Archaeological Services
University of Durham

Otterburn Training Area, Northumberland
Options for Change Development

AS90/MLRS Project
archaeological investigations 2002-2005
post-excavation analysis report

on behalf of
RPS Group PLC

and
Mowlem plc

for
Ministry of Defence

Report 1284
January 2006

Archaeological Services
University of Durham
South Road
Durham DH1 3LE
Tel: 0191 334 1121
Fax: 0191 334 1126
archaeological.services@durham.ac.uk
www.durham.ac.uk/archaeologicalservices

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1. Summary

Introduction

1.1 This report presents the results of archaeological mitigation programmes conducted in advance of, and during, developments at the Otterburn Training Area (OTA) in the Northumberland National Park between 2002 and 2005. The majority of works were undertaken for the AS90/MLRS Project; additional archaeological investigations at the OTA were undertaken as required.

1.2 The AS90 Project pre-construction phase works included archaeological excavations at Bellshiel Roman Camp, Bellshiel Layby, Bellshiel Road (north and south), Potts Durtrees, Todlaw Pike, Dere Street and Outer Golden Pot; topographical surveys at Yatesfield East Settlement, Watty Bell's Cairn and Bellshiel Law Long Cairn and cairnfield; and building recording at Ironhouse bastle, Craig bastle and Raw bastle. These works were commissioned by RPS Group on behalf of the Ministry of Defence, and conducted by Archaeological Services Durham University in accordance with a specification provided by RPS and a project design prepared by Archaeological Services.

1.3 Additional works undertaken as part of this project, but subsequent to the 2002 investigations, comprised further recording at Redesdale Camp NAAFI, Raw and Craig bastles and a watching brief at Raw Farm.

1.4 The AS90 Project construction phase works included archaeological monitoring during road improvement and associated works, cable trench excavations and fence removal; evaluation and excavation at Davyshiel (Central Maintenance Facility); and evaluation and monitoring at Carrick Heights (Electronic Target Range). These works were commissioned by Mowlem plc on behalf of the Ministry of Defence, and conducted by Archaeological Services Durham University in accordance with specifications provided by Mowlem, RPS and White Young & Green (WYG), and project designs prepared by Archaeological Services.

Results

1.5 The background to the project is described in Part I of this report.

1.6 Part II presents the results of the 2002 excavations. For each excavation site there are four report sections describing the works as follows: Introduction; Summary of Phase 1: excavation; Summary of Phase 2: post-excavation assessment and UPD; Phase 3: Post-excavation analysis.

1.7 It has been possible to address the specific research objectives for each site. The radiocarbon dating programme has been particularly useful, except at Bellshiel Roman Camp where most of the dated materials appear to be re-worked or otherwise intrusive.

1.8 Additional works, subsequent to the 2002 investigations, are described in Part III of this report.

1.9 Part IV provides further information regarding archiving, publication and bibliographic references.

1.10 The results of the construction phase investigations have also been included in this report (Part V), in order to present all of the AS90/MLRS Project archaeological works in one report.

Part I: Introduction

2. Project background

2.1 In agreement with English Heritage and the Northumberland National Park Authority the Ministry of Defence (MoD) undertook to commission a programme of agreed archaeological mitigation measures (the "Agreed Measures") at the Otterburn Training Area (OTA) if the Inquiry into the Options for Change development proposals found in favour of the MoD. The MoD proposals were approved in 2001 and Archaeological Services Durham University were subsequently commissioned by RPS (acting for the MoD) to implement the pre-construction components of the Agreed Measures in accordance with a specification supplied by RPS.

2.2 The pre-construction archaeological works comprised excavations, topographic surveys and building surveys. Some of the archaeological works involved excavations at Scheduled Ancient Monuments, for which Scheduled Monument Consent was granted by English Heritage following approval of specific project designs.

2.3 This document comprises the Phase 3: Post-excavation analysis report for the pre-construction excavations, and should be read in conjunction with our previous assessment report (Archaeological Services 2004a) which detailed the:

- project background
- previous works
- aims and objectives of the current project
- methods statements for each component
- excavations
- artefactual and conservation assessments
- environmental evidence assessments
- results and analysis of the topographic surveys
- results and analysis of the building surveys
- Updated Project Design for Phase 3: Post-excavation analysis

Specification for the project

2.4 The Agreed Measures relating to the archaeological works were set out in a document presented to the Inquiry (MoD/P/8/A, Appendix B) and subsequently ratified in Condition 4.1 of the Secretary of State's decision. These can be summarised as follows:

- works required prior to construction
- works during construction
- restrictions on the construction contractors' methods or areas of working
- miscellaneous provisions
- completed measures

2.5 The specification supplied by RPS covered works identified at the Inquiry, together with pre-construction excavation at an additional site (Bellshiel Layby). The specification was subsequently modified, by the removal of the construction period Watching Brief, and so can be summarised as follows:

Component 1: Pre-construction investigations
Phase 1: Excavation works at:

- Bellshiel Roman Camp
- Bellshiel Layby
- Dere Street
- Potts Durtees Road
- Bellshiel Road North
- Bellshiel Road South
- Todlaw Pike
- Outer Golden Pot

Phase 2: Post-excavation assessment, Updated Project Design (UPD)

Phase 3: Post-excavation analysis, archiving and publication

Component 2: Construction period Watching Brief
This component was removed from the specification.

Component 3: Topographical surveys
Phase 1: Topographical survey at:

- Yatesfield Settlement
- Watty Bell's Cairn
- Bellshiel Law Long Cairn and cairnfield

Phase 2: Post-fieldwork analysis, archiving and publication

Component 4: Building surveys
Phase 1: Building surveys at:

- Craig bastle
- Raw bastle
- Ironhouse bastle

Phase 2: Post-fieldwork analysis, archiving and publication

2.6 The construction phase works ('Watching Brief') became the subject of a separate contract between Archaeological Services and Mowlem plc and the report is reproduced here in full (Part V of this report).

Dates

2.7 The various fieldwork components of the pre-construction project were undertaken between 24th June and 28th November 2002. The draft assessment report was prepared between November 2002 and April 2003 (Archaeological Services Report 974, April 2003), with revisions made up to May 2004 (Archaeological Services Report 1096). This post-excavation analysis report

was prepared between May 2003 and October 2005. Additional works attached to this project were undertaken in 2004 (Section IV of this report).

Personnel

2.8 **Excavation**

Neil Adamson	Paul Gelderd
Alex Beacock	Jane Gosling (Supervisor)
Catherine Bell	David Graham (Supervisor)
Amanda Brend	Sean Johnson
George Campbell	Kevin Moore
Catherine Chisman	Sarah Phillips
Mark Douglas	Andy Platell (Supervisor)
Keith Elliott	Daniel Still (Supervisor)
John Foulkes (Supervisor)	Matthew Town
Fred Garrett (Supervisor)	

Post-excavation

Sample/record processing	Mark Douglas, Jennifer Elam, Daniel Still
Plant macrofossils	Dr Jacqui Cotton, Dr Charlotte O'Brien
Pollen	Dr Rob Scaife, Dr Charlotte O'Brien
Conservation	Jennifer Jones
Glass	Daniel Still
Industrial residues	Phil Clogg
Lithics	Dr Mark White
Pottery	Dr Chris Cumberpatch, Dr Steve Willis
Topographic surveys	Jim Wright, Andrew Newton
Building surveys	Richard Annis, Mark Douglas

Reporting

Illustration	Linda Bosveld with Catherine Bell, Janine Fisher, David Graham, Martin Railton
Text	Duncan Hale with Mark Douglas and Richard Annis, Peter Carne, Jacqui Cotton, Chris Cumberpatch, Charlotte O'Brien, Andy Platell, Rob Scaife, Daniel Still, Steve Willis, Jimmy Wright
Project Management	Richard Annis, Peter Carne, Duncan Hale
Project Co-ordinator	Duncan Hale

2.9 Sadly, two colleagues passed away during the course of the project: Lt Col (Retd) Nick Cheesman of the MoD Project Sponsor Team (Catterick) on the 2nd October 2004 and George (Geordie) Campbell of Archaeological Services on the 21st December 2002.

Acknowledgements

2.10 Archaeological Services is grateful for the assistance of Rachel Morse (RPS Project Manager), David Freke of RPS Group, Lt Col (Retd) Nick Cheesman of the MoD Project Sponsor Team (Catterick), Niall Hammond (Defence

Estates) and Dr Rob Young (Northumberland National Park Authority). The following consultees are also gratefully acknowledged for their assistance:

Stan Beckensall	Rock art expert
Mike Bell	Defence Estates OTE
Professor Richard Bradley	University of Reading
Terry Carroll	Planning Consultant, NNPA
John Cocker	Riverdale Hall Hotel, Bellingham
Lt Col (Retd) Richard Cross	Project Liaison Officer, WYG
Dr Margarita Díaz-Andreu	University of Durham
Paul Frodsham	Archaeologist, NNPA
Mayda Henderson	RPS Durham
Iain Hewitt	University of Bournemouth
Jacqui Huntley	EH Scientific advisor
Mike McKendry	Land Agent OTE
Range Liaison staff	Range Control, HQ OTE
Dr Clive Waddington	Archaeological Research Services
Kate Wilson	EH Inspector of Ancient Monuments
Dr Moyra Wilson	University of Durham

Archive

2.11 The project code is OTA02 for Otterburn Training Area 2002, and the site codes are OBC02 for Otterburn Bellshiel Camp, OBL02 for Otterburn Bellshiel Layby, OBRN02 for Otterburn Bellshiel Road North, OBRS02 for Otterburn Bellshiel Road South, OPD02 for Otterburn Potts Durtrees, OTP02 for Otterburn Todlaw Pike, ODS02 for Otterburn Dere Street and OGP02 for Otterburn Outer Golden Pot.

2.12 The project archive is currently held by Archaeological Services Durham University and will be transferred to Miss Lindsay Allason-Jones for curation at the Museum of Antiquities, University of Newcastle upon Tyne, upon completion of the project.

OASIS

2.13 Archaeological Services is registered with the Online AccesS to the Index of archaeological investigationS project (OASIS). The OASIS ID number for these pre-construction investigations is archaeol3-9228.

3. The study area (Figure 1)

3.1 Otterburn Training Area occupies over 23,000 hectares of high moorland and rough hill country within the Northumberland National Park, adjacent to the England/Scotland border. It is the largest single live firing area in the UK and has been used for training military personnel since 1911. It is also a working estate with 31 tenanted farms practising traditional hill livestock farming.

3.2 The geology of the Training Area can be broadly divided into three sections. The northern part comprises a high plateau of volcanic lavas, typically covered by moor mat-grass and bracken. In the central part there is a high ridge of Fell

Sandstone, which forms the watershed between the Coquet and Rede valleys, and is typically covered with a thick blanket of heather. The southern section comprises more recent limestones, shales and thin coal seams. The pasture is better here, particularly on the limestone, although there are also areas of bracken, coarse grasses and heather.

3.3 Locations of 2002 excavations (Figure 1):

Excavation	*NGR*
Bellshiel Roman Camp	NY 8159 9971
Bellshiel Layby	NT 8098 0109
Bellshiel Road, N & S	NT 8124 0058, NT 8139 0021
Potts Durtrees	NY 8767 9795
Todlaw Pike	NY 9020 9593
Dere Street N of Redesdale Camp	NY 8252 9941
Outer Golden Pot	NT 8044 0725

3.4 The excavations at Outer Golden Pot were to enable recording and moving of the cross-base and were fully reported in the assessment report (Archaeological Services 2004a).

Part II: Results of Component 1: Pre-construction works

For each investigation site below there are four report sections describing the works as follows: introduction; summary of Phase 1: excavation; summary of Phase 2: post-excavation assessment and UPD; Phase 3: Post-excavation analysis.

Bellshiel Roman Camp

4. Introduction

Location and condition

4.1 Bellshiel Roman Camp (Scheduled Monument no. 20944) is located within the south-west part of the training area (NGR: NY 8159 9971). It lies *c*.350m to the west of Dere Street Roman road and is one of a cluster of Roman marching camps to the north of the Roman fort at High Rochester (*Bremenium*). Its defences survive as a bank, up to a height of 1.5m, and ditch, except on the south side, which may not have been ditched due to the shallow and outcropping rockhead here. Elsewhere parts of the earthworks have been modified by later field boundaries and ploughing. There is a prehistoric cairn within its boundary, and coal-mining activities have left traces of mounds and pits. Bellshiel Road cuts through its south-west corner for a distance of about 120m. Current land use is rough grazing.

Topography

4.2 Bellshiel Roman Camp is particularly large, measuring approximately 525m by 325m and covering *c*.17 hectares, aligned broadly east-west. Its location took advantage of a natural broad, domed summit, a defensive steep hillside at its west side, and to a lesser extent the north. To the south the ground is comparatively flat, with a gentle slope down to Redesdale Camp. There is a similar gentle slope down eastwards, towards Dere Street, and it is in this direction that the main gate of the camp faces. The outline of the earthen rampart has generally survived well apart from areas along the southern alignment and south-eastern corner.

Previous archaeological work

4.3 The site was originally surveyed by MacLauchlan in 1852. The RCHME resurveyed the camp in 1995 (Welfare & Swan 1995). The first known archaeological intervention was undertaken in 1996 and included a geophysical survey and evaluation trenching (LUAU/NUAP 1996). These works were commissioned by the MoD, in order to assess the nature, extent and survival of archaeological deposits in the area of the proposed road widening. Three trenches were excavated by hand; two across the lines of the south and west ramparts and a third between the ramparts, parallel with the existing road. The evaluation demonstrated that the bank of the camp survived, although only to a height of 0.2m. A masonry wall was identified traversing the top of the Roman bank and a preliminary interpretation associated this with post-medieval activities in the vicinity. The third trench alongside the road in the interior of the camp revealed no archaeological features, but did show how shallow any surviving stratigraphy is likely to be.

Specific research objectives

4.4 The following research objectives were specific to this site:

- Is there any further evidence pre-dating the Roman Camp (as indicated by the prehistoric mound), surviving within it or beneath the ramparts?
- Is there any evidence for the presence and character of the Roman use of the site?
- Is it possible to elucidate the nature and construction of the fort defences?
- Is there any evidence for exploitation of the environment before the camp was built?
- Do any palaeosoils or dating evidence survive beneath parts of the ramparts?
- Is there any evidence for resource consumption during the Roman period?
- Can the nature of the post-medieval exploitation of the area be elucidated?
- What is the date and function of the stone boundary wall?
- Will palaeoenvironmental evidence survive under the probable post-medieval field boundary constructed over the Roman camp rampart?
- What is the nature and extent of any early coal mining features within the area?

5. Phase 1: Bellshiel Roman Camp excavation (OBC02)

5.1 Scheduled Monument Consent was granted by English Heritage prior to any works at this site. A 5m wide by 160m long trench was located immediately adjacent to the eastern edge of the existing Bellshiel Road which traverses the marching camp (Trench 1). This was excavated for the length of the scheduled monument, with a sufficient distance outside the defences to enable them to be properly understood. In the south, this was restricted by the presence of the concrete bases of temporary buildings. A second trench was excavated to the east of Trench 1. This trench measured 9m x 6m, and was located to assess the condition of the southern rampart and to investigate the wall on top of the rampart (Trench 2). The trenches were excavated by hand, as it had been established during the evaluation that surviving features would be easily damaged or missed if the turf was removed by machine.

5.2 Parts of the southern and western ramparts of the marching camp were excavated as well as a ditch outside the western rampart. A buried soil was identified beneath the southern rampart and it was demonstrated that turfs from this old surface were used in the construction of the rampart, along with other materials that were readily available on site: sandstone and clay subsoils. A stone wall, almost certainly a former land boundary, was set into the top of the western rampart but it was not possible to confirm its suspected post-medieval date. Early coal mining and more recent features were also recorded. A number of incised zig-zag motifs were identified on the bedrock. These

were recorded and subsequently removed from site for safe storage during the road-widening works.

6. Phase 2: Bellshiel Roman Camp assessment & UPD

Assessment

6.1 No absolute dating evidence was recovered during the excavations, however, charcoal fragments were retained from selected contexts for radiocarbon dating. Each class of artefact and a number of sediment samples were assessed for their potential to provide further information.

6.2 As part of the post-excavation phase, ten contexts from the camp excavations were sampled for environmental assessment (Section 24 and Appendix 3, Tables 7a and 7b). These included a number of deposits from contexts associated with the ramparts. None of the samples contained any plant macrofossils, with the exception of one charred cereal grain from context [17] (within the southern rampart), which was too degraded to be identified. Contexts [35], a gully near the northern end of trench, and [81], a rampart layer comprising turfs, contained significant quantities of charcoal, providing evidence for either burning of the local heathland or indicating the direct deposition of fuel waste. Overall, the plant macrofossil remains from the camp are insignificant. This could be the result of poor preservation conditions, but could also be a consequence of limited agricultural activity and crop processing within and around such camps. No further analysis was recommended on these samples.

6.3 Samples from three contexts at the site were also assessed for their pollen content: contexts [28] and [29] from beneath the southern rampart, a possible pre-Roman ground surface, and context [81], a rampart deposit containing probable turfs. Pollen preservation was found to be moderate to good. All of the pollen samples demonstrated that the on-site and local environment was heathland, an *Erica* (heather) and *Calluna* (ling) dominated community growing on an acid podzolic soil. Pollen analysis showed that the turf [81] was taken from the surrounding heathland environment. Within [28] *Corylus* values of 35% implied some local growth of hazel. It is possible that this may be evidence for a scrub woodland phase which occurred after earlier extensive woodland clearance and prior to soil degradation which culminated in podzolisation and heathland development. Apart from the hazel pollen there was little evidence for nearby contemporary woodland. There was no indication of pastoral or arable agriculture, however, it should be recognised that for heathland to be maintained, grazing and/or burning must take place. Thus, grazing of this area is a strong possibility.

6.4 The pottery assemblage from Bellshiel Camp consisted of seven sherds. Only one sherd was identified as pre-dating the 18th century, a small chip of a later medieval reduced sandy ware. The remainder of the pottery was of 18th century and later date, the majority being of 19th to 20th century date. No further analysis was recommended on this assemblage.

6.5 One flint was recovered during the excavations, a fabricator from context 79. This is a typical type of tool found in the region during the Neolithic/Bronze Age periods. No further analytical work was recommended, but the lithic was to be illustrated as part of the post-excavation analysis phase.

6.6 A considerable assemblage of glass was recovered during the excavations, totalling 55 sherds; all were of modern bottle glass and required no further work. These have now been discarded.

6.7 Two undiagnostic fragments of iron-working slag were recovered from the topsoil at the site. No further analysis was recommended on this assemblage.

6.8 Several ferrous items were recovered from the topsoil and submitted for conservation assessment. While conservation requirements were highlighted, the finds all appeared relatively modern and of no particular significance and so no further work was recommended.

6.9 The small cut features in the rockhead must be considered as rock art. They were man-made, almost certainly incised using a sharp metal implement to create crisp, V-shaped, wavy channels. Rock art is a well-known phenomenon in Northumberland and is largely recognised to date from the prehistoric period. The rock marks identified at Bellshiel Camp, however, are unlike the known rock art of the region, which consists mostly of cup and ring designs. Consultation with various rock art experts suggested that the motifs at Bellshiel are probably not prehistoric and that there are no known parallels either in Britain or on mainland Europe. The date and purpose of the marks therefore remained unresolved. It was anticipated that the blocks would be re-sited close to their original locations after the road-widening works. An illustrated description and discussion of the rock art was to be included in the post-excavation analysis report and publication.

Updated Project Design

6.10 At the post-excavation assessment and UPD stage, the available resources and information were considered to have the potential to address the specific research objectives, with the exception of establishing a date for the stone wall on top of the Roman rampart, presumed to be a post-medieval boundary wall.

6.11 The other research objectives were to be realised by further discussion and interpretation of the resource; by the use of specific analysis techniques such as Accelerator Mass Spectrometry (AMS) radiocarbon dating, and by comparison with other camps in the area such as Birdhope 1, 2 & 3, Sills Burn North & South, Silloans, Featherwood East & West, Chew Green I & III, North Yardhope and Bagraw.

6.12 AMS dating of charcoal and degraded, charred grain from various deposits ([05], [16], [17], [21], [35], [69], [74] & [81]) was to be undertaken to provide dates for the rampart and pre-rampart ground surface (turf from which was used in the construction of the rampart), a ditch and an otherwise undated gully.

6.13 Following submission of a draft UPD it was agreed at a project meeting that additional pollen work would provide little added value.

6.14 The flint fabricator was to be drawn for inclusion in the final report.

6.15 The discovery of rock art here raised more questions, such as:

- Can any parallels for the motifs be found?
- When were they created and what was their purpose, if any?

6.16 The recommendations for post-excavation analysis of the rock art included continuation of the consultation and research exercise and illustration of the motifs.

7. Phase 3: Bellshiel Roman Camp post-excavation analysis

7.1 Following the post-excavation assessment the UPD did not recommend any further works on the plant macrofossils, pollen, ceramics, glass or slag. The flint fabricator recovered from the excavation has been illustrated (Figure 2). Radiocarbon dates have been obtained from a number of materials from this excavation and further conservation has determined the nature of one of the iron objects recovered from the topsoil.

Radiocarbon dating

7.2 The following materials (Table 1) were dated by Beta Analytic Inc. in Miami, Florida, using the Accelerator Mass Spectrometry (AMS) technique. The record sheets detailing the calibration of radiocarbon age to calendar years are provided in Appendix I.

7.3 Although each sample provided plenty of carbon for accurate measurements the dates produced cannot be used to date parts of the site. It appears that the only materials available and potentially suitable for dating (for the most part charcoal fragments) were in fact re-worked and re-deposited and the dates produced do not reflect the true dates of the contexts from which they were taken. For example, the charcoal dated from [05] in the southern rampart broadly corresponds to the early Roman period, however, other dates from the make-up of the rampart are either much earlier or much later. Whilst the dates can be explained by re-deposition and intrusion they do not help to date the construction or use of the camp.

Conservation

7.4 Further investigative conservation has been carried out on one of the iron objects recovered from the topsoil, the other objects (a bolt and plate fragments) being clearly modern. The X-ray of this object showed what was thought to be a pair of tweezers, but the D-shaped section and thickness of the material rules this out. The object appears in fact to be a highly corroded, small linchpin of unknown date. It has been part air abraded and part coated with 7.5% Paraloid B72 in acetone/toluene. The conservation record is provided in Appendix II.

Table 1. Radiocarbon dating results from Bellshiel Roman Camp excavation

Context no.	Context type	Material	Archaeological Services sample no.	Beta sample no.	Measured radiocarbon age	Conventional radiocarbon age	2 sigma calibration
05	Layer in S rampart F67	charcoal	OBC021	184071	2020 ± 40 BP	1980 ± 40 BP	Cal BC 50 to Cal AD 100
16	Layer in S rampart F67	charcoal	OBC022	184072	930 ± 40 BP	920 ± 40 BP	Cal AD 1020 to 1210
17	Layer in S rampart F67	charred cereal ?barley	OBC023	184073	1100 ± 40 BP	1040 ± 40 BP	Cal AD 910 to 920 & Cal AD 960 to 1030
21	Turf within 05, in S rampart F67	charcoal	OBC024	184074	1640 ± 40 BP	1630 ± 40 BP	Cal AD 350 to 530
35	Layer in gully F34	charcoal	OBC025	184075	2820 ± 40 BP	2790 ± 40 BP	Cal BC 1020 to 830
69	Layer in ditch F70	charcoal	OBC026	184076	2800 ± 40 BP	2770 ± 40 BP	Cal BC 1000 to 820
74	Upper fill of ditch F70	charcoal	OBC027	184077	630 ± 40 BP	610 ± 40 BP	Cal AD 1290 to 1420
81	Turf in S rampart F67	charcoal	OBC028	184078	2890 ± 40 BP	2860 ± 40 BP	Cal BC 1130 to 920

Environmental investigations

7.5 The few palaeoenvironmental and archaeobotanical studies which have been carried out in the area to date have limited our understanding of the past human impact on the Northumberland landscape. Also, those studies which have been undertaken have provided little environmental data due to poor preservation of remains (Huntley & Stallibrass 1995). In addition, the northern half of the Northumberland National Park has largely remained unstudied from a palynological point of view (Young 2004a). The pollen analysis carried out on three samples from Bellshiel Roman Camp confirmed acid conditions of the soil which allowed the preservation of relatively abundant pollen. These pollen assemblages give us a snapshot of the vegetation just prior to the construction of the rampart, presumably of Late Iron Age/early Roman date. The landscape is open, following woodland clearance, and is dominated by heathland vegetation. Grazing or burning may have taken place in order to maintain this heathland. Moores & Passmore (1999) suggest that at Bloody Moss (also in the Northumberland National Park) there is evidence for forest clearance using fire in order to promote heather growth for grazing animals.

