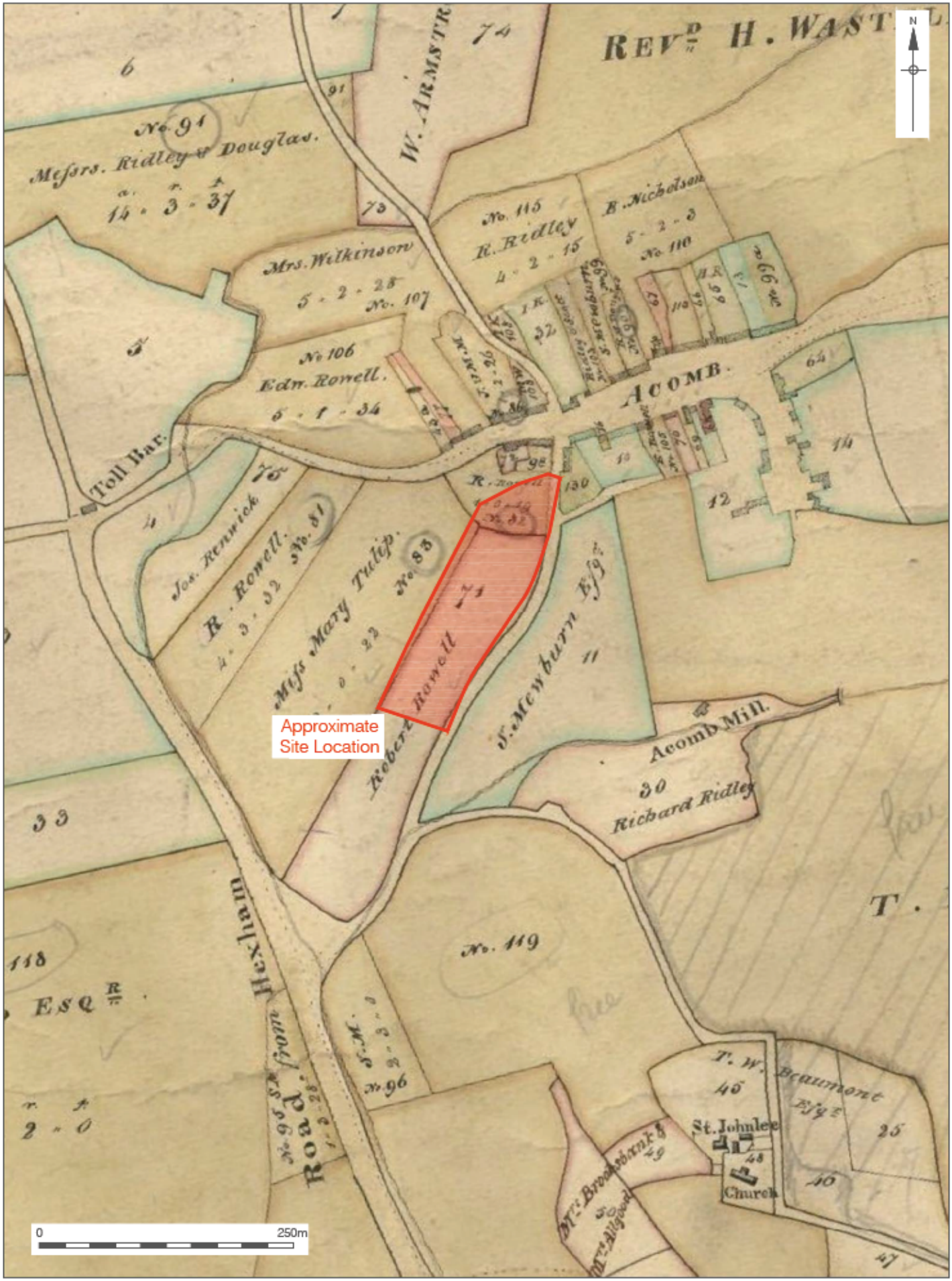

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Figure 11
Acomb tithe map, 1840
1:5,000 at A4

Plate 1. SSE facing section of Phase 2 ditch [107], (scale 1m)

Plate 2. NNW facing section of Phase 2 ditch [107], (scale 1m)

Plate 3. Overview showing Phase 2 ditch [110], southwest direction of view, (scale 1m)

Plate 4. Overview showing Phase 3 pit [103], northwest direction of view, (scale 1m)

Plate 5. Overview of Phase 3 corn-drying kiln [128], southeast direction of view, (scale 1m)

Plate 6. Overview of Phase 3 corn-drying kiln [122], north direction of view, (scale 1m)

Plate 7. West facing section of Phase 3 corn-drying kiln [128], (scale 2m)

Plate 8. NNW facing section of Phase 3 corn-drying kiln, (scale 1m)

Plate 9. Overview of Phase 3 corn-drying kiln [135], east direction of view, (scale 1m & 2m)

Plate 10. Overview of Phase 3 corn-drying kiln [135], west direction of view, (scale 1m)

Plate 11. North facing section across corn-drying kiln flue [119], (scale 1m)

Plate 12. Overview of corn-drying kiln [119] showing stone lining [186] and stone base [188], northwest direction of view, (scale 1m)

Plate 13. Overview of corn-drying kiln [119] showing stone base [188], east direction of view, (scale 0.50m & 1m)

Plate 14. Overview of corn-drying kiln [119], south direction of view, (scale 1m)

Plate 15. Corn-drying kiln [119] showing stone base [188] and underlying deposits [190], [191] & [192], (scale 1m)

Plate 16. Corn-drying kiln [119] showing burnt deposit [192], southeast direction of view (scale 1m)

