

**AN ARCHAEOLOGICAL EVALUATION OF  
LAND TO THE REAR OF TUDOR GROVE,  
HUMBLEDON HILL, SUNDERLAND,  
TYNE AND WEAR**

P

C

A

PRE-CONSTRUCT ARCHAEOLOGY

**DOCUMENT VERIFICATION**

**LAND TO THE REAR OF TUDOR GROVE,  
HUMLEDON HILL, SUNDERLAND, TYNE AND WEAR**

**EVALUATION REPORT**

<b>Pre-Construct Archaeology Limited Quality Control</b>	
<i>Project Number</i>	K3264
<i>Site Code</i>	HUM 13
<i>Report Number</i>	RN11032

<i>Task</i>	<i>Name</i>	<i>Signature</i>	<i>Date</i>
Text prepared by:	Aaron Goode		October 2013
Text checked by:	Jennifer Proctor	<i>J Proctor</i>	7 November 2013
Graphics prepared by:	Mark Roughley		October-November 2013
Graphics checked by:	Josephine Brown	<i>Josephine Brown</i>	7 November 2013
Post-Excavation Manager sign-off:	Robin Taylor-Wilson	<i>R.W. Taylor-Wilson</i>	21 November 2013

<i>Revision No.</i>	<i>Date</i>	<i>Checked by</i>	<i>Approved by</i>

**Pre-Construct Archaeology Limited  
North Regional Office  
Unit N19a TurSDale Business Park  
Durham  
DH6 5PG**

**An Archaeological Evaluation of land to the rear of Tudor Grove,  
Humbledon Hill, Sunderland, Tyne and Wear**

**Central National Grid Reference: NZ 438020 555260**

**Site Code: HUM 13**

***Commissioning Client***

**Marikal Limited  
31 Tudor Grove  
Sunderland  
Tyne and Wear  
SR3 1SB**

***Contractor:***

**Pre-Construct Archaeology Limited  
Northern Office  
Unit N19a Tursdale Business Park  
Durham  
DH6 5PG**

**© Pre-Construct Archaeology Limited  
November 2013**

This report is protected by copyright. The report and the information contained herein are and remain the sole property of Pre-Construct Archaeology Limited and are provided on a single site multi-user basis. If provided in paper form, the report may be utilised by a number of individuals within a location, but copying is prohibited under copyright. If provided in an electronic form the report may be utilised in a shared server environment, but copying or installation onto more than one computer is prohibited under copyright, and printing from electronic form is permitted for own, single location, use only. Multiple printing from electronic form for onward distribution is prohibited under copyright. Further distribution and uses of the report in its entirety or part thereof in electronic form is prohibited without prior consent from Pre-Construct Archaeology Limited.

Pre-Construct Archaeology Limited has made every effort to ensure the accuracy of the content of this report. However Pre-Construct Archaeology Limited cannot accept any liability in respect of, or resulting from, errors, inaccuracies, or omissions herein contained.

## CONTENTS

	<i>page</i>
<b>1. NON-TECHNICAL SUMMARY</b>	<b>1</b>
<b>2. INTRODUCTION</b>	<b>3</b>
2.1 General Background	3
2.2 Site Location and Description	4
2.3 Geology and Topography	4
2.4 Planning Background	7
2.5 Archaeological and Historical Background	8
<b>3. PROJECT AIMS AND OBJECTIVES</b>	<b>11</b>
3.1 Project Aims	11
3.2 Research Objectives	11
<b>4. ARCHAEOLOGICAL METHODOLOGY</b>	<b>13</b>
4.1 Fieldwork	13
4.2 Post-excavation	14
<b>5. RESULTS: THE ARCHAEOLOGICAL SEQUENCE</b>	<b>15</b>
5.1 Phase 1: Natural Sub-stratum	15
5.2 Phase 2: Colluvium	15
5.3 Phase 3: Post-medieval	15
5.4 Phase 4: Modern	16
<b>6. CONCLUSIONS AND RECOMMENDATIONS</b>	<b>19</b>
6.1 Conclusions	19
6.2 Recommendations	20
<b>7. REFERENCES</b>	<b>22</b>
<b>8. ACKNOWLEDGEMENTS AND CREDITS</b>	<b>24</b>

### List of Figures

Figure 1	Site Location	5
Figure 2	Trench Locations, with geophysical anomalies and scheduled area	6
Figure 3	Trench Locations, showing excavated features	17
Figure 4	Sections 1 to 7	18
Figure 5	Trench Locations, showing excavated features and geophysical anomalies	21

### List of Plates (Appendix 4)

Plate 1	Trench 2, looking NNW
Plate 2	Trench 15, looking south
Plate 3	Trench 10, ditch [11] in NW facing section
Plate 4	Trench 12, bank [12] in west facing section (oblique)

## **Appendices**

- Appendix 1 Stratigraphic Matrices**
- Appendix 2 Context Index**
- Appendix 3 Finds Index**
- Appendix 4 Plates**
- Appendix 5 Specification for the Evaluation**

## **1. NON-TECHNICAL SUMMARY**

- 1.1 An archaeological evaluation was undertaken 7-11 October 2013 by Pre-Construct Archaeology Limited on land to the rear of Tudor Grove, Humbledon Hill, Sunderland, Tyne and Wear. It was carried out pre-determination of a planning application for a proposed residential development on the lower northern slopes of Humbledon Hill and was commissioned by the developer, Marikal Limited.
- 1.2 The site lies to the south of the A690 Durham Road, to the south-west of Sunderland city centre, at central National Grid Reference NZ 438020 555260. It comprises rough pasture totalling c. 2.84 ha, bounded to the north and east by a narrow strip of woodland, beyond which lies the A690 and residential dwellings, respectively, to the west by residential dwellings fronting onto Tudor Grove and to the south by residential dwellings fronting onto Alpine Way.
- 1.3 The main archaeological interest of the site stems from known prehistoric activity within the immediate vicinity. The upper portion of Humbledon Hill is protected as a Scheduled Monument as it was occupied by a prehistoric defended settlement, although part of the settlement area has been compromised by housing development and a 19th-century reservoir. A prehistoric burial site is recorded as having been affected by the construction of the reservoir on the summit of the hill in 1873, this revealed three Bronze Age urns, two of which contained cremated human bone, and two inhumations were recorded nearby.
- 1.4 An archaeological desk-based assessment of the site was undertaken in 2000. A geophysical survey undertaken the following year indicated that the hill summit was the site of a defended settlement enclosed by a roughly sub-circular enclosure bounded by two ditches with an entrance on the west side. An archaeological evaluation undertaken in 2007 on the north-east side of the reservoir, prior to the scheduling, exposed a substantial outer enclosure ditch, which produced Iron Age pottery, a stone and earth bank and an inner ditch which produced possible Late Bronze Age pottery. Further potential linear features identified by the geophysical survey to the north and east of the enclosure, on the lower slopes of Humbledon Hill, were thought to be later in date and were not included in the scheduling, which was undertaken following the 2007 evaluation.
- 1.5 In broad terms, the evaluation aimed to establish the archaeological potential of the proposed development site. The trenches were either sited to investigate geophysical anomalies recorded in 2001 which were potentially indicative of sub-surface archaeological remains or sited as 'judgement' trenches in the indicative footprints of house plots in the proposed development.
- 1.6 The evaluation comprised 15 machine-excavated trenches (Trenches 1-15). Trenches 1-6 and 10-15 were sited to test mostly linear geophysical anomalies and Trenches 7-9 were 'judgement' trenches sited within the indicative footprints of three houses in the proposed development. Trenches 1-11 and 13 were located on steeply-sloping ground north of the scheduled area and Trenches 12, 14 and 15 were located on relatively level ground to the north-east of the scheduled area. Trenches 1-3 and 5-9 measured c. 10m x 1.60m, Trench 4 measured c. 9m x 1.60m, Trenches 10-12, 14 and 15 measured c. 10m x 1.60m and Trench 13 measured c. 20m x 1.60m.

- 1.7 Fractured limestone bedrock was the basal deposit encountered within all 15 trenches, although in Trenches 13 and 14 this material was overlain by patches of variously coloured boulder clay. In Trenches 11-15, bedrock and boulder clay were overlain by a colluvial deposit which was only present within the more level north-eastern part of the site.
- 1.8 Trenches 1, 3, 4 and 6 were sited to test a WSW-ENE aligned linear geophysical anomaly. A probable drainage ditch cut into the bedrock was recorded in each of these trenches. In Trench 3 the ditch produced 19th-century pottery, clay tobacco pipe stems and ceramic building material, indicating a late post-medieval date for the feature. Trench 10 was sited to test an intermittent NW-SE aligned geophysical anomaly. Although no corresponding archaeological feature was identified, a WSW-ESE aligned feature was recorded that likely represents a continuation of the ditch recorded in Trenches 1, 3, 4 and 6. Material recovered from the ditch in Trench 10 included late post-medieval pottery and glass.
- 1.9 Trench 2 was sited to test an ENE-WSW aligned geophysical anomaly in the north-western part of the site. No archaeological features were encountered.
- 1.10 Trench 12 was sited to test a NE-SW aligned geophysical anomaly, with a NW-SE aligned return, potentially representing part of another enclosure located to the north-east of the scheduled area. A low earthen bank recorded within the northern portion of the trench produced a single sherd of late post-medieval pottery and the feature was may have been formed during landscaping associated with a modern residential property to the south-east.
- 1.11 Trenches 10, 11, 13, 14 and 15 were positioned to test a group of NW-SE aligned geophysical anomalies in the north-eastern part of the site. No corresponding archaeological features were identified and the responses may have thus originated within topsoil and be of recent origin, potentially associated with the bank recorded in Trench 12.
- 1.12 Trenches 7, 8 and 9 were 'judgement' trenches sited within the indicative footprints of houses in the proposed development. No archaeological features were recorded.
- 1.13 In each trench, topsoil and its developed turf line formed the existing ground surface.
- 1.14 In summary, the evaluation identified no remains of archaeological significance. All recorded features are most probably of late post-medieval or later date.

## 2. INTRODUCTION

### 2.1 General Background

- 2.1.1 This report details the methodology and results of an archaeological evaluation undertaken by Pre-Construct Archaeology Limited (PCA) 7-11 October 2013 on land to the rear of Tudor Grove, Humbleton Hill, Sunderland, Tyne and Wear (Figure 1). The work was commissioned by Marikal Limited (the Client), who propose to develop the northernmost portion of the site for residential purposes. The evaluation was undertaken pre-determination of a planning application.
- 2.1.2 The proposed development site had particular potential for prehistoric archaeological remains since the upper part of Humbleton Hill – forming the southern central portion of the overall site - was occupied by a prehistoric defended settlement, now protected as a Scheduled Monument (SAM 1440212). The scheduled area includes the north-western portion of the settlement, while the south-eastern portion has been compromised by previous housing development and the construction of a reservoir on the summit of the hill in 1873. An antiquarian report indicates that construction of the reservoir destroyed a prehistoric barrow, with three Bronze Age urns being recorded, two of which contained cremated human bone, while two inhumations were also recorded.
- 2.1.3 An archaeological desk-based assessment undertaken in 2000 established that the overall site had high potential for prehistoric archaeological remains as a result of the aforementioned antiquarian account (GeoQuest Associates 2000). Geophysical survey in 2001 indicated that the prehistoric hilltop settlement comprised an enclosure c. 125m in diameter, which was probably bounded by two ditches with an entrance on the west side (ASDU 2001; Hale and Still 2003). An archaeological evaluation undertaken in 2007 to the north-east of the reservoir indicated that the hilltop was encircled by two ditches and a medial bank (NPA 2007). The outer ditch produced pottery of Iron Age date, while pottery from the inner ditch may have been of Late Bronze Age date. The upper slopes of the hilltop, beyond the area occupied by the reservoir, were scheduled following the 2007 evaluation. Potential linear features identified by the geophysical survey on the lower slopes, to the north and north-east of the enclosure, were assumed to be of later date and were not included in the scheduled area, likewise the area occupied by the reservoir, due to the substantial ground disturbance known to have occurred during its construction.
- 2.1.4 A Specification for the evaluation was prepared by the Tyne and Wear Archaeology Officer (TWAO) and this set out in detail the required evaluation methodology (Newcastle City Council 2013 - included as Appendix 5 to this report. The Specification followed the format set out in *Management of Research Projects in the Historic Environment (MoRPHE)* (English Heritage 2006).
- 2.1.5 The evaluation comprised 15 machine-excavated trial trenches, located either to target potential archaeological remains identified by the 2001 geophysical survey or as 'judgement' trenches to assess the archaeological potential of areas proposed for house plots but where no geophysical anomalies had been identified (Figure 2).



- 2.1.6 The Site Archive (Site Code: HUM 13) is currently held at the Northern Office of PCA and the retained element, comprising the written, drawn and photographic records, as well as a small assemblage of artefactual material, will be deposited with the Tyne and Wear Museums and Archives at Arbeia, South Shields, Tyne and Wear. The Online Access to the Index of Archaeological Investigations (OASIS) reference number for the project is: preconst1-163979.