7.6 There is little evidence from either the pollen or plant macrofossils that cereals were being cultivated, processed or stored locally, however this may in part be due to poor preservation and low cereal pollen production. The lack of arable farming stands in contrast with the results of some palynological analyses, for example by Topping (1989), which provides evidence for extensive prehistoric agricultural activity in Northumberland. However, other Roman sites from northern England have shown clearance episodes which are not accompanied by cereal cultivation, for example sites near Hadrian's Wall studied by Dumayne & Barber (1994). These clearances may relate to the building of the wall or to pastoral farming activities and the pollen data from Bellshiel Roman Camp provide evidence of abundant heathland which could only have persisted in the presence of periodic grazing or burning. Pollen analysis from Scotland suggests that the Roman occupation had little impact on farming in the Borders (Tipping 1994a). Moores (1999) and Moores & Passmore (1999) also suggest that arable agriculture in the Northumberland National Park was not more extensive during the Roman period than the Iron Age. In addition, there is pollen evidence from South Heddon in the Eastern Cheviots which suggests that local agriculture became less intense during the Romano-British period (Allen & Huntley 2004). The evidence affirms conclusions drawn by Huntley & Stallibrass (1995) that cereal cultivation in northern England during the Roman period saw episodes of expansion and decline and that there appear to be significant differences in the palaeobotanical evidence between military and civilian/rural sites.

7.7 Despite poor preservation of the plant remains, the reconstruction of the landscape at Bellshiel offers valuable information on the vegetation communities, extent of woodland cover and agricultural activity in an area where little such information is available. Further sites are needed to provide a clear picture of prehistoric agricultural activities in this area. The debate regarding the impact of the Romans on local agricultural practices continues.

Rock art

7.8 Although rock art is a well-known phenomenon in Northumberland and is largely recognised to date from the prehistoric period, the motifs identified at Bellshiel Camp (Figures 3 & 4) are unlike the known rock art of the region, or indeed elsewhere in Britain or on mainland Europe. Following continued consultation with experts in this field, there are still no known parallels for the Bellshiel motifs. At present all that can be said is that these small cut features in the sandstone rockhead were man-made, almost certainly incised using a sharp metal implement to create crisp, V-shaped, wavy channels. They are considered unlikely to be prehistoric. The date and purpose of the marks therefore remains unresolved.

7.9 Since the carvings could have been destroyed by the development works if left *in situ*, they were removed for safe temporary storage with Archaeological Services. The extraction involved the cutting and removal of the host stone blocks by professional quarry personnel. At the request of RPS the blocks were re-set in the ground in April 2004, on the eastern side of the temporary fence erected for the road-widening works. Those works were still in progress at the time. The stone blocks were oriented as originally found, set flush with the ground surface and with turf replaced around the edges. Modern coins and waterproof identifier labels were placed under each stone block.

F18 & F31 after re-siting at Bellshiel Camp

F20 after re-siting at Bellshiel Camp

Discussion

7.10 Despite the paucity of artefactual, environmental and dating evidence from the site, a number of specific research questions can now be answered. In addition to the prehistoric cairn close to the excavation, prehistoric activity in the area was attested to by a flint fabricator, a lithic tool typically used in the Neolithic/Bronze Age. Pollen evidence recovered from a turf used in the construction of the southern rampart, and from a possible pre-Roman land surface beneath the rampart, indicated that the local late prehistoric environment was heathland with limited hazel scrub prior to the construction of the camp. There was insufficient material to provide a date for the possible pre-Roman ground surface. However, for the heathland to have been maintained in those pre-Roman times either grazing or burning, or both, must have been taking place. Indeed significant quantities of charcoal were present in some rampart contexts. This implies that the later prehistoric landscape continued to be managed after the initial woodland clearance, and prior to the arrival of the Roman army.

7.11 No evidence for resource consumption in the Roman period was recovered. The only charred cereal grain from the whole excavation was a possible barley grain from a silt layer within the southern rampart, however, the grain is considered to be a later intrusion as AMS dating provided a 10th century AD date.

7.12 The nature of the camp's defences, within the limit of the excavation, was determined. As might be expected, the ramparts were constructed from materials that were readily available on site: sandstone, clay and turf. A ditch

was present on the western side of the camp but not on the southern side, perhaps due to the shallow rockhead there. A stone wall set in the top of the western rampart is believed to be a post-medieval boundary, although it was not possible to confirm the date.

7.13 Bellshiel Roman camp is one of a group of Roman camps located to the north of the Roman fort at High Rochester (*Bremenium*). The camps are closely associated with the route of the line of Roman Dere Street and it would seem that they were intended for the use of troops on the march (Welfare & Swan 1995). In terms of its size, Bellshiel camp falls into the category of larger camps as recorded by the Royal Commission in 1995. Some of the other camps located in this area are of comparable size, such as Silloans, and the two camps at Featherwood. However, the large size of these camps does not appear to be something that is unique to this area of Britain, as camps at the larger end of the scale are also found at Swindon and Greensforge in Staffordshire and Uffington and Norton in Shropshire.

7.14 There are two surviving entrances through the defences at Bellshiel. The position of the gate at the midpoint of the eastern rampart is marked by an outlying ditch of a traverse type entrance. On the southern rampart a gate is defended by an internal *clavicula*. The use of two distinct types of gateway within the same camp is not a common feature of Roman marching camps; one other example survives at Seatside I in Northumberland, although here the variation may be due to re-use and re-modelling (*ibid*.). At Chapel Rigg and Glenwhelt Leazes, both in Northumberland, an amalgamation of both forms of gateway defence is used, with *claviculae* being further protected by external traverses. The use of both forms of entrance at Bellshiel may, as is suggested for Seatside I, point to re-use and re-modelling.

7.15 The damage caused to the ramparts by later agricultural activity at Bellshiel is a common feature of these forms of structures. One of the recurring characteristics of Roman camp locations is that they were often located on fairly even ground, suitable for cultivation. This point is well illustrated by the five consecutive Roman military structures located within a concentrated area at Chew Green, just to the north of Bellshiel. The multiple re-use of the site, it would appear, is due to the fact that it is the only area of level ground in the vicinity of this strategically important location. Bellshiel is situated on a gently sloping hillside, which was ideally suited for later arable cultivation. For a limited period much of the landscape here was cultivated and the interior of the camp is covered with medieval ridge and furrow remains. In addition the camp is traversed by a number of later boundary banks, most probably associated with the laying out of the medieval and later field systems. These boundary banks also take advantage of the surviving Roman banks in regulating the areas of cultivation. Again this is a frequently encountered feature of the later use of Roman camp sites and is evident at Willowford and Plumpton Head in Cumbria and at Swine Hill, Silloans, Seatside, Markham Cottage and Burnhead in Northumberland. In upland areas the period relating to arable production was limited, due to the change to pastoral agriculture in the later medieval/post-medieval periods, whereas in more lowland areas arable agriculture continued to be the main form of production. In lowland

areas the fragile nature of camp construction meant that they eventually succumbed to the pressure of repeated ploughing; for the most part they now only appear as cropmarks. However, in some lowland situations, as at Upper Affcot in Shropshire, the ramparts continued in use as field boundary markers and their courses have been preserved in later hedgerows.

7.16 The insubstantial and temporary nature of the construction of these camps lends them an inherent susceptibility to damage, both from natural processes and agricultural practices. Nevertheless, the body of known Roman marching camps in England constitutes an internationally important archaeological resource (*ibid*.). The main concentrations of evidence come from areas of more marginal landscape, such as the upland moors of Northumberland, were the destructive processes have had less of an impact. The earthwork remains of Roman marching camps in Northumberland represent visible evidence of the Roman army's first incursion into new territory. Although occupation of the camps is believed to be short-lived, it is not clear whether these earth bank and ditch enclosures were employed by troops as overnight stopping places or if they were regularly re-occupied strategic centres during the course of a seasonal campaign (*ibid*.).

7.17 The usual form taken by these camps was rectangular with rounded angles, or, as is it often described, the 'playing card' shape. Other forms do occur, ranging from rhomboidal to square. It appears that these deviations from the standard form can be attributed to factors involving the size of the force involved in their construction, the topographic situation of the camp, whether the preferred layout was restricted in any way by landscape features, and the personal inclination of the Roman surveyor/surveyors involved in the original setting out of the camp prior to construction. The usual method of construction is relatively simple, the most basic form consisting of a turf bank broken by gates. In some instances the bank is surrounded by an external ditch, in which case the rampart can be found to contain not only turfs but also the upcast from the excavated ditch (*ibid*.).

7.18 The size of camp varies widely, ranging from the largest camps enclosing an area of between 15 to 24ha, down to very small structures of less than 1ha. The size of the enclosure, it is reasonable to assume, relates directly to the number of troops involved in their construction, occupation and effective defence. The smaller camps have often been regarded as evidence of Roman military training exercises in the art of camp construction. However, they may equally represent the movement of smaller numbers of troops on regular military operations (*ibid*.).

7.19 It would seem that there are many variables to be taken into consideration when examining the evidence offered by the surviving Roman marching camps. The one thing that most Roman camps appear to have in common is that, besides the ramparts themselves, very little evidence of activity or occupation survives.

7.20 Layers of dumping containing a high proportion of coal waste were identified in the northern part of the excavation. These were almost certainly derived

from the post-medieval exploitation of coal here; a bell-shaped crop pit was located immediately north-east of the dumped waste.

7.21 There is much evidence for coal mining on the Otterburn Training Estate though this is largely concentrated in the east and south-east. In the western part of the Estate, where there are fewer coal seams, there are typically only small clusters of two or three crop pits (Charlton 1996). The mine workings at Bellshiel are first shown on Warburton's 1719 Map of Northumberland. Charlton records 11+ crop pits and 6+ waste heaps here (*ibid*.).

7.22 The development of the coal industry in Upper Redesdale was prompted by a number of factors:

- the need for domestic fuel after the late 17th century when the wooded areas were depleted
- the practice of burning lime for land improvement at the end of the 18th century required regular quantities of coal
- the cost of acquiring coal from the Tyneside coalfield was prohibitive
- the potential market for coal in southern Scotland in the early 19th century
- coal and limestone were needed for other industries in the region such as iron smelting at Ridsdale and Hareshaw, and for the firing of the brick and tile kilns in Upper Redesdale in the mid-19th century (Day & Charlton 1981)

7.23 Given the above it is perhaps surprising that there was not more post-medieval exploitation of the local coal resources.

Bellshiel Layby evaluation (OBL02)

8. Introduction

Location and condition

8.1 The site is located within a loop of the layby immediately west of Bellshiel Road (NGR: NY 8159 9971) at a height of 298m OD, and comprises a low circular earthwork that could be a prehistoric structure or the result of more recent activities. The earthwork is situated at the top of a scarp with wide-ranging views from the south-east around to the north-west and has an opening to the south-east, approximately 2m wide. The feature is on the edge of the proposed Gunspur 45 and could be adversely affected by the construction and use of the gunspur. The site is currently unfenced and used as rough grazing.

Previous archaeological work

8.2 The characteristics and chronology of the earthwork are unknown, as it has not previously been subject to an evaluation. The site was surveyed by WJ Ford in 1997–98, who designated it "F3" and described it as a penannular enclosure 11m in diameter, partly earth-covered but constructed of stone. Ford reported that a modern fence had been constructed on the top of the earthwork, however, this must have been removed shortly after it was erected as no trace survived within the current trench.

Specific research objectives

8.3 The following research objectives were specific to this site:

- What is the character, date, preservation and potential of the feature?
- If the feature is prehistoric, does it contain any archaeobotanical data which will enhance our understanding in line with the generic research objectives for this period?
- To propose a scheme of full excavation, if appropriate, with research objectives, to record the earthwork in full and its context

9. Phase 1: Bellshiel Layby evaluation (OBL02)

9.1 The trench was aligned roughly north-south, measuring 15m x 2m and placed so as to sample the bank, exterior and interior of the enclosure. The trench was de-turfed by hand. The interior of the earthwork was slightly hollowed, and when excavated the topsoil thinned out as it approached the centre. Outside the earthwork, above the natural bedrock and subsoil, was a spread of sand overlain by a tumble of large, rough, weatherworn stones. This layer of stones appeared to continue around the entire earthwork, as surface undulations were visible all around the feature. The bank of the earthwork measured up to 0.7m in height and 12.7m in diameter, with a single 2m wide entrance in the south-eastern part of the circuit. The makeup of the bank consisted of a black humic silty loam layer, which was overlain by a light brown sand deposit with stone inclusions. The stones visible in the bank lay at random angles and did not appear to have been placed in any uniform manner. No foundation cuts were identified associated with the structure, nor any dating evidence for its

construction. The only artefact recovered during the excavation comprised a fragment of modern land drain from a sand deposit within the enclosure.

10. Phase 2: Bellshiel Layby assessment & UPD

Assessment

10.1 The function of this earthwork was not determined by the evaluation trench. The stone deposit outside the earthwork did not comprise the types of stones used for other sheepfolds in the area, in that the stones are not faced and there are no small wall stones.

10.2 Samples from two contexts were assessed for their potential to provide environmental information. The base layer within this mound, context [02], contained charcoal, coarse organic matter, root material and insect fragments. The coarse organic matter could imply a buried soil, although no waterlogged or charred macrofossils that could confirm this were preserved. Pollen from this context was also assessed. The sand layer [06] within the mound included root material and insignificant quantities of charcoal, neither of which could further the interpretation or chronology of the earthwork.

10.3 The single pollen sample was from the top of a possible buried soil/old land surface [02] of unknown date. Pollen was well-preserved within this context. The dominance of ling (*Calluna*) clearly showed that heathland was dominant on the site prior to the burial of the soil (i.e. the construction of the monument). There were also indications of local birch and hazel scrub woodland and grassland pasture.

10.4 It is likely that evidence regarding the function and date of the feature, and evidence pertinent to the other research objectives for this site, would only be recovered by total excavation.

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10.5 At the post-excavation assessment and UPD stage, the available resources and information were considered unlikely to have the potential to address the specific research objectives.

10.6 AMS dating of material from [02] was recommended establish a *terminus post quem* for the feature.

10.7 Following submission of a draft UPD it was agreed at a project meeting that additional pollen work would provide little added value.

11. Phase 3: Bellshiel Layby post-excavation analysis

Radiocarbon dating

11.1 The following material (Table 2) was dated by Beta Analytic Inc. in Miami, Florida, using the Accelerator Mass Spectrometry (AMS) technique. The record sheet detailing the calibration of radiocarbon age to calendar years is

provided in Appendix I. The sample provided plenty of carbon for accurate measurement.

Table 2. Radiocarbon dating result from Bellshiel Layby evaluation

Context no.	Context type	Material	Archaeological Services sample no.	Beta sample no.
02	Basal layer of bank F09	charcoal	OBL021	184079

Measured radiocarbon age	Conventional radiocarbon age	2 sigma calibration
360 ± 30 BP	270 ± 30 BP	Cal AD 1520 to 1580 & Cal AD 1630 to 1660

Environmental investigations

11.2 Plant remains were not preserved in either of the two contexts assessed from the circular earth/stone mound at Bellshiel Layby. The coarse-grained, aerobic nature of the sand deposit would have provided poor conditions for preservation. The organic deposit may have been laid down under waterlogged conditions which allowed the preservation of pollen and the chitinous exoskeletons of insects. The lack of plant macrofossils, however, suggests that it may have been only partly waterlogged and subject to periods of drying out. The absence of plant macrofossils prevents conclusions being drawn about the feature or about the land-use and economy of the site. The pollen implies an open landscape dominated by heathland at the time of the construction of the mound. There is no evidence for cereal cultivation, however this may be due to poor conditions for preservation. Pollen of grasses and ribwort plantain may suggest that pastoral farming was carried out in the area. There are indications of nearby birch and hazel scrub woodland.

Discussion

11.3 Analysis of the charcoal from the basal layer of the bank provided a post-medieval date. If this is the true date for the enclosure it would appear that the site probably was a sheepfold, corresponding to the introduction of sheep farming in the later medieval/post-medieval periods. Although the stone tumble around the earthwork did not contain the types of stones used for other sheepfolds in the area (in that the stones are not faced and there are no small wall stones) it is likely that this was a more rudimentary version.

11.4 Another possible interpretation of this site is that is was constructed as a look-out post or gun-post for use in military training.

11.5 It is understood that this feature will not now be damaged by the construction or use of Gunspur 45, as revised development proposals show the gunspur further away than originally planned.

Bellshiel Road North excavation (OBRN02)

12. Introduction

Location and condition

12.1 The excavation was located over the area containing the Newcastle University evaluation trench "3XI" (LUAU/NUAP 1997) on the east side of Bellshiel Road, midway between Bellshiel Layby and Bellshiel Roman Marching Camp (NGR: NT 8124 0058). The site lies at a height of *c*.262m OD. The area showed little sign of any archaeological significance on the surface although the evaluation trench was laid out across an apparent field bank. The area is presently open and used for rough grazing.

Previous archaeological work

12.2 There had been no archaeological excavation on the present site prior to the evaluation trench in 1997. The evaluation trench was commissioned by the MoD in order to assess the impact of the proposed road widening on surviving archaeology in the area. Trench "3XI" revealed evidence that there had been human activity in the vicinity, in the form of an earthen bank and a possible kiln or hearth. A medieval date was suggested based on documentary indications but the evaluation did not clarify this.

Specific research objectives

12.3 The following research objectives were specific to this scheme:

- What is the character, construction and date of archaeologically significant features?
- Are any of the linear features/banks boundary features, and to what do they relate? Are they contemporary with the other features?
- What is the function of the kiln/hearth and how does it relate to other features on the site?
- Is it possible to obtain absolute dating evidence for these features?
- What type of crops were being exploited in this rural landscape?
- What type of processing was conducted here and what is its relationship with nucleated and/or urban settlement?
- How do the results compare with data obtained from other medieval deposits along Bellshiel Road, Potts Durtrees Road and elsewhere in Northumberland?

13. Phase 1: Bellshiel Road North excavation (OBRN02)

13.1 A trench measuring 50m by 5m was excavated in the area of the evaluation trench, on the east side of the modern road ditch alongside Bellshiel Road. The topsoil was removed by mechanical excavator under close archaeological supervision. All subsequent excavation was undertaken by hand.

13.2 Two features were identified cutting into the subsoil. The first was a shallow pit [F53], sub-rectangular in plan, which measured 2.5m in length, 1.7m in width and 0.24m in depth. This was filled by a varied dark brown to black silty

clay [52] containing a series of lenses of ash and 3% charcoal inclusions. This deposit was assessed for its potential to provide evidence regarding function, as well as environmental and dating evidence. On the base and edges of the pit red scorching was apparent, presumed to be the result of dumping hot ash into the pit.

13.3 A linear slot had been cut into the north-eastern part of the pit and had been backfilled with re-deposited clay subsoil. Some disturbance was also noted at the north-western edge of the pit. Both of these intrusions formed part of the 1996 evaluation by NUAP (LUAU/NUAP 1997, Figure 18).

13.4 The second feature was a possible field drain or similar agricultural feature, and traversed the trench on an approximate north-south alignment [F59].

13.5 A low linear bank [F78] was identified traversing the central part of the trench, on an east-west alignment and comprised of re-deposited clay subsoil with occasional charcoal flecking. The bank measured 0.95m in width and up to 0.3m in height and was probably a former field boundary.

14. Phase 2: Bellshiel Road North assessment & UPD

Assessment

14.1 Three features were identified in the trench including a pit, linear drainage gully or agricultural feature and a low linear bank. No artefacts were recovered during the excavation. At the post-excavation assessment stage, the available resources and information were considered to have the potential to address most of the research objectives for the site.

14.2 Pit fill context [52] was sampled and assessed for its potential to provide environmental, economic and dating information. The large flot was dominated by modern root material, although a small quantity of charcoal and a single charred hazelnut fragment were preserved. Hazelnuts have commonly been utilized as a food source since the Mesolithic period, although a single find is not significant and provides no definite interpretation as to the function of the pit. The pit may have been used as an oven or rudimentary kiln, or at least had hot materials deposited within it. The burning around the edges and base of the cut did not reach a high enough temperature to enable dating by archaeomagnetic methods, however, carbonised materials recovered from the fill could be used to provide ^{14}C dates.

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14.3 A few features were identified in the excavation, including a pit with signs of burning. The archaeological resource was considered to have the potential to answer some of the stated objectives. The research objectives were to be realised by further discussion and interpretation of the resource, by comparison with similar sites including Bellshiel Road South and Potts Durtrees Road, and by the use of AMS dating on materials from the fill of the pit [F53/52].

15. Phase 3: Bellshiel Road North post-excavation analysis

15.1 Following the post-excavation assessment the UPD did not recommend any further works on the plant macrofossils. No artefacts were recovered during the excavation. A radiocarbon date was obtained from one context.

Radiocarbon dating

15.2 The following material (Table 3) was dated by Beta Analytic Inc. in Miami, Florida, using the Accelerator Mass Spectrometry (AMS) technique. The record sheet detailing the calibration of radiocarbon age to calendar years is provided in Appendix I. The sample provided plenty of carbon for accurate measurement.

Table 3. Radiocarbon dating result from Bellshiel Road North excavation

Context no.	Context type	Material	Archaeological Services sample no.	Beta sample no.
52	Fill of pit F53	Hazelnut shell	OBRN021	184080

Measured radiocarbon age	Conventional radiocarbon age	2 sigma calibration
2430 ± 40 BP	2510 ± 40 BP	Cal BC 790 to 500 & Cal BC 460 to 430

Environmental investigations

15.3 Environmental assessment of the pit fill at Bellshiel Road North uncovered a charred hazelnut shell which has been dated to the early/middle Iron Age by radiocarbon dating. Hazelnuts formed a large part of the diet in Britain during the Mesolithic in accordance with the culture of hunting and gathering. Caches of hazelnut shells have been recovered from Mesolithic middens such as those at Star Carr in North Yorkshire (Clark 1954). The introduction of domesticated animals and crops in the Neolithic reduced the dependence on wild foods, however hazelnuts remained an important food source. Pits dominated by hazelnut fragments are a common feature of Neolithic sites throughout Britain (Moffett, Robinson & Straker 1989) and these are considered to represent a stored food resource (Huntley & Stallibrass 1995).

15.4 The Bronze Age and Iron Age saw the expansion of agricultural practices that began in the Neolithic, which further reduced the amount of wild foods being consumed. Although cereals formed the staple diet from the Bronze Age, low numbers of hazelnuts have been recorded at sites in northern England of both Bronze Age and Iron Age date, which suggests that hazelnuts were still used as a supplementary food source. Such sites include a Late Bronze Age round-house at Hallshill, Northumberland (van der Veen 1992) and an Iron Age hill-fort at Dod Law, Northumberland (Smith 1988).

15.5 The find of a charred hazelnut at Bellshiel Road North indicates that here also, hazelnuts may have remained an important part of the diet. As only one shell was recovered, it is unlikely that the pit was used for food storage as was common in the Neolithic. As ash and charcoal were also found in this context, the shell was probably dumped into the pit with other domestic waste.

Discussion

15.6 Analysis of the charred hazelnut shell fragment from within the pit provided an early/middle Iron Age date. Given the scorching on the base and edges of the pit, and the lenses of ash and charcoal within, it seems probable either roasting took place in the pit, or that fuel waste from roasting was deposited in the pit in the Iron Age.

15.7 The archaeological resource here was otherwise very limited, with no other plant macrofossils or artefacts and the only other features being a recent drain and a former field boundary. A medieval date has been suggested for the boundary, based on documentary indications (LUAU/NUAP 1997).

Bellshiel Road South excavation (OBRS02)

16. Introduction

Location and condition

16.1 This excavation was located at on the east side of Bellshiel Road (NGR: NT 8139 0021), *c.*350m north of Bellshiel Roman Camp and 500m to the south of the Bellshiel Road North trench. The land here comprised very wet, rough pasture, at a height of *c.*245m OD, and contained a low earthen bank. The excavated area contained the evaluation trench "2F" (LUAU/NUAP 1997).