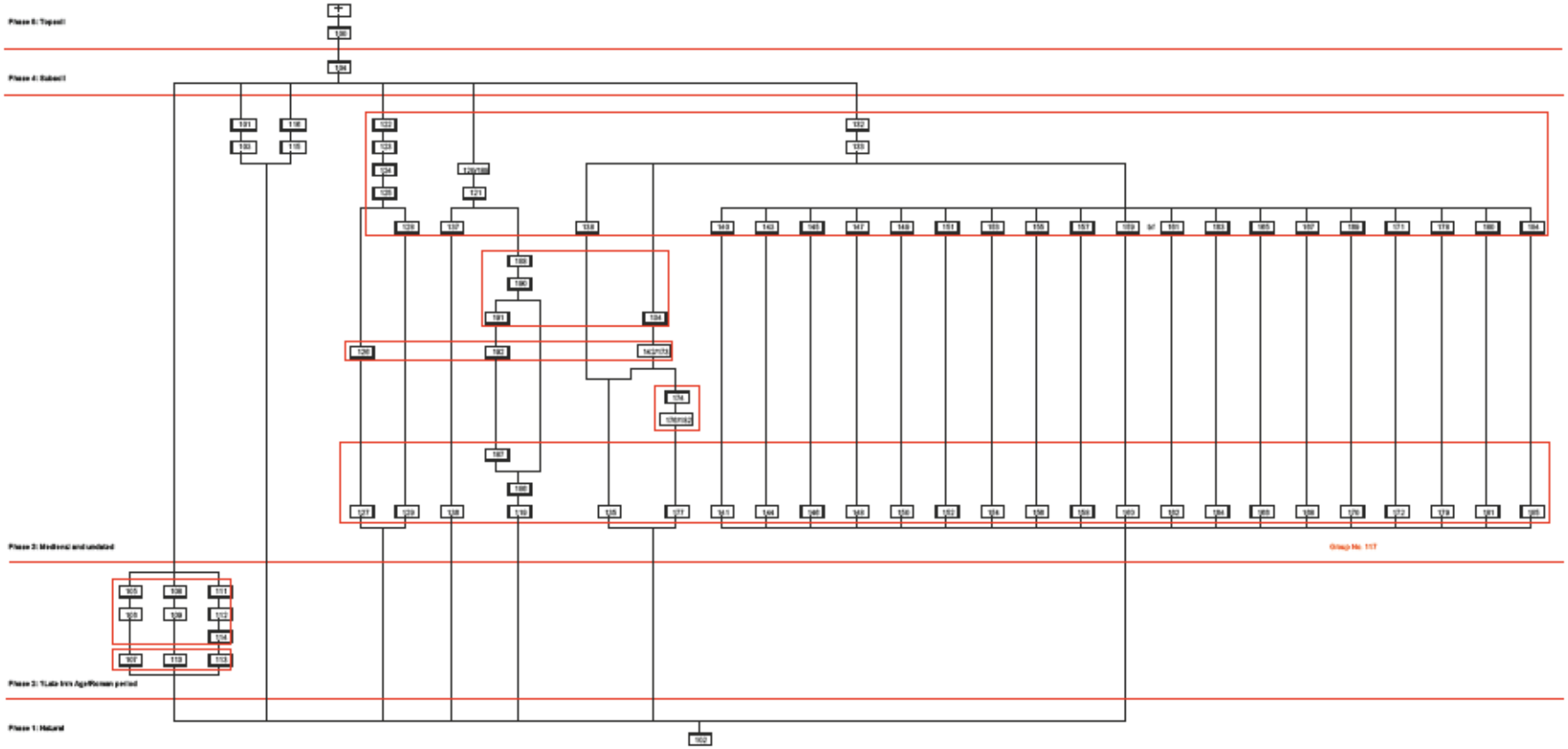
APPENDIX 3: CONTEXT INDEX

Context	*Group*	*Phase*	*Fill of*	*Filled by*	*Type 1*	*Type 2*	*Interpretation*
100		5			Deposit	Layer	Topsoil
101		3	[103]		Deposit	Fill	Pit
102		1			Deposit	Layer	Natural
103		3		[101]	Cut	Discrete	Pit
104		4			Deposit	Layer	Subsoil
105		2	[107]		Deposit	Fill	Ditch
106		2	[107]		Deposit	Fill	Ditch
107		2		[105], [106]	Cut	Linear	Ditch
108		2	[110]		Deposit	Fill	Ditch
109		2	[110]		Deposit	Fill	Ditch
110		2		[108], [109]	Cut	Linear	Ditch
111		2	[113]		Deposit	Fill	Ditch
112		2	[113]		Deposit	Fill	Ditch
113		2		[111], [112], [114]	Cut	Linear	Ditch
114		2	[113]		Deposit	Fill	Ditch
115		3		[116]	Cut	Discrete	Pit
116		3	[115]		Deposit	Fill	Pit
117		3			Group		Postholes/stakeholes
118							number not used
119		3		[120], [121], [186], [187], [188], [189], [190], [191], [192]	Cut	Discrete	Corn-drying kiln
120		3	[119]		Deposit	Fill	Corn-drying kiln, same as [189]
121		3	[119]		Deposit	Fill	Corn-drying kiln
122		3	[127]		Deposit	Fill	Corn-drying kiln
123		3	[127]		Deposit	Fill	Corn-drying kiln
124		3	[127]		Deposit	Fill	Corn-drying kiln
125		3	[127]		Deposit	Fill	Corn-drying kiln
126		3	[127]		Deposit	Discrete	Corn-drying kiln
127		3		[122], [123], [124], [125], [126]	Cut	Discrete	Corn-drying kiln
128		3	[129]		Deposit	Fill	Postholes/stakeholes
129		3		[128]	Cut	Discrete	Postholes/stakeholes
130		3	[119]		Masonry	Lining	Corn-drying kiln, same as [186]
131		3	[119]		Masonry	Lining	Corn-drying kiln, same as [186]
132		3	[135]		Deposit	Fill	Corn-drying kiln
133		3	[135]		Deposit	Fill	Corn-drying kiln
134		3	[135]		Masonry	Surface	Corn-drying kiln
135		3		[132], [133], [134], [138], [142], [173]	Cut	Discrete	Corn-drying kiln
136		3		[137]	Cut	Discrete	Corn-drying kiln posthole
137		3	[136]		Deposit	Fill	Corn-drying kiln posthole
138		3	[135]		Deposit	Fill	Corn-drying kiln
139							number not used
140	117	3	[141]		Deposit	Fill	Corn-drying kiln stakehole
141	117	3		[140]	Cut	Discrete	Corn-drying kiln stakehole
142		3	[135]		Deposit	Fill	Corn-drying kiln, same as [173]
143	117	3	[144]		Deposit	Fill	Corn-drying kiln stakehole
144	117	3		[143]	Cut	Discrete	Corn-drying kiln stakehole
145	117	3	[146]		Deposit	Fill	Corn-drying kiln stakehole
146	117	3		[145]	Cut	Discrete	Corn-drying kiln stakehole
147	117	3	[148]		Deposit	Fill	Corn-drying kiln stakehole
148	117	3		[147]	Cut	Discrete	Corn-drying kiln stakehole
149	117	3	[150]		Deposit	Fill	Corn-drying kiln stakehole
150	117	3		[149]	Cut	Discrete	Corn-drying kiln stakehole
151	117	3	[152]		Deposit	Fill	Corn-drying kiln stakehole
152	117	3		[151]	Cut	Discrete	Corn-drying kiln stakehole
153	117	3	[154]		Deposit	Fill	Corn-drying kiln stakehole
154	117	3		[153]	Cut	Discrete	Corn-drying kiln stakehole
155	117	3	[156]		Deposit	Fill	Corn-drying kiln stakehole
156	117	3		[155]	Cut	Discrete	Corn-drying kiln stakehole
157	117	3	[158]		Deposit	Fill	Corn-drying kiln stakehole

APPENDIX 3: CONTEXT INDEX

Context	*Group*	*Phase*	*Fill of*	*Filled by*	*Type 1*	*Type 2*	*Interpretation*
158	117	3		[157]	Cut	Discrete	Corn-drying kiln stakehole
159	117	3	[160]		Deposit	Fill	Corn-drying kiln stakehole
160	117	3		[159]	Cut	Discrete	Corn-drying kiln stakehole
161	117	3	[162]		Deposit	Fill	Corn-drying kiln stakehole
162	117	3		[161]	Cut	Discrete	Corn-drying kiln stakehole
163	117	3	[164]		Deposit	Fill	Corn-drying kiln stakehole
164	117	3		[163]	Cut	Discrete	Corn-drying kiln stakehole
165	117	3	[166]		Deposit	Fill	Corn-drying kiln stakehole
166	117	3		[165]	Cut	Discrete	Corn-drying kiln stakehole
167	117	3	[168]		Deposit	Fill	Corn-drying kiln stakehole
168	117	3		[167]	Cut	Discrete	Corn-drying kiln stakehole
169	117	3	[170]		Deposit	Fill	Corn-drying kiln stakehole
170	117	3		[169]	Cut	Discrete	Corn-drying kiln stakehole
171	117	3	[172]		Deposit	Fill	Corn-drying kiln stakehole
172	117	3		[171]	Cut	Discrete	Corn-drying kiln stakehole
173		3	[135]		Deposit	Fill	Corn-drying kiln, same as [142]
174		3	[177]		Deposit	Fill	Corn-drying kiln posthole
175							number not used
176		3	[177]		Deposit	Fill	Corn-drying kiln posthole, same as
177		3		[174], [176], [182]	Cut	Discrete	Corn-drying kiln posthole
178	117	3	[179]		Deposit	Fill	Corn-drying kiln stakehole
179	117	3		[178]	Cut	Discrete	Corn-drying kiln stakehole
180	117	3	[181]		Deposit	Fill	Corn-drying kiln posthole
181	117	3		[180]	Cut	Discrete	Corn-drying kiln posthole
182		3	[177]		Deposit	Fill	Corn-drying kiln posthole, same as
183							number not used
184	117	3	[185]		Deposit	Fill	Corn-drying kiln stakehole
185	117	3		[184]	Cut	Discrete	Corn-drying kiln stakehole
186		3	[119]		Masonry	Lining	Corn-drying kiln
187		3	[119]		Masonry	Surface	Corn-drying kiln
188		3	[119]		Masonry	Surface	Corn-drying kiln
189		3	[119]		Deposit	Fill	Corn-drying kiln, same as [120]
190		3	[119]		Deposit	Fill	Corn-drying kiln
191		3	[119]		Deposit	Fill	Corn-drying kiln
192		3	[119]		Deposit	Fill	Corn-drying kiln

GLA 19: Matrix



APPENDIX 5: POTTERY ASSESSMENT

By: Jenny Vaughan (NCAS)

Summary

A small assemblage of 21 sherds of pottery weighing 221 grams was recovered from seven contexts (five of them associated with the corn driers) during the excavations. All the sherds were medieval with a possible latest date range of later 12th to early 14th century.