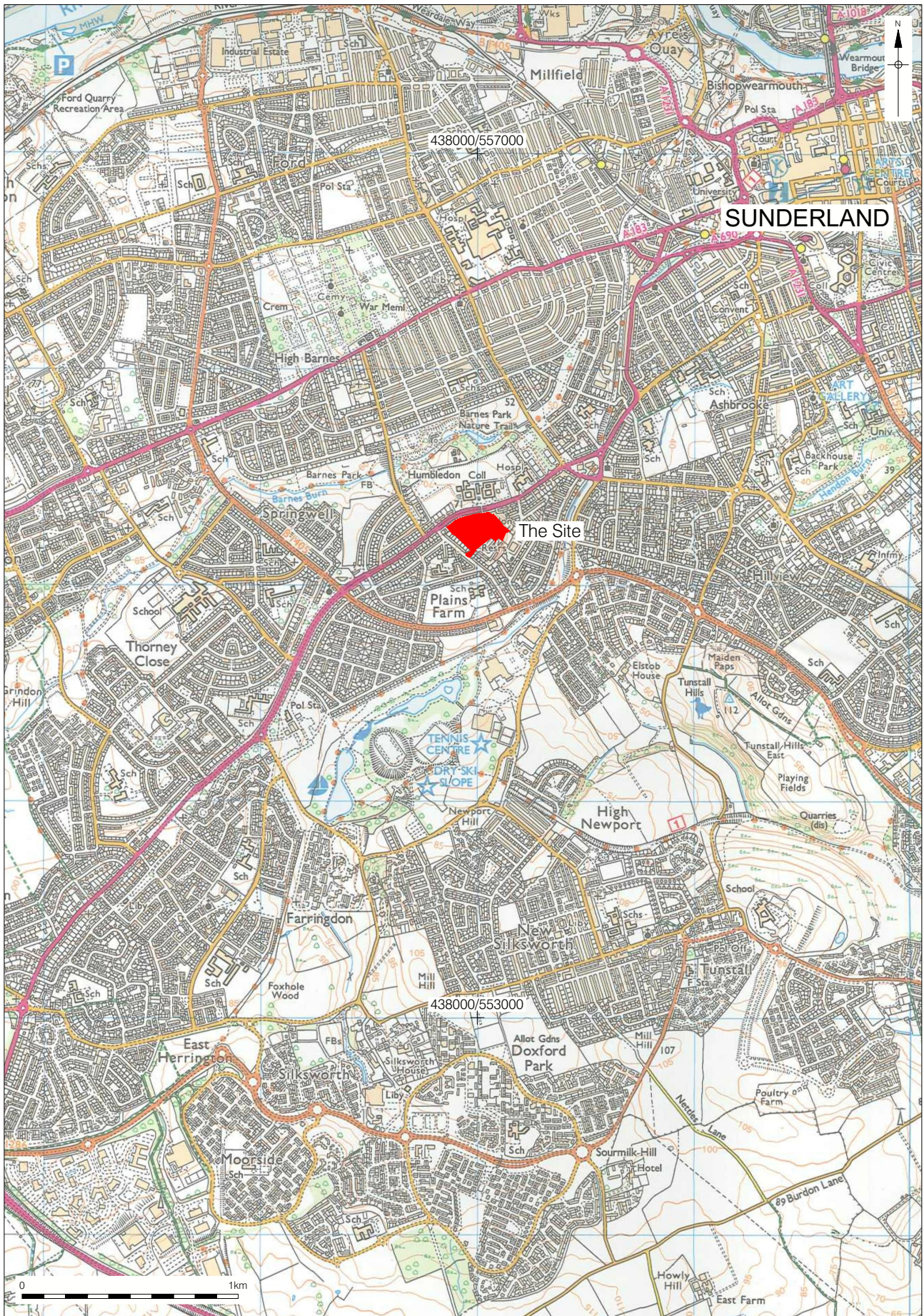
## **2.2 Site Location and Description**

- 2.2.1 The site is located on the lower northern slopes of Humbleton Hill, to the south of Durham Road (A690) on the south-western outskirts of the City of Sunderland, centred at National Grid Reference NZ 438020 555260 (Figure 1).
- 2.2.2 The development site comprises rough pasture, c. 2.84 ha in total area and measuring c. 190m NE-SW by up to 170m NW-SE. It is bounded to the north and east by a narrow strip of woodland, beyond which lies the A690 and residential dwellings, respectively, to the west by residential dwellings fronting onto Tudor Grove and to the south by residential dwellings fronting onto Alpine Way (Figure 2).
- 2.2.3 The evaluation was undertaken only within a corridor of land occupying the northernmost portion of the overall development site, *i.e.* outwith the scheduled area which surrounds the 19th-century reservoir on its west and north sides and part of its east side. At the time of the evaluation, site access was via the residential dwellings 31 Tudor Grove and 24 Alpine Way.

## **2.3 Geology and Topography**

- 2.3.1 Humbleton Hill comprises Ford Formation (shelf-edge Reef) Dolostone, a sedimentary bedrock that formed in the Permian Period when the local environment was dominated by shallow carbonate seas (British Geological Survey website). The limestone bedrock in the vicinity of the hill is generally not overlain by superficial geological deposits.
- 2.3.2 Humbleton Hill is a prominent landscape feature with good views across the surrounding countryside to the River Wear, which lies 2.5km to the north, and the coast, which lies 3km to the east. The Barnes Burn is located c. 300m to the north of the site. The summit of the hill lies at c. 105m OD with the land falling away on all sides, the steepest slope being to the north. The proposed development site takes in the hill summit, its northern slope, most of its western slope and part of its eastern slope, with present ground level lying at c. 81.50m OD in the north-easternmost portion of the site.





© Crown copyright 2011. All rights reserved. License number 36110309  
 © Pre-Construct Archaeology Ltd 2013  
 22/10/13 MR

Figure 1  
 Site Location  
 1:25,000 at A4





© Crown copyright 2013. All rights reserved. License number PMP36110309

© Pre-Construct Archaeology Ltd 2013  
22/10/13 MR

Figure 2  
Trench Locations, geophysical survey results and area of Sceduled Ancient Monument  
1:1,250 at A4

## 2.4 Planning Background

- 2.4.1 The archaeological evaluation was carried out pre-determination of a planning application for a proposed development of approximately 10 executive dwellings on the lower northern slopes of Humbledon Hill.
- 2.4.2 The archaeological evaluation was required, as part of the planning process, to inform the Local Planning Authority (LPA), the TWAO and the Client, of the character, date, extent and degree of survival of archaeological remains at the site. The aim was to provide results which should inform a decision regarding further archaeological mitigation measures. A report of the results was to be submitted with the planning application.
- 2.4.3 The requirement to undertake the archaeological investigation is in line with planning policy at a national level, as set out in the *National Planning Policy Framework* (NPPF) (DCLG 2012). The NPPF came into effect in 2012, replacing *Planning Policy Statement 5: 'Planning for the Historic Environment'* (PPS5) (DCLG 2010), to provide updated guidance for LPAs, property owners, developers and others on the conservation and investigation of the historic environment. Heritage assets - those parts of the historic environment that have significance because of their historic, archaeological, architectural or artistic interest - remain a key concept of the NPPF, retained from PPS5. Despite the deletion of PPS5, the *PPS5: Planning for the Historic Environment - Practice Guide* (English Heritage, DCMS and DCLG (revised) 2012), remains a valid, UK Government-endorsed, document.
- 2.4.4 Chapter 12 of the NPPF 'Conserving and enhancing the historic environment' describes, in paragraph 126, how LPAs should '*...set out in their Local Plan a positive strategy for the conservation and enjoyment of the historic environment' and details, in paragraph 128, that 'In determining applications, LPAs should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum, the relevant [Historic Environment Record] HER should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, LPAs should require developers to submit an appropriate desk-based assessment and where necessary [the results of] a field evaluation'.*
- 2.4.5 Sunderland City Council is currently preparing its Local Development Framework (LDF), which will set out how the city will develop over the next 20 years. The LDF will replace the current Unitary Development Plan (UDP) which was adopted in 1998 and partially amended in 2007 by UDP 'Alteration No. 2'. The latter document contains the following policies relating to archaeological remains in 'Chapter 10 - Built Environment':

B11

*THE CITY COUNCIL WILL PROMOTE MEASURES TO PROTECT THE ARCHAEOLOGICAL HERITAGE OF SUNDERLAND AND ENSURE THAT ANY REMAINS DISCOVERED WILL BE EITHER PHYSICALLY PRESERVED OR RECORDED.*

B12

*THERE WILL BE A PRESUMPTION IN FAVOUR OF THE PRESERVATION OF SCHEDULED ANCIENT MONUMENTS AND OTHER NATIONALLY IMPORTANT ARCHAEOLOGICAL SITES. PLANNING PERMISSION FOR DEVELOPMENT WHICH WOULD HAVE AN ADVERSE EFFECT ON THEIR SITE OR SETTING WILL BE REFUSED UNLESS EXCEPTIONAL CIRCUMSTANCES PREVAIL.*

B13

*THE CITY COUNCIL WILL SEEK TO SAFEGUARD SITES OF LOCAL ARCHAEOLOGICAL SIGNIFICANCE. WHEN DEVELOPMENT AFFECTING SUCH IS ACCEPTABLE IN PRINCIPLE, THE COUNCIL WILL SEEK TO ENSURE MITIGATION OF DAMAGE THROUGH PRESERVATION OF THE REMAINS IN SITU AS A PREFERRED SOLUTION. WHERE THE PHYSICAL PRESERVATION OF REMAINS IN THE ORIGINAL SITUATION IS NOT FEASIBLE, EXCAVATION FOR THE PURPOSE OF RECORDING WILL BE REQUIRED*

B14

*WHERE DEVELOPMENT PROPOSALS AFFECT SITES OF KNOWN OR POTENTIAL ARCHAEOLOGICAL IMPORTANCE, THE CITY COUNCIL WILL REQUIRE AN ARCHAEOLOGICAL ASSESSMENT/EVALUATION TO BE SUBMITTED AS PART OF THE PLANNING APPLICATION. PLANNING PERMISSION WILL NOT BE GRANTED WITHOUT ADEQUATE ASSESSMENT OF THE NATURE, EXTENT AND SIGNIFICANCE OF THE REMAINS PRESENT AND THE DEGREE TO WHICH THE PROPOSED DEVELOPMENT IS LIKELY TO AFFECT THEM.*

- 2.4.6 The Tyne and Wear Specialist Conservation Team at Newcastle City Council provides archaeological development control throughout Tyne and Wear, and the TWAO – a member of the Specialist Conservation Team - produced the aforementioned Specification (included as Appendix 5 to this report) to set out the requirements for the archaeological evaluation to be undertaken ahead of determination of the planning application.

## **2.5 Archaeological and Historical Background**

- 2.5.1 The undeveloped upper part of Humbleton Hill has statutory protection as a Scheduled Monument (SAM 1440212, HER 13787) since it takes in part of the area occupied by a defended settlement of prehistoric date. The scheduled area includes the north-western portion of the settlement; to the south-east, the settlement has been compromised by housing development, gardening activities and the construction of a 19th-century reservoir and is therefore not included in the scheduling, given the level of disturbance to which it has been subjected (Figure 2).
- 2.5.2 During the construction of the reservoir in 1873, a barrow on the summit of the hill was destroyed; this revealed three Bronze Age urns, two of which contained cremated human bone (HER 7). A short iron knife with a curved handle (HER 21) was found nearby and two inhumations were also discovered in the vicinity (HER 20). These were reported at the time to be of Anglo-Saxon date, due to the size of the skeletons (Mitchell 1919).

- 2.5.3 Geophysical survey of the pasture fields occupying the upper slopes of Humbledon Hill was undertaken in 2001. This identified two parallel features running around the summit, c. 9m apart, with the outermost interpreted as a ditch and the innermost interpreted as a ditch or possibly a palisade formed by a series of postholes (ASDU 2001; Hale and Still 2003). These features, most prominent to the north-west and south-west of the reservoir, suggested an enclosed area measured c. 125m in diameter over the summit of the hill.
- 2.5.4 An archaeological evaluation was undertaken in 2007 (prior to the scheduling) on the north-east side of the hill. Two trenches were located across the features – as detected by the earlier geophysical survey - encircling the hill and another was located to the south-east, beyond the area surveyed (NPA 2007). The most northerly trench, Trench 1, revealed that the outer linear feature was a ditch c. 3m wide and 1m deep, with Iron Age pottery recovered from it. Upslope was a 2.20m wide and 0.90m high stone bank, constructed with fragmented limestone. The inner ditch was 0.53m wide and 0.53m deep and produced pottery of possible Late Bronze Age date. To the south-west of the inner ditch, and therefore within the enclosed area, a shallow limestone-filled feature was partially exposed within the limits of the trench. This was semi-circular, measuring a maximum of 2.40m wide, and may represent part of a circular burial mound, although no human bone or cremation vessel was encountered. The outer ditch in Trench 2, to the south-east of Trench 1, also produced fragments of Iron Age pottery. The bank in this area was wider and lower than in Trench 1, measuring 3.05m wide and 0.40m high. The inner ditch was not identified in Trench 2 and the projected alignment of this ditch south-eastwards from Trench 1 indicates that it was probably overlain by the stone bank. This suggests that the wide outer ditch, which produced Iron Age pottery, and the bank, may have been later additions to the hilltop defences.
- 2.5.5 The geophysical survey also recorded two groups of pits, c. 2m in diameter, within the interior of the enclosure, in the area to the south-west of the reservoir. Several linear features were also detected in this area, including an L-shaped anomaly, possibly a structural feature. External to the ditches in the south-west was an anomaly which may represent part of a small rectilinear enclosure. Two evaluation trenches were investigated in this south-western area in 2006; the first was positioned across the linear features encircling the hill and the second targeted one of the group of interior pits (TWM 2006). The three linear features recorded in this area by geophysical survey were revealed in the trench as archaeological features, comprising the two ditches encircling the hill and the putative external ditched enclosure. Two sherds of possible prehistoric pottery were recovered from two of the ditches. However, the evaluation was abandoned before any further excavation or recording could take place on the instruction of the landowner.
- 2.5.6 The area of known or suspected archaeological remains of significance on the summit of Humbledon Hill was 'scheduled' following the 2007 evaluation. A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Culture, Media and Sport according to the regime set out in the *Ancient Monuments and Archaeological Areas Act 1979*. This degree of protection means that it is against the law to:
- disturb a scheduled monument by carrying out works without consent;
  - cause reckless or deliberate damage to a scheduled monument;

- use a metal detector or remove an object found at a scheduled monument without a licence from English Heritage.