Previous archaeological work

16.2 There had been no archaeological excavation on the site prior to the evaluation trenching in 1997, commissioned by the MoD to assess the impact of the proposed road widening on archaeological remains in the area. The evaluation identified parallel linear features including a ditch and gully with upcast banks, and a scatter of sandstone overlying a pit filled with burnt materials. 17 sherds from one jug of 13th-14th century date were recovered from the pit (LUAU/NUAP 1997). It was concluded that this evidence pointed to medieval activity in the area and more particularly to the period prior to the commencement of the Anglo-Scottish wars in 1296 (*ibid.*).

Specific research objectives

16.3 The following research objectives were specific to this scheme:

- What is the character, construction and date of archaeologically significant features?
- Are any of the linear features boundary markers, and to what do they relate? Are they contemporary with the other features present?
- Is it possible to ascertain the function of shallow scrape identified in the evaluation and how does it relate to other features on the site?
- Is it possible to obtain absolute dating evidence for these features?
- What type of crops were being exploited in this rural landscape?
- What type of processing was conducted here and what is its relationship with nucleated and/or urban settlement?
- How do the results compare with data obtained from the medieval deposits elsewhere along Bellshiel Road, Potts Durtrees Road and elsewhere in Northumberland?

17. Phase 1: Bellshiel Road South excavation (OBRS02)

17.1 A trench measuring 50m by 5m was excavated in the area of the evaluation trench, on the east side of the modern road ditch alongside Bellshiel Road. The topsoil was removed by mechanical excavator under close archaeological supervision. All subsequent excavation was undertaken by hand.

17.2 The excavation identified a number of archaeological features including ditches, gullies, postholes, possible occupation spreads and a possible sequence of crude hearths, or at least the dumping of burnt materials.

17.3 The base of a V-shaped ditch [F30] was identified, cutting the natural subsoil and traversing the central part of the trench on an approximate east-west orientation. This measured 0.6m in width, 0.25m in depth and was filled by a waterlogged, gleyed deposit [29] with iron panning and angular yellow sandstone inclusions. A shallower, broader re-cut of the ditch was identified [F09], which had removed all but the base of the earlier ditch [F30]. The lower fill of the re-cut consisted of grey/brown silty clay [28], laminated by mineral panning. This was overlain by a band of humic silt 10mm deep [27]. Above this was the upper ditch fill, a gleyed sandy silty clay [26]. This context contained iron-pan laminations and stones of various sizes.

17.4 A narrow band of dark grey/black humic silt up to 10mm in depth [36] overlay the clay subsoil to the south of the ditch [F09]. This was overlain by a dark brown silty loam, with charcoal flecking throughout [08], up to 0.30m in depth. On the northern side of the ditch the natural subsoil was directly overlain by a layer of pale yellow/white silty sandy clay with frequent charcoal flecks throughout [12]. The southern part of this layer appeared in section as the basal layer of a broad, low bank in front of the ditch and contained several large stones. The southern side of [12] was overlain by a circular patch of dark grey/brown clayey silt with charcoal inclusions [18], which in turn was overlain by a light brown silty sand [21]. This was overlain by a dark grey/brown silty sand [23], again with charcoal inclusions, and a yellow/grey sand deposit [25], then a deposit of reddish brown gritty sand [24] with signs of burning. This sequence of deposits could represent discrete episodes of localised burning, or at least the dumping of hot materials against the side of the former bank.

17.5 A much smaller bank [F13] was identified traversing the trench on an east-west alignment, to the north of [12]. This consisted of light brown/grey friable clayey silt, with charcoal flecking and daub throughout. On its northern side this was overlain by a layer of grey silty sand [07] containing a spread of stone, possibly wall tumble. Medieval pottery was recovered from this context. On its southern side, the bank [F13] was cut by a slot [F14], which measured 0.6m in width and 0.24m in depth, and was filled by light brown/yellow silty sand [10] from which medieval pottery sherds were recovered. This context was cut by a sub-circular posthole [F20], filled by grey/black silty sand with charcoal flecks [19], from which a single sherd of medieval pottery was recovered.

17.6 The end of a possible wall foundation trench was identified cutting the northern side of [12] and comprised a cut measuring 1.7m in length, 1m in width and up to 0.17m in depth [F33]. The cut was filled with a mixed brown/grey silty sand [22]. A layer of dark orange/brown clayey silt with frequent charcoal flecks and stone fragments [04=11], up to 0.3m in depth, overlay this part of trench. Medieval pottery sherds were recovered from this context. A similar shallow layer was also identified continuing beneath the east-facing section; this comprised dark orange/brown clayey silt with charcoal fleck inclusions [15].

17.7 Two linear gullies were identified traversing the trench. In the northern part of the trench a probable shallow field drain [F17], aligned approximately north-east/south-west, cut the natural subsoil. This was filled by dark orange/brown silty sand [16]. In the southern part of the trench a shallow gully [F06] aligned east-west, cut context [08]. The gully had vertical sides with a flat base, and was filled by a dark brown fine loam [05].

18. Phase 2: Bellshiel Road South assessment & UPD

Assessment

18.1 Each class of artefact and a number of sediment samples were assessed for their potential to provide further information. A total of 49 ceramic sherds, from a maximum of 42 vessels, were recovered during the excavation. Contexts [07] and [04=11] were relatively extensive layers to the north and south of a steep-sided cut [F14], a possible wall foundation trench, and both contained sherds of earlier medieval date (11th to early 13th century). The largest single group of pottery came from [07]. The remainder of the assemblage was assigned a broad 'medieval' date. Although small in size, the assemblage was considered to be of significance in contributing to our knowledge of the pottery of Northumberland, although the wares cannot, as yet, be assigned to specific sources. The assemblage established the presence of fine, sandy splash-glazed wares in the area and indicated activity in the vicinity in the earlier medieval period.

18.2 An unstratified fitting with copper alloy traces (which suggest that it was plated) was recovered from the site during machining of the topsoil. It was X-rayed and assessed as being moderately corroded but stable.

18.3 Six contexts at the site were sampled for environmental assessment. Two of the contexts sampled contained numerous pot sherds, [04] and [07]. Context [04] contained moderate quantities of charcoal alongside coal and peaty material. This deposit also contained two degraded charred cereal grains and a charred breadwheat grain. Breadwheat was commonly consumed from the post-Roman period onwards (Van der Veen 1992; Huntley & Stallibrass 1995), although it has been recorded in Romano-British and Iron Age deposits in northern England (e.g. Archaeological Services 2001a). Assessment of a sample from [18] determined the presence of relatively small quantities of charcoal and an absence of archaeobotanical remains. It is possible that the limited presence of charred remains is the result of poor preservation, but it may also suggest that the context was not a hearth feature. Context [24], a possible burnt layer higher up the sequence, again contained no significant charred remains. Context [19], a posthole fill, contained a significant proportion of charcoal but no charred or waterlogged plant macrofossils. The charcoal may be derived from domestic waste. Context [36], a narrow, humic layer contained no significant charred remains. Charcoal from selected deposits could be used to obtain radiocarbon dates for events described above.

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18.4 The excavation identified a number of archaeological features including ditches, gullies, postholes, possible occupation spreads and a possible sequence of crude hearths, or at least the dumping of burnt materials. These features were dated to the 11th-13th centuries, based on the pottery evidence.

18.5 Assessment of the archaeological resource indicated that it had the potential to answer the stated objectives. The research objectives were to be realised by further post-excavation analysis, discussion and interpretation of the resource, and by comparison with similar sites including Bellshiel Road North, Potts Durtrees Road and Loaning Burn (Charlton & Day 1982). This is a period for which there is relatively little excavated material in the Otterburn area, and so the information that can be gained from the excavations would be particularly significant.

18.6 The relationship between the features excavated here and those recorded during the evaluation phase was to be established.

18.7 Mechanical cleaning of the metal fitting with copper alloy traces was recommended, to be followed by XRF analysis.

18.8 AMS dating of charcoal and charred grain from various deposits ([04], [07], [18], [19], [24] & [36]) was recommended to provide dates for features including the series of deposits of apparently burnt material.

19. Phase 3: Bellshiel Road South post-excavation analysis

19.1 Following the post-excavation assessment the UPD did not recommend any further works on the plant macrofossils, although two of the indeterminate charred cereal grains have subsequently been identified as oat (one each from [04] & [07]). Although the establishment of a pottery typology for the area is desirable, it is beyond the scope of the current project; no other analysis was recommended for this ceramic assemblage. Radiocarbon dates were obtained from several contexts. Further conservation and analysis was undertaken on the metal fitting.

Radiocarbon dating

19.2 The following materials (Table 4) were dated by Beta Analytic Inc. in Miami, Florida, using the Accelerator Mass Spectrometry (AMS) technique. The record sheets detailing the calibration of radiocarbon ages to calendar years are provided in Appendix I. Each sample provided plenty of carbon for accurate measurements.

19.3 The radiocarbon dates correspond particularly well with both the stratigraphy and the dates indicated by the pottery assemblage. The only relatively early date was from [36], a narrow band of humic silt, stratigraphically earlier than the other dated contexts and the main ditch at the site.

Table 4. Radiocarbon dating results from Bellshiel Road South excavation

Context no.	Context type	Material	Archaeological Services sample no.	Beta sample no.	Measured radiocarbon age	Conventional radiocarbon age	2 sigma calibration
04	Layer, ?former surface	Charred breadwheat grain	OBRS021	184081	660 ± 40 BP	630 ± 40 BP	Cal AD 1290 to 1410
07	Layer, ?wall tumble	Charred oat grain	OBRS022	184082	770 ± 40 BP	750 ± 40 BP	Cal AD 1220 to 1300
18	Layer	charcoal	OBRS023	184083	680 ± 40 BP	660 ± 40 BP	Cal AD 1280 to 1400
19	Fill of posthole F20	charcoal	OBRS024	184084	980 ± 40 BP	910 ± 40 BP	Cal AD 1020 to 1220
24	Layer, signs of burning	charcoal	OBRS025	184085	720 ± 40 BP	680 ± 40 BP	Cal AD 1270 to 1320
36	Layer	charcoal	OBRS026	184086	1760 ± 40 BP	1740 ± 40 BP	Cal AD 220 to 400

Environmental investigations

19.4 The poor preservation of plant remains is likely to be due to the coarse-grained and well-drained nature of the sediment in the contexts. Oats and bread wheat have been identified from the few charred remains present. This combination of cereals has been commonly grown in northern England since the post-Roman period. For example, bread wheat and lesser frequencies of oats were recovered from early medieval deposits at Caythorpe, North Yorkshire (Huntley 1993), and a peak of oats/wheat pollen has been recorded at Brownchesters in Redesdale up until *c*.685 AD (Moores 1998). Several later medieval sites suggest that bread wheat and oats had become the dominant cereals in northern England from the 11th century (Huntley & Stallibrass 1995). Such sites include Prudhoe Castle on Tyneside (Vaughan 1983) and Church Close, Hartlepool, Cleveland (Huntley 1987; 1988).

19.5 Pollen analysis also suggests that arable farming in Northumberland continued or intensified throughout the post-Roman period. Increased crop cultivation, including barley and rye, is recorded at Fellend Moss around 1050 AD (Davies & Turner, 1979), and cereal pollen increased at Bloody Moss around 575 AD (Moores, 1998). Pollen from the upper section of a core at Broad Moss indicates an intensification of both pastoral and arable land-use which Pasmore & Stevenson (2001) suggest may have occurred during the Medieval Warm Period (*c*.10th – 14th centuries).

19.6 Pollen analysis of samples from a small hollow at South Heddon in the Eastern Cheviots also provides a detailed history of past arable cultivation in the area (Allen & Huntley 2004). The record spans the last 5000 years and showed that major woodland clearance occurred during the Middle Bronze Age, followed by a slight woodland recovery in the late Bronze Age. The presence of barley-type pollen indicated that intensive cereal cultivation was taking place from the Bronze Age to the early part of the Romano-British period. There may also have been a period of stock husbandry during the earlier part of the Iron Age. The pollen evidence from the later Romano-British and early medieval period has been interpreted as indicating a reduction in local agriculture. The results indicate that agriculture declined over the last 1000 years with the development of heather moorland.

Conservation

19.7 Further conservation and Energy Dispersive X-ray Fluorescence (EDXRF) analysis has been carried out on the small U-shaped fitting recovered from the topsoil during stripping. The fitting was found to be made of copper alloy, not ferrous material as originally suspected, although iron corrosion products were also present. The surface is a fairly uniform dark orange colour, giving the impression of an iron object.

19.8 The object was made from sub-circular wire of 3.5mm diameter, which was bent into shape. The terminals are round, flattened and perforated, with some decorative shaping above. The perforations are filled with iron corrosion products, suggesting attachment to an iron object.

19.9 The fitting was mechanically cleaned using a H_2O/IMS/detergent mix. Surface EDXRF analysis determined that the object was made of copper with a very small percentage of added lead. The conservation record is provided in Appendix II.

Discussion

19.10 There is some correspondence between the features investigated in the LUAU/NUAP evaluation trench and those in the current investigation. Ditch [F30] with re-cut [F09] almost certainly corresponds to ditch 17 of the evaluation, with bank material identified to the north in each case. Similarly, gully [F14] broadly corresponds to the evaluation gully 28. The evaluation 'scrape' 31 was not identified in the 2002 excavation, although a number of additional features were investigated in the larger excavation. The splash-glazed sherds recovered during the evaluation will almost certainly be of the same ware as some of those recovered during the excavation.

19.11 Some features at the site have been dated by both ceramic and radiocarbon content. With the exception of two supposed recent features, all the other features appear to be 11th-14th century in date. The posthole [F20], which cut the gully [F14], contained medieval pottery and provided an 11th/12th century radiocarbon date. The low bank on the north side of the gully was overlain by possible wall tumble [07] which contained numerous 11th to early 13th century pot sherds and provided a 13th century radiocarbon date.

19.12 A possible wall foundation trench [F33] on the south side of the gully was overlain by silt [04] which contained 11th to early 13th century pot sherds and provided a 14th century radiocarbon date.

19.13 A sequence of deposits in the central part of the excavation, overlying the south side of the bank adjacent to ditch [F30/F09] could represent discrete episodes of localised burning, or at least the repeated dumping of hot materials against the side of the bank. Radiocarbon dates for the earliest and latest of these deposits are essentially the same, with date ranges spanning the late 13th/14th century. The bank and ditch pre-date this sequence and post-date [36], from which a 3rd/4th century date was obtained.

19.14 The recovery of daub from context [13], with an associated spread of stone wall tumble, the ceramic assemblage and the discovery of a possible wall foundation trench also containing medieval pottery, all suggest medieval settlement here, possibly associated with the field systems recorded 350m to the south at Bellshiel Roman camp. The botanical evidence, although limited, comprised a small quantity of charred cereal grains, again evidence of occupation though the absence of chaff may indicate that cereal processing was undertaken alsewhere. It is interesting to note that the excavation at Potts Durtrees, where well-preserved stone-built structures were exposed, produced less botanical evidence than Bellshiel Road South, with only one hazelnut shell and one indeterminate cereal grain being recovered at Potts Durtrees. Environmental data from rural medieval settlements in north-east England is typically sparse (Huntley & Stallibrass 1995).

19.15 The information gained from the Bellshiel Road South excavation demonstrates the potential for the discovery of medieval occupation sites in upland Northumberland. These sites are relatively under-represented in the archaeological resource of the Training Estate, however, it is apparent that there is the potential for more research in the future.

Potts Durtrees Road excavation (OPD02)

20. Introduction

Location and condition

20.1 The excavation was located 700m north of Potts Durtrees Farm, on a broad, gentle south-west-facing slope at a height of *c*.280m OD (NGR: NY 8767 9795). The visible remains of a ruined medieval house to the west of the road survive as low turf-covered walls on three sides, with the eastern end apparently truncated by the modern road. The current excavation was undertaken on the east side of the road where features associated with the house might survive. The current land use at the site is rough grazing.

Previous archaeological work

20.2 Charlton and Day noted the site as a building within an enclosure (CD24), but no survey was undertaken (Charlton & Day 1977). There had been no known archaeological excavation on this site prior to the evaluation trenching, commissioned by the MoD in 1997, to assess the impact of the proposed road widening on surviving archaeology in the area (LUAU/NUAP 1997). A trench ("2D") one metre wide was hand dug across the width of the building to the west of the road, including some of the area outside the walls. The evaluation demonstrated that two courses of the long parallel walls survive to a height of 0.35m, and significant quantities of late 13th-16th century green-glazed pottery sherds were found. Few medieval occupation sites are known on the Otterburn Training Estate.

Specific research objectives

20.3 The following research objectives are specific to this site:

- What is the character, function and date of features associated with the building?
- Is there any evidence for exploitation of this area before the medieval period?
- Are there any other structures associated with the building, and what was their construction technique?
- Is there any sealed dating material associated with the building or any outbuildings?
- What evidence is there for arable cultivation and pastural practices?
- What do the plant remains reveal about the economic and social status of the building?
- How does this relate to the exploitation of the surrounding landscape?

20.4 Environmental data obtained from rural medieval settlements in north-east England is sparse (Huntley & Stallibrass 1995). The Potts Durtrees Road medieval building was considered to have the potential to reveal important information regarding the characteristics of rural life in medieval Northumberland.

21. Phase 1: Potts Durtrees Road excavation (OPD02)

21.1 The proposal was to widen the east side of the road, away from the visible surviving remains of the building. Any surviving remains east of the road would be impacted upon, therefore an initial trench measuring 10m by 5m was excavated by hand to investigate any remains of the building or ancillary features. The trench was subsequently extended by hand to the north, south and west to enable excavation and recording of additional features.

21.2 A series of natural deposits were present on the site overlying the limestone bedrock; many of these were simply natural variations within the subsoil, others filled a possible glacial watercourse.

21.3 In the north-western part of the trench the eastern wall [F39] of the ruined building was identified amongst an area of stone tumble [49] on an approximate north-south alignment. The wall consisted of one course of large roughly-dressed sandstone blocks, measuring up to 0.60m x 0.40m x 0.35m in size with smaller packing fragments, and measured at least 4.30m in length, up to 0.60m in height and *c*.0.60m in width. The wall had been severely damaged by the construction of Potts Durtrees Road and its eastern drainage ditch [F41], which actually cut through the southern end of this wall, the northern enclosure wall and the yard surface (below). The layer of stone tumble [49] over and around the wall was identified both within the interior of the building and overlying the yard area. A possible knife blade and residual flint micro-blade were recovered from this context on the internal side of the wall.

21.4 To the east of the building, and aligned with the north and south walls of the building, two upstanding earth banks were evident. The remains of stone walls were found beneath the banks. Both walls were unbonded and comprised roughly-dressed sandstone with smaller packing stones as a core, and were found beneath layers of stone tumble. The northern wall [F04] survived to a height of 0.77m, was *c*.0.9m wide and was set into a foundation trench [F05], which cut a silty sand layer [08]. A loam matrix [06] surrounded the stones and contained three sherds of pottery. The base of the cut contained a deposit of light brown silty sand [07] beneath the lowest course of stone. A single sherd of pottery was recovered from this layer. The bank covering the northern wall could be seen to continue beyond the yard in a south-west direction across the hillside.

21.5 The southern wall [F09] survived to a height of 0.6m and was *c*.1.5m wide. The wall was predominantly made of sandstone, with blocks of varying sizes, although two large limestone blocks were also incorporated into the part of the wall which was investigated. No foundation trench was identified for this wall, although the contemporary topsoil must have been removed first as the wall was apparently built directly onto subsoil. This wall had not survived as well as the northern wall. The trench was extended southwards, downslope, from the wall but no further features were identified.

21.6 The eastern wall of the building [F39] and the two enclosure walls [F04 & F09] defined the extent of a yard or garth adjoining the eastern end of the building. The natural subsoil deposits here appear to have been levelled, which

may have included the final infilling of the former watercourse with such re-deposited mixed materials, to form a roughly-metalled yard [F03]. The yard surface layer [51] comprised angular and sub-angular sandstone fragments of varying sizes in a silt matrix. This surface did not extend across the whole area between the enclosure walls. Sondages cut through the surface showed it to be typically *c*.0.1m in thickness, overlying natural and re-deposited natural subsoils. No archaeological features or finds were identified beneath [51]. A number of artefacts, principally pot sherds, were recovered during the cleaning of the surface.

21.7 Three features cut the yard surface. One was a sub-circular cut [F35] measuring *c*.1m in diameter and 0.29m in depth in the southern part of the yard area. The cut was filled by silty sand [36] and a number of sub-angular red sandstone blocks [F33]. This feature was provisionally interpreted as a large posthole or post-pad.

21.8 A posthole [F45] was identified, measuring 0.4m in diameter, 1.6m east of the post-pad. A narrow gully [F13] was also excavated 0.5m north of and parallel to the southern enclosure wall. Most of the trench, including the yard area, was overlain by a mid-brown sandy silt [02] from which the majority of artefacts were recovered.

22. Phase 2: Potts Durtrees Road assessment & UPD

Assessment

22.1 The excavations identified a number of archaeological features including the eastern wall of the medieval building, enclosure walls, a crude metalled surface, postholes and a gully. It had previously been thought likely the eastern end of the building would have been completely destroyed by the construction of Potts Durtrees Road. The excavation also revealed that the removal of topsoils and the levelling of subsoils was undertaken prior to the construction of the enclosed yard surface which adjoined the eastern end of the building. Structural features were identified within the yard surface, including a possible post-pad and posthole, which probably represent the remains of a wooden structure against the southern enclosure wall. It is likely that the yard was contemporary with the building and was used for agricultural purposes including the stabling of livestock.

22.2 A number of artefacts were recovered and environmental samples taken. Each class of artefact and ecofact was assessed for their potential to provide further information.

22.3 A total of 84 ceramic sherds weighing 480 grams from an estimated 35 vessels were recovered and assessed. The pottery of rural Northumberland is relatively poorly known (in comparison with the situation near the coast and further south) and the descriptive names ascribed to the various ware types identified reflected this.

22.4 Layer [02] immediately above the yard surface produced the largest single pottery group from the site by far (80 sherds representing a maximum of 31 vessels). Positive dating evidence was sparse but the pottery appeared to be of earlier medieval date, ranging from the late 11th to 14th centuries, with a small group of unidentified reduced sandy wares which may be slightly later in date. One group of 47 sherds from the central part of [02] appeared to be from a single vessel, a strap-handled jug of Brandsby-type (13th and 14th centuries). It was noted that the oxidised sandy wares may be comparable to those recovered from the Bellshiel Road South excavations.

22.5 Two sherds from context [06] in the northern wall appear to date to the earlier part of the medieval period. One of the sherds was of a type also found at the Bellshiel Road South site. A single sherd of Oxidised Sandy ware was also recovered from this context.

22.6 A single rim sherd of prehistoric pottery, probably from a jar with a plain upstanding rim, was recovered from [07], beneath the northern enclosure wall [F04]. The vessel is of the later prehistoric tradition, possibly late Bronze Age but more probably of Iron Age date.

22.7 Three flints were recovered during the excavations. One broken orange micro-blade and one grey thumbnail scraper were found in [02], immediately above the yard surface, and one white patinated micro-blade was recovered from the stone tumble deposit [49] over the eastern wall of the medieval building. These are all typical of lithic tools utilized in the region during the Neolithic/Bronze Age periods and indicate activity here during the prehistoric period, however, all are residual.

22.8 Three ferrous artefacts were recovered from the site. All were corroded but stable. Two of the items required X-radiography as part of the conservation assessment. A small modern object incorporating a rotating perpetual calendar and maker's mark, and a hooked object were recovered from [02], above the yard surface. A knife blade was recovered from the stone tumble deposit [49] over the eastern wall of the medieval building.

22.9 Five contexts from the Potts Durtrees excavations were sampled for environmental assessment. The processing of context [02], a layer overlying a metalled surface, produced a small quantity of flot comprising an insignificant proportion of charcoal and no archaeobotanical remains. A silt/clay deposit [10] and the tumble layer [49] from over the eastern end of the building, also produced small to moderate flots with limited charcoal preservation.

22.10 Within the samples from [36], a posthole fill, and [51], the yard surface layer, were a charred hazelnut and degraded cereal grain respectively. These remains may suggest the presence of anthropogenic waste material within the structure, but the quantities were too low to determine the nature of the activity that may have produced the charred remains.

Updated Project Design

22.11 The excavations identified a number of archaeological features including the eastern wall of the previously identified medieval building, enclosure walls, a crude metalled surface, postholes and a gully. These features were broadly dated to the 11th-14th centuries, based on the pottery evidence.

22.12 The archaeological resource was assessed and considered to have the potential to answer the stated objectives. The research objectives were to be realised by further post-excavation analysis, discussion and interpretation of the resource, and by comparison with similar sites including Loaning Burn and Bellshiel Road North and South. Topographic survey of the site and its surroundings would have aided the interpretation and graphic presentation of the site, however, this was beyond the scope of the current works.