Range and Variety

The pottery is catalogued in the simple table below. FGN (fabric group number) is perhaps unnecessary for this small group but gives a broad guide to type and dating.

context	cut	FGN	fabric	sherds	weight (g)	comments
101	pit 103	3	oxidised gr	1	3	Hard reddish fabric with ill-sorted inclusions. Some similarity to Dog Bank (12th c. gritty wares).
101		3	buff gr	1	4	
101		4	buff	1	9	
104	subsoil	4	buff	1	12	With darker (orange/brown) surfaces. Inturned clubbed rim with well-defined internal hollow.
104		6	buff grey	2	21	Sherds are not from same vessel. Grey cores with variable buff margins, some sooting
104		6	early green gl	1	11	
121	corn-dryer 119	7	reduced green gl?	2	39	Base in dark grey fairly fine fabric (?as in [123]) with thin buff ext surface and patchy/worn int. Possibly from a glazed vessel.
123	corn-dryer 127	3	buff gr	2	21	With med to large incl, some ferrous grits
123		4	buff	1	9	
123		7	reduced green gl	1	20	Fairly fine sandy fabric with occ med grits. Thin/worn green gl
123		10	oxidised	1	8	Fine light orange/brown fabric with occ incl visible on surface.
125	corn-dryer 127	10	medieval	2	5	Abraded and burnt, thin walled grey fabric with paler surfaces, some large incl
133	corn-dryer 135	6	early green gl	2	16	Dark grey with med and occ large quartz incl. Thin buff margins and traces thin gl ext.
138	corn-dryer 135	3	buff grey gr	3	43	Collared rim, harsh grey gritty fabric with buff margins/surfaces. Ill-sorted incl with many large grains breaking surfaces. Joining sherds.

FGN 3: gritty wares - 12th to 13th century.
FGN 4: light firing wares, i.e. buff or white - 13th to early 14th century
FGN 6: sandy grey or grey cored types including early green glazed wares. Unglazed vessels may have buff margins/surfaces - 13th century, some may be earlier.
FGN 7: reduced green glazed wares in finer fabrics than FG 6 – later 13th to 14th century
FGN 10: medieval general, not further categorised

Abbreviations used

ext	external, exterior
gl	glazed
gr	gritty (some inclusions >.5mm)
incl	inclusions
int	internal
med	medium sized [inclusions] c. .25-.5mm
occ	occasional

Discussion

Suggested dates for individual contexts are given below. Because knowledge of medieval pottery in the Tyne valley is limited these are essentially by analogy with larger assemblages of pottery from urban Tyneside, so should be treated with caution. Assemblages of pottery from sites in Northumberland differ both from Tyneside and each other. This is not surprising as medieval pottery production was generally speaking a small scale 'cottage' industry. There may be regional types and trends but local differences.

The sherds are broadly speaking of known regional types but do not form a cohesive group. There were only three form sherds, the rest were featureless body sherds. The base from [121] and rim from [138] (corn driers [119] and [135] respectively) are relatively large vessel fragments which suggests they have not travelled far and may have been used, and broken, on site, particularly the rim. The rest possibly derive from manure spreading. The two rims should be diagnostic but a brief search has found no immediate parallels. The form of the jar rim in [138] is known in the region but not on vessels made in such a gritty fabric.

This group of pottery is unfortunately of little interest other than as a broad indicator of date.

context	feature	sherds	weight (g)	Comment/date
101	pit 103	3	16	One small sherd possibly 12th C. otherwise 13th.
104	subsoil	4	44	13th C.
121	corn-dryer 119	2	39	13th to early 14th C.
123	corn-dryer 127	5	58	13th C.
125	corn-dryer 127	2	5	? but no later than 13th C.
133	corn-dryer 135	2	16	13th C.
138	corn-dryer 135	3	43	Early 13th C.?

Recommendations

No further analysis of the pottery assemblage is required. A short report on this material should be prepared for inclusion in any future publication text.

APPENDIX 6: ASSESSMENT OF POTENTIAL METAL PRODUCTION MICRO-RESIDUES

By Dr R. Mackenzie

Introduction

The following report covers the assessment of potential metallurgical production residues from bulk samples recovered during archaeological fieldwork on land at Acomb, Northumberland.

The assemblage consists of five small sub-samples of possible metallurgical micro-residues that have been separated from bulk environmental samples; there are also two larger sub-samples of approximately 200ml that comprise sieved material (<2mm) from their respective bulk samples. The contents of the samples have been examined using a large magnifying lens with supplementary light and where necessary, relevant micro-residues have been separated from the samples.

The aims of this assessment have been to identify and give an initial interpretation of any metal production residues present, and also to determine whether further analysis could provide additional information about activities previously carried out at the site.

Results of Assessment

The residues relating to metal production found in each sample are listed below in sample number order.

Sample 8 from fill [120] of corn-dryer [119] contains four pieces of spheroidal hammerslag of approximately 2mm and one of approximately 4mm diameter.

Sample 15 from fill [132] of corn-dryer [135] contains two small fragments of possible iron smithing slag, weighing seven grams in total.

Sample 17 from backfill [138] of corn-dryer [135] contains two fragments of iron oxide/possible flake hammerscale approximately 3mm in size.

Sample 19 from fill [142] of corn-dryer [135] contains three flakes of iron oxide/possible flake hammerscale approximately 2-3mm in size, and one small fragment of undiagnostic slag of less than one gram in weight.

Sample 21 from fill [174] of posthole [177] in base of corn-dryer [135] contains approximately 200 pieces of flake hammerscale and 20 pieces of spheroidal hammerslag; the total weight of both micro-residue types is 12 grams.

Interpretation of Results

All of the samples contain residues that can be attributed to iron smithing, although only trace levels are present in four of the five samples. The amount of smithing micro-residues present in Sample 21 is significant, and the ratio of micro-residue types is more indicative of secondary, rather than primary iron smithing.

Secondary smithing of iron was the type of work commonly undertaken by village or itinerant blacksmiths and farriers. As one might expect, the residues from secondary smithing tend to be far more common in the archaeological record than those of primary smithing, which tends to be concentrated at iron smelting sites.

Sample 21 was recovered from the fill of a posthole in the base of medieval corn drying kiln [135] The amount of smithing micro-residues recovered is perhaps more suggestive of a one-off smithing event, rather than longer term activities at a village forge. One could postulate that a blacksmith had visited the site for a relatively short period to forge some iron, perhaps to manufacture or repair some in-situ ironwork, and that the waste from this event had been swept up and used as backfill in the nearest convenient pit.

Potential of the Assemblage

The assemblage does not have any potential for more detailed metallurgical analysis.

Recommendations

The micro-residues can be disposed of. A short report should be prepared for inclusion with any future publication text.

APPENDIX 7: FAUNAL REMAINS ASSESSMENT
By Karen Deighton

Introduction

Approximately 225 fragments of animal bone were recovered by hand from the backfills [120] and [121] of a medieval corn drying kiln [119] and from backfill [133] of corn drying kiln [135] Material was also examined from the residues of three environmental samples (mesh sizes 2mm and 10mm) from corn drying kiln [119].

Method

The material was firstly sorted into recordable and non-recordable fragments and bones with fresh breaks were reassembled. Identification was aided by Schmid (1972) and Lawrence and Brown (1973).