2.5.7 The limit of the scheduled area at Humbledon Hill was defined as extending 'outwards' only as far to include the concentric ditches around the hill summit, as detected by the geophysical survey in 2001. The internal 'settlement area' lying within the overall site boundary was included in the scheduled area, with the exception of the footprint of the 19th-century reservoir – the scheduled area is depicted on Figure 2. Linear features identified by geophysical survey to the north and north-east of the double-ditched enclosure were assumed to be later in date than the prehistoric features, therefore the lower slopes of the hill running down to the overall site boundary to the west, north and east were not covered by the scheduling.

### **3. PROJECT AIMS AND RESEARCH OBJECTIVES**

#### **3.1 Project Aims**

3.1.1 The project is 'threat-led' with potential to disturb or destroy important sub-surface archaeological remains, if present. Therefore, the broad aim of the project was to inform the LPA, advised by the TWAO, and the Client regarding the character, date, extent and degree of survival of archaeological remains at the site.

3.1.2 With the results of the 2001 geophysical survey available, archaeological trial trenching was selected as the next most appropriate investigative tool to test the archaeological potential of the proposed development site.

3.1.3 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 The specific research objectives of the archaeological evaluation were principally for the prehistoric period, since the upper part of Humbledon Hill, within the overall site boundary, is occupied by a defended settlement of prehistoric date; a Scheduled Monument as previously described (Figure 2).

3.2.2 The 2001 geophysical survey identified areas of potential archaeological interest, on the northern slopes of the hill, which were not included in the scheduling. Although the results of the geophysical survey did not appear to indicate intensive activity beyond the defended settlement, it did identify variously aligned linear geophysical anomalies (labelled as 'Anomalies A-H' on Figure 2) interpreted as either soil-filled features or possible stone-filled features. Therefore, the evaluation specifically aimed to target these anomalies to establish whether or not they represent features of archaeological significance.

3.2.3 The project was considered to have good potential to make a significant contribution to existing archaeological knowledge of Sunderland in general and of the Late Bronze Age and Early Iron Age periods in particular. Specific research objectives to be addressed by the project were formulated with reference to existing archaeological research frameworks. *Shared Visions: The North-East Regional Research Framework for the Historic Environment* (NERRF) highlights the importance of research as a vital element of development-led archaeological work (Petts and Gerrard 2006).

3.2.4 The NERRF identifies the following key priorities within the research agenda for the Prehistoric period which are of direct relevance to this project:

- li – Chronology
- lii - Settlement



3.2.5 In sum, the proposed archaeological work had the following site-specific objectives:

- to test the geophysical anomalies in order to establish whether or not they are indicative of buried archaeological remains;
- to establish the presence or absence of prehistoric activity and, where such remains are identified, to more clearly define the date and nature of the activity;
- to establish the palaeoenvironmental context of any prehistoric activity;
- to inform the scope and design of other mitigation measures, should they be deemed to be required.

## 4. ARCHAEOLOGICAL METHODOLOGY

### 4.1 Fieldwork

4.1.1 The evaluation fieldwork was undertaken 7-11 October 2013. All fieldwork was undertaken in accordance with the relevant standard and guidance document of the Institute for Archaeologists (IfA) (IfA 2008a). PCA is an IfA-Registered Organisation. The evaluation was undertaken according to the aforementioned Specification compiled by the TWAO (included as Appendix 5 to this report) which should be consulted for full details of methodologies employed regarding archaeological excavation, recording and sampling.

4.1.2 Archaeological trial trenching was considered as the most appropriate investigative tool to test the archaeological potential of the site. Fifteen trenches (Trenches 1-15) were located across the northern portion of the site on variable alignments and sited to target either potential archaeological features identified by geophysical survey (anomalies 'A-H') or as 'judgement' trenches to test areas proposed for house plots but where no geophysical anomalies were identified.

4.1.3 A summary of the rationale for the trenching (with proposed trench dimensions) is set out below:

- Trench 1 (7m x 1.60m) - targeting geophysical anomaly 'C', 'soil-filled feature', western extent.
- Trench 2 (7m x 1.60m) - geophysical anomaly 'A', 'soil-filled feature', eastern extent.
- Trench 3 (7m x 1.60m) - geophysical anomaly 'C', 'soil-filled feature', western extent.
- Trench 4 (9m x 1.60m) - geophysical anomaly 'C', 'soil-filled feature', western extent.
- Trench 5 (7m x 1.60m) - geophysical anomaly 'B', 'soil-filled feature', central portion.
- Trench 6 (7m x 1.60m) - geophysical anomaly 'C', 'soil-filled feature', central portion.
- Trench 7 (7m x 1.60m) - judgement trench in proposed house plot.
- Trench 8 (7m x 1.60m) - judgement trench in proposed house plot.
- Trench 9 (7m x 1.60m) - judgement trench in proposed house plot.
- Trench 10 (10m x 1.60m) - geophysical anomaly 'D', 'soil-filled feature', central portion.
- Trench 11 (10.20m x 1.60m) - geophysical anomaly 'F', 'possible stone-filled feature', western extent.
- Trench 12 (10m x 1.60m) - geophysical anomaly 'E', 'soil- and stone-filled features', central portion
- Trench 13 (20m x 1.60m) - geophysical anomaly 'F', 'stone-filled feature', central portion.
- Trench 14 (10m x 1.60m) - geophysical anomaly 'H', 'soil-filled feature', central portion.
- Trench 15 (10m x 1.60m) - geophysical anomaly 'G', 'possible stone-filled feature' south-eastern extent.

- 4.1.4 All trenches were set-out by PCA using a Leica Viva Smart Rover Global Navigation Satellite System (GNSS), with pre-programmed co-ordinate data determined by an office-based CAD Technician. The Smart Rover GNSS provides correct Ordnance Survey co-ordinates in real time, to an accuracy of 1cm.
- 4.1.5 All trenches were mechanically-excavated by a back-acting 'JCB' with toothless ditching bucket under archaeological supervision. The trenches were excavated to the top of the first significant archaeological horizon, or the clearly defined top of the natural sub-stratum, whichever was reached first. All potential archaeological features were identified and marked on the ground with sprayline at the time of machine clearance of overburden.
- 4.1.6 Hand cleaning was undertaken in trenches where archaeological features were identified. All potential features were subject to partial or complete excavation within the trenches with photography and archaeological recording taking place at appropriate stages in the process. A selection of digital photographs is included as Appendix 4 to this report. All trenches were recorded, irrespective of whether or not they contained archaeological features.
- 4.1.7 Temporary Bench Marks were established across the site using the Smart Rover GNSS instrument. The height of all principal strata and features were calculated relative to Ordnance Datum 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 14 archaeological contexts were defined in the 15 trenches (Appendix 2). Post-excavation work involved checking and collating site records, grouping contexts and phasing the stratigraphic data (Appendix 1). A written summary of the archaeological sequence was then compiled, as described below in Section 5.
- 4.2.2 The artefactual material from the evaluation comprised a small assemblage of pottery, ceramic building material, glass and flint. Examination of the artefactual material was undertaken and relevant comments integrated into Section 5, with a summary report on the material included as Appendix 3. No other categories of organic or inorganic artefactual material were represented. None of the material recovered during the evaluation required specialist stabilisation or an assessment of its potential for conservation research.
- 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 evaluation. To this end, no appropriate deposits were encountered. No other biological material was recovered.
- 4.2.4 The complete Site Archive will be packaged for long term curation. In preparing the Site Archive for deposition, all relevant standards and guidelines documents referenced in the Archaeological Archives Forum guidelines document (Brown 2007) will be adhered to, in particular a well-established United Kingdom Institute for Conservation (UKIC) document Walker, (UKIC 1990) and the relevant IfA publication (IfA 2008b). The depositional requirements of the body to which the Site Archive will be ultimately transferred will be met in full.

## **5. RESULTS: THE ARCHAEOLOGICAL SEQUENCE**

*During the evaluation, separate stratigraphic entities were assigned unique and individual 'context' numbers, which are indicated in the following text as, for example [123]. 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 within the base of each of the 15 evaluation trenches. Fractured limestone bedrock, [14.1], comprised the basal deposit across all trenches investigated. It was noted that within the eastern portion of the site (Trenches 10-15), the limestone bedrock was fractured to a lesser degree than to the west (Trenches 1-9).
- 5.1.2 In Trenches 13 and 14, limestone bedrock was overlain by extensive patches of boulder clay, [14.2]. This comprised firm silty clay, ranging in colour from light pinkish brown in Trenches 14 and 15 to light yellowish brown and brownish yellow in Trench 13.
- 5.1.3 The maximum recorded height for either limestone bedrock or overlying boulder clay was c. 88.80m OD in Trench 6 and the minimum recorded height was c. 82.50m OD in Trench 12. These values broadly reflect the natural topography of the area investigated, with a steep slope down from south to north.
- 5.1.4 The depth at which the limestone bedrock or boulder clay was encountered below existing ground level varied across the site, ranging from a minimum of 70mm in Trench 6, where topsoil directly overlay limestone bedrock, to a maximum of 0.80m in Trench 13, this in the eastern portion of the site where a substantial thickness of colluvium overlay the bedrock and, where present, boulder clay.

### **5.2 Phase 2: Colluvium**

- 5.2.1 In Trenches 11-15, bedrock and, where present, boulder clay were overlain by a sterile clayey silt deposit, [13], which was only present within the relatively level easternmost part of the site (Sections 6 and 7, Figure 4). The thickness of the deposit varied from up to 0.40m in the central portion of Trench 13 to 0.17m in Trench 11. It was encountered at maximum and minimum heights of 85.95m OD in Trench 13 and 84.79m OD in Trench 15, respectively. This material has been interpreted as being of colluvial origin (commonly referred to as 'hillwash').

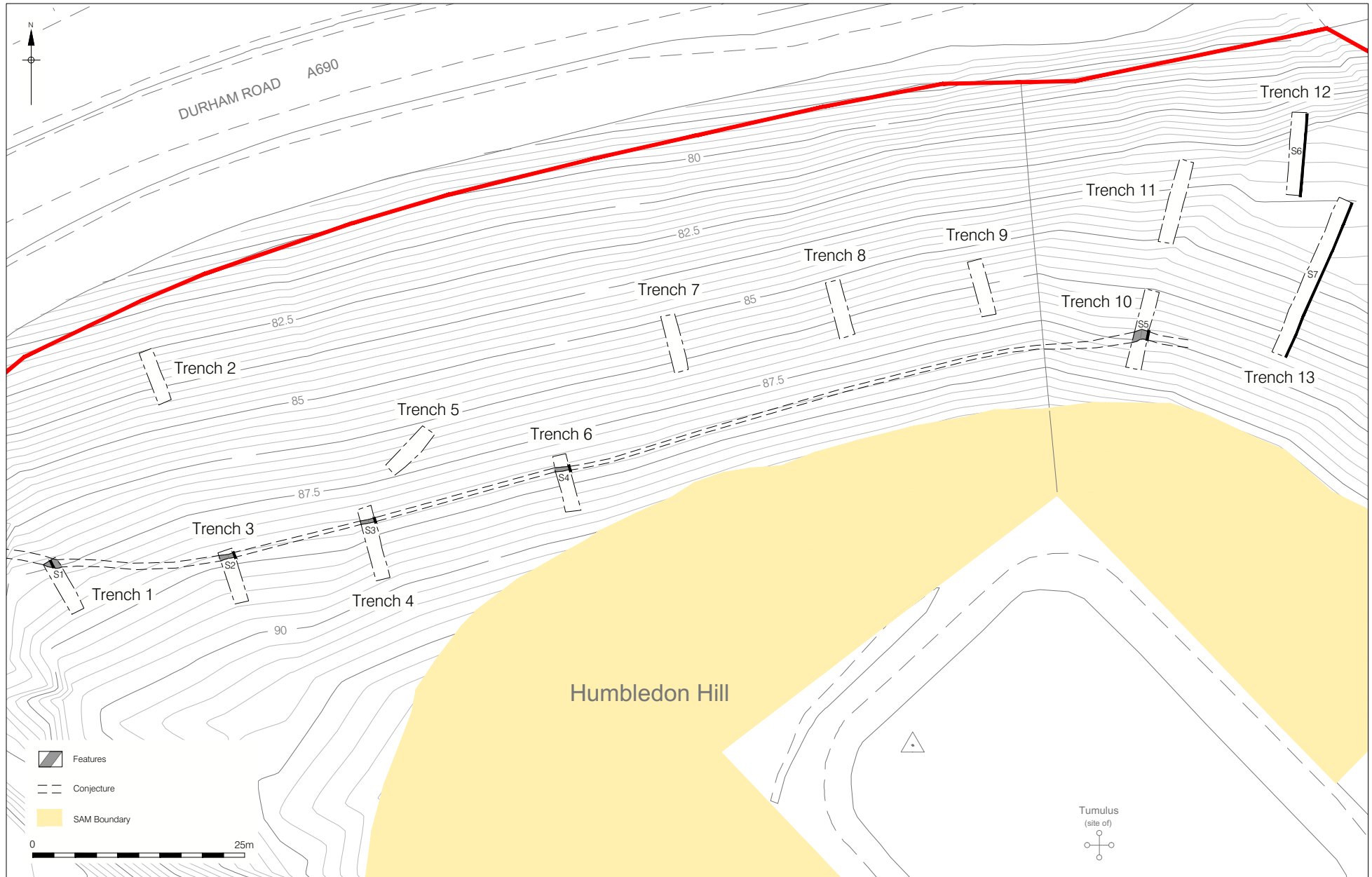
### **5.3 Phase 3: Post-medieval**

- 5.3.1 Phase 3 represents activity of late post-medieval date. Trenches 1, 3, 4 and 6 were positioned to investigate a linear geophysical anomaly (Anomaly C) that ran WSW-ENE across the site, curving slightly at its WSW extent (Figure 2). A similarly aligned ditch was recorded within each of these trenches, [3], [5], [7] and [9], respectively, cut into bedrock (Figure 3). This ditch is considered to be the origin of the geophysical response; however it is noteworthy that in each case the archaeological feature was located a short distance to the north of its position as indicated by the geophysical survey.