22.13 The pottery assemblage from the current excavation comprises 83 medieval sherds and one late prehistoric sherd. The medieval pottery of rural Northumberland is still relatively poorly known and the descriptive names ascribed to the various ware types identified reflect this. Further work could be undertaken to establish a pottery typology for the area, which should include further analysis of the assemblages recovered during the evaluation phase. This work is, however, beyond the scope of the present project. The Brandsby-type jug sherds recovered from the central part of [02] were to be reconstructed and drawn. It was also recommended that the prehistoric sherd be drawn. Analyses of the carbonised residue on the exterior and rim of this sherd were recommended.

22.14 Three flint tools were recovered during the excavations, however, all were residual. No further analytical work was recommended for these tools but they were all to be illustrated.

22.15 Three ferrous artefacts were recovered from the site: a small object incorporating a rotating perpetual calendar and makers mark, a hooked object and a knife blade. All were corroded but stable. Conservation recommendations included air abrasion of all objects and analysis of the mineralised deposits on the knife blade.

22.16 No further analysis was recommended for the environmental samples from this site.

23. Phase 3: Potts Durtrees Road post-excavation analysis

23.1 Following the post-excavation assessment the UPD did not recommend any further works on the plant macrofossils or flints. Although the establishment of a pottery typology for the area is desirable, it is beyond the scope of the current project; no other analysis was recommended for this ceramic assemblage. The flints, Brandsby-type jug and prehistoric sherd have been illustrated (Figures 2 & 5). Further investigative conservation was undertaken on the knife blade only, the other objects being clearly modern. Radiocarbon dating has not been used for this site.

Environmental investigations

23.2 The find of a charred hazelnut from Potts Durtrees Road again indicates that wild foods continued to be used in this area to supplement the diet. A charred cereal grain was recovered, confirming that arable farming was taking place to some degree, however it was too degraded to be identified further. The low number of charred remains and absence of chaff also make it impossible to conclude whether the cultivation and processing of the cereals was carried out locally. A range of sites in Northumberland indicates that grain was sometimes transported over fairly long distances, particularly during the later medieval period (Young 2004b). Thus, the grain recovered at Potts Durtrees Road may indicate the existence of local cereal production or may have been brought to the site from some distance.

Conservation

23.3 Further conservation has been carried out on the iron knife blade recovered from the wall tumble deposit [49] at the eastern end of the building. The knife is 138mm long with a maximum blade width of 22mm. The blade is triangular in section with a wide back (up to 7mm). The tang is wedge-shaped in section, 11mm wide and tapering.

23.4 There is no evidence of mineralised material on the tang. The blade has a few small areas of probable mineralised leather, suggesting that the knife may have been in a leather sheath when it was deposited.

23.5 The knife was part air abraded. The abraded surfaces were coated with 7.5% Paraloid B72 (an ethyl methacrylate copolymer). The conservation record is provided in Appendix II.

Discussion

23.6 The earliest evidence for activity in this area is provided by three residual flint artefacts: two micro-blades and one thumbnail scraper. These are all typical of lithic tools utilized in the region during the Neolithic/Bronze Age periods. One rim sherd of later prehistoric pottery was also recovered from beneath the northern enclosure wall; the sherd is possibly late Bronze Age but more probably of Iron Age tradition.

23.7 The excavation at Potts Durtrees Road provided, in particular, an opportunity to investigate the nature of medieval agricultural exploitation of upland Northumberland. The information gained from this site is important as it adds to the limited pool of data so far collected for this under-studied period in the Otterburn area.

23.8 The form of the visible evidence at the site, low turf-covered walls, conforms to the character of a large number of other similar sites in the vicinity of Otterburn (Charlton & Day 1977) and can be closely compared to three other sites in the area; Loaning Burn, 4km north of the village of Elsdon (*ibid*.), the settlement at Davyshiel to the west of Otterburn Training Camp (LUAU/NUAP 1996), and Memmerkirk, 5km north-west of Alwinton (Harbottle 1963). At all of these sites evidence was recovered for large stone-

built structures with associated enclosures. At Loaning Burn, the two recorded buildings measured 21m by 6m and 12m by 5m; at Davyshiel they were 20m by 5m and 13m by 5m, and at Memmerkirk 15m by 4.6m.

23.9 An earlier archaeological evaluation was conducted at Potts Durtrees, which concentrated on the western side of the present road. This revealed the north and south walls of the building noted by Charlton. A large quantity of pottery, dating from the 13th to the 16th century, was recovered from this excavation (LUAU/NUAP 1996).

23.10 The 2002 excavation at Potts Durtrees concentrated on the area to the east of the present road. This was carried out in order to examine and record any archaeological remains which would be subsequently destroyed as a result of the road-widening scheme. The east end wall of the building was located, 4.3m in length and laid on a north-south alignment. Two further walls, unbonded, were located beneath earth banks. These were aligned with the north and south walls of the building, and formed what appeared to be an enclosed yard with a partial metalled surface on the eastern side of the building. The majority of the pottery recovered ranged in date from the late 11th to 14th century. A very limited amount of archaeobotanical evidence was recovered from samples taken during the course of the excavation: one charred hazelnut shell and one indeterminate cereal grain.

23.11 The similarity between the Potts Durtrees evidence and other sites in the area is best demonstrated by a comparison with the complex of buildings and enclosures at Davyshiel (LUAU/NUAP 1996). The extensive field survey carried out at Davyshiel located two buildings of similar size to those at Potts Durtrees and also evidence of stock enclosures. It was concluded that the intricate earthwork evidence indicated a multi-period landscape, with medieval ridge and furrow, stone structures and enclosures overlying earlier features of possible Romano-British date (LUAU/NUAP 1996). Evidence for post-medieval activity was also present with the identification of a possible foundation trench for a 17th century bastle house.

23.12 The proposition that the Davyshiel complex demonstrates a continuity of landscape use and settlement site may explain the presence of prehistoric material at Potts Durtrees. It is entirely feasible that the Potts Durtrees site has seen a similar history of continued habitation which only a more extensive scheme of archaeological investigation could confirm.

23.13 At Loaning Burn the two rectangular buildings and a bowl-shaped kiln were surrounded by an earth and turf bank. The walls of the buildings were constructed, as at Potts Durtrees, from rough coursed sandstone blocks with an infilling of smaller stones, although evidence for clay and earth bonding was also recorded at Loaning Burn. Associated with the buildings was a circular corn-drying kiln. These kilns are a commonly recognised feature of isolated upland settlements (Charlton & Day 1982) that demonstrate that cereal production was being carried out in the upland areas of Northumberland during the medieval period.

23.14 The excavations carried out at Memmerkirk (Harbottle 1963) revealed a large sub-rectangular building, which was divided internally into three rooms. The walls were of a similar construction to those found at the other sites, rough coursed sandstone with smaller stone infilling. There were also walled enclosures on two sides of the building and an associated boundary bank. The pottery found on the site dated to the late medieval period. This all came from a single context, a dark layer of soil immediately above the natural subsoil. It was concluded that the structure represented a seasonally occupied shieling, associated with the summer grazing of cattle on upland pastures.

23.15 When the evidence from Potts Durtrees is examined with reference to other sites of a similar form in the area, it is apparent that it may represent either of two types of structure. The relatively small assemblage of finds and near absence of archaeobotanical evidence could suggest that the site was a seasonally occupied dwelling, connected with the summer grazing of cattle. Alternatively, the wide date range of the pottery and the close proximity of large regulated field systems may point to a more permanent settlement. These questions remain open and only further fieldwork is likely to provide the answers.

Todlaw Pike excavation (OTP02)

24. Introduction

Location and condition

24.1 The excavation site was located along the north-east side of a military road between Davyshiel and Leighton Hill, due east from the Otterburn Camp Headquarters (NGR centre: NY 9020 9593). The excavation measured 400m by 5m and occupied a gentle south-facing slope from *c*.260m OD at the north-western end of the trench down to *c*.240m OD at the south-eastern end.

24.2 The excavation was within the area of a Scheduled Ancient Monument (No. 25156) comprising a hut circle settlement, cairnfield and Bronze Age cemetery site, altogether covering *c*.6 hectares. The works were therefore carried out under Scheduled Monument Consent granted by English Heritage. Current land use is rough grazing, with the existing road traversing the monument area for a distance of about 100m.

Previous archaeological works

24.3 The site was originally surveyed by Beryl Charlton in 1976 (Charlton and Day 1977) and subsequently by Tim Gates in 1981 (Charlton 1982). Rock carvings have previously been noted within the monument area. A recent aerial photographic survey commissioned by the MoD (Gates 1997) did not provide any new information.

24.4 Topographical survey, geophysical survey and evaluation trenching were commissioned by the MoD in 1996 on the north-east side of the road, within 5m of the existing roadside ditch (LUAU/NUAP 1996). This comprised the first archaeological excavation on the site. Three trenches each measuring 25m by 2m were excavated, spaced so as to give a reasonable cover. They were stripped of turf by machine and then hand dug. Possible postholes and gullies were identified. At least two stone cairns were visible in the turf within 5m of the existing road, although these were not excavated.

Specific research objectives

24.5 The following research objectives were specific to this scheme:

- Confirmation of structure, period and function of the two cairns
- Interpretation of the nature and use of the cairnfield and landscape
- To elucidate the function of the features between the visible remains
- Is the classification of surface features as clearance cairns valid without excavation?
- What is the relationship between the ritual, settlement and field clearance activities?

24.6 Most evidence for Bronze Age activity in the area relates to burial or ceremonial sites, and little evidence is available to determine the characteristics, extent and magnitude of agricultural activity, landscape modification and natural resource exploitation (Huntley & Stallibrass 1995; Barrett 1999). Previous macro-environmental assessments of Bronze Age sites

in Northumberland are sparse, comprising those at Hallshill, where large numbers of emmer grains, emmer chaff and barley grains were preserved (van der Veen 1992), Whitton Hill (van der Veen 1984) and Kellah Burn (Archaeological Services 2001b) where plant remains were badly preserved and low in number. Bulk sediment samples for plant macrofossil assessment were not taken during the evaluation stage at this site, although a layer of burning and charcoal was found in Trench 2 (LUAU/NUAP 1996).

24.7 Additional research questions for this site therefore included:

- What is the date of the cairns and the establishment/abandonment of the field system?
- Are there sealed palaeoenvironmental deposits beneath the cairns?
- What evidence is there for arable cultivation?
- What is the extent of natural resource exploitation?
- What are the implications of resource use and cultivation with respect to the habitat and environmental conditions (*sensu* Moores 1999)?

25. Phase 1: Todlaw Pike excavation (OTP02)

25.1 The trench measured 400m in length and 5m in width from the outer, north-eastern edge of the existing roadside ditch. Topsoil stripping over the known cairns was conducted by hand. Where other stone features were identified immediately below the surface during the course of the machine strip, machining was stopped and those areas were also stripped by hand. It had been agreed prior to commencement of the excavation that if any additional features were uncovered extending beyond the limits of the trench, then the trench would be widened in consultation and agreement with English Heritage.

25.2 Many features were excavated and recorded here, including cairns, stone spreads, gullies and stakeholes. None of the cairns contained burials or any other artefacts, although occasional finds were recovered from the overlying topsoil. The cairns appear to have been constructed during field clearance activities. One of the cairns [F36] was more unusual in that it contained a cist-like structure into which a possible stone platform may have been laid.

25.3 In the northern part of the trench several cut features were identified including two curvilinear gullies and six stakeholes. No finds were recovered from these features, although a sediment sample was retained from [18] for possible environmental and dating evidence. Another small stakehole was identified 20m further south below cairn [F03].

25.4 A small clearance cairn [F40] was identified *c*.35m from the north end of the trench. This comprised one large weathered sandstone block of maximum dimension 0.7m, against which a number of smaller, sub-rounded sandstone blocks had been deposited. No other structural elements or artefacts were present. The stones lay on top of a mid-brown/cream silty sand layer [06], which was present across much of the trench directly beneath the topsoil [05].

25.5 A second small clearance cairn [F47] was identified *c*.85m from north end of trench. It comprised one large, central, sandstone block measuring 0.5m x 0.4m, which was surrounded by smaller sandstone cobbles. The largest stone was visible above the ground surface. No other structural elements or artefacts were present.

25.6 Cairn [F36] was located within the central part of the trench and measured 3.4m along the east-west axis, 2.8m along the north-south, and up to 0.45m in height. The initial phase of the construction of the cairn consisted of six narrow, shallow cuts into the yellow sandy clay subsoil, forming a small sub-rectangular structure aligned broadly east-west and measuring approximately 2.7m x 2m [F61]. Angular, grey, coarse-grained sandstone slabs [60] measuring up to 0.81m x 0.56m x 0.13m were set within these foundation cuts. The remainder of each cut was backfilled with dark brown silty clay [59] and small sandstone pebbles, apparently as packing against the large stone slabs. The slabs lay at various angles from the vertical but are all likely to have been set upright originally, forming an incomplete cist-like structure. Within the structure, iron-panning was present on top of the subsoil, which was overlain by a deposit of mid-brown humic silt [53] with no inclusions or artefacts. The silt was overlain by a number of horizontal grey sandstone slabs [52] measuring up to 0.55m x 0.50m x 0.20m. It was not clear if these had been deliberately laid in the structure or if they had been parts of the upright slabs which had subsequently fallen in. It seems likely that the stones had been deliberately placed, as together they formed a level, but incomplete, platform. These large stones were overlain by a layer of smaller sandstones [50], typically measuring 80-90mm across but up to 0.15m by 0.10m. Both the larger and overlying smaller stones were in a matrix of brown/black silty sand [51], which also overlay the edging slabs [60]. The whole feature was overlain by dark, rooty topsoil [49]. No artefacts were recovered from the feature, although a sample was retained from the lower silt layer [53] for possible environmental and dating evidence.

25.7 Approximately 2m to the north of [F36] another cairn [F08] was identified. An earth-fast sandstone boulder provided the focus of the cairn, around which a deposit of stones [11] formed the body of the feature. The central boulder protruded up to 0.4m above a layer of creamy brown silty sand [10], which overlay yellow/grey sandy clay [16]. The weathered stones [11] forming the body of the cairn sat on top of [10], in a matrix of dark grey/brown peaty silt [12], which was overlain by dark, rooty topsoil [49]. The stones were of various sizes up to 0.5m, but averaged 0.15m in diameter. The excavated part of the cairn measured 4m in length, 3m in width and up to 0.6m in height. The west side of the cairn continued beneath the east-facing section of the trench. No artefacts were recovered during excavation of this clearance cairn.

25.8 A large cairn [F04] was excavated approximately 20m north of [F08]. This cairn was identified as an upstanding earthwork feature prior to excavation. The trench was extended to the east in order to encompass the extent of this cairn, which was then excavated in quadrants. The earliest phase comprised an oval concentration of sandstone blocks in the eastern quadrant, with one large stone on its west side, forming a small clearance cairn [F64] that measured

1.2m by 1.8m and up to 0.51m in height. No artefacts or other structural features were associated with the small clearance cairn [F64].

25.9 Above [F64] was a silt layer [41], which had accumulated around closely-packed weatherworn sandstone blocks [07] of various sizes up to 0.27m by 0.10m. These formed the main body of the cairn, which measured 6.8m along the north-south axis, 6m east-west and up to 0.83m in height. Some larger stones on the east side of the cairn may have formed part of a kerb. In the southern quadrant, a shallow depression in the top of [41] was filled by a thin layer of black silty peat [55]. No finds were recovered from the cairn itself but three residual flint micro-blades were the found in the topsoil [05] of the west quadrant.

25.10 Cairn [F09] was located approximately 30m north of cairn [F04]. It measured *c*.5m in length and 1.7m in width, and continued beneath the northern baulk; it had been truncated on its western side by one of the earlier evaluation trenches, Trench 2 (LUAU/NUAP 1996). The cairn overlay natural iron-panning [23] and comprised a scatter of sub-angular sandstone blocks [22], measuring between 0.1m and 0.4m across, some fractured but most weatherworn. At the northern and southern edges of the cairn there were larger stones, possibly part of a former kerb. A layer of dark brown/grey silty clay [35] was identified overlying and between the stones. A single flint was recovered from the black fibrous topsoil [21] overlying the cairn.

25.11 Cairn [F03] was identified within the topsoil [05] 65m from the north end of the trench. The cairn overlay a cream/mid-brown silty sand [14], a stakehole [F39], iron-pan [15] and clay subsoil [16]. This clearance cairn comprised one large block of sandstone and a layer of smaller blocks with two apparent concentrations. It was truncated on its western side by the existing road ditch.

25.12 Cairn [F02] was identified *c*.30m from the north end of the trench, which was extended westwards here to encompass the cairn. The feature overlay a black silty peat [67], which overlay a cream/mid-brown silty sand [06]. This cairn itself comprised layers of angular yellow sandstone blocks up to 0.4m across, which were overlain by topsoil [05]. The eastern and western sides of the cairn were truncated, the remaining part measuring 4m in length, 2m in width and 0.5m in depth. No artefacts were found. This cairn may be the result of more recent clearance and deposition, as it overlies a peat layer, unlike the other cairns which lie on the degraded B horizon.

25.13 Cairn [F13] was the northernmost clearance cairn in the trench and consisted of 13 sandstone blocks in a loose formation over an area of 2.5m by 1.5m. These stones extended over the northern part of gully [F17].

25.14 Layers of stone were excavated in both the northern and southern ends of the trench. In each case the stones overlay a cream/mid-brown silty sand [06]. The northern spread [F01] measured 1.8m by 1.4m and consisted of 19 yellow weatherworn sandstone blocks up to 0.4m by 0.3m by 0.3m. A modern telephone cable had cut through the eastern part of this layer. The southern stone spread [F58] also consisted of weatherworn yellow sandstone blocks; it

measured at least 10m by 5m and continued beneath both baulks. No archaeological finds were recovered from the excavations of these features.

25.15 A flat-bottomed ditch [F57] was recorded in the west-facing section, cutting through layer [06] into the clay subsoil [16], close to the earlier LUAU evaluation trench 3 (LUAU/NUAP 1996). The ditch measured 1.25m in width and 0.25m in depth and was filled by black silty peat [56].

25.16 A modern farm track [F44], aligned approximately east-west, traversed the central part of the trench.

26. Phase 2: Todlaw Pike assessment & UPD

Assessment

26.1 Each class of artefact and ecofact was assessed for its potential to provide further information. Four flints were recovered, all from topsoil contexts. Three micro-blades were found overlying cairn [F04] and a flake with conchoidal fracture lines, possibly from axe manufacture, was found overlying cairn [F09]. These are all typical of lithics utilized in the region during the Neolithic/Bronze Age periods. The assemblage confirms activity at the site during the prehistoric period but is not large enough to show extensive occupation/exploitation in the area.

26.2 Seven contexts at the site were sampled for environmental assessment, which determined the absence of charred plant macrofossils in all seven contexts. Contexts [15], [18] and [53] contained no charcoal or any other materials indicative of anthropogenic activity. Insignificant quantities of charcoal were preserved in [10] and [35]. Small to moderate proportions of charcoal were present in two samples associated with cairn features, however these were also too low to suggest intensive activity or waste deposition in the vicinity of the site. The silty peat deposit [55] overlying part of cairn [F04], and [65] both contained moderate quantities of charcoal. Peaty material was present in the flot of [55], however, neither contained waterlogged or charred plant macrofossils.

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26.3 The archaeological resource was assessed and considered to have the potential to address some of the stated objectives, by means of radiocarbon dating, further discussion and interpretation, and by comparison with similar sites.

26.4 Due to the small size of the flint assemblage no further analytical work was recommended, but the lithics were to be illustrated for the final report.

26.5 Charred plant macrofossils were absent from all the environmental samples taken from the site and so no further work was recommended. However, AMS dating of charcoal from specific deposits, such as [10] underlying cairn [F08], [65] underlying cairn [F64], [35] between the stones of cairn [F09] and [55], a peaty layer in the top of cairn [F04], was recommended in order to provide *termini post quem* and *termini ante quem* for the construction of these cairns.

27. Phase 3: Todlaw Pike post-excavation analysis

27.1 Following the post-excavation assessment the UPD did not recommend any further works on the plant macrofossils or flints, other than illustration. The illustrations are provided in Figure 2. Radiocarbon dates were obtained from four contexts as recommended.

Radiocarbon dating

27.2 The following materials (Table 5) were dated by Beta Analytic Inc. in Miami, Florida, using the Accelerator Mass Spectrometry (AMS) technique. The record sheets detailing the calibration of radiocarbon ages to calendar years are provided in Appendix I. Each sample provided plenty of carbon for accurate measurements.

27.3 The radiocarbon dates have been particularly useful in providing *termini post quem* and *termini ante quem* for the construction of the cairns and other excavated features at Todlaw Pike. Charcoal from context [65] was dated to the very early Bronze Age and lay directly beneath cairn [F64], which in turn was directly beneath cairn F04. This layer, and its equivalents elsewhere across the excavation, also pre-dated cairn [F09] and all the stakeholes and gullies in the northern part of the site.

27.4 Charcoal from [35], over and between the stones of cairn [F09], and [55], a peaty layer in the top of cairn [F04], was dated to the early post-Roman period.

27.5 Charcoal from context [10] was dated to the middle Bronze Age. This layer and its equivalents elsewhere across the excavation pre-dated the ditch [F57], the stone spreads [F01] and [F58] and all the other cairns except [F47] and [F36], which contained the cist-like structure.

Environmental investigations

27.6 The absence of charred plant remains is, again, likely to be due to the aerobic nature of the sediment in the contexts. An uncharred seed of fat-hen/orache was recovered from context [10]. These seeds were often used as an additional food source as they are rich in starch. However, the abundance of modern roots in the flot and the well-drained nature of the sediment suggests that this seed may be a modern introduction. The absence of plant remains also indicates that the silty peat deposit [55] is likely to have only been partially waterlogged.

Table 5. Radiocarbon dating results from Todlaw Pike excavation

Context no.	Context type	Material	Archaeological Services sample no.	Beta sample no.	Measured radiocarbon age	Conventional radiocarbon age	2 sigma calibration
10	layer beneath cairn F08	charcoal	OTP021	184089	3050 ± 40 BP	3010 ± 40 BP	Cal BC 1390 to1120
35	layer between the stones of cairn F09	charcoal	OTP022	184090	1490 ± 40 BP	1460 ± 40 BP	Cal AD 540 to 660
55	layer in the top of cairn F04	charcoal	OTP023	184091	1610 ± 40 BP	1580 ± 40 BP	Cal AD 400 to 570
65	layer beneath cairn F64	charcoal	OTP024	184092	3710 ± 40 BP	3690 ± 40 BP	Cal BC 2200 to 1950

27.7 The poor preservation of plant remains has resulted in little information being provided about the site during the construction of the Bronze Age cairns. Unfortunately, plant macrofossil remains have been preserved at very few Bronze Age sites in the area; only two sites in Northumberland have so far produced plant macrofossils. These include a later Bronze Age site at Whitton Hill, which is dominated by ring ditches and provided evidence for barley and spelt cultivation (van der Veen 1984). The second site is the mid-late Bronze Age round house at Hallshill (van der Veen 1992) which revealed the local production of emmer and spelt wheat in combination with barley and flax. Pollen analysis indicates that the Bronze Age was characterised by an increase in woodland clearance and agricultural expansion in the region (e.g. Allen & Huntley 2004; Davies & Turner 1979; Dumayne & Barber 1994; Topping 1989) and in Scotland (e.g. Tipping 1994a), although within the area of the Northumberland National Park, this appears to have been relatively small-scale (Davies & Turner 1979; Passmore & Stevenson 2001). Clearly there is a need to investigate further Bronze Age sites in the region in order to provide more information about localised variations in agricultural practices.

Discussion

27.8 Despite the paucity of artefactual and environmental evidence from the site, a number of specific research questions can now be answered.

27.9 In total ten cairns were excavated, none of which contained any burial or artefactual evidence, although occasional artefacts were recovered from the topsoil. It was concluded that they represented clearance cairns. Only one of the cairns [F36] demonstrated any form of deliberate internal structure. This particular cairn contained a cist-like structure, a recurrent feature of Bronze Age burials in the North of England. Although no identifiable traces were found it is possible that this structure originally contained an inhumation burial, evidence for which could not survive in the acidic soil. However, there was no artefactual evidence to support this hypothesis either.