The following were recorded for each element: context, anatomical element, taxa, proximal fusion, distal fusion, side, burning, butchery, pathology and erosion. Ribs and vertebra were recorded as horse, pig, dog, sheep size or cattle size but not included in quantification as their multiple numbers introduce bias. Recording of fusion follows Silver (1969). Cattle and pig teeth were aged after Grant (1982) and sheep teeth after Payne (1973). The ageing of horse teeth follows Goody (1983). Recognition and recording of butchery is after Binford (1981). Recording of sexing data for pig canines follows von den Driesch (1976). Measurements were taken after von den Driesch. The material was recorded onto an access database

Preservation

Fragmentation was heavy, with only 2% of long bones complete and 51.6% at the fragment or shaft stage. Bone surfaces were severely eroded and powdery to the touch. This poor preservation affected identification, with approximately 33% of the bone not attributed to taxa. Recording of fusion data, observation of evidence for canid gnawing and butchery and collection of metrical data were also affected. Indeed no examples of canid gnawing were observed and only one instance of chopping.

The Taxa Present

Fill	**120**	**121**	**133**	**Total**
Corn dryer	**119**	**119**	**135**	
Taxa				
Cattle	79	1		80
Cattle size	15			15
Horse	22			22
Sheep/goat	5		1	6
Sheep size	2			2

Pig	8			8
Dog	14			14
Cat	1			1
Deer species	1			1
Total	**147**	**1**	**1**	**149**

Table 1: Taxa by context

Context	cut	sample	Cattle size	Sheep/goat	Sheep/goat size
120	119	8	8		
121	119	9	1		
192	119	23		2	3

Table 2: Taxa from sample residues

The samples add little information to the assemblage but reflect the taxa seen in the hand collected assemblage.

Cattle were the most abundant taxa, mostly adult bones were seen but 6 juvenile elements were also recorded. At least 5 individuals were present.

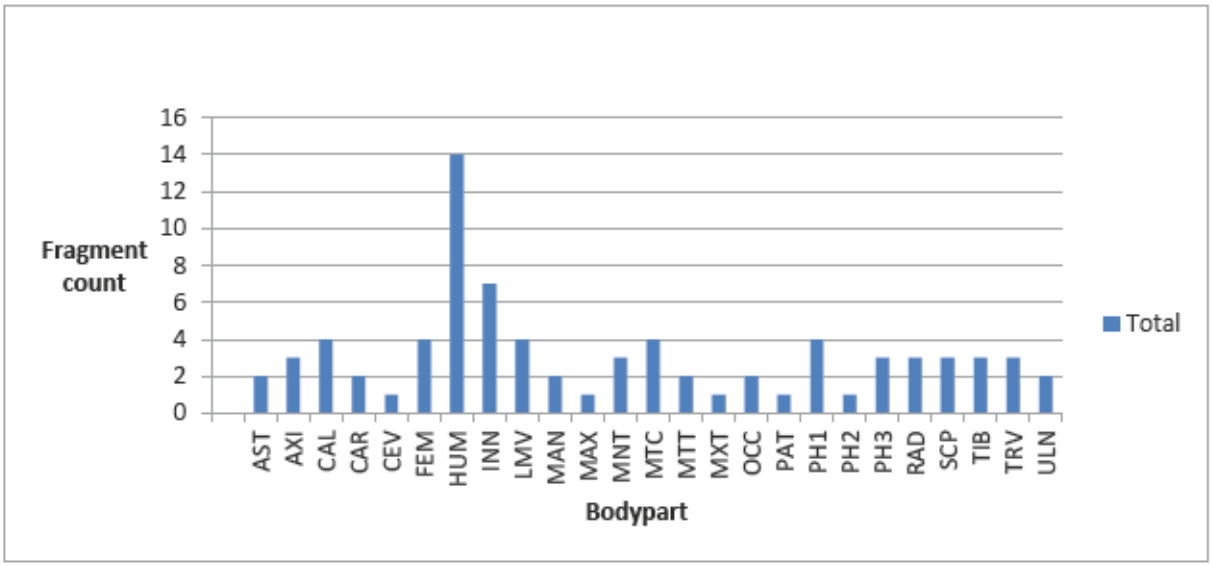


Chart : Body part analysis for cattle bone

Body part analysis (see chart) seems to show a slight bias towards humerus and innominate (largely acetabulum) which are meat bearing bones and could indicate the use of prime cuts of meat, suggesting consumption/kitchen waste rather than prime butchery. However the data set is fairly small and should be approached with caution.

Pigs form a minor part of the assemblage. Two male pig canines were noted. A number of immature animals were noted both from fusion and toothwear data which is not unusual for an animal raised solely for meat (Grant 1988).

Sheep/goat remains form a small fraction of the assemblage which is unusual for the 13th-14th centuries (Grant 1988). Available tooth wear (unfortunately from 1 mandible only) suggests an animal of 4-6yrs.

A single deer bone was noted. The species is uncertain as its size could suggest either red or fallow deer but poor preservation prevents examination of distinguishing criteria.

The possible non-food taxa present were horse, dog and cat, with horse remains the most prevalent The remains of at least 3 individuals were present. Where horses could be aged these were 3-4years and 8 years, relatively young animals. Fusion also suggests young adults. No butchery evidence was visible to determine if the carcasses had been utilised post mortem. It is believed that the consumption of horsemeat was unusual in the medieval period, due to a papal bull forbidding its consumption. However skins and bones were still used and meat was sometimes fed to dogs (Cummins 1988).

The remains of least 2 dogs were observed .The fusion data available suggest no animals of younger than 10months were present. A single fragment of cat maxilla suggests an adult animal. Both taxa formed an integral part of the medieval rural landscape (Grant 1988), one as a herder, guard and hunter, the other as a controller of pests and of course their presence as feral scavengers should not be overlooked. Pelts of both taxa were also used.

Conclusion

The nature of the bone indicates that corn-drying kiln [119] was probably used for disposing of Kitchen/ butchery waste and animal carcasses after it fell into disuse, possibly to diminish odours associated with decomposition and deter scavengers.

Recommendations

Due to the small size of the assemblage no further analysis is necessary. A report on the material should be included in any publication of the site.

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APPENDIX 8: ASSESSMENT OF HUMAN BONE

By James Young Langthorne

Introduction

This report details the results of the human bone assessment on the single piece of human bone retrieved in the course of archaeological investigations at Garden House Bank, Acomb.

Results

A single piece of disarticulated bone, approximately 1/3 of a humerus, was recovered from context [120], the uppermost backfill of corn drying kiln [119] during the archaeological investigation along with a large volume of animal bone.

Table 1: Disarticulated Bone Assessment

Context no.	Skeletal Element	No. of fragments	Condition	MNI for each context	Sex	Age	Comments/Pathology
120	Humerus (proximal shaft-midshaft)	1	Poor	1	?	?	Surface of bone severely worn. No visible pathology.

A minimum number of 1 individual was represented in fill [120]. The heavy wear on the surface of the bone precluded the assessment of any superficial pathologies that may have originally been visible on the bone. No morphological changes to the bone's profile resulting from pathological causes, such as the deviation that may occur due to an unset broken arm, were apparent on the humerus either.

Only the proximal shaft-midshaft region of the humerus was still extant and it was in a poor condition, probably indicating that it was both redeposited and exposed to conditions that would have caused it to deteriorate before becoming part of the backfill within corn drying kiln [119].

Recommendations

It is unlikely that further work on the single fragment of disarticulated bone will provide any further information to enlarge the conclusions of the archaeological investigation. The results of this assessment should form part of any future publication text.

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APPENDIX 9: CHARCOAL AND PLANT MACROFOSSIL ASSESSMENT

By L. Allott (QUEST)

Introduction

This report summarises the findings arising out of the charcoal and plant macrofossil assessment undertaken by Quaternary Scientific (University of Reading).

The samples derive from two phases of activity; Phase 2 – Prehistoric (two samples from ditch deposits) and Phase 3 – Medieval and Undated (14 samples from three corn-drying kilns and associated features). This report presents an overview of the contents of these samples and aims to assess the significance and potential of the charred plant remains assemblages to provide information regarding diet, the agricultural economy and vegetation environment as well as fuel selection associated with the use of the corn-drying kilns. It also aims to assess the suitability of the charred plant remains for dating.

Methods

Flots and residue charcoal fragments from 16 bulk soil samples were submitted by Pre-Construct Archaeology for post-excavation assessment.