- 5.3.2 The profile of the ditch varied across the trenches, but it generally had steeply-sloping sides and a concave base (Sections 1-4, Figure 4). Its dimensions varied from a maximum width of 0.79m in Trench 6 to a minimum width of 0.64m in Trench 3. Its maximum recorded depth was 0.46m in Trench 6 and the maximum and minimum height was 88.34m OD in Trench 6 and 86.91m OD in Trench 1, respectively. The ditch was infilled with mid brown sandy silt, [2], [4], [6] and [8], respectively, with occasional inclusions of small and medium fragments of limestone. From the section excavated across the ditch in Trench 3, its infill, [4], produced one sherd of late post-medieval pottery, part of a handle from a vessel of probably mid to late 19th-century date, stem fragments from two clay tobacco pipes and a chip of ceramic building material. It is therefore interpreted as a probable drainage ditch of late post-medieval date.
- 5.3.3 Trench 10 was located c. 70m to the east of Trench 6 and positioned to investigate geophysical Anomaly D that ran NW-SW across the eastern part of the site. No archaeological feature was identified that corresponded to the anomaly, however a WSW-ENE aligned linear feature, [11], was recorded within the central portion of Trench 10. This measured up to 1m wide and 0.30m deep and was recorded at a maximum height of 87.21m OD (Section 5, Figure 4). Its single mid brown sandy silt infill, [10], produced a sherd of late post-medieval pottery and a fragment of clear glass, of similar or more recent date. On the basis of its position, orientation and dating evidence, the feature is interpreted as representing a continuation of the ditch recorded in Trenches [1], [3], [4] and [6]. If this were the case, the ditch was therefore recorded for a total distance of c. 125m.
- 5.3.4 Trench 12 in the eastern part of the site was positioned to test a group of geophysical anomalies (Anomaly E) running NE-SW, with NW-SE returns. These had been interpreted as a possible soil-filled feature flanked by possible stone-filled features. A substantial mid orange brown dump deposit, [12], overlay colluvial deposit [13] and was up to 0.52m deep. It extended across the northern portion of Trench 12 for a maximum distance of 4.90m from north to south and was encountered at maximum and minimum heights of 82.83m OD and 81.53m OD, respectively. A single sherd of late post-medieval pottery, probably of mid to late 19th-century date, was recovered from this deposit. It is interpreted as the remains of an earthen bank of relatively recent origin possibly formed during landscaping of the garden associated with the residential dwelling situated to the south-east. The bank is assumed to be the origin of the geophysical anomalies and, as with the drainage ditch recorded to the west, the archaeological feature was positioned slightly to the north of the location indicated by the geophysical survey.

## **5.4 Phase 4: Modern**

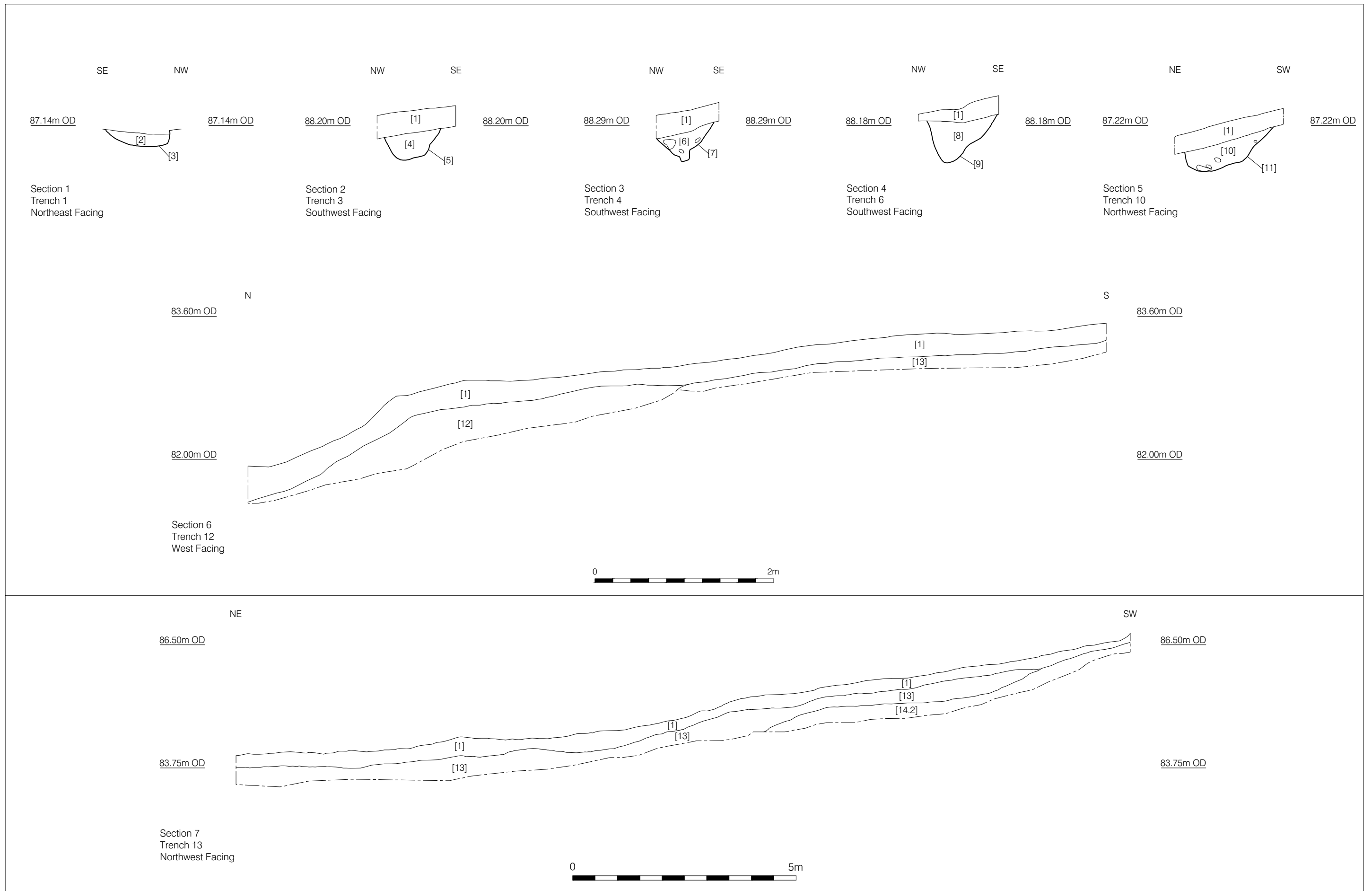
- 5.4.1 Topsoil, [1], was recorded in all 15 trenches and generally comprised friable, dark grey clayey silt. The maximum thickness recorded for any topsoil layer was 0.30m in Trench 13 and the minimum was 0.15m, this in Trenches 2 and 15. The maximum and minimum heights recorded for the topsoil were 89.74m OD, in Trench 3, and 81.57m OD, in Trench 12, respectively. A single struck flint flake was recovered from the topsoil in Trench 7. This was crudely retouched along on edge and may be a scraper of Late Bronze Age date. All topsoil had a developed turf line, this forming the existing ground surface of the rough pasture which comprised the entirety of the area investigated within the overall development site.



© Crown copyright 2013. All rights reserved. License number PMP36110309

© Pre-Construct Archaeology Ltd 2013  
22/10/13 MR

Figure 3  
Trench Locations showing excavated features  
1:625 at A4



## 6. CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Conclusions

6.1.1 Geological deposits and archaeological deposits and features encountered during the evaluation have been assigned to four phases of activity:

- Phase 1. Natural limestone bedrock was the basal deposit encountered within all 15 trenches. The steep northern slope of the hillside was reflected in the level at which bedrock was recorded, for example, 88.80m OD in Trench 6 closest to the summit of the hill compared to 82.50m OD in Trench 12, the northernmost trench investigated. Patches of boulder clay were recorded overlying bedrock in two trenches located in the north-eastern part of the site.
- Phase 2. A colluvial deposit up to 0.40m thick was recorded in the north-eastern part of the site, within Trenches 11-15. This part of the site was relatively flat and this material had presumably accumulated in this area through the process of colluviation at the base of the hill slope.
- Phase 3. A probable drainage ditch was recorded within Trenches 1, 3, 4, 6 and 10 running WSW-ENE across the central part of the site for a distance of over 125m. A small assemblage of post-medieval artefactual material was recovered from its fill in two trenches. In the north-eastern part of the site an earthen bank recorded in Trench 12 produced a sherd of late 19th- to 20th-century pottery. This feature is interpreted as a garden boundary or landscaping feature, potentially having been created in association with the residential dwelling situated to the south-east.
- Phase 4. Topsoil was recorded in all 15 trenches; along with its developed turf line this formed the existing ground surface of the rough pasture in which the work was conducted.

6.1.2 No remains of archaeological significance were encountered within any of the trenches investigated. The WNW-ENE aligned geophysical anomaly which extends across the western part of the site has been interpreted as a probable drainage ditch of late post-medieval origin. The earthen bank recorded in the north-eastern part of the site is assumed to be the origin of one of the geophysical anomalies in this area. No other features were encountered within any of the trenches in this area and it is considered possible that the numerous geophysical anomalies detected here were caused by disturbances of relatively recent date within the topsoil. The alignment of these features indicates that they were probably contemporary with the earthen bank, which is of probable relatively recent date.

6.1.3 As no evidence for prehistoric activity was recorded, the project has not contributed any further information to the key priorities identified within NERRF research agenda.

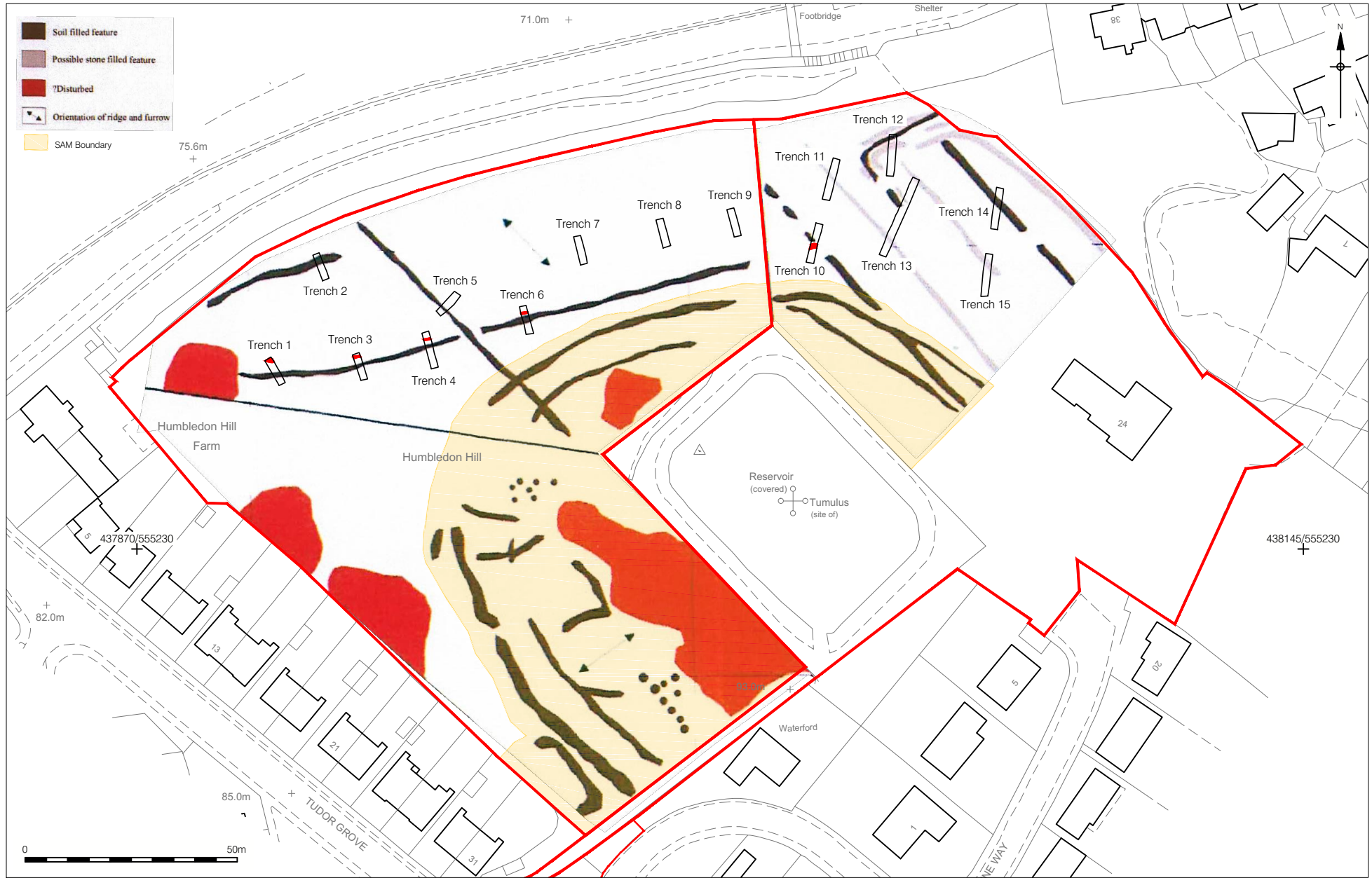


6.1.4 It is of note that the ditch recorded in Trenches 1, 3, 4 and 6 was in each case located further to the north than its position as indicated by the geophysical survey, from a minimum of c. 0.50m in Trench 6 to a maximum of c. 2.30m in Trench 1 (Figure 5). This discrepancy is assumed to be the result of differing surveying methods. The current evaluation trenches were set-out using a Leica iCON gps 60 Global Navigation Satellite System (GNSS), with pre-programmed co-ordinate data determined by an office-based CAD operative; this instrument provides corrected Ordnance Survey co-ordinates in real time, to an accuracy of 1 cm. The geophysical survey report (ASDU 2001) states that a grid was established across the site and tied in to known Ordnance Survey points. The relevance of this to the current development proposal is that the northern limit of the scheduled area was determined by the location of the outermost enclosure ditch encircling the hilltop, as indicated by the geophysical survey. The evaluation indicates, however, that the ditches lie up to c. 2.30m further north.