27.10 It is probable that the cairns are closely associated with the nearby cremation cemetery of the same period. The close association between cemeteries, or at least burials, and cairnfields is a recognised phenomenon (Bradley 1978). It is suggested however, that one of the cairns [F02], based on stratigraphic evidence, may post-date the main group and may indicate later field clearance activities taking place in the area. Four flints, one flake and three micro-blades, were recovered from topsoil contexts. These flints types are typical of the form associated with Neolithic/Bronze Age periods in the Northumberland region.

27.11 Cairnfields are regarded as evidence of secondary clearance of areas for agricultural production (*ibid*.). The initial clearance of forest and undergrowth would allow for small-scale farming practices, however, with the introduction of more efficient methods of cultivation, and particularly after the introduction of the simple plough, stone clearance became a practical necessity. The cairnfield at Todlaw Pike is typical of this type of prehistoric site and can be compared with those in other upland areas such as the Peak District, West Durham and North Yorkshire.

27.12 At Todlaw Pike the Scheduled Ancient Monument includes features other than the cairnfield, such as hut circles and a Bronze Age cemetery. In the Peak District, the multi-period landscape in the region of Gardom's Edge illustrates a similar relationship between clearance cairns, settlements (in this case originating in the Neolithic) and extensive prehistoric field boundaries (Hodges & Smith 1991). The cairnfield at Chatton Sandyford, Northumberland, was investigated by Jobey (1968). This site, which consists of two large round cairns and 150 smaller stone mounds, shows many similarities with Todlaw Pike. Jobey excavated six of the cairns at Chatton Sandyford. The largest, one of the two round cairns, contained three Beaker inhumations and two cremations. Five of the smaller cairns were excavated, one of which appeared to have contained a grave, however this was not conclusively proven, and the remainder, it was concluded, probably represented stone clearance. Jobey noted that flint, as at Todlaw Pike, was discovered in the vicinity of the cairns and it was suggested that this demonstrated that the area was settled during the prehistoric period and that further burials may be present in some of the other smaller cairns.

27.13 Unlike some of the cairns at Todlaw Pike ([F03], [F08], [F40] and [F47]) none of the cairns excavated by Jobey were focused around earthfast boulders. It is recognised, however, that there is a tendency for cairns to be closely related to the presence of these larger immovable stones (Bradley 1978), and it is suggested that they are indicative of being used as a nucleus for the formation of a cairn during clearance.

27.14 It would appear that the Todlaw Pike cairnfield does demonstrate that agricultural activity was taking place in the area during the Bronze Age, and that this is closely related to the other elements of the monument, namely the hut circle settlement and the cemetery. However, it is also possible that these cairns, or indeed other unexcavated cairns elsewhere in this cairnfield, also had a ceremonial or ritual function; this may be supported by the presence of the cist-like structure in cairn [F36]. It may be the case that cairnfields, such as that at Todlaw Pike, are not simply the product of agricultural practicality, but are rather part of a wider ritual landscape.

27.15 Finally, a cautionary tale . . . it cannot be determined by visual inspection alone that a cairn is necessarily a clearance cairn. Recent fieldwork by the University of Durham at Turf Knowe in the Breamish Valley has proved this point. Excavation of the Turf Knowe South cairn, which was originally thought to be a field clearance cairn, revealed a complex tri-radial monument dating to the late Neolithic or early Bronze Age with two cists and other internal features (Frodsham 2004). Similarly, the Turf Knowe North cairn, which was barely visible prior to excavation, also turned out to be a substantial early Bronze Age burial monument with two cists (*ibid*.).

Dere Street excavation (ODS02)

28. Introduction

Location and condition

28.1 The excavation was located on Dere Street at NGR: NY 8252 9941, about 1km north-west of *Bremenium* Roman fort at High Rochester, immediately south of the right-angle bend in the tarmac road from Redesdale Camp to Featherwood Farm. The putative line of the Roman road lies under the track to the south of the junction and continues under the existing tarmac road to the north of the junction, although previous evaluation trenching there found no trace of it. The current excavation trench was located across the trackway, between two earlier evaluation trenches *c*.10m south of the junction in an area of rough grass.

Previous archaeological work

28.2 Dere Street was surveyed by MacLauchlan (1852) and described by Margary (1973). Archaeological investigations along its length have included sections noted by Richmond (1948) between Foulplay Head and Harden Edge, and excavations by Crow (1993) near High Rochester. The former revealed an embankment or *agger* of local clay 3 feet (1m) high and 28 feet (8.5m) wide, surfaced with a skin of broken shale, while the latter revealed a sandstone block foundation set in coarse sand and estimated at 5.4m in width, with a kerb along the eastern edge (the western edge had been robbed out). A later cobble surface narrowed the width to 2.5m.

28.3 Nine evaluation trenches were excavated along the course of Dere Street by the Newcastle University Archaeological Practice (NUAP) during 1995, to examine the impact of the proposed development (LUAU/NUAP 1996). These included two on the present site, located on either side of the trackway to the south of the junction (Trenches 1A and 1B). Trench A exposed a thin layer of metalling to the east of the track and a shallow ditch to the west. These were interpreted as remains of the Roman road surface and drainage ditch. Further to the north, metalling was identified in Trench 7 and a ditch, tentatively identified as the eastern roadside ditch, in Trench 6. No Roman remains were identified in the remaining trenches.

28.4 Six further evaluation trenches were dug by NUAP in the area during 1996 (LUAU/NUAP 1997). Trench 1E exposed metalling on top of an *agger*. This was not sectioned so its full size and method of construction were not determined. Trench 1F exposed metalling over a raised bank interpreted as 'an isolated linear block of subsoil and topsoil cut away to the west and ... east' (*ibid*., 14). The remaining four trenches, including three cut through the modern tarmac road, identified no Roman remains.

Specific research objectives

28.5 It was proposed to widen the east-west military road north of the site. This will involve ground disturbance for up to 5m to the north of the current tarmac surface, across the full width of Dere Street. Since a large part of this area had already been disturbed by construction of the tarmac road running north from the junction, it was thought unlikely that Roman remains would survive in this

area. However, to fully mitigate the effect of any possible damage, it was proposed to excavate that part of the trackway between the two earlier evaluation trenches, to fully establish the character of Dere Street at this point and to further investigate the structure and survival of the road. This would then allow the 1995/6 findings to be compared with other excavated sections across Dere Street.

28.6 The following research objectives were specific to this site:

- What is the date of this feature?
- What construction techniques were used?
- Is there evidence for the continued use of this feature?
- How do these compare with other sections of Dere Street?

28.7 Few environmental assessments have been undertaken on Roman road deposits although environmental investigations of settlements along the routes of Roman roads have provided an indication of the organisation of agricultural production and consumption during the period (e.g. Archaeological Services 2001).

28.8 Environmental investigations at this site will address the following research questions:

- Are there any palaeoenvironmental materials/soils sealed beneath the road?
- Do the road ditches contain palaeoenvironmental material, indicating the use of the road in the Roman period or subsequently, particularly any peat deposits?

29. Phase 1: Dere Street excavation (ODS02)

29.1 To ensure that features could be correctly interpreted, a 5m wide trench was excavated across the full width of the track between the two earlier evaluation trenches. The topsoil was machine stripped and metalling cleaned by hand. To prevent unnecessary damage to archaeological features, a 1m wide section was to be dug through the metalling. At the end of the excavation the trench was backfilled and the track reinstated.

29.2 During excavation, it became apparent that the Roman road surface extended eastwards, below the base of the earlier evaluation Trench A. The section was therefore extended in this direction to ensure that the full width of the road was sampled.

29.3 The natural subsoil across the trench was a gley, a mottled orange/grey silty clay containing sand and clay patches [06]. In a sondage excavated at the western end of the trench, this became more orange with increasing depth. Above the natural subsoil was a thin layer of black silt interpreted as an old soil horizon [13]. A sample of this material was collected for environmental assessment and possible dating.

29.4 A 7.8m wide, densely packed layer of angular sandstone cobbles overlay this old soil horizon [F12]. There was a distinct kerb of larger than average stones on the west side, and a less well-defined kerb to the east. Excluding these kerbs, the stones generally increased in size towards the centre of the deposit and ranged in size from approximately 0.2m to 0.5m in length. The upper surface to this layer was very irregular, indicating that it did not comprise the road surface itself.

29.5 A 0.3m thick deposit of friable sandstone pebbles in a light grey silty sand matrix [08] covered the western half of the stone layer. This deposit filled the interstices between the stones as well as overlying the whole layer. Many of the pebbles had broken down into loose sand and this is likely to have been intentional, to create a smooth surface for the road. A light grey/brown silty gravel [10] of similar depth to [08] covered the eastern half of the stone layer and overlapped [08]. These are thought to represent two tipping horizons within the same construction phase rather than a later rebuild to the road since there was no indication of any variation in the underlying stone foundation at this point, nor was there a weathered surface between [08] and [10].

29.6 Two similar deposits of very light brown silty sand lay on either side of the road. Context [05] to the west was 0.25m thick and context [11] to the east was 0.3m thick. Both deposits overlapped the edges of the road, indicating that they post-dated it. The NUAP evaluation trench exposed the surface of [11] (together with the eastern edge of road surface [10]) although neither was excavated, being misinterpreted as 'banded glacial drift subsoil' (LUAU/NUAP 1996, 29).

29.7 A 0.05m thick deposit of mid-brown silty sand [09] filled a shallow depression in the surface of [10]. Above this lay a surface of rounded pebbles [F04], up to 0.1m in diameter, in a silty sand matrix. This surface did not cover the full width of the road, starting some 2m to the east of the western edge of the earlier structure. Eastwards the surface became more broken, although partial remains continued as far as NUAP evaluation Trench 1A. Context [F04] correlates with the evaluation context 51, the metalled surface identified by that excavation. From the dimensions given in that report (*ibid*., Fig.17), this surface appears to have overlapped [11], giving a relationship between these two layers. However, this should be treated with caution, since layers under the metalling are not fully described in the evaluation report.

29.8 A 0.1m thick layer of silt [03] overlay the cobble surface [F04] and above this was a further surface of gravel [02]. This surface was 3.4m wide and 0.15m thick, except where wheel ruts had penetrated the underlying silt. These ruts had been infilled with finer gravel, including tarmac fragments. Either side of this gravel surface, a layer of peat covered the remainder of the trench [01].

30. Phase 2: Dere Street assessment and UPD

Assessment

30.1 The original Roman road consisted of stone foundation [12] overlain by an *agger* of sand and gravel (layers [08] and [10]). These two layers are thought to indicate different tip horizons within a single construction phase rather than a later major widening of the road. There is no indication that the road had an original cobbled surface above this gravel (although this could be due to later truncation of such a surface). In size, the excavated section compares well with previously excavated sections by Richmond (1948) and Crow (1993), although details of materials and construction vary between these samples. This is likely to be due to locally available resources being used for construction.

30.2 No artefacts were recovered during this small excavation, however, samples were retained from four deposits for environmental assessment. Context [02], the upper cobbled surface, and [09], a silt layer, contained neither charcoal nor charred archaeobotanical remains. Charcoal was present in small quantities in silt deposit [03] and the probable old soil horizon [13]. Charred plant macrofossils were also absent from these layers, however, radiocarbon dating of the charcoal could provide dates relating to the pre- and post-construction of Dere Street.

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30.3 The Roman road was identified and excavated. It was shown to be relatively well-preserved with a good foundation, kerbs at either side and an *agger*. No contemporary roadside ditches were identified within this limited excavation.

30.4 The archaeological resource was assessed and considered to have the potential to answer all of the stated objectives, with the exception of the environmental evidence from contemporary roadside ditches. The research objectives were to be realised by further interpretation and discussion of the resource, and by comparison with other excavated sections across Roman roads in the area.

30.5 Although no artefacts were recovered during this small excavation, charcoal from a silt layer [03] above Dere Street and the probable old soil horizon [13] beneath Dere Street were to be used to provide dates relating to the pre- and post-construction of the road.

31. Phase 3: Dere Street post-excavation analysis

31.1 Following the post-excavation assessment the UPD did not recommend any further works on the plant macrofossils. Samples from two contexts were submitted for radiocarbon dating as recommended, however, the sample from [03], overlying Dere Street, proved too old for age determination.

Radiocarbon dating

31.2 The following material (Table 6) was dated by Beta Analytic Inc. in Miami, Florida, using the Accelerator Mass Spectrometry (AMS) technique. The record sheet detailing the calibration of radiocarbon age to calendar years is

provided in Appendix I. This sample provided plenty of carbon for accurate measurements.

Table 6. Radiocarbon dating result from Dere Street excavation

Context no.	Context type	Material	Archaeological Services sample no.	Beta sample no.
13	buried soil beneath Dere Street	charcoal	ODS022	184088

Measured radiocarbon age	Conventional radiocarbon age	2 sigma calibration
2210 ± 40 BP	2190 ± 40 BP	Cal BC 380 to 160

31.3 The radiocarbon date has provided a later Iron Age date for the buried soil horizon beneath the Roman road.

Environmental investigations

31.4 Plant remains were also absent from the contexts assessed from Dere Street. These contexts were taken from a pre-Roman land surface of likely Iron Age date. The poor preservation of plant remains here is unfortunate as, in addition to a paucity of Bronze Age deposits, plant-rich samples from the Iron Age are also rare in this locality. Excavations at Chester House (Holbrook 1988) and Murton (van der Veen 1985) revealed the limited cultivation of barley, spelt and emmer wheat, and barley and emmer wheat were the dominant cereals used at Fawdon Dean (Archaeological Services 2004).

31.5 Pollen analysis from the north of the National Park indicates the intensification of agricultural activity during the Iron Age (Tipping, 1994b). Oats and rye were recorded and there is evidence for the maintenance of a high percentage of pasture land. Pastoral farming also appears to have been of importance in the Iron Age at Drowning Flow (Moores 1999), Bloody Moss (Moores 1999) and Broad Moss (Davies & Turner 1979; Passmore & Stevenson 2001).

31.6 Further sites need to be investigated in order to establish a detailed picture of agricultural practices across the region during the Iron Age. In addition, debate continues over the extent of woodland clearance at this time, which may best be answered with further palynological studies.

Discussion

31.7 A surprising thickness of silt lay on either side of the road, rising to the full height of the *agger*. The relief is too slight for this to be accounted for by hillwash and the material is not an accumulation of peat. Given the generally low intensity of agriculture in the area (Charlton 1996), it is unlikely to be a cultivation deposit and there would be little reason to deliberately deposit material in this location. The most probable origin is run-off from the *agger*

itself. Given the quantity of material involved, this would imply that the *agger* was originally significantly higher than at present. In this respect, it should be noted that Richmond (1948) noted a section of *agger* standing 1m high, a little to the north of the current site. Too little of this silt was exposed to verify this suggestion.

31.8 Two stone surfaces overlay the *agger*, separated from each other by a thin silt. Since the lower surface appears to have overlain the silts to the side of the road both surfaces are thought to significantly post-date the Roman road. One of the surfaces was the metalling identified in NUAP evaluation Trench 1A and misidentified there as the Roman road surface.

31.9 The 1996 NUAP evaluation identified an *agger* in Trench 1E, located at Middle Golden Pot. This was not sectioned so its full size and method of construction were not determined. From the profile given in the report, it appears to have been about 10m wide and between 0.5m and 1m high, making it comparable with other excavated sections.

31.10 No other sections of *agger* were identified during either the 1995 or 1996 evaluations. However, a raised bank, interpreted as 'an isolated linear block of subsoil and topsoil cut away to the west and ... east' (LUAU/NUAP 1997, 14), was found in Trench 1F (south of Featherwood Marching Camp) during 1996. Again this was not sectioned, nor was the subsoil examined away from the bank. Therefore no attempt appears to have been made to validate this conclusion. Trench 3 of the 1995 evaluation was also located over this bank, slightly to the south (LUAU/NUAP 1996, 29). The bank was not sectioned and is not referred to in the description section of the evaluation report.

31.11 Trench 8 of the 1995 evaluation was located over a bank originally thought to be an *agger*. However, this bank was described in the report as 'entirely natural, formed of grey and yellow sandy clay subsoil' (*ibid*., 31). Once again, it does not appear to have been sectioned and, given the fact that the *agger* at the present excavation site was also described as 'natural subsoil', little confidence can be placed in this conclusion.

31.12 A number of other examples of metalling were found during the two evaluations. One of these (1996 Trench 1E, Context 3) similarly overlay a silt to the side of the *agger* and is recognised in the evaluation report as a later feature (LUAU/NUAP 1997, 13). Sections dug across Dere Street outside *Bremenium* also revealed later metalled surfaces above the *agger* (Crow 1993).

31.13 The dating of these metalled surfaces is problematic, given the general lack of artefacts from all sections dug across the road. It is likely that repairs have been made to the original structure on an *ad hoc* basis ever since Roman times so the metalled surfaces could similarly vary in date. The two surfaces identified in the current excavation are separated from the *agger* by a considerable thickness of silt and are likely to be post-medieval in date. Cattle droving, farm or mining access or early 20th century military activity seem the most probable reasons for these particular repairs.

31.14 The nature of the ditch identified in NUAP evaluation Trench 1B is uncertain. From the recorded depths of excavation, the ditch appears to have been cut through the silt layer [05] (assuming this deposit extends so far west) rather than through the natural subsoil. The excavated ditch would therefore post-date the Roman road. Any original Roman ditch (on either side of the road) would be expected to lie under silts [05] and [10] and therefore would not have been identified by the evaluation. It was beyond the remit of the current excavation to re-excavate these earlier trenches so this could not be examined in the field. As with repairs to the road, it is likely that drainage ditches have been dug on an *ad hoc* basis alongside the road ever since Roman times.

31.15 The evaluation had concluded that the Roman road was 'insubstantial and at times ephemeral' (LUAU/NUAP 1997, 33) and therefore likely to have been totally destroyed by construction of the modern tarmac road. However, it has now been shown to survive as a substantial buried feature. Furthermore, this feature had been exposed by the evaluation and misinterpreted as a variation in the natural subsoil. This casts doubt on conclusions drawn from the evaluation elsewhere along the line of Dere Street. From the size of the surviving *agger*, it seems improbable that it has been totally removed by the current tarmac road. Because of this, provision should be made to ensure adequate time and resources are available for archaeological recording work in this area during the watching brief phase of the development.

Part III: Additional works at OTA 2003-2005

32. Redesdale Camp NAAFI roof: investigation of the roof structure

32.1 This work was previously presented as Archaeological Services Report 1092 (March 2004), from which the following is reproduced.

1. Summary

The project

1.1 This report presents the results of an investigation into the form of the roof structure within the NAAFI (Navy, Army and Air Force Institute) building at Redesdale Camp, Otterburn Training Area, Otterburn, Northumberland. This work was carried out as part of a wider scheme of architectural recording conducted in advance of the proposed demolition of the buildings on the camp.

1.2 The works were commissioned by RPS Group PLC on behalf of the Ministry of Defence, and conducted by Archaeological Services Durham University.

Results

1.3 The roof structure was discovered to be recent in date and of limited architectural or historical interest.

2. Project background

Location (Figure 1)

2.1 The site is located at Redesdale Camp, Otterburn Training Area, Otterburn, Northumberland, at grid reference NY 8251 9870. The NAAFI building is near the centre of the site, on the north-east side of the main camp road.

Development proposal

2.2 The proposal is to demolish the buildings of Redesdale Camp and to create a wooded hide and Battalion Echelon Area.

Objective

2.3 The objective of the scheme of works was to investigate and record the roof structure within the NAAFI building. The work was undertaken to complement an historical study of the site prepared by Paul Francis (Francis 2003), and recording work carried out by Archaeological Services.

Dates

2.4 Fieldwork was undertaken on the 17th February 2004. This report was prepared between 24th and 28th March 2004.

Personnel

2.5 Fieldwork was conducted by Mark Douglas and David Graham. This report was prepared by Mark Douglas, with illustrations by Linda Bosveld. The Project Manager was Richard Annis.

Archive

2.6 The site code is NRC04, for **N**AAFI **R**edesdale **C**amp 20**04**. The site archive will be deposited with the Museum of Antiquities, University of Newcastle upon Tyne, together with the rest of the AS90 Project archive.

3. Historical background

3.1 Redesdale Camp was established in 1912 and from this time, up until the 1960s, troops were accommodated in tents. The only permanent buildings on the camp were the officers' accommodation, dining halls, hospital, NAAFI, latrines and ablution blocks. These buildings, some of which survive on the camp, were of timber construction. In the 1960s the tented accommodation was replaced by permanent Vic Hallam (VH) barrack buildings.

The NAAFI building

3.2 The present NAAFI building dates from the 1930s and was built to replace an earlier NAAFI situated on the southern side of the camp. In the last stages of its use it provided bars for the junior ranks based in the camp, as well as teaching and service rooms and staff accommodation. The building is covered with profiled metal cladding; there are two parallel pitched roofs, covered with metal sheets, over the central section which houses the bars.

4. Observations (*Figure 1*)

4.1 The section of roof that was investigated was located above the Junior Ranks Bar, towards the centre of the south-western half of the building. One complete roof truss was recorded. The materials of the truss were made in imperial measurements, and so these dimensions are given in the following account of the structure.

4.2 The truss is constructed from galvanised steel angle and flat bar. The span is 8.75m rising to an apex at 2.59m. The complete truss is constructed using two basic prefabricated components, with each being made up of a length of 2¼" x 2¼" (56mm x 56mm) angle and a short section of 2¼" x ½" (56mm x 12mm) flat bar riveted to either end. In each truss there are five sections of 9' 10" (2.97m) in length, and ten sections 5' 8" (1.73m) long.

4.3 These basic components are assembled to make a low-pitched truss, with two verticals to support the tie beam, and diagonals braces to the apex and rafters. The horizontal span is made of three of the longer sections, as are diagonal braces rising from the base of the verticals to the apex of the roof. All of the other components are shorter sections.

4.4 The photograph below (Figure 2) shows the eastern half of the truss that was recorded. Similar frames can be seen behind; the wires at the bottom support the suspended ceiling of the junior ranks bar.

4.5 It is apparent that the structure is not the original 1930s roof. All of the dimensions are imperial and not metric, which indicates that the manufacture of the steel components predates the adoption of the metric system in the early 1970s. However, the fact that each of the truss members is stamped with the British Steel logo demonstrates that it can be no earlier than 1967, when the British steel industry was nationalised with the passing of the Iron and Steel Act.

4.6 Following the recording of this truss, a further section of the roof, on the northern-eastern side of the building, was examined by Lt Col (Retd) Richard Cross. The materials and construction are the same here as in the south-eastern side.

5. Recommendations

5.1 It is clear that the whole of the original roof has been replaced in the recent past. No further work is recommended in connection with this project.

Figure 2 The eastern side of the roof truss, looking south-eastwards. The roofing sheets are fixed to light metal purlins bolted to the cleats; the trusses are fixed directly to the building's frame.

Figure 3 The connection between the roof truss and a steel upright on the south-west face of the building.

33. Raw Farm: archaeological watching brief during construction of cattle shed

33.1 A report was previously prepared (July 2004) for these works, from which the following is reproduced.

1. Summary

The project

1.1 This report presents the results of an archaeological watching brief conducted during the construction of a livestock shed at The Raw Farm, Otterburn Training Area, Otterburn, Northumberland.

1.2 The works were commissioned by Landmarc Support Services Ltd, and conducted by Archaeological Services Durham University.

Results

1.3 An archaeological watching brief was carried out in order to examine and record any archaeological deposits exposed during groundworks as part of a new cattle shed construction at The Raw.

1.4 No archaeological deposits or remains were identified during the watching brief.

2. Project background

Location

2.1 The Raw Farm is situated to the north-west of Elsdon and lies within the Otterburn Training Area. The site is located at NGR centre: NY 981 944.

Development proposal

2.2 The proposal is for the construction of a livestock shed immediately north of the existing farm buildings.

Objective

2.3 The objective of the archaeological watching brief was to observe and record any significant archaeological deposits, layers or features that were exposed during the groundworks.

Specification

2.4 The works have been undertaken in accordance with a Specification provided by Landmarc Support Services Ltd.

Dates

2.5 Fieldwork was undertaken between 12th-13th July 2004. This report was prepared on the 14th July 2004.

Personnel

2.6 Fieldwork and reporting were conducted by Alan Rae. The project manager was Duncan Hale.

Acknowledgements

2.7 Archaeological Services is grateful for the assistance of staff from Landmarc Support Services Ltd and the Ministry of Defence.

Archive

2.8 The site archive will be deposited with the Museum of Antiquities, University of Newcastle upon Tyne, together with the rest of the AS90 Project archive.