The flots were scanned under a stereozoom microscope at 7-45x magnifications and their contents recorded (Table 1). Flots measuring greater than 100ml were subsampled for assessment of plant macrofossils, however the composition of the whole flot has been taken into account to establish potential for further work. Charred plant remains were also recovered from sample residues (Table 1) and these are considered together with those from the flots. Provisional taxonomic identifications have been provided through comparison with modern reference material and published reference atlases (Cappers *et al* 2006; Jacomet 2006). Nomenclature follows Stace (1997) for wild species and Zohary and Hopf (2000) for cultivated plants.

Charcoal fragments were selected for assessment where moderate amounts of charcoal were extracted from sample residues. The fragments were fractured following standardised procedures (Gale and Cutler 2000; Leney and Casteel 1975) along three planes to reveal transverse, tangential longitudinal and radial longitudinal surfaces. Specimens were viewed under a stereozoom microscope for initial grouping, and an incident light microscope at magnifications up to 400x to facilitate identification of the woody taxa. Taxonomic identifications were assigned by comparing suites of anatomical characteristics visible with those documented in reference atlases (Hather 2000; Schoch *et al*. 2004; Schweingruber 1990). Genera, family or group names have been given where anatomical differences between taxa are not significant enough to permit more detailed identification. Nomenclature used follows Stace (1997), and taxonomic identifications of charcoal are recorded in Table 2. All taxa are referred to by their English and Latin names in the first instance in the text and thereafter using their English common names only.

Results and Interpretation of the Charcoal and Charred Plant Macrofossil Assessment

Flots range from less than 5 to 420ml in volume. Uncharred modern plant remains such as roots and seeds were common and comprised a large proportion, >50%, of nine of the 16 flots. Uncharred modern seeds noted include goosefoots, (Chenopodiaceae), knotgrass (*Polygonum* sp.), stinging nettle (*Urtica dioica*) buttercup (*Ranunculus* sp.) and elder (*Sambucus nigra*) and together these remains suggest significant potential for post-depositional disturbance within the features. Several of the flots also contained a high percentage of fine sediment and on the whole charred remains including wood charcoal and charred plant macrofossils contributed only a small proportion of the total. Charred plant macrofossils were present in all of the flots and numerous in most. Preservation was variable, however in the majority of samples they were moderately-well to well preserved.

Phase 2 – Prehistoric

Samples <2> [111], <3> [112] from ditch [113]

Charred plant macrofossils

Charred plant macrofossils were infrequent and poorly preserved in both samples from ditch [113]. Sample <2>, [111] produced occasional cereal caryopses including possible oat (*Avena* sp.), wheat (*Triticum* sp.), barley (*Hordeum* sp.) and possible rye (cf. *Secale cereale*), as well as arable weed taxa such as goosefoots (Chenopodiaceae), chickweed (cf. *Cerastium* sp.) and bedstraw (*Galium* sp.). Sample <3> [112] produced infrequent cereal caryopses only, for which no identifications could be provided due to their poor preservation.

Barley grains were morphologically consistent with a hulled variety, however, in the absence of twisted grain or diagnostic chaff no further identifications could be provided. Due to poor preservation of the wheat caryopses, inherent variability within the genus and the absence of diagnostic chaff, no further identification could be provided. A single grain, identified as possible rye is unusual in this prehistoric context and, given the presence of significant evidence for post deposition disturbances through root action, it is plausible that the grain is a contaminant associated with the more extensive medieval land use at the site.

Charcoal

Wood charcoal fragments were infrequent and small in samples <2> and <3> from ditch [113] and therefore no identification work was undertaken.

Phase 3 - Medieval

All of the medieval features sampled and submitted for assessment derive from three corn-drying kilns [119], [127] and [135] and their associated fills and features.

Corn-drier [119] (samples <8> [120], <9> [121] <22> [190], <23> [192])

Corn-drier [127] (samples <10> [122], <11> [123], <12> [124], <13> [125] – backfill deposits and sample <14> [126] – basal fill)

Corn-drier [135] (samples <15> [132], <16> [133] and <17> [138] and samples <19> [142] and <21> [174] from posthole [177] within the kiln)

Charred Plant Macrofossils

Charred plant macrofossils were present in all of the medieval features sampled. Very few macrofossils were evident in sample <23> [192] from corn-drying kiln [119] which was instead dominated by wood charcoal fragments (see below), and sample <12> [125] from corn-drier [127]. In the remaining samples, however, cereal caryopses and weed seeds of arable taxa were frequent (50-250) and in some cases abundant (>250). On the whole they were moderately well preserved with occasional assemblages displaying good preservation. Weed taxa tended to display better preservation that the cereal caryopses although this will only be confirmed following analysis.

The cereal assemblage comprised oat and barley caryopses with fewer occurrences of wheat and rye. It is currently unclear whether the oat caryopses are of the wild or cultivated variety as no diagnostic floret bases were recorded. All of the barley grains were consistent with hulled barley and occasional twisted grains suggest the presence of at least some 6-row hulled barley. Many of the wheat grains appear morphologically consistent with a free-threshing bread-type wheat (*Triticum* cf. *aestivum* sl.) and the presence of some wheat rachis should assist in confirming/refining the wheat identification. Rye grains were tentatively identified in the flot from sample <11>, and in material picked from the residues of samples <10>, <19> and <21> and it is likely that fully sieving and sorting some of the richest flots will reveal further examples although initial indications are that it was not the dominant crop. No sprouted cereal grains or detached coleoptiles were noted during the assessment.

Non-cereal crops were not a prominent component of the assemblages, however, flax (*Linum* sp.) including the cultivated flax/linseed (*Linum usitatissimum*) were recorded in five samples relating to each of the corn-drying kilns. This crop may have been grown for its fibres or for the oil rich seed. Legumes, including possible pea and vetches were also present in low quantities in many of the samples and are likely to have been cultivated for both human and animal consumption.

Weed seeds were frequent to abundant in many of the samples and were generally well preserved. A diverse array of arable weed taxa are represented (Table 1) the vast majority of which can occur in a range of ecological habitats. Further species identifications may help define some of the soil types cultivated as well as cultivation and harvesting practices employed. Stinking mayweed (*Anthemis cotula*) for example is typically associated with cultivation of heavy clay soils. It is often associated with free-threshing wheat and expansion of cultivation onto heavier clay soils. Initial indications are that wheat was not a very prominent crop at this site and its presence may therefore be associated with another crop. The occurrence of knapweed (*Centaurea* sp.) is interesting as one of the species within this group, cornflower (*C. cyanus*), is a common occurrence amongst rye in mainland Europe (Huntley & Stallibrass 1995).

Wild food resources may also be represented in the weed seed assemblage as many of these plants provide edible leafy greens in addition to their association with crops. Determining this from these mixed assemblages is however impossible. Charred elder seeds and hazel nut shell fragments may

also derive from gathered foods but since they are edible to animals and birds as well as humans their presence in low quantities here should be treated with caution.

Charcoal

Small quantities of wood charcoal were present in each of the flots and on the whole these fragments measure <4mm in size. Wood charcoal fragments were also recovered from the residues of 11 medieval samples, five of which contained 11-30 fragments and one sample, <23> [192], contained >31 fragments. Where available up to ten fragments were identified from each of the larger assemblages (Table 2). Preservation was moderate to good with very little evidence for post depositional sediment encrustation or percolation that can result from fluctuation in ground water.

Taxa identified include oak (*Quercus* sp.), hazel/alder (*Corylus/Alnus* sp.), cherry/blackthorn (*Prunus* sp.), willow/poplar (*Salix/Populus* sp.), field maple (*Acer campestre*), ash (*Fraxinus excelsior*) and birch (*Betula* sp.). Oak was present in all of the assemblages while the other taxa were more sporadically represented. Sample <23> [192] from corn-drier [119] provided the largest assemblage of charcoal (>100 fragments) with roundwood of both ash and cherry/blackthorn also noted. Two of the willow/poplar fragments from this sample also retained evidence for woodworm damage suggesting the wood may have been dead and dried for a significant time prior to charring.