## **6.2 Recommendations**

6.2.1 The results of the archaeological evaluation indicate that, for the most part (see below), the proposed development will not affect any archaeological remains of significance on Humbledon Hill. In sum, it is recommended that no further archaeological fieldwork is required in order to mitigate the impact of the development on heritage assets of archaeological importance.

6.2.2 Notwithstanding the above recommendation, the results of the archaeological evaluation indicate that there appears to be a discrepancy of the order of up to c. 2.0m between the location of archaeological features as recorded by the current evaluation and the earlier geophysical survey. Therefore, it is recommended that the boundary of the scheduled area is extended to the north and north-east by this distance in order to ensure that any development groundworks undertaken immediately adjacent to the scheduled area boundary do not disturb features of prehistoric date, with the outermost boundary ditch of the defended settlement being of particular concern in this regard.



© Crown copyright 2013. All rights reserved. License number PMP36110309

© Pre-Construct Archaeology Ltd 2013  
07/11/13 MR

Figure 5  
Trench Locations showing excavated features and geophysical survey anomalies  
1:1,250 at A4

## 7. REFERENCES

### Bibliography

- Archaeological Services Durham University, 2001. *Humbledon Hill, Sunderland, Geophysical Survey*, ASDU unpublished.
- Brown, D.H., 2007. *Archaeological Archives. A guide to best practice in creation, compilation transfer and curation*, Archaeological Archives Forum.
- Department for Communities and Local Government, 2010. *Planning Policy Statement 5, 'Planning for the Historic Environment'*, HMSO.
- Department for Communities and Local Government, 2012. *The National Planning Policy Framework (NPPF)*, HMSO.
- English Heritage, 2006. *Management of Research Projects in the Historic Environment*, English Heritage.
- English Heritage, Department of Culture, Media and Sport and Department for Communities and Local Government, 2012. *PPS5: Planning for the Historic Environment - Practice Guide* (Revision Note June 2012), English Heritage, DCMS and DCLG.
- Hale, D.N. and Still, D.C., 2003. 'Geophysical surveys at Picktree, Chester-le-Street and Humbledon Hill, Sunderland', *Durham Archaeological Journal* 17, 1-7.
- Institute for Archaeologists, 2008a. *Standard and guidance for archaeological field evaluation*, IfA.
- Institute for Archaeologists, 2008b. *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives*, IfA.
- Mitchell, W.C., 1919. *The History of Sunderland*, Holmeside, Hills Press.
- Newcastle City Council., 2013. *Specification for Preliminary Archaeological Evaluation at Humbledon Hill, off Durham Road, Sunderland, Tyne and Wear Specialist Conservation Team* unpublished.
- Newton, A.C. and Noel, M.J., 2000. *An Archaeological Desk Based Assessment for a Proposed development at Humbledon Hill, Sunderland*, GeoQuest Associates unpublished.
- North Pennines Archaeology Limited, 2007. *Archaeological Evaluation on land at 24 Alpine Way, Sunderland, Tyne and Wear*, NPA unpublished
- Petts, D. and Gerrard, C., 2006. *Shared Visions: The North-East Regional Research Framework for the Historic Environment*, English Heritage, Durham University and Durham County Council.
- Tyne and Wear Museums Archaeology, 2006. *Humbledon Hill, Sunderland, Tyne and Wear. Short Report*. TWM unpublished.
- Walker, K., 1990. *Guidelines for the Preparation of Excavation Archives for Long-term Storage*, UKIC.

## **Online Sources**

British Geological Survey website:

[http://www.bgs.ac.uk/education/geology\\_of\\_britain/home.html](http://www.bgs.ac.uk/education/geology_of_britain/home.html)

Department for Communities and Local Government website at:

<https://www.gov.uk/government/organisations/department-for-communities-and-local-government>

English Heritage website at:

<http://www.english-heritage.org.uk/publications>

*MAGIC* website, at: <http://magic.defra.gov.uk>

*Sitelines* website (the online Tyne and Wear Historic Environment Record), at:

[www.twsitelines.info/](http://www.twsitelines.info/)

Sunderland City Council UDP website: <http://www.cartogold.co.uk/sunderland/>

## 8. ACKNOWLEDGEMENTS AND CREDITS

### **Acknowledgements**

Pre-Construct Archaeology would like to thank Richard Marsden of Marikal Limited for commissioning the archaeological evaluation herein described.

The role of Jennifer Morrison, Tyne and Wear Archaeology Officer (Tyne and Wear Specialist Conservation Team, Newcastle City Council), is acknowledged.

### **PCA Credits**

*Project Manager:* Robin Taylor-Wilson

*Fieldwork:* Aaron Goode (Site Supervisor and Survey), David Green, Neal Lythe

*Report:* Aaron Goode

*Illustrations:* Mark Roughley

*Flint comment:* Aaron Goode

*Post-medieval finds comments:* Jennifer Proctor

**APPENDIX 1**  
**STRATIGRAPHIC MATRICES**



**APPENDIX 2  
CONTEXT INDEX**



**HUM 13: CONTEXT INDEX**

<b>Context</b>	<b>Trench</b>	<b>Phase</b>	<b>Type 1</b>	<b>Type 2</b>	<b>Interpretation</b>
1	1-15	4	Deposit	Layer	Topsoil
2	1	3	Deposit	Fill	Fill of ditch [3]
3	1	3	Cut	Linear	Ditch filled by [2]
4	3	3	Deposit	Fill	Fill of ditch [5]
5	3	3	Cut	Linear	Ditch filled by [4]
6	4	3	Deposit	Fill	Fill of ditch [7]
7	4	3	Cut	Linear	Ditch filled by [6]
8	6	3	Deposit	Fill	Fill of ditch [9]
9	6	3	Cut	Linear	Ditch filled by [8]
10	10	3	Deposit	Fill	Fill of ditch [11]
11	10	3	Cut	Linear	Ditch filled by [10]
12	12	3	Deposit	Layer	Dump deposit, forming bank
13	11-15	2	Deposit	Layer	Colluvium
14.1	1-15	1	Deposit	Natural	Limestone bedrock
14.2	13-15	1	Deposit	Natural	Boulder clay

**APPENDIX 3  
FINDS INDEX**

## ***HUM13: FINDS INDEX***

### **Trench 7, Topsoil [1]**

One worked flint flake, 13g. Crudely retouched along one edge, possible scraper of Late Bronze Age date.

### **Trench 3, fill [4] of ditch [5]**

One sherd of pottery, 3g. Part of a cream-glazed ribbed handle, 19th-20th century.

Two fragments of clay tobacco pipe stem, total weight 4g. Small bore: internal stem diameter 0564in, 19th century.

One scrap of ceramic building material, 1g.

### **Trench 10, fill [10] of ditch [10]**

One sherd of pottery, 2g. Small fragment of white-glazed plate, 19th-20th century.

One sherd of clear glass, 1g. 19th-20th century.

### **Trench 12, bank deposit [12]**

One sherd of pottery, 7g. Light brown glazed stoneware, 19th century.

**APPENDIX 4  
PLATES**



Plate 1: Trench 2, looking NNW (scale 1m)



Plate 2: Trench 15, looking south (scale 1m)





Plate 3: Trench 10, ditch [11] in NW facing section (scale 1m)



Plate 4: Trench 12, bank [12] in west facing section (oblique)] (scale 1m)

**APPENDIX 5**  
**SPECIFICATION FOR THE EVALUATION**

# Tyne and Wear Specialist Conservation Team

## Specification for Preliminary Archaeological Evaluation at Humbledon Hill, off Durham Road, Sunderland

Planning Application: pre application

Author:

Jennifer Morrison  
Tyne and Wear Archaeology Officer  
Newcastle City Council  
Environment and Regeneration Directorate  
Housing, Planning and Transport  
Development Management  
Civic Centre  
Barras Bridge  
Newcastle upon Tyne  
NE1 8PH  
Tel (0191) 2116218  
[jennifer.morrison@newcastle.gov.uk](mailto:jennifer.morrison@newcastle.gov.uk)

Date: 13 August 2013

County Archaeologist's Reference Number: MON10825

The Tyne and Wear Specialist Conservation Team is the curatorial service for archaeology, industrial archaeology and historic buildings throughout the Tyne and Wear districts. It helps and advises Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland Councils to carry out their statutory duties to care for the precious historic environment of Tyneside and Wearside. The Team can be found at the Housing, Planning and Transport Division of the Environment & Regeneration Directorate of



## Introduction

Site grid reference: NZ 3794 5529

A new eco residential village, consisting of 11 executive dwellings, is proposed on the lower slopes of Humbledon Hill.

The upper part of the Hill (but not the reservoir) is protected as a Scheduled Ancient Monument (SAM 1440212).

On the summit of the Hill are the ruinous but attractive walls of a 19<sup>th</sup> century reservoir, once part of Humbledon Hill Water Works. The redevelopment of Humbledon Hill will pave the way for the maintenance and repair of the existing reservoir walls.

HER 13787 defended settlement (Scheduled Ancient Monument)

The settlement on Humbledon Hill includes the western half of a defended settlement; to the east, the settlement has been compromised by housing development, gardening activities and the construction of a Victorian reservoir. This area is not included in the scheduling, given the level of disturbance to which it has been subjected. Geophysical survey in 2003 and archaeological evaluation in 2006 and 2007 demonstrated that the defended settlement includes a roughly sub-circular enclosure measuring a maximum of 75m north east to south west by 62m north west to south east, within two ditches and a medial bank. The inner ditch is c.0.5m wide and 0.5m deep and is considered to be the remains of a palisade trench, which formerly contained a wooden fence. The outer ditch is situated about 9m outside the inner ditch and measures up to 3m wide and 1m deep. Between the two ditches there is a stone and earth bank standing to a maximum height of 0.8m interpreted as the remains of a rampart. There is an entrance through the west side of the enclosure. Two substantial, ditched features immediately outside the settlement on the south and south west sides have the same character as the outer ditch and are considered the remains of structures associated with it. Prehistoric pottery, recovered from the ditches, demonstrated that the inner ditch was dug during the later Bronze Age and the outer ditch was subsequently dug during the Iron Age. Animal bone, some of it burnt, and flint pieces were recovered from parts of the ditches. Also recovered was what was identified as the corner of a triangular loom weight of Iron Age date. Within the interior of the enclosure, there are a series of pits, each 2m in diameter and archaeological evaluation also uncovered what was thought to be the part of a Bronze Age round cairn. Extent of Monument: The monument includes the remains of the settlement and associated ditched features with a margin of 2m around the north and east sides considered essential for their support and protection. Further remains identified by geophysical survey beyond the double-ditched enclosure are later in date and are not included in the scheduling.

HER 7 cremations in urns

In 1873, during the construction of the Humbledon Hill High Reservoir on the summit of the hill, a barrow was removed and three urns were discovered. 1) A food vessel urn was found about 4 ft below the surface, about half full of small bones. 2) A second urn was found about 3 ft below the surface, 9 ft east of no. 1, with some bones in it, "but it fell all to pieces before it was got out". 3) A food

vessel urn, crushed before it was recovered. A small heap of bones, without a cover, was also found, 3 ft below the surface. Nos. 1 and 3 are recorded as having been found inverted, and the implication is that no. 3 also held a cremation.

HER 20 inhumations

"Near these cinerary urns [HER 8] were discovered two skeletons of a great size". Mitchell also noted that a prehistoric burial had been found on Humbledon Hill in 1750, but gave no reference.

HER 21 knife

"Near these cinerary urns [HER 8] was a short iron knife with a curved handle".

HER 9 flint arrowheads

Miket reports that one arrowhead, lacking its tang, was found in 1950, and three were found c. 1953. Young received this information as "3 leaf-shaped arrowheads...recovered from the area of Humbledon Hill in the 1950s", but added, cryptically: "this material was not traced at Sunderland Museum".