3. Historical and archaeological background

3.1 Otterburn Training Area (OTA) occupies over 23,000 hectares of high moorland and rough hill country within the Northumberland National Park, adjacent to the English/Scottish border. It is the largest single live firing area in the UK and has been used for training military personnel since 1911. It has also remained a working estate with 31 tenanted farmers practising traditional hill livestock farming.

4. The geology

4.1 The geology of the training area can be broadly divided into three sections. The northern part comprises a high plateau of volcanic lavas, typically covered by moor mat-grass and bracken. In the central part there is a high ridge of Fell Sandstone, which forms the watershed between the Coquet and Rede valleys, and is typically covered with a thick blanket of heather. The southern section comprises more recent limestones, shales and thin coal seams. The pasture is better here, although there are also areas of bracken, coarse grasses and heather.

5. The archaeological watching brief

Introduction

5.1 An area 40m x 22m was stripped using a 360º mechanical excavator equipped with a toothless bucket, under strict archaeological supervision.

5.2 A natural orange/grey/brown boulder clay was reached at a depth of 0.42m OD. Immediately above this was a layer of silty clay topsoil 0.42m in depth.

5.3 No archaeological features or remains were identified during the course of the excavation.

34. Raw and Craig bastles: survey of internal features and vaults 2004

34.1 This work was previously presented as Archaeological Services Report 1235 (December 2004), from which the following is reproduced.

1. Background

1.1 The north end of the vaulted ground floor of the bastle at The Raw was recorded in the winter of 2004, after the removal of wooden lining for a feed bin. The area hidden by the bin was the whole of the room north of the present entrance door. The walls were swept clean and drawn (Figures 10, 11), and a void in the north wall and an area of graffiti was recorded. The account below describes all of the graffiti in the bastle, and the features at the north end of the ground floor.

1.2 The vaulted ceilings of the ground floor rooms at The Raw and Craig bastles were recorded photographically. Key plans indicating the layout of the photographs at each site are given below in Sections 4 and 5, and the photographic montages are provided on A3 sheets.

2. Graffiti

2.1 Five areas of graffiti are visible on the ground floor walls inside Raw bastle, all of which are marked on the elevation drawing and illustrated below. One of the areas is composed of two separate markings, resulting in six distinct graffiti.

1 West wall, roughly central, third course above floor level. This mark possibly represents the letters W D. However, the first letter is badly worn and very difficult to interpret, and may be a combination of any of the letters V, M, and W (Figure 1)

2 West wall south of the present door, fourth course above floor. This mark appears to represent a capital letter N. A shallower incised line crossing the letter suggests that this initial is possibly doubled and reversed (Figure 2).

3, 4 Two adjacent graffiti on the east wall, south of the blocked doorway; one on the sixth course above the floor level, the other slightly to the south of this block and on the fifth course. The lower block appears to read H.H W I, while the upper probably bears the letters H I W N. As with graffito 2, the N is crossed by a second, opposing diagonal line, and may be doubled and reversed (Figures 3-5).

5 Eastern wall, to the north of the doorway, fifth course up from floor level. A small graffito on the northern side of the forced doorway. The inscription is very crudely incised and obscure, and is thus difficult to make out. It might represent the letters C H n I. The whole inscription is shallow, and so a low light level was necessary to show it in relief (Figure 6).

6 North wall, east of the void. This is another worn marking like 5. Two letters appear to have been carved, most probably the capitals J H. However, this stone is further obscured by various horizontal incisions crossing the face of the block, possibly tool marks. Given these marks, and their potential to distort

the graffito, it is possible that the inscription may show the letters I H, or even a paired HH, using only three vertical lines, and thus doubling the initial (Figure 7).

2.2 Much of the graffiti is difficult to interpret, either because of wear on the stones, or because the original carving was very shallow. Varying interpretations can be applied to several of the pieces, as many of the incisions are now very slight, or are separate from the main inscription, and thus it is difficult to determine whether a mark is now a worn part of the original piece, or a separate cut which is being included by mistake. The above descriptions give the most probable interpretation of each inscription, along with any possible other interpretations if necessary.

3. The void in the north wall

3.1 At the north end of Raw bastle, a void was recorded in the ground floor wall. This opening started at approximately 1.1m above the floor and emerged at ground level outside the building. The void is a rough hole through the wall with ragged, irregular edges (Figures 8 and 9). A wooden frame is set into the lower part inside the building. At the top of this frame a horizontal beam, measuring 50mm x 100mm x 1120mm, crosses the opening. This supports the ends of three planks, set flat, running north-south, and measuring 120mm x 20mm x 500mm. Their north ends are set into stones in the rear of the void, and the planks support slates and a concrete slab that extends to the edges of the void at the north, west and east; the concrete has been cast directly *in situ*. The south edge of the slab is retained by a plank standing on the main beam. The concrete slopes downwards to the south, dropping approximately 80mm across its whole length (Figure 13).

3.2 Underneath the main beam a wooden frame is set into the void, its face flush with the wall. The frame is a parallelogram, with vertical sides; it measures 0.59m by 0.81m across the external lengths, and has been mortared into the wall. Behind the frame, the void shows as an irregular hollow in the wall, with stones knocked out apparently randomly. On the west side at the rear of the hollow, a large stone appears to curve around to form a back for the void, as if an attempt were being made to form a recess or a cupboard. However, this seems to be an illusion, and no tool marks are visible. The hollow extends to form a ragged-edged passage on the eastern side, joining the hole in the external face wall of the building. No attempt has been made to finish off this passage (Figure 14).

3.3 Above the frame is a rougher chimney-shaped void extending into the ceiling. This void measures approximately 0.9m x 0.65m, and extends 1.1m upwards from the top of the edge-set plank that retains the concrete slab. A D-shaped hole can be seen extending from this void into the vault roof, showing where the wall core has collapsed. Slipped and fallen bocks can be seen towards the top of the chimney, and at the very top a series of horizontal beams can be seen. These rounded beams are orientated north-south, and support stone slabs, presumably part of the floor of the storey above (Figure 12).

3.4 The void appears to represent a failed window, the random coursing of the masonry having defeated an attempt to drive a straight passage through the wall. Masonry has collapsed into the hole, causing the void which extends to the ceiling. This, and the resulting weakness in the main wall, has affected the end of the roof vault. The collapse presumably caused the window to be abandoned and boarded over, as, apart from the mortar surrounding the frame, the void appears entirely unfinished.

Figure 1
Graffito 1, western wall.

Figure 2
Graffito 2, western wall.

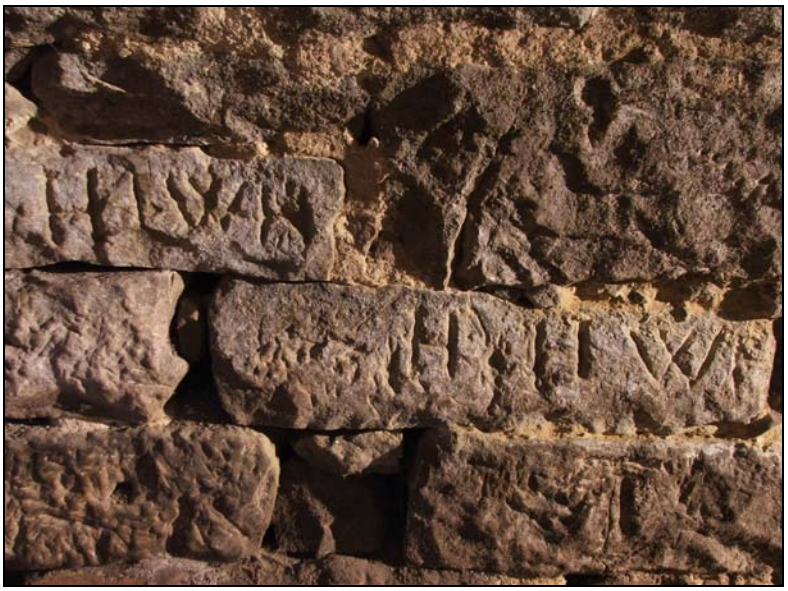


Figure 3
Graffiti 3 and 4.

Figure 4
Detail of the lower block, graffito 4

Figure 5
Detail of the upper block, graffito 3.

Figure 6
Graffito 5, eastern wall.

Figure7
Graffito 6, northern wall.

Figure 8
Interior view, northern wall, 1m scale. The panelling has been removed from the wall, and the wall cleaned, but the boarding remains on the void.

Figure 9
A wider image of the above view, illustrating some of the collapsed roofing vault. 1m scale.

Figure 10
Interior view, eastern wall, 1m scale. Panelling has been removed and the area cleaned, but blocking remains in the disused doorway.

Figure 11
Interior view, west wall; 1m scale. The panelling and has been removed and the area has been cleaned.

Figure 12
North wall, looking upwards into the void. A 'chimney' of collapse is visible at the bottom of the image, and several blocks that have fallen from the vault. The two beams appear to support a slab, possibly a repair to the floor above.

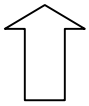
Figure 13
The north wall, after removal of the boards over the void. The sloping cast concrete above the horizontal beam is visible.

Figure 14
North wall. A close image of the wooden frame set into the stonework, directed through the void to the hole in the outer face of the wall. This illustrates the incline of the void, demonstrating the angle at which it passes through the wall.

4. Vault at The Raw: layout of photographs

The full photograph reference numbers for this vault are **2004_1216Image0019** to ~**0039**. See also the printed montage.

		window / void		
	0020.JPG	0019.JPG	0021.JPG	
entrance	0023.JPG	0022.JPG	0024.JPG	blocked door
	0026.JPG	0025.JPG	0027.JPG	
	0029.JPG	0028.JPG	0030.JPG	
	0032.JPG	0031.JPG	0033.JPG	
	0035.JPG	0034.JPG	0036.JPG	
	0038.JPG	0037.JPG	0039.JPG	
		main door		

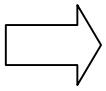


North

5. Vault at Craig bastle: layout of photographs

The full photograph reference numbers for this vault are **2004_1216Image0045** to ~**0071.** See also the printed montage.

	internal stair opening	door	
	0046.JPG	0045.JPG	0047.JPG
	0049.JPG	0048.JPG	0050.JPG
	0052.JPG	0051.JPG	0053.JPG
	0055.JPG	0054.JPG	0056.JPG
	0058.JPG	0057.JPG	0059.JPG
	0061.JPG	0060.JPG	0062.JPG
door	0064.JPG	0063.JPG	0065.JPG
	0067.JPG	0066.JPG	0068.JPG
	0070.JPG	0069.JPG	0071.JPG

North 

Part IV: Additional information

35. Archiving

35.1 The project code is OTA02 for Otterburn Training Area 2002, and the site codes are:

- OBC02 for Otterburn Bellshiel Camp 2002
- OBL02 for Otterburn Bellshiel Layby 2002
- OBRN02 for Otterburn Bellshiel Road North 2002
- OBRS02 for Otterburn Bellshiel Road South 2002
- OPD02 for Otterburn Potts Durtrees Road 2002
- OTP02 for Otterburn Todlaw Pike 2002
- ODS02 for Otterburn Dere Street 2002
- OGP02 for Otterburn Outer Golden Pot 2002

35.2 The final project archive will be compiled in accordance with Appendix 3 of MAP2 (English Heritage 1991) and in accordance with the *Guidelines for the Preparation of Archaeological Archives for Long Term Storage* (UKIC 1990) and will contain copies of reports produced for the project (project designs, interim reports, assessment and final reports, specialist reports), correspondence, survey data, excavation records, context sheets and registers, summary account of the context record, site drawings and registers, photographic records and registers, site matrices, artefacts, summary account of the artefact record, sample record sheets and registers, ecofacts, summary of the environmental record and X-ray plates. Some of this material is in digital format.

35.3 The archive is currently held by Archaeological Services Durham University and will be transferred to Miss Lindsay Allason-Jones for curation at the Museum of Antiquities, University of Newcastle upon Tyne, upon completion of the project. This has been arranged following discussions between MoD/Defence Estates, RPS, NNPA, Archaeological Services and Lindsay Allason-Jones. Defence Estates will issue a form at the end of the project enabling the release of the archive for deposition.

36. Publication

36.1 The project does not merit publication as a monograph or other stand-alone publication. It is important, however, that reports on the works are published, as academic reports and a popular report.

36.2 Two academic reports will be produced to disseminate significant results of the works to the profession, as follows 1: the evaluations, excavations, post-excavation analyses, topographic surveys and watching briefs, and 2: the building surveys. These reports will be published in *Archaeologia Aeliana*, as agreed by the varied interested parties (MoD/Defence Estates, RPS, NNPA and Archaeological Services).

36.3 The popular report will probably take the form of a small booklet, will be fully illustrated and will summarise the results of the whole project for the non-specialist, highlighting the project's contribution to the understanding of the Otterburn, and wider, area. It is understood that a print-run of 2500 may be commissioned in the first instance.

37. Timetable

37.1 The published academic reports will be drafted for approval by Easter 2006.

37.2 The popular report will be drafted for approval by Easter 2006.

37.3 The complete project archive will be deposited with the Museum of Antiquities, University of Newcastle upon Tyne, upon completion of the above publications.

38. Additional works

38.1 Although not possible within the scope of the current project, the following additional works would greatly enhance the interpretation and presentation of results for both the public and the archaeological profession. It is anticipated that these works could be incorporated into possible future survey projects at the Otterburn Training Area.

38.2 At Ironhouse bastle the surviving earthwork features of the settlement are vulnerable to damage by erosion and by livestock, despite the fenced enclosure that surrounds much of the site. For future management, interpretation and presentation purposes, the whole of the settlement, including the bastle, would benefit from a detailed topographical survey.

38.3 Similarly, at Potts Durtrees topographic survey could be used to record the remainder of the building and associated surviving features, which include the east end of the yard, the land boundary, a possible trackway, the surrounding ridge and furrow cultivation remains and quarry features.

38.4 It is understood that there are plans for the clearance of some buildings to the west of Raw bastle, so that the building will be more readily viewed and understood as an early modern defensible house. This will provide opportunities for closer examination of some of the features of interest described in this report and would enhance the subsequent presentation of the site.

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Appendix I

Radiocarbon calibration sheets

Appendix II

Conservation record sheets

OBC02
CONSERVATION RECORD
EH CONTRACT CONSERVATION, UNIV of DURHAM

Conservator : JAJ
Date : 04/04

SF No :	Context : ex A 01	X-radiograph No : 4746

Object : ?Lynch pin	Material : Fe	Photography : Digital pix bc&ac

DESCRIPTION :

Complete Fe ?lynch pin, 41mm long. Made from 'D' sectioned Fe, 4.5mm wide and 2.5-3mm thick. The Fe is bent over to form a small loop.

The XR suggested the object might be a pair of tweezers, but the 'D' shaped section and its thickness rules this out.

CONDITION :

Highly corroded, with some cracking and slight surface loss.

CONSERVATION TREATMENT :

- Part air abraded.
- Part coated with 7.5% Paraloid B72 in acetone/toluene.

ANALYSIS :

none

STORAGE :

Should be stored in an airtight container at a stable temperature and below 20% RH, to inhibit further corrosion. The RH should be controlled by active silica gel, which is regularly monitored and regenerated as necessary.

OBRS02
CONSERVATION RECORD
EH CONTRACT CONSERVATION, UNIV of DURHAM

Conservator : JAJ
Date : 04/04

SF No : u/s	Context : u/s	X-radiograph No : 4745

Object : Fitting	Material : CuA	Photography : Digital pix bc&ac

DESCRIPTION :

CuA 'U' shaped fitting, 26mm long and 24mm wide max. Made from sub-circular wire, 3.5mm diam, bent into shape. The terminals are round, flattened and perforated, with some decorative shaping above.

The perforation s are filled with Fe corrosion products, suggesting attachment to an iron object.

CONDITION :

Lightly corroded and stable, with slight soil cover as received. Little Cu patination remains, and the surface is a fairly uniform dark orange in colour, giving the impression of an iron object.

CONSERVATION TREATMENT :

Mechanically cleaned using a H2O/IMS/detergent mix.

ANALYSIS :

Surface EDXRF analysis found the object to be made from Cu, with a very small percentage of added lead.

Levels of elements detected in surface corrosion should be regarded as being qualitative only, as they do not accurately reflect the quantitative composition of the original alloy.

STORAGE :

Should be stored in an airtight container at a stable temperature and below 40% RH, to inhibit further corrosion. The RH should be controlled by active silica gel, which is regularly monitored and regenerated as necessary.

OPD02
CONSERVATION RECORD
EH CONTRACT CONSERVATION, UNIV of DURHAM

Conservator : JAJ
Date : 05/04

SF No : 001Δ	Context : EXT 049	X-radiograph No : 4747

Object : Knife	Material : Fe	Photography : Digital pix bc∾ X16 col slide detail

DESCRIPTION :

Iron blade plus broken tang. The knife is 138mm long, with a maximum blade width of 22mm. The blade is triangular in section, with quite a wide back (up to 7mm). The extreme point is missing.

The tang is wedge-shaped in section, 11mm wide max and tapering, with the end broken off. There is no evidence of mineralised material on the tang.

The blade has a few small areas of probable mineralised leather, suggesting the possibility of the knife's deposition inside a leather sheath.

CONDITION :

Highly corroded and fragile. The Fe corrosion is generally bulky, with some warts, pits and corrosion blisters.

CONSERVATION TREATMENT :

- Part air abraded
- Abraded surfaces coated with 7.5% Paraloid B72 (an ethyl methacrylate copolymer)

ANALYSIS :

none

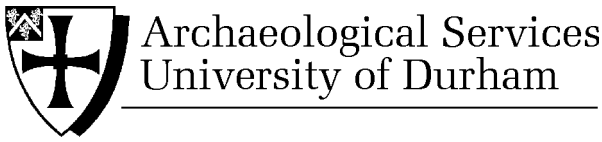
STORAGE :

Should be stored in an airtight container at a stable temperature and below 20% RH, to inhibit further corrosion. The RH should be controlled by active silica gel, which is regularly monitored and regenerated as necessary.

Possible mineralised leather X16

Part V: Report on construction phase works at OTA 2003-2005

This work has also been presented as Archaeological Services Report 1280 (October 2005) for Mowlem plc; the report is reproduced here with their kind permission.



Otterburn Training Area, Northumberland
Options for Change Development

AS90/MLRS Project
construction phase archaeological works 2003-2005

on behalf of
Mowlem plc

for
Ministry of Defence

Report 1280
October 2005

Archaeological Services
Durham University
South Road
Durham DH1 3LE
Tel: 0191 334 1121
Fax: 0191 334 1126
archaeological.services@durham.ac.uk
www.durham.ac.uk/archaeologicalservices

Otterburn Training Area, Northumberland
Options for Change Development
AS90/MLRS Project
construction phase archaeological works 2003-2005 Report 1280, October 2005

MLRS at Otterburn Training Area

AS90 at Otterburn Training Area

Otterburn Training Area, Northumberland
Options for Change Development

AS90/MLRS Project
construction phase archaeological works 2003-2005

Report 1280
October 2005

Archaeological Services Durham University
on behalf of
Mowlem plc
for
Ministry of Defence

Contents

Illustrations

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1. Summary

The project

1.1 This report presents the results of archaeological investigations conducted during the construction phase of works for the AS90/MLRS Project at the Otterburn Training Area, Otterburn, Northumberland. The investigations comprised watching briefs during 68km of road-widening works including the construction of new stone tracks, passing places, gunspurs, tactical observation posts, vehicle bays, drains, culverts, bridges and echelon areas; trial trench evaluation, excavation and watching briefs at Davyshiel (Central Maintenance Facility/CMF); and trial trench evaluation and watching briefs at Carrick Heights (Electronic Target Range/ETR). A watching brief was also maintained during removal of the perimeter fence at the former Redesdale Camp.

1.2 The works were commissioned by Mowlem plc and conducted by Archaeological Services Durham University.

Results

1.3 Areas of re-deposition and truncation of deposits were identified and the presence or lack of archaeological evidence recorded during the watching brief appears to reflect the agricultural/military operations carried out on the site from the medieval period to the present day. Archaeological material was encountered in few of the areas monitored during the road improvement watching brief, although a truncated section of Dere Street Roman road was identified and recorded near Featherwood.

1.4 Trial trench evaluation at Davyshiel prior to the construction of the CMF enabled the recording of a number of earthwork features of medieval and post-medieval date. A post-medieval corn-drying kiln was also excavated to the north-west of the CMF site. Walls of probable post-medieval date were excavated at the ETR.

2. Project background

Introduction

2.1 Otterburn Training Area (OTA) occupies over 23,000 hectares of high moorland and rough hill country almost entirely within the Northumberland National Park, adjacent to the England/Scotland border (Figure 6). It is bounded to the west by the A68 trunk road and to the east by the B6341 (NGR centre: NY 860 050). OTA is the largest single live firing area in the UK and has been used for training military personnel since 1911. It is also a working estate with 31 tenanted farms practising traditional hill livestock farming.

Development proposal

2.2 The development proposal was to widen approximately 50km of existing roads at the OTA and to construct new sections of road, passing places, gunspurs, tactical observation posts, vehicle bays, drains, culverts, bridges and echelon areas as part of the Ministry of Defence's Options for Change AS90/MLRS Project. The construction of a Central Maintenance Facility (CMF) was also proposed for land at Davyshiel.

2.3 During the development phase, a variation to the main construction contract was awarded for the construction of an Electronic Target Range (ETR) on land at Carrick Heights.

Archaeological mitigation measures

2.4 In agreement with English Heritage and the Northumberland National Park Authority the Ministry of Defence (MoD) undertook to commission a programme of agreed archaeological mitigation measures ("the Agreed Measures") at the Otterburn Training Area if the Inquiry into the AS90/MLRS Project development proposals found in favour of the MoD. The MoD proposals were approved in 2001 and Archaeological Services Durham University were subsequently commissioned to implement both the pre-construction and construction components of the Agreed Measures.

2.5 The Agreed Measures relating to the archaeological works were set out in a document presented to the Inquiry (MoD/P/8/A, Appendix B) and subsequently ratified in Condition 4.1 of the Secretary of State's decision. These can be summarised as follows:

- works required prior to construction
- works during construction
- restrictions on the construction contractors' methods or areas of working
- miscellaneous provisions
- completed measures

2.6 The pre-construction archaeological works were commissioned by RPS Group PLC on behalf of the MoD and comprised excavations, topographic surveys and building surveys (Archaeological Services 2004 & 2005). The construction phase archaeological works were commissioned by Mowlem plc and are reported on here. The locations of the investigations for both phases of work are shown on Figure 7.

2.7 This report is also reproduced as Part V of Archaeological Services Report 1284 (2005), which details the final results of all archaeological investigations undertaken by Archaeological Services on the OTA between 2002 and 2005.

Objectives

2.8 The overarching aims of the construction phase works (watching brief) were to provide facilities for professional archaeologists to identify, record and retrieve, as far as possible, archaeological remains that were located in the course of the construction works and to monitor the construction contractor's adherence to the agreed limitations on working methods in those areas where listed buildings or scheduled ancient monuments were present. The project objectives are presented in more detail in Section 3, below.

2.9 The objective of the additional archaeological works at Davyshiel and Carrick Heights was to excavate, sample and record known archaeological features prior to construction works for the Central Maintenance Facility and Electronic Target Range respectively.

Specification

2.10 The various construction phase archaeological works were undertaken in accordance with specifications provided by White Young & Green Consulting Engineers, acting on behalf of the Ministry of Defence (Appendix III).

Dates

2.11 The construction phase archaeological works began in May 2003 with the start of the road improvements watching brief, which was completed in June 2004. The CMF works were undertaken in 2003 and 2004 and the ETR works in 2004 and 2005. Archaeological fieldwork for this project was concluded with the end of the ETR watching brief in September 2005.

2.12 This report was prepared between June 2004 and October 2005.

Personnel

2.13 Construction phase fieldwork was conducted by Graeme Attwood, Katie Bell, Janet Beveridge, Ed Blinkhorn, Mark Douglas, David Graham, Andy Platell, Sam Roberts, Chris Scurfield and Andy Willis, and was supervised by Alan Rae. This report was prepared by Alan Rae and Duncan Hale with contributions by Andy Willis and illustrations by Linda Bosveld, Janine Fisher, David Graham and Martin Railton. Specialist analyses were conducted by Dr Chris Cumberpatch (ceramics), Louisa Gidney (faunal remains), Jason Mole (lithics) and Dr Charlotte O'Brien (plant remains). The project manager was Duncan Hale.

Acknowledgements

2.14 Archaeological Services is grateful for the assistance of the following companies and organisations: the Ministry of Defence, White Young & Green, Mowlem Civil Engineering, CPS Engineering Ltd, RPS Group, the Northumberland National Park Authority and all the tenant farmers.