Sample Number	Context	Context / deposit type	Parent Context	Weight g	Flot volume ml	Volume scanned	Uncharred %	Sediment %	Seeds uncharred	Charcoal ≥4mm	Charcoal <4mm	Charcoal <2mm	Crop seeds charred	Identifications	Preservation	Weed seeds charred	Identifications	Preservation	Other botanical	Identifications	Preservation	Charred botanicals from residue
2	111	Ditch	113	25	100	100	75	20	*			**	**	cf. Secale cereale, Avena sp., Triticum sp., Hordeum sp.	+	*	Chenopodium sp., cf. Cerastium sp., Galium sp.	+				
3	112	Ditch	113	5	60	60	94	5	*			**	*	Cerealia indet.	+							
8	120	Corn drier	119	10	70	70	85	<5	*	*	*	***	**	Cerealia indet., Avena sp., Hordeum sp., Linum usitatissimum, cf. Vicia faba	+/++	** (*)	Polygonum/Rumex sp., Carex sp., Persicaria sp., Stellaria sp., Tripleurospermum inodorum, Poaceae, Plantago sp., cf Lapsana communis, Anthemis cotula	+++				NIL (2 uncharred modern only)
9	121	Corn drier	119	16	80	80	40	<5	*	*	**	***	**	Avena sp., Hordeum sp., Linum sp.	++	***	Raphanus sp., Anthemis cotula, Plantago sp., Polygonum/Rumex sp., Persicaria sp., Centaurea sp., Lapsana communis, Galium sp., Chenopodiaceae	+++				
10	122	Corn drier	127	42	230	100	50	20	*	*	*	**	**	Cerealia indet., Avena sp., Hordeum sp., Triticum sp.	+/++	***	Chenopodiaceae, Plantago sp., Poaceae, Vicia/Lathyrus sp., Anthemis cotula (lots), Persicaria sp., Lapsana communis	+/++				cf Secale cereale (1/++), Corylus avellana (1/++)
11	123	Corn drier	127	56	20	100	70	10	*	*	**	***	**	Triticum sp., Cerealia indet., Secale cereale, Avena sp. (majority), Linum sp.	++	**	Vicia/Lathyrus sp., Chenopodiaceae, Centaurea sp., cf. Stellaria sp., Poaceae, Anthemis cotula, Persicaria sp.	++	*	Rachis of Triticum sp. (free threshing wheat?), Culm	++	Corylus avellana (1/++)

Sample Number	Context	Context / deposit type	Parent Context	Weight g	Flot volume ml	Volume scanned	Uncharred %	Sediment %	Seeds uncharred	Charcoal >4mm	Charcoal <4mm	Charcoal <2mm	Crop seeds charred	Identifications	Preservation	Weed seeds charred	Identifications	Preservation	Other botanical	Identifications	Preservation	Charred botanicals from residue
																				frags		
12	124	Corn drier	127	56	150	100	60	30	*	*	*	**	**	Avena sp., Triticum aestivum sl., Triticum sp., Vicia/Pisum sp., cf. Hordeum sp.	+/++	**	Anthemis cotula, cf. Fumaria sp., Lapsana communis, Raphanus sp., Persicaria sp., Chenopodiaceae, Stellaria media	+/++	*	rachis	+	
13	125	Corn drier	127	72	420	100	85	10	*	*	*	**	*	Triticum sp., Hordeum sp., Avena sp., Cerealia indet.	+/++	*	Lapsana communis (1), Anthemis cotula (1)	++				
14	126	Corn drier (basal fill)	127	6	40	40	80	10			*	**	**	Avena sp., Cerealia indet., Vicia/Lathyrus/Pisum sp., Linum usitatissumum	++	**	Anthemis cotula, Chenopodium sp., Lapsana communis, cf. Stellaria sp., Poaceae, Rumex sp.	++				Corylus avellana (1/++)
15	132	Corn drier	135	12	25	25	30	5		*	*	**	***	Hordeum vulgare, Avena sp., Triticum sp., Vicia/Lathyrus/Pisum sp.	++	***	Sambucus nigra, Persicaria sp., Carex sp., Anthemis cotula, Tripleurospermum inodorum, Stellaria sp., Silene sp., Poaceae, Chenopodiaceae	++/+++				Hordeum sp. (1/++)
16	133	Corn drier	135	10	15	15	85	5			*	**	*	Hordeum sp., Triticum sp., Vicia/Lathyrus/Pisum sp.	+/++	**	Persicaria sp., Anthemis cotula, Sambucus nigra, Chenopodiaceae, cf. Solanum sp., Ranunculus sp.	++	*	Arrhenatherum elatius subsp. bulbosum, Cerealia detached	++	

Sample Number	Context	Context / deposit type	Parent Context	Weight g	Flot volume ml	Volume scanned	Uncharred %	Sediment %	Seeds uncharred	Charcoal >4mm	Charcoal <4mm	Charcoal <2mm	Crop seeds charred	Identifications	Preservation	Weed seeds charred	Identifications	Preservation	Other botanical	Identifications	Preservation	Charred botanicals from residue
																				embryo		
17	138	Corn drier	135	11	10	10	<5	40			*	**	***	Hordum vulgare (some retaining chaff), Avena sp., Vicia/Lathyrus sp., Triticum sp.	++/+++	***	Anthemis cotula, Rumex sp., Lapsana communis, Galium sp., Tripleurospermum inodorum, Carex sp., Raphanus sp., Silene/Stellaria sp.	++/+++	*	twisted awn frag (Avena sp.), other chaff?	++	Avena sp. (1), Hordeum vulgare (5), Cerealia (2), Corylus avellana frag (1) (++)
19	142	primary deposit Corn drier [135]	177	3	5	5	<5	10			*	**	**	Triticum sp., Hordeum sp., Avena sp., Cerealia indet.	++	***	Lapsana communis, Solanum sp., Carex sp., Vicia/Lathyrus sp., Polygonum/Rumex sp., Centaurea sp., Raphanus, Chenopodiaceae, Sambucus nigra, Poaceae, Persicaria sp.	+++				**(*) Hordeum velgare, Secale cereale, Avena sp., cf. Triticum sp., Vicia/Lathyrus sp. (++)
21	174	Post hole in Corn drier [135]	177	6	5	5	5	<5			*	***	**	Triticum sp., Avena sp.,Hordeum sp. (majority), Vicia/Lathyrus/Pisum sp., Linum sp.	++	***	Plantago sp., Anthemis cotula, Centaurea sp., Lapsana communis, Carex sp., Chenopodiaceae, Stellaria /Silene sp., Vicia/Lathyrus sp.	++/+++				**(*) Hordeum vulgare, cf. Secale cereale, Avena sp., cf. Triticum sp., (+/++)
22	190	Corn drier	119	13	100	100	90	<5				**	***	Avena sp., cf. Hordeum sp.	++	***	Silene sp., Lamiaceae, Anthemis cotula, Lapsana communis, Polygonum/Rumex sp., Chenopodiaceae, Poaceae, Carduus/Cirsium sp., Centaurea sp., Vicia/Lathyrus sp., carex sp.	++/+++				* Avena sp., Hordeum vulgare, cf. Triticum sp., Vicia/Lathyrus sp. (++)

Sample Number	Context	Context / deposit type	Parent Context	Weight g	Flot volume ml	Volume scanned	Uncharred %	Sediment %	Seeds uncharred	Charcoal >4mm	Charcoal <4mm	Charcoal <2mm	Crop seeds charred	Identifications	Preservation	Weed seeds charred	Identifications	Preservation	Other botanical	Identifications	Preservation	Charred botanicals from residue
23	192	Corn drier	119	21	90	90	<5	<5		*	** *	** **	*	Avena sp. (2 noted)	++							cf. Avena sp. (1), Cerealia indet. (1)

Table 1: Flot quantification (* = 1-10, ** = 11-50, *** = 51-250, **** = >250) (+ = poor, ++ = moderate, +++ = good).