HER 2919 reservoir

It is not known exactly when proposals were first made for a reservoir on Humbledon Hill, but it is recorded that a pumping station and open reservoir were constructed by 1855. It is probable that the Humbledon Hill reservoir was built as a result of increasing demand by the growing town of Sunderland and was part of a rolling scheme of work to improve sewerage and water supply to the town. The Sunderland Times of 27th May 1873 states:- "The summit of Humbledon Hill about 300 feet above the level of the sea, situated about 1 mile west of Bishopwearmouth has been chosen as the site of a high level reservoir for the use of the Sunderland and South Shields Water Company...". There is little information recorded specifically about the reservoir at Humbledon Hill other than it was roofed over in 1949. Photographs recording this are held by the Sunderland Local Studies Centre. The first cartographic evidence of the reservoir occurs on maps of 1896 (the OS 2nd edition) and 1899 (R.S. Roundthwaite's plan of the Borough of Sunderland). The reservoir is surrounded by a stone wall surmounted by a three strand wire fence. The walls range in height depending upon the lay of the land on which they stand, but are generally between 2 and 2.95 metres in height. The western wall of the reservoir compound has a gate approximately 2.5 metres wide at its southern end. The western and eastern walls are approximately 80 metres long and the north wall is approximately 50 metres long. The southern wall backs on to the land attached to private houses. The south wall has a section missing at its junction with the eastern wall. Viewed from the western side the reservoir enclosure has a grassy covered mound running along the inside of the wall for its entire length. This gives the impression that the old covered reservoir is still in position. A similar situation occurs when the reservoir is viewed from the north. Viewed from inside the walls it is obvious the reservoir has been demolished or filled in. A mound of earth, covered by grass and approximately 2 metres high runs from south west to north west about 3 metres inside the wall. This mound then turns north east and runs along inside the north wall. The rest of the reservoir is filled with broken rubble which has been compressed to form a flat surface. The rubble fill seems to be comprised of broken brick and stones with signs of other building materials visible in various places. Much of it is overgrown with grass and weeds. There are no remains of any structures visible and it seems likely that the reservoir tanks have either been filled in or demolished. It is not

possible to see whether the reservoir was cut down to the rock head as the fill completely obscures any signs of foundations or other construction. Humbledon Hill pumping station was begun in 1846 by The Sunderland Water Company. It was completed in 1852. A new reservoir was built on top of Humbledon Hill in 1873-4. The engine house at Humbledon survives and is listed grade 2. It used a Cornish type sinking engine probably supplied by R & W Hawthorn of Newcastle. By 1851 two workers cottages had been built, along with a storehouse, blacksmith's shop, boundary walls, entrance gates, cooling ponds and layout of the grounds. The engine probably survived until 1927 by which time the station had been electrified. The earliest surviving pumping station in the area, constructed between 1846 and 1849. Also the most utilitarian of the early Sunderland and South Shields Water Company Stations. Designed for a single cylinder, double-acting non-rotative house engine; the surviving engine house has external buttresses to help support the beam pivot. The station was electrified in 1924.

#### HER 10883 Civil War Camp

On 7th March 1644 the Scottish troops were based on Humbledon Hill. Their magazine at Sunderland provided powder, musket balls and eight 12-pound cannonballs to Humbledon Hill. On seeing the royalist troops marching from Penshaw Hill (HER 10881) towards the town, the Scots left the hill and a skirmish took place at Offerton. On 9th March seven Scottish regiments crossed the Wear. On 12 March the Scottish army split, marching towards Durham, Hartlepool and South Shields. Two regiments were left in Sunderland. Here Catholic prisoners and captives from other Civil War skirmishes were held.

#### HER 5426 pillbox

There was a WW2 pillbox on Humbledon Hill.

#### **Previous archaeological work:**

An archaeological desk based assessment was produced in 2000 (Geoquest Associates).

A geophysical survey was carried out in 2001 (Archaeological Services Durham University) and was published in Durham Archaeological Journal in 2003. The survey showed that the hill was encircled by a double ditch.

TWM Archaeology started an archaeological evaluation to test the results of the geophysical survey in 2006 but was asked to leave the site by their client before completing the work. Two sherds of presumed prehistoric pottery were taken away by their commissioning client.

Small scale archaeological evaluation was undertaken close to 24 Alpine Way in 2007 (North Pennines Archaeology Ltd). It was this work which confirmed the survival of the defended settlement and its date. The site was then scheduled.

The appointed archaeologist **must** read these reports before starting work. Copies are held by the HER

In accordance with paragraph 141 of the National Planning Policy Framework and UDP Policies B11, B12, B13 and B14 a further programme of evaluation is now required. The report of the results will be submitted with the planning application.

## ***Research Aims and Objectives***

The evaluation report should make reference to Regional and Thematic Research Frameworks.

'Shared Visions: The North-East Regional Research Framework for the Historic Environment' by David Petts with Christopher Gerrard, 2006 notes 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.

See <http://www.algao.org.uk/Association/England/Regions/ResFwks.htm>

'Frontiers of Knowledge' edited by Matthew FA Symonds and David JP Mason 2010 is the Research Framework for Hadrian's Wall, part of the Frontiers of the Roman Empire World Heritage Site. The aim of the publication is to assess the existing knowledge base for our understanding of the monument, to identify and prioritise key themes for future research and to set out a strategy and action plan by which the initial set of objectives might be achieved.

For the English Heritage Research Agenda see <http://www.english-heritage.org.uk/professional/protection/national-heritage-protection-plan/>

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index.

All staff on site must understand the project aims and methodologies.

## ***Methods statement***

12 evaluation trenches are needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER, and it must contain recommendations for any further archaeological work needed on this site.

**The commissioning client needs to be aware that the purpose of the preliminary evaluation is merely to ascertain if archaeological remains survive on this site and if they do, to determine their broad date, nature and function. Where archaeological remains are found in the preliminary trenches, and if these remains are at threat by the proposed development, further archaeological excavation and or a watching brief will be required before and during development work.**

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards.

The work will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 ([www.english-h.gov.uk/guidance/map2/index.htm](http://www.english-h.gov.uk/guidance/map2/index.htm)) and Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 ([www.english-heritage.org.uk/publications](http://www.english-heritage.org.uk/publications) ).

The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

All work must be carried out in compliance with the codes of practice of the Institute of Field Archaeologists and must follow the IFA Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate. [www.archaeologists.net](http://www.archaeologists.net)

### ***Notification***

**The County Archaeologist needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the County Archaeologist of the start and end dates of the Evaluation. He must also keep the County Archaeologist informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the County Archaeologist reasonable access to the development to undertake monitoring.**

## **PROJECT INITIATION**

### ***PROJECT DESIGN***

Because this is a detailed specification, the County Archaeologist does **not** require a Project Design from the appointed archaeologist. The appointed archaeologist is expected comply with the requirements of this specification.

### ***HEALTH AND SAFETY AND RISK ASSESSMENT***

A health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2006 contains general guidance on Risk management (section 2.3.2, Appendix 2).

Risk assessments must be produced in line with legislative requirements (for example the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Control of Substances Hazardous to Health (COSHH) Regulations 2002 and the Personal Protective Equipment at Work Regulations 2002) and best practice e.g. as set out in the FAME (Federation of Archaeological Managers & Employers) formerly SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual  
[www.famearchaeology.co.uk](http://www.famearchaeology.co.uk)  
[www.scaum.org/uk](http://www.scaum.org/uk)

The Risk Assessment will identify what PPE (hard hats, glasses/goggles, steel toe cap and instep boots, gloves, high-viz clothing etc) is required.

Other potentially applicable legislation:

Working at Heights Regulations 2005, Manual Handling 1992

'Safe use of ladders and stepladders: An employers' guide' HSE Books 2005

Some archaeological work (such as those that last more than 30 days or involve more than 500 person days) may be deemed notifiable projects under C.D.M Regulations 1994 (amended 2007). Where C.D.M Regs apply, the HSE must be notified. A CDM Co-ordinator and principal contractor must be appointed. The CDM-C will produce a Health and Safety file. The PC will prepare the Construction Phase Plan. The HSE website includes a Power Point presentation on CDM training.

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive ([www.hse.gov.uk](http://www.hse.gov.uk)) and the local authority health and safety department.

Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists ([www.archaeologists.net](http://www.archaeologists.net)), the Construction Industry Research and Information Association ([www.contaminated-land.org](http://www.contaminated-land.org)) and the Association of Geotechnical and Geoenvironmental Specialists ([www.ags.org.uk](http://www.ags.org.uk)).

See also Environment Agency, 2005 "Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management".

The Archaeological Contractor must be able to provide written proof that the necessary levels of Insurance Cover are in place.

The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings.

Excavation trenches should:

- Be protected from vehicles and guarded off for pedestrians
- not have steep sides or must be shored
- have good access and egress

The archaeologists must not work near overhead power lines.

Underground services can be easily damaged during excavation work. If proper precautions are not taken, it is all too easy for workers to hit these services resulting in a risk of

- heat, flame and molten metal from electric cables
- escaping gas from gas pipes
- flooding of the excavation when a water pipe is damaged
- interruption of services

Excavation work in the public highway, kerbside or pavement can only be undertaken by those with a Street Works certificate of competence. Before the excavation takes place the person supervising the digging must have been given service plans and be trained in how to read them. All persons involved in the excavation must know about safe digging practice and emergency procedures. A locator must be used to trace the line of any pipe or cable or to confirm that there are no pipes or cables in the way. The ground will be marked accordingly. There must be an emergency plan to deal with damage to cables and pipes.

## **PROJECT EXECUTION**

### **1) Archaeological evaluation**

The evaluation work **must** keep out of the Scheduled Area.

Before starting work the appointed archaeologist will send a proposed trench location plan to the County Archaeology Officer for approval. The trench location plan will show the proposed development and the geophysical interpretation (figure 5 in Archaeological Services Durham University's 2001 report).

There will be one trench (two in plot 3) in the area of each proposed new house. Where geophysical anomalies lie within the plot of a house they will be targeted by the trench in that plot (plot 1 has possible pits within it, plots 3 and 4 have a positive linear anomaly, presumably a ditch, plots 9-11 have a mixture of negative and positive linear anomalies and possible pits etc). Some of the linear anomalies relate to field boundaries shown on the first edition OS map, others may be prehistoric.

The dimensions of the trenches are:

Plot 1	2m x 7m	to target possible pits
Plot 2	2m x 10m	to target linear anomaly
Plot 3	two trenches each 2m x 7m	to target the 2 linear anomalies
Plot 4	2m x 7m	
Plot 5	2m x 7m	
Plot 6	2m x 7m	
Plot 7	2m x 7m	
Plot 8	2m x 7m	
Plot 9	1m x 20m	to target the positive and linear anomalies
Plot 10	1m x 20m	to target the positive and linear anomalies
Plot 11	1m x 20m	to target the positive and linear anomalies

in plan **at base**.

The appointed archaeologist **must** be able to get into the trench to plan, photograph and sample excavate any archaeological features which are found. In order to do this safely, where archaeological features lie over 1.2m below present ground level, trenches **must** be widened (if feasible) to allow safe access, otherwise shoring will be required.

Trench positions should be accurately surveyed prior to excavation and tied in to the national grid.

The trenches should be excavated to the depth of natural subsoil if this can be reached safely.

Trenches must avoid known services.

Trenches must stay a safe distance away from pylons and overhead power lines.

The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration.

The commissioning client will advise of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine.

Trenches must avoid any **Japanese Knotweed** (it is the commissioning client's responsibility to advise their archaeologist if Japanese Knotweed is present on the site). Japanese knotweed was introduced into Britain in the 19th century as an ornamental plant. Over time it has become widespread in a range of habitats, including roadsides, riverbanks and derelict buildings. It out-competes native plants and animals and is now classed as an invasive species. It spreads through its crown, rhizome (underground stem) and stem segments, rather than its seeds. The weed can grow a metre in a month and can grow through concrete and tarmac, damaging buildings and roads. Studies have shown that a 1cm section of rhizome can produce a new plant in 10 days. Rhizome segments can remain dormant in soil for twenty years before producing new plants.



In the UK there are two main pieces of legislation that cover Japanese Knotweed. These are:

### **Wildlife and Countryside Act 1981**

Listed under Schedule 9, Section 14 of the Act, it is an offence to plant or otherwise cause the species to grow in the wild. This lists over 30 plants including Japanese knotweed, giant hogweed and parrot's feather. An offence under the Wildlife and Countryside Act can result in a criminal prosecution.

### **Environmental Protection Act 1990**

Japanese Knotweed is classed as 'controlled waste' and as such must be disposed of safely at a licensed landfill site according to the Environmental Protection Act (Duty of Care) Regulations 1991. Soil containing rhizome material can be regarded as contaminated and, if taken off a site, must be disposed of at a suitably licensed landfill site and buried to a depth of at least 5 m. An infringement under the Environmental Protection Act can result in enforcement action being taken by the Environment Agency which can result in an unlimited fine. You can also be held liable for costs incurred from the spread of Knotweed into adjacent properties and for the disposal of infested soil off site during development which later leads to the spread of Knotweed onto another site.

See also the Environment Agency 'Japanese Knotweed Code of Practice'.

It's down to landowners to control these plants, but they don't have to remove them. However, causing the plants to spread by removing or disposing of them incorrectly [i.e. disturbing them through archaeological excavation] would be illegal {info taken from [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk) and [www.devon.gov.uk](http://www.devon.gov.uk)}.

### **Tasks**

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above.

Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision and the remaining deposits are to be excavated by hand.

All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to worthy of preservation in-situ.

Excavation is to be carried out by single context planning and recorded on *pro forma* context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded.