Archive

2.15 The project code is OTA03, for Otterburn Training Area 2003. Site codes have been assigned to works in specific areas. The archive is currently held by Archaeological Services Durham University and will be transferred (together with the pre-construction phase archive) to Miss Lindsay Allason-Jones for curation at the Museum of Antiquities, University of Newcastle upon Tyne, on completion of the project. Defence Estates will issue a form at the end of the project enabling the release of the archive for deposition.

OASIS

2.16 Archaeological Services is registered with the Online AccesS to the Index of archaeological investigationS project (OASIS). The OASIS ID number for this programme of investigation is archaeol3-10729.

Topography and geology

2.17 The topography and geology of the Training Area can be broadly divided into three sections. The northern part comprises a high plateau of volcanic lavas, typically covered by moor mat-grass and bracken. In the central part there is a high ridge of Fell Sandstone, which forms the watershed between the Coquet and Rede valleys, and is typically covered with a thick blanket of heather. The southern section comprises more recent limestones, shales and thin coal seams. The pasture is better quality in the southern part, particularly on the limestone, although there are also areas of bracken, coarse grasses and heather.

3. Aims and objectives

Overarching aim

3.1 The overarching aims of the construction phase works (watching brief) were to provide facilities for professional archaeologists to identify, record and retrieve, as far as possible, archaeological remains that were exposed during groundworks in those parts of the development which fell outside the pre-construction excavations and to monitor the construction contractor's adherence to the agreed limitations on working methods in specific areas.

3.2 The objective of the additional archaeological works at Davyshiel and Carrick Heights was to excavate, sample and record known archaeological features prior to construction works for the Central Maintenance Facility and Electronic Target Range respectively.

Specific requirements

3.3 There were specific requirements for monitoring the construction contractor's adherence to the agreed limitations on working methods in those areas where listed buildings or scheduled ancient monuments were present, as follows:

- restrictions on working widths and the location of the road widening at Todlaw Pike
- location of widening at Deer Law hut circles
- width restrictions and location of widening at Yatesfield
- width restrictions and location of widening at Bellshiel
- location of widening to east of Dere Street north of Middle Golden Pot
- width restrictions and location of widening at Countess Well
- width restrictions and location of widening adjacent to the western part of High Rochester to Bridge of Aln road
- location of widening in the vicinity of Potts Durtrees medieval building
- width restrictions and protection of Watty Bell's Cairn
- width restrictions and location of widening at medieval structure 2d
- modification of Highshaw Bastle passing place

Research objectives

3.4 The research objectives for this project were:

- to integrate the project within the English Heritage national policy framework and its objectives, as outlined within Exploring Our Past (English Heritage 1991a), the Research Agenda (English Heritage 1997) and Policy Statement on implementation (English Heritage 1999)
- to ensure that nationally prepared research-based documents, for example the output of national societies for different archaeological specialisations, are utilised at the individual project level
- to ensure that the project results met the development of regional research initiatives, as outlined within Frameworks for our Past (English Heritage 1996), within the MARS report (Darvill & Fulton 1998), and in

particular the North-East Regional Research Framework initiative, the development of which is ongoing

- to marry results and interpretations conducted within a developer-funded framework with those conducted in a research framework to address the north-eastern frameworks already made explicit in different formats, for example that for environmental archaeology (Huntley & Stallibrass 1995)
- to address specific research issues arising from individual and organisational contributions, for example to local journals such as Northern Archaeology and Archaeologia Aeliana
- to provide all members of the project team with a framework within which to operate and interpret the archaeological evidence as it comes to light
- to ensure that the methods and sampling strategies adopted, both stated before fieldwork and adapted as the project developed, were appropriate to the research potential of the project
- to ensure that project elements were placed in the context of the overall project and within the framework of archaeological study at a local, regional and national level
- to provide a basis for the overall synthesis of the results for the final report, in particular the academic publication

Updating research objectives

3.5 It has not been found necessary to update the specific research objectives as a result of the post-fieldwork assessment process.

4. Previous archaeological works

4.1 The first comprehensive archaeological survey of the Training Area was carried out by the Conservation Group of Otterburn Estate and the Field Research Group of the Society of Antiquaries of Newcastle upon Tyne between 1975 and 1977. Directed by Beryl Charlton, this survey resulted in the production of a gazetteer and review of archaeological remains on the estate (Charlton & Day 1977; Charlton 1996). There is an abundance of archaeological sites of most periods in the Training Area, ranging from Neolithic burial monuments to Roman forts, medieval farmsteads and post-medieval industrial sites, all of which suggest that the area was considerably more densely populated than in recent times.

4.2 Following MoD proposals for the 'Options for Change' project, archaeological surveys and evaluations were undertaken at a number of locations in the Training Area in 1995 to 1997, in order to assess the potential archaeological significance of specific areas affected by the road-widening proposals. These investigations were undertaken jointly by Lancaster University Archaeological Unit and The Archaeological Practice, University of Newcastle upon Tyne. The evaluations identified a number of areas where the survival of significant archaeological remains would be threatened by the proposed developments (LUAU/NUAP 1996, 1997).

4.3 Subsequently, in 2002, Archaeological Services undertook the detailed excavation of a number of sites threatened by development for the AS90/MLRS Project, as well as further topographic survey and historic building recording, as shown in Figure 7 and listed below. The results of these investigations are fully described and discussed in Archaeological Services Reports 1096 (2004) and 1284 (2005).

4.4 Locations of 2002 investigations:

Excavation	*NGR*
Bellshiel Roman Camp	NY 8159 9971
Bellshiel Layby	NT 8098 0109
Bellshiel Road, N & S	NT 8124 0058, NT 8139 0021
Potts Durtrees	NY 8767 9795
Todlaw Pike	NY 9020 9593
Dere Street N of Redesdale Camp	NY 8252 9941
Outer Golden Pot	NT 8044 0725
Topographic survey	
Yatesfield East Settlement	NY 8600 9770
Watty Bell's Cairn	NT 8921 0199
Bellshiel Law Long Cairn	NT 8132 0117
Building survey	
Craig bastle	NY 9372 9988
Raw bastle	NY 9427 9802
Ironhouse bastle	NY 9335 9833

5. Methods

Standards

5.1 Archaeological Services abides by the Institute of Field Archaeologists' (IFA) *Code of Conduct* (1997a) and *Code of Approved Practice* (1997b), and the British Archaeologists and Developers Liaison Group's *Code of Practice*. The works have been conducted in accordance with specifications provided by White Young & Green Consulting Engineers; approved methods statements prepared by Archaeological Services; and with the IFA *Standard and Guidance* for archaeological field evaluation (2001a), archaeological excavation (2001b) and archaeological watching briefs (2001c).

Fieldwork

5.2 Unless stated otherwise below, each trench was opened by a mechanical excavator fitted with a toothless ditching blade. The development-led stripping, which was closely monitored by archaeologists, was undertaken using a variety of machines, with ditching blades where possible. All topsoil stripping was carried out under close archaeological supervision and spoil was stored alongside the excavations. Modern overburden was removed by machine where encountered. Reinstatement, where necessary, comprised backfilling with excavated spoil and compaction by machine.

5.3 In areas where machining could potentially damage archaeological features close to the surface (for example, the stone walls at the ETR and the corn-drier near the CMF) machine stripping was not used; these sites were de-turfed by hand.

5.4 Archaeological features were identified and cleaned by hand using standard archaeological procedures. Excavation of archaeological deposits was conducted by hand. The excavations were recorded using the Archaeological Services Iconic Formation Process Recording System and our Field Procedures Manual v.4.1 (Archaeological Services 2003).

5.5 Archaeological features were sectioned and excavated, and recorded in plan and section. Plans were typically drawn at a scale of 1:20, sections at a scale of 1:10. All archaeological features, finds and samples were recorded using standard Archaeological Services procedures and forms as contained within the Field Procedures Manual.

5.6 Each stratigraphic matrix was established on site during the course of the excavations.

5.7 The locations of small finds, trench locations and levels were recorded using total station survey instruments. Levels and trench locations have been related to Ordnance Survey datum. The photographic record included bracketed colour transparencies and monochrome 35mm stills, as well as digital photography.

5.8 All excavation work was subject to an environmental sampling strategy, which was agreed with Jacqui Huntley (English Heritage Regional Science Advisor)

prior to the commencement of any site works. 30-litre bulk sediment samples were taken from the fills of cut features as well as any other securely interpreted stratigraphic units (such as buried soils) and waterlogged deposits, which were considered to have potential for preserving palaeoenvironmental or archaeological information. In some instances samples were specifically collected for the recovery of pollen evidence.

5.9 Sampling was conducted by our Environmental Archaeologist (Dr Charlotte O'Brien) and by our field personnel, all of whom have been trained in environmental sampling strategies and procedures.

5.10 Artefactual finds were removed from site to a secure location at the end of each working day. Small finds were recorded and packaged separately from bulk material; they were listed and numbered, and their three-dimensional co-ordinates recorded. All small finds were appropriately packaged, and removed from site to suitable secure storage at the end of each day.

5.11 It was not considered appropriate for these excavations, where low quantities of finds were anticipated, to employ an on-site finds officer. All field personnel are trained in the recovery, labelling and storage of artefacts.

Post-excavation assessment

5.12 Following the completion of fieldwork all site records were checked and cross-referenced. Context registers have been included in this report (Appendix I).

5.13 All bulk sediment samples were assessed for their potential to provide environmental and economic evidence, as well as their suitability for subsequent ^{14}C dating. For general biological assessment 5-litre sub-samples have been processed, as below.

5.14 Bulk sediment samples were sub-sampled and processed using a manual flotation technique with both flots (largely plant remains) and residues being retained on 500μm mesh sieves. Flots were examined at up to x50 magnification for botanical remains. The residues were also inspected for fruit stones, nutshells, small bones, pottery sherds, slag etc., and scanned with a magnet for ferrous materials.

5.15 The assessment reports for each site, below, record the general nature of the sediment, the composition of sample flot and residue, the types of plant remains present (e.g. waterlogged and charred, seed/leaf/stem/root types seen and easily identified), the preservation quality of plant remains, and observations on ecological groups represented. Data tables and abundance scores are provided. Recommendations for further work on the samples are provided where appropriate.

5.16 Artefacts have been assessed by specialists in individual types of materials encountered on site rather than through a generic 'finds specialist' to ensure an accurate, up-to-date and academically viable report is produced. Specialists were selected on the basis of their modern academic knowledge and their

ability to interpret artefactual assemblages within the wider archaeological context.

5.17 Assessments of the excavated material have been completed following the recommendations of *Management of Archaeological Projects*, Appendix 4 (English Heritage 1991b). Each class of artefact recovered from the site has been examined to determine in particular:

- the quantification, age and description of the artefacts
- the significance of the material within the archaeological context
- the potential of the material for further analysis, including elemental analysis
- any conservation requirements
- the storage requirement
- the discard policy

5.18 The suitability of samples and materials for scientific dating techniques such as ^{14}C dating have been assessed from specific contexts.

6. Road improvement and associated works: watching brief

Introduction

6.1 A total of 40km of asphalt roads were widened and 28km of new and widened stone tracks were constructed together with passing places, drains, tactical observation posts, vehicle bays, gunspurs, services and 267 new culverts. Six echelon areas were also developed at Stewartshiels, Davyshiel, Headshope, Yatesfield, Leighton Hill and Redesdale. There were two major bridgeworks, one involving demolition of an existing roadbridge and subsequent new construction, the other involving refurbishment of a stone arch roadbridge.

6.2 For construction purposes the road system was divided into 56 sections, as shown in Figure 7, not including the roads associated with the new echelon areas. The watching brief results for each section are provided below. A list of contexts with descriptions and associated finds is provided in Appendix I. The site code was OTA03.

Typical road improvement in progress, Road WW-XX, looking SW

Road A-B

6.3 Road A-B measured 1.1km in length, orientated north to south, and was between 197.17m and 260.41m OD. The works consisted of 2m of road-widening along the eastern edge of the existing road and 1m of road-widening along the western edge of the existing road. Additional work undertaken in conjunction with the road-widening was the construction of gunspurs 1a and 1c, and concrete culverts C1/1, C1/1e, C1/2 and C1/2a.

6.4 The natural orange/brown boulder clay [3] was reached at a depth of 0.58m below ground level (bgl). Immediately above this was a layer of greyish brown

clay silt [2] 0.35m in depth. The uppermost deposit was a silty clay topsoil [1] 0.23m in depth. No archaeological deposits or artefacts were recovered.

Road B-C

6.5 Road B-C measured 2.6km in length, orientated broadly north-east to south-west, and was between 247.35m and 281.87m OD. The road-widening took place along the north-western edge of the Scheduled Ancient Monument at High Shaw Bastle (SAM20909). The works consisted of 2m of road-widening along the north-western edge of the existing road and 1m of road-widening along the south-eastern edge; additional works comprised the construction of gunspurs 7, 8, 10 and 11, and concrete culverts C1/3, C1/4, C1/5, C1/6, C1/7, C1/8, C1/10, C2/1 and C2/2.

Access track construction for Gunspur 7, Road B-C

Access track construction for Gunspur 7, Road B-C

6.6 The natural mottled orange/grey/brown boulder clay [6] was reached at a depth of 0.62m bgl. Immediately above this was a layer of greyish brown clay silt [5] 0.38m in depth. The uppermost deposit was a silty clay topsoil [4] 0.34m in depth. No archaeological features or remains were identified during the course of the groundworks.

Road C-D

6.7 Road C-D measured 1km in length, orientated north-west to south-east, and was between 245.29m and 279.48m OD. The works consisted of 2m of road-widening along the south-western edge of the existing road and 1m of road-widening along the north-eastern edge of the existing road. Additional works undertaken in conjunction with the road-widening comprised the construction of gunspurs 14 and 15.

6.8 The natural orange/brown boulder clay [9] was reached at a depth of 0.60m bgl. Immediately above this was a layer of dark grey brown clay silt [8] 0.40m in depth. The uppermost deposit was a silty clay topsoil [7] 0.20m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road D-E

6.9 Road D-E measured 2.1km in length, orientated north-east to south-west, and was between 224.81m and 240.48m OD. The works consisted of the construction of a new stone road measuring 7m in width. Additional works comprised the construction of gunspurs 16 and 22, and concrete culverts C2/7, C2/7a, C2/7b, C2/7c, C2/7d, C2/7e, C2/8, C2/9, C2/35, C2/36 and C2/37.

6.10 The natural gleyed orange/brown to blue/grey boulder clay [12] was reached at a depth of 0.48m bgl. Immediately above this was a layer of dark brown peat [11] 0.28m in depth. The uppermost deposit was a silty clay topsoil [10] 0.20m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road E-F

6.11 Road E-F measured 1.1km in length, orientated north-west to south-east, and was between 243.67m and 278.55m OD. The works consisted of 2m of road-widening along the eastern edge of the existing road and 1m of road-widening along the western edge of the existing road. Additional works comprised the construction of gunspurs 17 and 18, and concrete culverts C2/13, C2/15 and C2/16.

6.12 The natural orange/brown boulder clay (15) was reached at a depth of 0.62m bgl. Immediately above this was a layer of orange/brown clay silt [14], 0.32m in depth. The uppermost deposit was a silty clay topsoil [13] 0.30m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road F-C

6.13 Road F-C measured 2.2km in length, orientated north-east to south-west, and was between 225.77m and 279.77m OD. The works consisted of 2m of road-widening along the western edge of the existing road and 1m of road-widening along the eastern edge. Additional works undertaken in conjunction with the road widening comprised the construction of gunspurs 11b, 12, 13 and 19, and concrete culverts C2/3, C2/4 and C2/5.

6.14 The natural orange/brown boulder clay [18] was reached at a depth of 0.60m bgl. Immediately above this was a layer of greyish brown clay silt [17] 0.35m in depth. The uppermost deposit was a silty clay topsoil [16] 0.25m in depth.

6.15 Evidence for a recent bonfire was found between chainage 760m and 780m. No archaeological deposits or features were identified, and no artefacts recovered.

Road F-G

6.16 Road F-G measured 2.7km in length, orientated north-west to south-east, and was between 236.39m and 265.96m OD. The road-widening was excavated along the north-eastern edge of the Scheduled Ancient Monument at Tod Law Pike (SM25156). The works consisted of 2m of road-widening along the western edge of the existing road and 1m of road-widening along them eastern edge of the existing road. Additional works comprised the construction of gunspurs 23 and 24, and concrete culverts C2/18, C2/19, C2/20, C2/21, C2/22, C2/23, C2/24, C2/25, C3/1, C3/2, C3/3, C3/4, C3/4a, C3/5, C3/6, C3/7, C3/7a, C3/8, C3/8a and C3/8b.

6.17 The natural orange/brown boulder clay [43] was reached at a depth of 0.45m bgl. Immediately above this was a layer of greyish brown clay silt [42] 0.35m in depth. The uppermost deposit was a silty clay topsoil [136] 0.10m in depth. No archaeological features or remains were recorded during the course of the groundworks.

Road G-H

6.18 Road G-H measured 1.3km in length, orientated north-east to south-west, and was between 233.46m and 255.14m OD. The works consisted of 2m of road-widening along the eastern edge and 1m along the western edge of the existing road. Additional works undertaken comprised the construction of gunspur 26, and concrete culverts C3/22, C3/23, C/24, C3/25, C3/26 and C3/27. Davyshiel echelon was joined to the eastern side of road G-H by two concrete junctions.

6.19 The natural orange/brown boulder clay [46] was reached at a depth of 0.38m bgl. Immediately above this was a layer of greyish brown clay silt [45] 0.25m in depth. The uppermost deposit was a silty clay topsoil [44] 0.13m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road H-J

6.20 Road H-J measured 350m in length, orientated east to west, and was between 214.23m and 231.73m OD. The road traverses west from Otterburn Camp, across the northern end of the proposed CMF works at Davyshiel. The works consisted of a 9m-wide strip along the northern edge of the existing road and 1m of road-widening along the southern edge of the existing road. Additional works comprised the construction of concrete culverts C3/21, C3/21a and C3/21b.

6.21 Some evidence for ridge and furrow remains was noted during the road-widening, with one ridge standing to 0.30m in height. The works also cut into the northern edge of a crop pit, which was filled with 20th century refuse (not retained). A crop pit is a bell-shaped pit excavated for coal extraction; these are often found in groups where there are outcrops of coal-bearing strata. The row of crop pits at Davyshiel are likely to be post-medieval in date, as the area was not being mined at the time of a 1604 survey (Sanderson 1891). The results of investigations in the CMF area are described in Section 6, below.

6.22 The natural orange/brown boulder clay [21] was reached at a depth of 0.35m bgl. Immediately above this was a layer of very dark brown/black peaty soil [20] 0.15m in depth. The uppermost deposit was a silty clay topsoil [19] 0.20m in depth.

Road H-K

6.23 Road H-K measured 1.7km in length, orientated east to west, and was between 233.96m and 270.23m OD. The road-widening was conducted along the north-eastern edge of the Scheduled Ancient Monument at Fairney Cleugh (SAM25159). The works consisted of 2m of road-widening along the southern edge of the existing road and 1m of road-widening along the northern edge. Additional works undertaken comprised the construction of gunspur 27, and concrete culverts C3/16, C3/17, C3/18, C3/19, C3/20 and C4/1.

6.24 The natural orange/brown boulder clay [49] was reached at a depth of 0.50m bgl. Immediately above this was a layer of greyish brown clay silt [48] 0.32m in depth. The uppermost deposit was a silty clay topsoil [47] 0.18m in depth. No archaeological features or remains were recorded during the course of the excavation.

Road K-L

6.25 Road K-L measured 1.6km in length, orientated north to south, and was between 238.23m and 294.21m OD. The road-widening was conducted along the eastern edge of a ruined medieval building at Potts Durtrees. A detailed archaeological excavation had already taken place here (Archaeological Services 2004 & 2005).

6.26 The works consisted of 2m of road-widening along the eastern edge and 1m along the western edge of the existing road. Additional works undertaken in conjunction with the road-widening comprised the construction of gunspurs 29 and 31, and concrete culverts C3/13, C3/14, C3/15 and C3/16.

6.27 The natural orange/brown boulder clay [124] was reached at a depth of 0.59m bgl. Immediately above this was a layer of greyish brown clay silt [123] 0.36m in depth. The uppermost deposit was a silty clay topsoil [122] 0.23m in depth. No archaeological deposits or artefacts were recovered.

Road L-L1

6.28 Road L-L1 measured 150m in length, orientated north-east to south-west, and was between 293.48m and 300.34m OD. The road-widening was conducted along the north-western edge of the Scheduled Ancient Monument at Hare Cairn (SAM25062). The works consisted of 2m of road-widening along the eastern edge of the existing road and 1m of road-widening along the western edge of the existing road. Additional works undertaken in conjunction with the road widening comprised the construction of gunspur 30.

6.29 The natural orange brown boulder clay [55] was reached at a depth of 0.58m bgl. Immediately above this was a layer of greyish brown peaty clay silt [54] 0.35m in depth. The uppermost deposit was a silty clay topsoil [53] 0.23m in depth. No archaeological features or remains were recorded during the course of the excavation

Road L-G

6.30 Road L-G measured 1.5 km in length, orientated north-west to south-east, and was between 253.77m and 302.66m OD. The road-widening was conducted along the north-eastern edge of the Scheduled multi-period settlement at Barracker Rigg (SAM25162/01, SAM25162/02, SAM25162/04, SAM25162/05). The works consisted of 2m of road-widening along the north-eastern edge of the existing road and 1m of road-widening along the south-western edge. Additional works comprised the construction of gunspurs 25 and 26, and concrete culverts C3/9, C3/10, C3/11 and C3/12.

6.31 The natural gleyed orange/brown to blue/grey boulder clay [24] was reached at a depth of 0.74m bgl. Immediately above this was a layer of very dark grey/brown peat [41] 0.20m in depth, which had accumulated naturally within a glacial depression 900m from junction G. This was overlain by a layer of light grey clay silt [40] 0.06m in depth, which was overlain by a layer of dark brown peat [23], 0.28m in depth. The uppermost deposit was a silty clay topsoil [22], 0.21m in depth.

6.32 A sondage, 1.2m by 1m and 1.2m in depth, was excavated to the south of the new road edge at chainage 910m in order to expose the stratigraphic sequence. The south-facing section was recorded (Figure 8), and an overlapping column sample collected in monolith tins. 30 litre samples were also retrieved from each of the lower [41] and upper [23] peat deposits and three pieces of timber were recovered from [41] for assessment of their potential to provide archaeological information. The results of the assessment are presented at the end of this Section (para. 6.130-136). The deposits and timbers appear to have accumulated naturally within a glacial hollow, where preservation of plant macrofossils was poor due to periodic drying out of otherwise waterlogged conditions.

6.33 No archaeological features or remains were recorded during the course of the excavation.

Road K-M

6.34 Road K-M measured 1.8km in length, orientated east to west, and was between 184.20m and 233.47m OD. The works consisted of 2m of road-widening along the southern edge and 1m along the northern edge of the existing road. Additional works undertaken in conjunction with the road-widening comprised the construction of gunspurs 32 and 33, and concrete culverts C4/2, C4/3, C4/4, C4/5, C4/6, C4/7, C4/8 and C4/9.

6.35 The natural orange/brown boulder clay [52] was reached at a depth of 0.48m bgl. Immediately above this was a layer of greyish brown clay silt [51] 0.25m in depth. The uppermost deposit was a silty clay topsoil [50] 0.23m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road M-N

6.36 Road M-N measured 738m in length, orientated north to south, and was between 217.26m and 248.30m OD. The works consisted of 1m of road-widening along the eastern and western edges of the existing road. Additional works undertaken in conjunction with the road widening comprised the construction of gunspurs 35 and 37, and concrete culverts C4/10, C4/11 and C2/12.

6.37 The natural orange/brown boulder clay [127] was reached at a depth of 0.38m bgl. Immediately above this was a layer of dark grey brown silty clay silt [126] 0.20m in depth. The uppermost deposit was a silty clay topsoil [125] 0.18m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road N-P

6.38 Road N-P measured 600m in length, orientated east to west, and was between 228.73m and 248.30m OD. The works consisted of 2m of road-widening along the southern edge of the existing road and 1m of road-widening along the northern edge. Additional works undertaken in conjunction with the road-widening comprised the construction of gunspurs 39 and 40, and concrete culverts C4/13, C4/14 and C4/15.