Sample Number	Context	Context / deposit type	Parent Context	Sample Volume processed	Charcoal Identifications
2	111	Ditch	113	36	
3	112	Ditch	113	36	
8	120	Corn drier	119	30	
9	121	Corn drier	119	39	*Quercus* sp., (5), *Corylus/Alnus* sp. (2), *Prunus* sp. (2), cf. *Acer campestre* (1)
10	122	Corn drier	127	37	Quercus sp. (1), Betula sp. (1), Corylus/Alnus sp. (1), Vitrified (2)
11	123	Corn drier	127	38	
12	124	Corn drier	127	18	
13	125	Corn drier	127	19	
14	126	Corn drier (basal fill)	127	9	
15	132	Corn drier	135	32	
16	133	Corn drier	135	32	Quercus sp. (4), Salix/Populus sp. (1)
17	138	Corn drier	135	16	
19	142	Primary deposit Corn drier [135]	177	12	
21	174	Post hole in Corn drier [135]	177	18	
22	190	Corn drier	119	26	Quercus sp. (4), Prunus sp. (1), Salix/Populus sp. (5)
23	192	Corn drier	119	5	Fraxinus excelsior rw (3) (not complete), Prunus sp. rw (2) (not complete), Prunus sp. (1), Quercus sp. (1), Salix/Populus sp. (3) (2 with wood worm damage)

Table 2: Sample volumes and charcoal identifications

Significance and Potential for Further Analysis

The small assemblages of charred plant remains from prehistoric ditch [113] deposits are of limited significance for further analysis due to the low quantities and poor preservation of the remains. By comparison the medieval assemblages hold far greater significance and potential for analysis.

Botanical assemblages of charred plant macrofossils and charcoal from rural medieval sites are underrepresented in the north-east of England when compared with those from larger urban centres (Huntley and Stallibrass 1995, Hall and Huntley 2007, Huntley 2010). Sites with medieval grain drying kilns are spread across the region and include East Rainton, Sunderland (Vitolo and Adams 2017), Peter Gate, Cumwhinton and Low Crosby in Cumbria (O'Meara and Hall 2014; Jackson *et al* 2015) and Hoddom, Dumfriesshire (Holden 2006) for which botanical analysis have been undertaken. There are however, very few assemblages from medieval rural or small town sites in this central region of Northumberland and instead the focus has centred on Roman sites within the area.

Charred plant macrofossils from the site are generally well preserved and abundant with a high diversity of taxa, both weeds and crops, represented. The cereal assemblages appear to suggest a mixed cropping regime, which is comparable with that noted at other sites with corn-driers (O'Meara and Hall 2014; Jackson *et al* 2015, Vitolo and Adams 2017) and is likely to reflect cultivation of dredge to limit the impact of crop failure. Assemblages derive from three kilns and present the opportunity for comparisons to be drawn between the features at the current site and with those from other sites across the region. The broad array of cereals, weeds and non-cereal crops suggest that agricultural activities were fairly extensive and analysis of the assemblages has potential to shed light on the range of activities and where these may have taken place. More specifically the associated weed assemblages have potential to reveal at least some of the soil types being cultivated and may reveal information regarding crop husbandry techniques and timings.

The samples also hold potential to explore possible uses of the drying kilns. Initial indications are that, in the absence of sprouted grain or chaff, the kilns were not used in the brewing process for halting the malt (as is commonly evident in Roman examples) or to assist dehusking. The absence of significant quantities of chaff suggests the grain had been processed to some extent however the large assemblage of weeds indicates that this process was not entirely complete and the remains do not represent the final 'clean' grain product. It remains to be determined (if possible) whether they were used to dry grain for storage or as part of the milling process. Further analysis and quantification will shed light on the ratios of grain to weeds to chaff and the sizes of weed represented which will further assist this discussion.

Wood charcoal fragments are less abundant and more sporadically represented in the kiln features. Although the scope of the analysis may be more limited than that of the charred plant macrofossils the assemblage is of significance as there is a lack of charcoal data for the region as a whole and more particularly in the immediate surrounds of the site as shown in maps of the region by Huntley (2010). The assemblages of wood charcoal from corn-drier [119] can contribute information regarding the range of taxa used for fuel and may reveal information regarding the types of fuel wood represented (whether predominantly from round wood for example), possible fuel wood collecting strategies and the vegetation habitats from which they derive. It is also plausible that some of the wood charcoal originates from wattle

used in the kiln construction although establishing this is unlikely to be possible from the charcoal assemblage alone. Of the three charcoal rich assemblages from this kiln, sample <22> [190] and sample <23> [192] were thought during excavation to represent fuel from the last use of the feature. This is supported by the almost complete absence of plant macrofossils which are so prominent in all other deposits. Analysis will also clarify whether the current assemblages mirror those from other corn-driers such as Peter Gate (O'Meara and Hall 2014) and Collfryn (Britnell 1984) which both contain numerous different taxa or whether a more restricted range of taxa are evident suggesting targeted fuel collection.

Suitability for C14 date

Of the prehistoric features, sample <2> [111] contains charred cereal grains that may be used to date the material within the ditch fill. It should be noted, however, that dating material from such a small assemblage within a potentially slow filling feature such as a ditch may not provide a clear date for the feature itself and dating such material is therefore not recommended.

All the medieval contexts contain charred plant remains such as charred cereal caryopses, hazel nut shell fragments or wood charcoal fragments that are suitable for C14 dating. If scientific dating is required to clarify the date of the kilns it is recommended that two different taxa are submitted from individual contexts to establish internal consistency. The fuel rich assemblage, <23> [192] from kiln [119] may represent a primary deposit and would be eminently suitable for dating.

Recommendations

Analysis of charred plant macrofossils and wood charcoal should be undertaken with the following research aims and questions in mind:

Charred Plant Macrofossils

1. Characterise the composition of the plant macrofossil assemblage.
2. Does assemblage composition differ between kilns?
3. Characterise the nature of the arable economy at the site during the medieval land-use
4. Do the weed taxa provide evidence for the types of land under cultivation?
5. Do the arable weeds provide evidence for cultivation practices?
6. Is there evidence for other vegetation habitats being exploited?
7. How does the assemblage compare with other contemporary sites within the region and particularly those with medieval grain-drying kilns?
8. Does the assemblage provide evidence for the role of the kiln in crop processing or storage?

Charcoal

1. Determine the range of woody taxa and size of fuel wood represented.
2. Characterise the vegetation environments from which fuel was sourced
3. How does the assemblage compare to contemporary charcoal assemblages from the region, particularly from drying kilns?

It is recommended that full analysis, involving sorting, identification and quantification of charred plant macrofossils, is carried out on 12 samples containing >50 moderate to well preserved individuals (see below for sample selection). If plant remains are particularly abundant it may be necessary to examine a representative subsample. The analysis will address the research aims and questions outlined above.

Corn-drier [119] (samples <8> [120], <9> [121] <22> [190])
Corn-drier [127] (samples <10> [122], <11> [123], <12> [124], <14> [126])

Corn-drier [135] (samples <15> [132], <16> [133] and <17> [138] and samples <19> [142] and <21> [174] from posthole [177] within the kiln)

It is recommended that three samples from feature [119] are fully analysed (see sample selection below). This analysis will involve identification of up to one hundred charcoal fragments from each sample, where available, and preparation of a report suitable for publication.