Scientific investigations should be undertaken in a manner consistent with “The Management of Archaeological Projects”, English Heritage 1991 and with “Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists”, English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science ([jacqui.huntley@english-heritage.org.uk](mailto:jacqui.huntley@english-heritage.org.uk) or 07713 400387) **before** the evaluation begins. See Appendix 1 for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on Treasure Act procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

### ***Recording***

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in **either** black and white print and colour transparency **or** with a digital camera) will be made. All images must include a clearly visible graduated metric scale.

All photographs forming part of the record should be in sharp focus, with an appropriate depth of field. They should be adequately exposed in good natural light or, where necessary, sufficiently well-lit by artificial means.

### **Use of digital cameras**

Use a camera of 5 megapixels or more.

For maximum flexibility digital Single Lens Reflex cameras offer the best solution for power users. 6 megapixels should be considered a minimum requirement.

When photographing with digital SLR cameras, there is often a magnifying effect due to smaller sensor sizes.

If the JPEG (Joint Photographic Experts Group) setting is used, set the camera for the largest image size with least compression. The JPEG format discards information in order to reduce file size. If the image is later manipulated, the quality will degrade each time you save the file.

For maximum quality, **the preferred option** is that the RAW (camera-specific) setting is used. This allows all the information that the camera is capable of producing to be saved. Because all of the camera data is preserved, post processing can include colour temperature, contrast and exposure compensation adjustments at the time of conversion to TIFF (Tagged Interchangeable File Format), thereby retaining maximum photographic quality.

The RAW images must be converted to TIFF before they are deposited with the HER and TWAS because special software from the camera manufacturer is needed to open RAW files.

Uncompressed formats such as TIFF are preferred by most archives that accept digital data.

### **Post photography processing:**

The submitted digital images must be 'finished', ready to be archived.

Post photography processing workflow for RAW images:

- 1 Download images
- 2 Edit out unwanted shots & rotate
- 3 Batch re-number
- 4 Batch caption
- 5 Batch convert to TIFF
- 6 Edit in Photoshop or similar
- 7 Save ready to burn to CD
- 8 Burn to CD
- 9 Dispatch

Batch caption – the image files should be named to reflect their content, preferably incorporating the site or building name. Consistent file naming strategies should be used. It is good practice not to use spaces, commas or full stops. For advice, go to <http://ads.ahds.ac.uk/project/userinfo/deposit.html#filenaming>. In order to find images at a future date and for copyright the site or building name, photographer's name and/or archaeological unit etc must be embedded in the picture file. The date can be appended from the EXIF data. Metadata recording this information must be supplied with the image files. A list of images, their content and their file names should be supplied with the image files on the CDs.

Batch conversion to TIFF – any white balance adjustments such as 'daylight' or 'shade' be required then this can be done as part of the conversion process. Ensure that any sharpening settings are set to zero.

Edit in 'Imaging' software such as Photoshop – tonal adjustments (colour, contrast) can be made. Rotate images where necessary, crop them to take out borders, clean the images to remove post-capture irregularities and dust. Check for sensor dust at 100% across the whole image.

Save ready for deposit – convert to TIFF and save. Retain the best colour information possible – at least 24 bit.

If the JPEG setting has been used and the image has been manipulated in any way it should be saved as a TIFF to prevent further image degradation through JPEGing.

Burn to CD – the NMR recommends using Gold CDs. Use an archive quality disk such as MaM-E gold. Gold disks have a lower burn speed than consumer disks.

Disks should be written to the 'Single Session ISO9660 – Joliet Extensions' standard and not UDF/Direct CD. This ensures maximum compatibility with current and future systems.

Images should be placed in the root directory not in a folder.

The CD will be placed in a plastic case which is labelled with the site name, year and name of archaeological contractor.

### **For more guidance on digital photography:**

Digital Imaging Guidelines by Ian Leonard, Digital Archive Officer, English Heritage (22 September 2005)

Understanding Historic Buildings – A guide to good recording practice, English Heritage, 2006

Duncan H. Brown, 2007, “Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation”

IFA, Guidance on the use and preservation of digital photographs

FISH (Forum on Information Standards in Heritage), September 2006 v.1, A Six Step Guide to Digital Preservation, FISH Fact Sheet No. 1

Visual Arts Data Service and Technical Advisory Service for Images, Creating Digital Resources for the Visual Arts: Standards and Good Practice [http://vads.ahds.ac.uk/guides/creating\\_guide/contents.html](http://vads.ahds.ac.uk/guides/creating_guide/contents.html)

AHDS Guides to Good Practice – Julian Richards and Damian Robinson (eds), Digital Archives from Excavation and Fieldwork: Guide to Good Practice, Second Edition

### **Printing the images:**

In view of the currently unproven archival performance of digital data it is always desirable to create hard copies of images on paper of archival quality.

A selection of the images will be printed in the finished report for the HER, two images per A4 page.

When preparing files for printing, a resolution of 300dpi at the required output size is appropriate.

A **full set** of images will also be professionally printed in black and white and colour for submission as part of the site archive.

Use processing companies that print photos to high specifications. Commercial, automatic processing techniques do not meet archival standards and must not be used.

All prints for the archive must be marked on the back with the project identifier (e.g. site code) and image number.

Store prints in acid-free paper enclosures or polyester sleeves (labelled with image number)

Include an index of all photographs, in the form of running lists of image numbers

The index should record the image number, title and subject, date the picture was taken and who took it

The print sleeves and index will either be bound into the paper report or put in an A4 ringbinder which is labelled with the site name, year and archaeological unit on its spine.

## **Plans and drawings**

The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

## **2) Post-excavation and report production**

### ***Finds Processing and Storage***

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation.

Finds shall be recorded and processed in accordance with the IFA Guidelines for Finds Work

Finds will be assessed by an experienced finds specialist.

See 'Investigative Conservation. Guidelines on how the detailed examination of artefacts from archaeological sites can shed light on their manufacture and use', English Heritage, 2008.

Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information).

Industrial slag and metal working debris will be assessed by a specialist.

Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to “Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material.

If necessary, pottery sherds and bricks should be recommended for Thermoluminescence dating. See ‘Luminescence Dating: guidelines on using luminescence dating in archaeology’, English Heritage, 2008.

Inductively-coupled plasma spectroscopy (ICPS) and thin sectioning can be used to establish the chemical composition of clay fabric (pottery), which helps to locate production sites and identify the products of known sites.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA “Standard and guidance for the collection, documentation, conservation and research of archaeological materials”, 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication “First Aid for Finds” (Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication “Guidelines for the Preparation of Excavation Archives for Long-term Storage” (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – “A Strategy for the Care and Investigation of Finds”, English Heritage, 2003, “Finds and Conservation Training Package”, English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (07713 400387) where necessary.

## **PRODUCTS**

### **The report**

1. The Archaeological Contractor must produce an interim report of 200 words minimum, **two weeks after the completion of the field-work**, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.
2. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition (‘MAP2’) 1991 and Management of Research Projects in the Historic Environment (MoRPHE) 2006.
3. A full archive report or post-excavation assessment, with the following features should be produced **within six months of the completion of the field-work**. All drawn work should be to publication standard. The report must include:

\* Location plans of trenches and grid reference of site

- \* Site narrative – interpretative, structural and stratigraphic history of the site
- \* Plans showing major features and deposit spreads, by phase, and section locations
- \* Sections of the two main trench axes and through excavated features with levels
- \* Elevation drawings of any walls etc. revealed during the excavation
- \* Artefact reports – full text, descriptions and illustrations of finds
- \* Tables and matrices summarising feature and artefact sequences.
- \* Archive descriptions of contexts, grouped by phase (not for publication)
- \* Deposit sequence summary (for publication/deposition)
- \* Colour photographs of trenches and of archaeological features and finds
- \* Laboratory reports and summaries of dating and environmental data, with collection methodology.
- \* A consideration of the results of the field-work within the wider research context (ref. NERRF).
- \* Recommendations for further work on site, or further analysis of finds or environmental samples
- \* Copy of this specification

4. One bound and collated copy of the report needs to be submitted:

- for deposition in the County HER at the address on the first page.

Four digital copies (pdf of the report on CD) must be submitted:

- one for the commissioning client
- one for the planning authority (Sunderland City Council) – this must be formally submitted by the developer to the planning department with the appropriate fee.
- one for deposition in the County HER at the address below. This CD will also include all of the digital images as TIFFs and the accompanying metadata.

*PLEASE DO NOT ATTACH THE HER'S CD TO THE PAPER REPORT AS THEY ARE STORED SEPARATELY*

**The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.**

## **Publication**

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short report of, for example 20 pages, in a journal such as *Archaeologia Aeliana*, the *Arbeia*

Journal, Industrial Archaeology Review or Durham Archaeological Journal. This is merely to give the commissioning client an indication of potential costs.

**Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.**

### ***Archive Preparation and Dissemination***

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects {Brown, 2007, 1}.

The site archive (records and materials recovered) should be prepared in accordance with Managing Archaeological Projects, Second Edition, 5.4 and appendix 3 (HBMC 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, “Archaeological documentary archives” IFA Paper No. 1, “Archaeological Archives – creation, preparation, transfer and curation” Archaeological Archives Forum etc., Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and “Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation” by Duncan H. Brown, Archaeological Archives Forum, July 2007.

### ***Documentary Archive***

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form.

This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included.

All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft.

Do not fold documents

Do not use self-adhesive labels or adhesive or tape of any kind

High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H.

Do not ink over original pencil drawings.



Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes

Store documents flat

All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number.

All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents.

Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

### *Material Archive*

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects.

All artefacts and ecofacts retained from the site must be packed in appropriate materials.

All finds must be cleaned as appropriate to ensure their long-term survival

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively e.t.c. )

The archive should include all environmental remains recovered from samples or by hand, all vertebrae remains not used for destructive analysis, environmental remains extracted from specialist samples (such as pollen preparations in silicone oil).

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number

Use tie-on rot-proof labels where necessary

Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags

Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information

Use permanent ink on bags and labels

Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum (Tyne and Wear Museums).

Contact Alex Croom at Arbeia Roman Fort (0191 4544093).

A letter will be sent to the County Archaeology Officer within six months of the report having been submitted, confirming where the archive has been deposited.

### *Digital Archive*

Copy of the report on CD as a pdf plus all of the digital images as TIFFs.

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

### **Archaeology Data Service**

The digital archive including the image files can, if the appointed archaeologist and commissioning client choose to, be deposited with the ADS (The Archaeology Data Service) which archives, disseminates and catalogues high quality digital resources of long-term interest to archaeologists. The ADS will evaluate datasets before accepting them to maintain rigorous standards (see the ADS Collections Policy). The ADS charge a fee for digital archiving of development-led projects. For this reason deposition of the images with the ADS is optional.

Archaeology Data Service  
Department of Archaeology  
University of York  
King's Manor  
York  
YO1 7EP  
01904 433 954

Web: <http://ads.ahds.ac.uk>

### **SIGNPOSTING**

#### **OASIS**

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at <http://www.oasis.ac.uk/>. Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their

grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and your client understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or [oasis@english-heritage.org.uk](mailto:oasis@english-heritage.org.uk)). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or [oasis@ads.ahds.ac.uk](mailto:oasis@ads.ahds.ac.uk)). Or contact the Tyne and Wear Archaeology Officer at the address below.

### ***The tender***

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience
2. Details of any sub-contractors employed
3. A quotation of cost, broken down into the following categories:-
  - \* Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.
  - \* Post-excavation costs, incl. storage materials
  - \* Cost of Environmental analysis and scientific dating per sample
  - \* Estimated cost for full publication of results in an archaeological journal
  - \* Overheads
4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

### ***Monitoring***

*The Archaeological Contractor will inform the County Archaeologist of the start and end dates of the excavation to enable the CA to monitor the work in progress.*

*Should important archaeological deposits be encountered, the County Archaeologist must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.*

## **APPENDICES**

### ***1 Environmental Sampling, Scientific Analysis and Scientific Dating***

**This is a compulsory part of the evaluation exercise.**

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Advisor for Archaeological Science (07713 400387) **before** the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Scientific investigations should be undertaken in a manner consistent with “The Management of Archaeological Projects”, English Heritage 1991 and with “Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists”, English Heritage, 2004.

See also ‘Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post excavation’, English Heritage, second edition 2011.

<http://www.english-heritage.org.uk/publications/environmental-archaeology-2nd/>

English Heritage guidance documents on archaeological science can be downloaded as pdf files from [www.helm.org.uk](http://www.helm.org.uk) or [www.English-Heritage.org.uk](http://www.English-Heritage.org.uk) > Learning and Resources > Publications > Free Publications.

See also the Environmental Archaeology Bibliography (EAB):  
[http://ads.ahds.ac.uk/catalogue/specColl/eab\\_eh\\_2004/](http://ads.ahds.ac.uk/catalogue/specColl/eab_eh_2004/)

and the NMR sciences thesaurus:

[http://thesaurus.english-heritage.org.uk/thesaurus.asp?thes\\_no=560](http://thesaurus.english-heritage.org.uk/thesaurus.asp?thes_no=560)

There must be full specialist liaison throughout the project – this need not necessarily be face-to-face.

Sampling should be demonstrated to be both fit for purpose and in-line with the aims and objectives of the project.

The choice of material for assessment should be demonstrated as adequate to address the objectives.

Evaluations and assessment of scientific material should provide clear statements of their potential and significance in addition to descriptive records. These statements should relate to the original objectives but may also lead to new or modified objectives.

Post excavation analysis and interpretation requires sufficient information exchange and discussion to enable scientific specialists to interpret their material within the established intellectual framework.