Corn-drier [119] (samples <9> [121] <22> [190], <23> [192])

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RADIOCARBON DATING CERTIFICATE

13 November 2017

Laboratory Code	SUERC-75906 (GU45475)
Submitter	Kate Turner Pre-Construct Archaeology Ltd. Unit 54 Brockley Cross Business Centre 96 Endwell Road Brockley London SE4 2PD
Site Reference	Garden Lane, Acomb
Context Reference	[135]
Sample Reference	GLA16 <16> (133)
Material	Charred cereals
$\delta^{13}C$ relative to VPDB	-25.0 ‰
Radiocarbon Age BP	898 ± 29

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

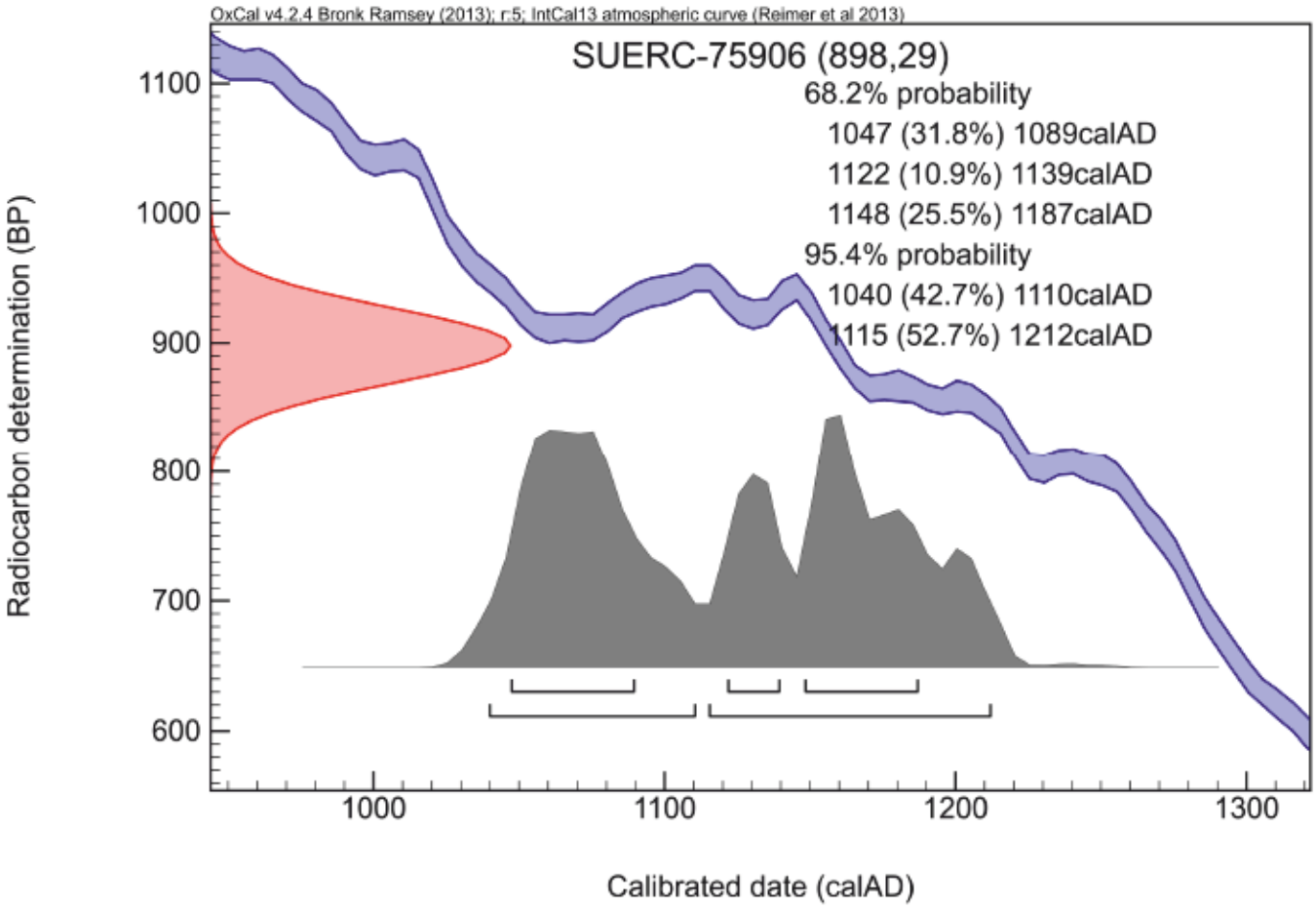
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

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

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

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

Checked and signed off by : P. Nayont



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

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

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

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*
† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

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RADIOCARBON DATING CERTIFICATE

13 November 2017

Laboratory Code	SUERC-75907 (GU45476)
Submitter	Kate Turner Pre-Construct Archaeology Ltd. Unit 54 Brockley Cross Business Centre 96 Endwell Road Brockley London SE4 2PD
Site Reference	Garden Lane, Acomb
Context Reference	[119]
Sample Reference	GLA16 <9> (121)
Material	Charcoal : Corylus/Alnus sp.
$\delta^{13}C$ relative to VPDB	-26.1 ‰
Radiocarbon Age BP	722 ± 29

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

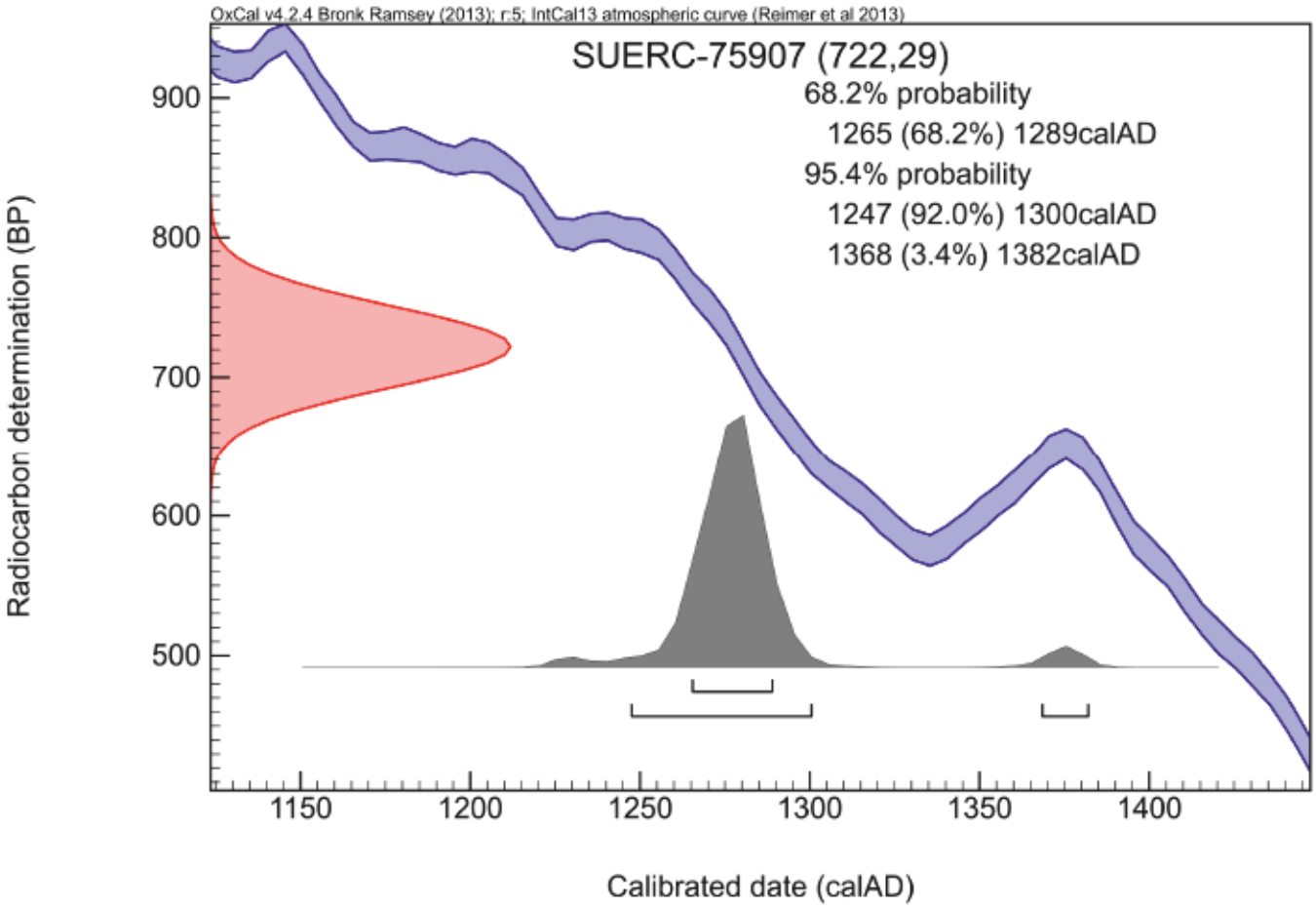
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

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

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

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

Checked and signed off by : P. Naysmith



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

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

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

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