Archaeological and scientific analyses should be integrated as fully as possible. It is not acceptable to leave the scientific analyses simply as appendices. Archive reports should include full data from all specialist materials. All reports, including any publications, must present sufficient primary data to support the conclusions drawn.

{From '10 principles of good practice in archaeological science' by English Heritage 2010}.

### ***Types of sample***

Flotation samples are used to recover charred and mineral-replaced plant remains, small bones, industrial residues etc. Such samples should be whole earth, 40-60 litres or 100% of small features. The flot mesh size should be 0.25-0.3mm. The residue sieve size should be 0.5-1mm. The flot and <2mm residue should be sorted under the microscope. >2mm residues can be sorted by eye.

Coarse-sieved samples are used to recover small bones (such as bird and fish), bone fragments, molluscs and small finds (beads, pottery, coins etc). Such samples should be 100 or more litres, wet or dry sieved, minimum mesh 2mm. Specialist advice is recommended.

Other types of sample are monoliths, specialist, cores and small spot. These are taken for specific reasons and need specialists.

### ***Aims and objectives***

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site? Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible. Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that sticky clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample.

The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of

the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Ceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

### ***Scientific Dating***

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic and Optically Stimulated Luminescence dating.

See 'Archaeomagnetic Dating: Guidelines on producing and interpreting archaeomagnetic dates', English Heritage, 2006 and

'Luminescence Dating: guidelines on using luminescence dating in archaeology', English Heritage, 2008.

Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998.

All tenders will quote the price of these techniques per sample.

For large excavations, particularly of prehistoric sites, a specialist scientific dating consultant must be part of the post-excavation assessment team. They will ensure that money set aside for dating is well spent, that the most appropriate soil samples are submitted for dating, that the right number of samples are submitted for dating. The expert will explain what to date and why. Don't send off samples for dating just for sake of it. The English Heritage Scientific Dating team (contact Pete Marshall) can provide contact details for scientific dating experts.

Once radiocarbon date results come back from the lab, avoid eyeballing your C14 dates. Modelling gives better date estimates.

AMS can now be used to date cremated bone.

### ***Pollen***

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing

and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

### ***Forams and diatoms***

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot samples.

### ***Insects***

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

### ***Industrial Activity***

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for micro-slugs (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium\_87 or strontium\_88 etc) and mineralogical composition.

See “Archaeomagnetic dating”, English Heritage, 2006

“Guidelines on the X-radiography of archaeological metalwork”, English Heritage, 2006.

Historical Metallurgy Society, 2008, “Metals and metalworking: a research framework for archaeometallurgy”.

Centre for Archaeology Guidelines on 'Archaeometallurgy' 2001.

'Science for Historic Industries: Guidelines for the investigation of 17<sup>th</sup> to 19<sup>th</sup> century industries', English Heritage, 2006.

### ***Buried soils and sediments***

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

See also 'Geoarchaeology. Using earth sciences to understand the archaeological record', English Heritage, 2007.

### ***Wood***

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Pre-excavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap on-site – plan, photograph, record the size and orientation of the wood (radial, tangential, transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used.

Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

### ***Leather and organic materials***

Waterlogged organic materials should be dealt with following recommendations in "Waterlogged Organic Artefacts – Guidelines on their Recovery, Analysis and Conservation", English Heritage, 2012 and "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

### ***Glass***

As glass-making furnaces are above ground structures, they rarely survive. However sample residues can produce glass fragments which define glass working even though no traces of furnaces survive.

Excavations at Whitby Abbey recovered glassworking waste from preliminary sampling. Targeted bulk sampling in subsequent years recovered more evidence for glass working. Raw glass, twisted rods of glass and a possible glass inlay for an illustrated book were found. Similar glass rods were found at St. Gregory's Minster at Kirkdale, North Yorkshire.



Analysis can find out where glass was imported from (a lot of Roman glass came from Alexandria).

Analysis of the composition of glass can show varying additives and salt composition. At Whitby Abbey the varying salt composition in glass throughout the Early Medieval period reflected climate change.

Is the glass made from recycled glass waste or raw materials?

Is there evidence of glass blowing?

English Heritage has guidance forthcoming in 2010.

## **2      *Animal Bone***

Animal bone can explore themes such as hunting and fowling, fishing, plant use, trade network, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, local environment.

Domestic animal bone was used in prehistoric and Roman cremation rituals.

Post medieval cattle bones – small cow bones invariably represent animals which produced high quality buttermilk for cheese. Big ‘improved’ cattle with large bones were produced for large quantities of meat and poorer quality milk. Large and small cattle bones are often found together on post medieval sites, usually with less of the small bones.

Animal bone assemblages should be assessed by a recognised specialist.

The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size). See “Ancient Monuments Laboratory Advisory Note, “Assessment of animal bone collections from excavations”, Sebastian Payne, 1991 and “The Assessment of a collection of animal bones”, S. Davis, n.d., Ancient Monuments Laboratory.

### **Fish bone**

Because fish bones are so small, particularly freshwater and estuarine species, they are often only recovered in large bulk samples. Samples must always be sieved.

Rescue excavations carried out in the 1970s at the Iron Age hillfort of Broxmouth in East Lothian produced an assemblage of fish bone. Recent analysis of this material has proved the presence of large specimens of ling and other species

which suggests that the Broxmouth population carried out deep-sea fishing. It has previously been suggested that Iron Age fishing would only have been undertaken by lines from the shore. It has also been suggested that fish was not consumed in Iron Age Britain due to religious or cosmological reasons {Hannah Russ, Ian Armit, Jo McKenzie, Andrew Jones, 2012, Deep-sea fishing in the Iron Age? New evidence from Broxmouth hillfort, South-east Scotland in Environmental Archaeology, Vol 17, Number 2, pp 177-184}.

Roman agenda – did the Romans eat fish? Were they sourced locally or imported? Use of fish as a sauce (garum).

Excavations at Bridge Street, Chester showed that in the Roman period fish was eaten and was both locally sourced and imported (mullet and Spanish mackerel).

Medieval and post medieval agenda – evidence for the deep sea fishing 'revolution', size-biased collections, replacement or supplement of freshwater and estuarine fish in the diet by deep sea fish.

There was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted.

Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones.

A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find.

Herring bones are so small that they can only be retrieved by 2mm sieving.

Clay soils are difficult to sieve, hot water can help.

Acidic soils mean poor preservation of bone.

See English Heritage 2002, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1.

Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York.

Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

[www.fishlab.org](http://www.fishlab.org)

### **3 Human Remains**

Human remains must be treated with care, dignity and respect.

Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

The excavation area must be shielded from public view with screens.

The excavation of human remains is a delicate and time consuming operation. The process can take one or two days per skeleton. If the skeleton cannot be excavated all in one day cover it with plastic sheeting overnight to prevent it from drying out. The remains should be excavated as completely as possible to give the bioarchaeologist the maximum amount of data.

A bioarchaeologist should be employed for any burial excavation from the start of the project.

A basic diagram of a skeleton should be available on site for staff to consult (such as that in Abrahams et al, 2008, McMinn's the human skeleton).

Once the top of a skeleton is reached, excavation will be undertaken using delicate tools such as paintbrushes, teaspoons, dental equipment and plasterers' leaves.

Recover all teeth, hand and foot bones.

Excavate the pubic symphysis of the pelvis with care as it is needed for age estimation of adults.

The ends of the ribs that meet the sternum are useful for age estimation of adults.

There will be a possibility that gall, bladder and kidney stones may survive. Sesamoid bones may be present in the hands and feet, calcified cartilages in the neck, on the ribs and on the hyoid bone in the neck.

Foetal bones may be present in the abdominal area of female skeletons.

The bones should be shaded from strong sunlight so they do not dry out and crack.

Bones should be drawn at 1:10 using a planning frame. Manual and digital photographs should be taken with a scale and a magnetic north arrow clearly visible. 3D recording using an EDM may be undertaken.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated

and inhumed human remains”, McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment.

Analysis of the osteological material should take place according to published guidelines “Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

There is a new (2013) English Heritage guideline for the destructive sampling of archaeological human remains for scientific analysis ‘Science and the Dead’.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards).

Radiocarbon dating can be used to chronologically phase burial grounds and track developments in demographic change and variations in the health of the population.

Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

AMS can now be used to date cremated bone.

Carbon and nitrogen stable isotope analysis can be used to study diet, usually to address broad questions about a wider population, rather than to study an individual. Most studies use 30 or more skeletons. Studies have included how social position influenced diet and how diet varied with geographic location.

Strontium and oxygen stable isotope analysis can be used to determine where individuals originated from.

The final placing of the remains after scientific study and analysis will be agreed beforehand.

*Health & Safety associated with human remains:*

Micro-organisms that might cause harm to humans are extremely unlikely to survive beyond about 100 Years.

More recent remains could be more hazardous to health as they may be in sealed lead coffins. Lead coffins should not be opened. They should be reburied intact without archaeological examination.

There is a danger of lead poisoning arising from high levels of lead in the atmosphere generated by lead coffins (see H. Needleman, 2004, Lead poisoning in Annual Review of Medicine, 55, pp. 209-22).

The possible risks of contracting disease from excavated human remains are highly negligible but could include the virus smallpox, tetanus and anthrax spores, the bacterial infection leptospirosis and the fungal disease mycoses (a problem in dry dusty soils and in crypts).

Excavators should be up-to-date with tetanus inoculations.

Anthrax can come from materials derived from animals – coffin pads, pillows or coffin packing.

Working with human remains may cause psychological stress (see J. Thompson, 1998, Bodies, minds and human remains, in M. Cox (ed) 1998, Grave concerns: Death and Burial in England 1700-1850, pp 197-201).

Normal hygiene measures should be undertaken – washing hands, wearing masks and gloves. Heavily soiled clothing should be burned at an HSE approved site.

Further guidance is available in:

“Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England”, The Church of England and English Heritage, 2005 ([www.english-heritage.org.uk/upload/pdf/16602\\_HumanRemains1.pdf](http://www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf))

“Church Archaeology: its care and management”, Council for the Care of Churches, 1999

Charlotte A. Roberts, 2009, ‘Human Remains in archaeology: a handbook’, CBA Practical Handbooks in Archaeology No. 19  
S Mays, 2010, The Archaeology of Human Bones, second edition

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel’s website:

<http://www.britarch.ac.uk/churches/humanremains/index.html>

or email the secretary [simon.mays@english-heritage.org.uk](mailto:simon.mays@english-heritage.org.uk)

#### **4 Treasure**

All finders of gold and silver objects, and groups of coins from the same finds, over 300 years old, have a legal obligation to report such items under the Treasure Act 1996. Prehistoric base-metal assemblages found after 1st January 2003 also qualify as Treasure.

Summary Definition of Treasure (Portable Antiquities Scheme [www.finds.org.uk](http://www.finds.org.uk) )

The following finds are Treasure under the Act, if found after 24 September 1997 (or, in the case of category 2, if found after 1 January 2003):

- Any metallic object, other than a coin, provided that at least 10 per cent by weight of metal is precious metal (that is, gold or silver) and that it is at least 300 years old when found. If the object is of prehistoric date it will be Treasure provided any part of it is precious metal.
- Any group of two or more metallic objects of any composition of prehistoric date that come from the same find (see below)
- Two or more coins from the same find provided they are at least 300 years old when found and contain 10 per cent gold or silver (if the coins contain less than 10 per cent of gold or silver there must be at least ten of them). Only the following groups of coins will normally be regarded as coming from the same find: Hoards that have been deliberately hidden; Smaller groups of coins, such as the contents of purses, that may have been dropped or lost; Votive or ritual deposits.
- Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure.

Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category.

Note: An object or coin is part of the 'same find' as another object or coin if it is found in the same place as, or had previously been together with, the other object. Finds may have become scattered since they were originally deposited in the ground.

If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or [Robert.Collins@newcastle.ac.uk](mailto:Robert.Collins@newcastle.ac.uk)) who can provide guidance on the Treasure Act procedures.

**If you need this information in another format or language, please contact Jennifer Morrison, Archaeology Officer.**

# PCA

---

## **PCA SOUTH**

UNIT 54  
BROCKLEY CROSS BUSINESS CENTRE  
96 ENDWELL ROAD  
BROCKLEY  
LONDON SE4 2PD  
TEL: 020 7732 3925 / 020 7639 9091  
FAX: 020 7639 9588  
EMAIL: [info@pre-construct.com](mailto:info@pre-construct.com)

---

## **PCA NORTH**

UNIT 19A  
TURSDALE BUSINESS PARK  
DURHAM DH6 5PG  
TEL: 0191 377 1111  
FAX: 0191 377 0101  
EMAIL: [info.north@pre-construct.com](mailto:info.north@pre-construct.com)

---

## **PCA CENTRAL**

7 GRANTA TERRACE  
STAPLEFORD  
CAMBRIDGESHIRE CB22 5DL  
TEL: 01223 845 522  
FAX: 01223 845 522  
EMAIL: [info.central@pre-construct.com](mailto:info.central@pre-construct.com)

---

## **PCA WEST**

BLOCK 4  
CHILCOMB HOUSE  
CHILCOMB LANE  
WINCHESTER  
HAMPSHIRE SO23 8RB  
TEL: 01962 849 549  
EMAIL: [info.west@pre-construct.com](mailto:info.west@pre-construct.com)

---

## **PCA MIDLANDS**

17-19 KETTERING RD  
LITTLE BOWDEN  
MARKET HARBOROUGH  
LEICESTERSHIRE LE16 8AN  
TEL: 01858 468 333  
EMAIL: [info.midlands@pre-construct.com](mailto:info.midlands@pre-construct.com)

---