6.39 The natural orange/brown boulder clay [130] was reached at a depth of 0.40m bgl. Immediately above this was a layer of dark grey brown silty clay [129] 0.25m in depth. The uppermost deposit was a silty clay topsoil [128] 0.15m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road N-Q

6.40 Road N-Q measured 1.4km in length, orientated north to south, and was between 248.84m and 259.79m OD. The road-widening was conducted along the western edge of the Scheduled Ancient Monument at Yatesfield Hill

(SAM25157). The works consisted of 2m of road-widening along the western edge of the existing road and 1m of road-widening along the eastern edge of the existing road. Additional works undertaken comprised the construction of gunspurs 34 and 38, and concrete culverts C4/16, C4/17 and C4/18.

6.41 The natural orange/brown boulder clay [134] was reached at a depth of 0.38m bgl. Immediately above this on the western side was a layer of redeposited natural and hardcore. This was overlain by thin (0.05m) turf. On the eastern side of the existing road the boulder clay was overlain by hardcore and turf only. No archaeological features or remains were recorded.

Road Q-S1

6.42 Road Q-S1 measured 400m in length, orientated north-east to south-west, and was between 259.76m and 222.56m OD. The works consisted of 2m of road-widening along the eastern edge of the existing road. Additional works comprised the construction of concrete culvert C6/1.

6.43 The natural orange/brown boulder clay [135] was reached at a depth of 0.38m bgl. Immediately above this on the western side was a layer of redeposited natural and hardcore. This was overlain by thin (0.05m) turf. On the eastern side of the existing road the boulder clay was overlain by hardcore and turf only. As with the previous road section, it is apparent that the area has been disturbed in the recent past. No archaeological features or remains were identified during the course of the works.

Road S1-T

6.44 Road S1-T measured 660m in length, orientated north-east to south-west, and was between 222.85m and 248.37m OD. The works consisted of 2m of road-widening along the eastern edge of the road and 1m of road-widening along the western edge. There were no additional works associated with this road.

6.45 The natural orange/brown boulder clay [26] was reached at a depth of 0.23m bgl. This was overlain by a silty clay topsoil [25] 0.23m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road T-U

6.46 Road T-U measured 532m in length, orientated north-west to south-east, and was between 225.81m and 231.53m OD. The works consisted of 2m of road-widening along the western edge of the existing road and 1m of road-widening along the eastern edge of the existing road.

6.47 The natural orange/brown boulder clay [28] was reached at a depth of 0.28m bgl. This was overlain by a silty clay topsoil [27] 0.28m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road U-L

6.48 Road U-L measured 1km in length, orientated north-west to south-east, and was between 225.19m and 293.24m OD. The works consisted of 2m of road-

widening along the western edge of the existing road and 1m of road-widening along the eastern edge.

6.49 The natural orange/brown boulder clay [30] was reached at a depth of 0.30m bgl. This was overlain by a silty clay topsoil [29] 0.30m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road T-V

6.50 Road T-V measured 2.2km in length, orientated north-east to south-west, and was between 250.56m and 307.81m OD. The road was widened by 2m on the western side and concrete culverts C6/2, C6/3, C6/4, C6/5, C6/7, C6/8, C6/9, C6/10 and C6/11 were constructed.

6.51 The natural orange/brown boulder clay [139] was reached at a depth of 0.32m bgl. Immediately above this was a layer of dark greyish brown clay silt [13] 0.19m in depth. The uppermost deposit was a silty clay topsoil [137] 0.13m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road V-W

6.52 Road V-W measured 200m in length, orientated east to west, and was between 308.94m and 313.00m OD. The works consisted of 2m of road-widening along the northern edge of the existing road.

6.53 The natural orange/brown boulder clay [142] was encountered at 0.28m bgl. Immediately above this was a layer of very dark greyish brown clay silt [141] 0.18m in depth. The uppermost deposit was a silty clay topsoil [140] 0.10m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road W-X

6.54 Road W-X measured 500m in length, orientated north to south, and was between 313.15m and 329.29m OD. The road was widened by 2m along its eastern edge.

6.55 The natural orange/brown boulder clay [145] was reached at a depth of 0.29m bgl. Immediately above this was a layer of dark greyish brown clay silt [144] 0.18m in depth. The uppermost deposit was a silty clay topsoil [143] 0.11m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road X-Y

6.56 Road X-Y measured 1.6km in length, orientated east to west, and was between 311.81m and 354.86m OD. The works consisted of the construction of a new stone road measuring 5m in width. Additional works undertaken comprised the construction of eight tactical observation posts: four measured 60m by 5m; two measured 90m by 5m; one measured 105m by 5m; and one measured 50m by 5m.

6.57 The natural gleyed orange/brown to blue/grey boulder clay [157] was reached at a depth of between 0.50m and 0.75m bgl. Immediately above this was a layer of very dark brown peaty silty clay [156] between 0.38m and 0.62m in depth. The uppermost deposit was a silty clay topsoil [155] 0.12m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road Y-AA

6.58 Road Y-AA measured 530m in length, orientated east to west, and was between 352.10m and 352.07m OD. The works consisted of 2m of road-widening along the northern edge of the existing road. Additional works comprised the construction of five tactical observation posts: one measured 15m by 5m; two measured 35m by 5m; one measured 25m by 5m; and one measured 45m by 5m linked to the northern end of junction BB.

6.59 The natural orange/brown boulder clay [160] was reached at a depth of 0.36m bgl. Immediately above this was a layer of very dark brown peaty silty clay [159] 0.23m in depth. The uppermost deposit was a silty clay topsoil [158], 0.13m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road BB-CC

6.60 Road BB-CC measured 527m in length, orientated north-west to south-east, and was between 337.43m and 347.21m OD. The works consisted of 2m of road-widening along the eastern edge of the existing road to chainage 350m, and 2m of road-widening along the western edge of the existing road to chainage 527m. Additional works undertaken in conjunction with the road-widening comprised the construction of concrete culverts C5/3 and C5/4.

6.61 The natural orange/brown boulder clay [179] was reached at a depth of 0.38m bgl. Immediately above this was a layer of very dark brown peaty silty clay [178] 0.28m in depth. The uppermost deposit was a silty clay topsoil [177] 0.10m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road Q-GG

6.62 Road Q-GG measured 2.3km in length, orientated north-west to south-east, and was between 258.77m and 336.34m OD. The works consisted of 2m of road-widening along the western edge of the existing road and 1m of road-widening along the eastern edge. Additional works undertaken comprised the construction of gunspurs S1, S3 and S5, and concrete culverts C7/2, C7/3, C7/4, C7/5, C7/6, C7/7, C7/7a and C7/8.

6.63 The natural gleyed orange/brown to blue/grey boulder clay [58] was reached at a depth of 0.38m bgl. Immediately above this was a layer of grey brown peaty clay silt [57], 0.18m in depth. The uppermost deposit was a silty clay topsoil [56] 0.20m in depth. No archaeological deposits or features were identified, and no artefacts were recovered.

Road GG-NN

6.64 Road GG-NN measured 2.6km in length, orientated north-east to south-west, and was between 324.76m and 336.34m OD. The works consisted of 2m of road-widening along the northern edge and 1m of road-widening along the southern edge of the existing road. Additional works comprised the construction of concrete culverts C7/1, C8/7, C8/8, C8/9, C8/10, C8/11, C8/12 and C8/13.

6.65 The natural gleyed orange/brown to blue/grey boulder clay [61] was reached at a depth of 0.48m bgl. Immediately above this was a layer of greyish brown clay silt [60] 0.35m in depth. The uppermost deposit was a silty clay topsoil [59] 0.13m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road DD-FF

6.66 Road DD-FF measured 1.9km in length, orientated north-west to south-east, and was between 279.84m and 310.14m OD. The works consisted of 2m of road-widening along the eastern edge of the existing road and 1m of road-widening along the western edge of the existing road. Additional works comprised the construction of gunspurs S2 and S4 and concrete culverts C7/9, C7/10, C7/11 and C7/12.

6.67 The natural orange/brown boulder clay [64] was reached at a depth of 0.52m bgl. Immediately above this was a layer of greyish brown clay silt [63] 0.35m in depth. The uppermost deposit was a silty clay topsoil [62] 0.17m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road R-EE

6.68 Road R-EE measured 1.5km in length and was between 229.82m and 286.69m OD. The works consisted of 2m of road-widening along the northern edge of the existing road and 1m along the southern edge. Additional works undertaken comprised the construction of concrete culverts C7/13, C7/14, C7/16 and C7/17.

6.69 Natural orange/brown boulder clay [67] was reached at a depth of 0.48m bgl. Immediately above this was a layer of greyish brown clay silt [66] 0.25m in depth. The uppermost deposit was a silty clay topsoil [65] 0.23m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road DD-R1

6.70 Road DD-R1 measured 700m in length and was between 250.10m and 275.43m OD. The works consisted of 2m of road-widening along the eastern edge of the existing road and 1m of road-widening along the western edge of the existing road. Additional works comprised the construction of concrete culverts C7/15 and C7/19.

6.71 The natural orange/brown boulder clay [70] was reached at a depth of 0.50m bgl. Immediately above this was a layer of greyish brown clay silt [69] 0.27m

in depth. The uppermost deposit was a silty clay topsoil [68] 0.23m in depth. No archaeological deposits or features were identified, and no artefacts were recovered.

Road R2-GG

6.72 Road R2-GG measured 3.8km in length, orientated broadly north-west to south-east, and was between 252.52m and 340.10m OD. The works consisted of 2m of road-widening along the eastern edge and 1m along the western edge of the existing road. Additional works undertaken comprised the construction of concrete culverts C7/21, C7/22, C7/23, C7/24, C7/25, C7/26, C7/27, C7/28, C7/29, C7/30, C7/30a and C7/32.

6.73 The natural orange/brown boulder clay [73] was reached at a depth of 0.58m bgl. Immediately above this was a layer of greyish brown clay silt [72] 0.35m in depth. The uppermost deposit was a silty clay topsoil [71] 0.23m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG5-GG23 (Stewartshiels echelon area)

6.74 Road GG5-GG23 measured 1.3km in length, orientated north-west to south-east, and was between 264.11m and 320.45m OD. The works consisted of 2m of road-widening along the eastern edge and 1m of road-widening along the western edge of the existing road. Additional works comprised the construction of concrete culvert C7/34.

6.75 Natural orange/brown boulder clay [76] was reached at a depth of 0.58m bgl. Immediately above this was a layer of greyish brown clay silt [75] 0.35m in depth. The uppermost deposit was a silty clay topsoil [74] 0.23m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG14-FF (Stewartshiels echelon area)

6.76 Road GG14-FF measured 1.1km in length, orientated east-west, and was between 265.07m and 308.53m OD. The works consisted of 2m of road-widening along the northern edge of the existing road and 1m along the southern edge of the existing road. Additional works undertaken in conjunction with the road-widening comprised the construction of concrete culvert C7/36.

6.77 The natural orange/brown boulder clay [79] was reached at a depth of 0.58m bgl. Immediately above this was a layer of greyish brown clay silt [78] 0.35m in depth. The uppermost deposit was a silty clay topsoil [77] 0.23m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG1-GG12 (Stewartshiels echelon area)

6.78 Road GG1-GG12 measured 500m in length, orientated north-west to south-east, and was between 304.95m and 308.53m OD. The works consisted of 2m of road-widening along the western edge of the existing road and 1m of road-

widening along the eastern edge. Additional works undertaken comprised the construction of concrete culverts C7/38 and C7/39.

6.79 The natural orange/brown boulder clay [82] was reached at a depth of 0.52m bgl. Immediately above this was a layer of greyish brown clay silt [81] 0.30m in depth. The uppermost deposit was a silty clay topsoil [80] 0.22m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG11-GG2 (Stewartshiels echelon area)

6.80 Road GG11-GG2 measured 600m in length, orientated east-west, and was between 320.40m and 325.10m OD. The works consisted of 2m of road-widening along the southern edge of the existing road and 1m along the northern edge. Additional works comprised the construction of thirteen vehicle bays and concrete culverts C7/37, C7/43, C7/44, C7/45 and C7/46.

6.81 The natural orange/brown boulder clay [85] was reached at a depth of 0.50m bgl. Immediately above this was a layer of greyish brown clay silt [84] 0.31m in depth. The uppermost deposit was a silty clay topsoil [83] 0.19m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG12-FF2 (Stewartshiels echelon area)

6.82 Road GG12-FF2 measured 460m long, orientated east-west, and was between 309.07m and 325.10m OD. The works consisted of 2m of road-widening along the northern edge and 1m along the southern edge of the existing road. Additional works undertaken comprised the construction of concrete culverts C7/40, C7/41 and C7/42.

6.83 The natural orange/brown boulder clay [88] was reached at a depth of 0.49m bgl. Immediately above this was a layer of greyish brown clay silt [87] 0.34m in depth. The uppermost deposit was a silty clay topsoil [86] 0.15m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG26-GG38 (Stewartshiels echelon area)

6.84 Road GG26-GG38 was 400m long, orientated north-east to south-west, and was between 270.27m and 273.57m above sea level. The works consisted of the construction of a new stone road measuring 7m in width. Additional works comprised the construction of eleven vehicle bays.

6.85 The natural orange/brown boulder clay [91] was reached at a depth of 0.50m bgl. Immediately above this was a layer of greyish brown clay silt [90] 0.35m in depth. The uppermost deposit was a silty clay topsoil [89] 0.15m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG26-GG37 (Stewartshiels echelon area)

6.86 Road GG26-GG37 measured 400m in length, orientated east-west, and was between 296.03m and 288.23m OD. The works consisted of the construction of a new stone road 7m wide.

6.87 The natural orange/brown boulder clay [94] was reached at a depth of 0.52m bgl. Immediately above this was a layer of greyish brown clay silt [93] 0.37m in depth. The uppermost deposit was a silty clay topsoil [92] 0.15m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG25-GG36 (Stewartshiels echelon area)

6.88 Road GG25-GG36 measured 407m in length, orientated north-south, and was between 296.03m and 302.08m OD. The works consisted of the construction of a new stone road 7m wide.

6.89 The natural orange/brown boulder clay [97] was reached at a depth of 0.50m bgl. Immediately above this was a layer of greyish brown clay silt [96] 0.35m in depth. The uppermost deposit was a silty clay topsoil [95] 0.15m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG15-GG24 (Stewartshiels echelon area)

6.90 Road GG15-GG24 measured 208m in length, orientated north-east to south-west, and was between 304.32m and 306.08m OD. The works consisted of the construction of a new stone road measuring 7m in width.

6.91 The natural orange/brown boulder clay [100] was reached at a depth of 0.56m bgl. Immediately above this was a layer of greyish brown clay silt [99] 0.35m in depth. The upper deposit was a silty clay topsoil [98] 0.21m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG24-GG27 (Stewartshiels echelon area)

6.92 Road GG24-GG27 measured 425m in length, orientated north-west to south-east, and was between 308.29m and 327.18m OD. The works consisted of the construction of a new stone road 7m wide.

6.93 The natural orange/brown boulder clay [121] was reached at a depth of 0.59m bgl. Immediately above this was a layer of greyish brown clay silt [120] 0.39m in depth. The uppermost deposit was a silty clay topsoil [119] 0.20m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG22-GG21 (Stewartshiels echelon area)

6.94 Road GG22-GG21 measured 385m in length, orientated north-west to south-east, and was between 322.50m and 335.18m OD. The works consisted of the construction of a new stone road 7m wide.

6.95 The natural orange/brown boulder clay [103] was reached at a depth of 0.57m bgl. Immediately above this was a layer of greyish brown clay silt [102] 0.35m in depth. The uppermost deposit was a silty clay topsoil [101] 0.22m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road FF3-GG11 (Stewartshiels echelon area)

6.96 Road FF3-GG11 measured 80m in length, orientated north-east to south-west, and was between 319.89m and 323.27m OD. The works consisted of the construction of a new stone road 7m wide.

6.97 The natural orange/brown boulder clay [106] was reached at a depth of 0.60m bgl. Immediately above this was a layer of greyish brown clay silt [105] 0.37m in depth. The uppermost deposit was a silty clay topsoil [104] 0.23m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road GG3-GG35 (Stewartshiels echelon area)

6.98 Road GG3-GG35 was 1.1km long, orientated east-west, and was between 300.35m and 325.17m OD. The works consisted of the construction of a new stone road 7m wide.

6.99 The natural orange/brown boulder clay [109] was reached at a depth of 0.58m bgl. Immediately above this was a layer of greyish brown clay silt [108] 0.35m in depth. The uppermost deposit was a silty clay topsoil [107] 0.23m in depth. No archaeological deposits or features were identified and no artefacts were recovered.

Road GG31-GG34 (Stewartshiels echelon area)

6.100 Road GG31-GG34 measured 1.5km in length, orientated east-west, and was between 307.37m and 333.10m OD. The works consisted of the construction of a new stone road 7m wide.

6.101 The natural orange/brown boulder clay [112] was reached at a depth of 0.55m bgl. Immediately above this was a layer of greyish brown clay silt [111] 0.35m in depth. The uppermost deposit was a silty clay topsoil [110] 0.20m in depth. No archaeological deposits or features were identified and no artefacts recovered.

Road GG34-GG4 (Stewartshiels echelon area)

6.102 Road GG34-GG4 measured 1.3km in length, orientated north-east to south-west, and was between 272.10m and 331.18m OD. The works consisted of the construction of a new stone road 7m in width.

6.103 The natural orange/brown boulder clay [115] was reached at a depth of 0.54m bgl. Immediately above this was a layer of greyish brown clay silt [114] 0.31m in depth. The uppermost deposit was a silty clay topsoil [113] 0.23m in depth. No archaeological deposits or features were identified and no artefacts recovered.

Road GG32-GG33 (Stewartshiels echelon area)

6.104 Road GG32-GG33 measured 200m in length, orientated east-west, and was between 316.21m and 318.06m OD. The works consisted of the construction of a new stone road 7m wide.

6.105 The natural orange/brown boulder clay [118] was reached at a depth of 0.58m bgl. Immediately above this was a layer of greyish brown clay silt [117] 0.35m in depth. The uppermost deposit was a silty clay topsoil [116] 0.23m in depth. No archaeological deposits or features were identified and no artefacts were recovered.

Road NN-PP

6.106 Road NN-PP measured 630m in length, orientated north-east to south-west, and was between 208.66m and 217.68m OD. The works consisted of 2m of road-widening along the eastern edge of the existing road. Additional works comprised the construction of culvert C8/6.

6.107 The natural orange/brown boulder clay [148] was reached at a depth of 0.36m bgl. Immediately above this was a layer of very dark grey brown peaty clay silt [147] 0.25m in depth. The uppermost deposit was a silty clay topsoil [146] 0.11m in depth. No archaeological deposits or features were identified and no artefacts found.

Road PP1-SS

6.108 Road PP1-SS measured 1.74km in length, orientated north-west to south-east, and was between 207.58m and 259.72m OD. The works consisted of 5m of road-widening along the western edge of the existing road (chainage 0-550m) and 5m of road-widening along the eastern edge of the existing road (chainage 550m-1740m). Additional works comprised the construction of gunspurs 42 and 43, and concrete culverts C8/1, C8/2, C8/3, C8/14 and C8/15.

6.109 Sandstone bedrock [151] was reached at a depth of 0.22m bgl. Immediately above this was a layer of dark brown/grey clay silt [150] 0.13m in depth. The uppermost deposit was a silty clay topsoil [149] 90mm in depth. No archaeological deposits or features were identified and no artefacts recovered.

Road SS-UU

6.110 Road SS-UU measured 1.2km in length, orientated north-west to south-east, and was between 256.81m and 304.12m OD. The works consisted of 2m of road-widening along the eastern edge of the existing road and 1m of road-widening along the western edge. Additional works comprised the construction of gunspurs 44, 45 and 46, and concrete culvert C8/4.

6.111 Natural orange/brown boulder clay [163] was reached at a depth of 0.34m bgl. Immediately above this was a layer of greyish brown peaty clay silt [162] 0.24m in depth. The upper deposit was a silty clay topsoil [161] 0.10m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road UU-WW

6.112 Road UU-WW measured 2km in length, orientated north-west to south-east, and was between 307.25m and 324.56m OD. The works consisted of 2m of road-widening along the eastern edge and 1m along the western edge of the existing road. Additional works undertaken comprised the construction of concrete culverts C9/5, C9/6, C9/7, C9/8 and C9/9.

6.113 The natural orange/brown boulder clay [166] was reached at a depth of 0.37m bgl. Immediately above this was a layer of greyish brown peaty clay silt [165] 0.25m in depth. The uppermost deposit was a silty clay topsoil [164] 0.12 m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Road WW-XX

6.114 Road WW-XX measured 800m in length and was located south and north-east of Featherwood, at between 324.59m and 347.22m OD. The works consisted of 2m of road-widening along the eastern edge of the existing road and 1m of road-widening along the western edge. Additional works undertaken comprised the construction of concrete culverts C10/4, C10/5, C10/6, C10/7, C10/8, C10/9 and C10/10.

6.115 The natural orange/brown boulder clay [170] was reached at a depth of 0.29m bgl. Immediately above this was a layer of greyish brown clay silt [168] 0.17m in depth. The uppermost deposit was a silty clay topsoil [167] 0.12m in depth.

Dere Street foundation remains near Featherwood

6.116 Towards the southern limit of road WW-XX, at NT 8160 0355, a single layer of sub-rounded and sub-angular stones between 0.2m and 0.6m in size and

0.20m in thickness was revealed (Figure 9). The layer [169] measured up to 4m north-south and 2.5m east-west. It was immediately above the boulder clay [170], and was overlain by topsoil [167]. This material almost certainly comprised the truncated foundation layer for Dere Street Roman road, as previously excavated 4km to the south in 2002 (Archaeological Services 2004, 53-58).

6.117 No other archaeological deposits or features were identified in this stretch of road and no artefacts were recovered.

Road XX-AB

6.118 Road XX-AB measured 2.5km in length, orientated north-west to south-east, and was between 347.28m and 461.50m OD. The works consisted of 3m of road-widening along the eastern edge of the existing road and the construction of concrete culverts C10/1, C10/2, C10/4, C11/17, C11/18, C11/19 and C11/20.

6.119 The natural orange/brown boulder clay [173] was reached at a depth of 0.27m bgl. Immediately above this was a layer of greyish brown peaty clay silt [172] 0.15m in depth. The uppermost deposit was a silty clay topsoil [171] 0.12 m in depth. No archaeological deposits or features were identified, and no artefacts recovered

Road AB-AC

6.120 Road AB-AC measured 1.3km in length, orientated north-west to south-east, and was between 458.83m and 498.96m OD. The works consisted of 3m of road-widening along the eastern edge of the existing road to chainage 900m, and 3m of road-widening along the western edge to chainage 1327m. Additional works undertaken comprised the construction of concrete culverts C11/1a, C11/1, C11/2, C11/3, C11/4, C11/5, C11/6, C11/7, C11/8, C11/9, C11/10, C11/11, C11/12, C11/13, C11/14 and C11/15.

6.121 The natural orange/brown boulder clay [176] was reached at a depth of 0.24m bgl. Immediately above this was a layer of greyish brown peaty clay silt [175] 0.14m in depth. The uppermost deposit was a silty clay topsoil [174] 0.11 m in depth. No archaeological deposits or features were identified, and no artefacts recovered

Davyshiel echelon area

6.122 Davyshiel echelon area required the construction of 730m of new stone roads, linking a series of vehicle parks and repair areas on the eastern side of road G-H, at between 225.00m and 244.99m OD. Additional works undertaken in conjunction with these were the construction of concrete culverts C3/28, C3/29, C3/30, C3/31, C3/32, C3/33 and C3/35.

6.123 The natural gleyed orange/brown to blue/grey boulder clay [33] was reached at a depth of 0.38m bgl. Immediately above this was a layer of dark brown peat [32] 0.28m in depth. The uppermost deposit was a silty clay topsoil [31]

0.10m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Headshope echelon area

6.124 Headshope echelon area consisted of the construction of 750m of new stone roads, linking a network of vehicle parks and repair areas, on the western side of junction A, at between 193.63m and 236.46m OD. Additional works undertaken here comprised the construction of concrete culverts C1/1a, C1/1f, and gunspur 1b.

6.125 The natural gleyed orange/brown to blue/grey boulder clay [36] was reached at a depth of 0.40m bgl. Immediately above this was a layer of orange/brown silty clay [35] 0.27m in depth. The uppermost deposit was a silty clay topsoil [34] 0.13m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

Yatesfield echelon area

6.126 Yatesfield echelon area required the construction of 1.2km of new stone roads, linking a network of vehicle parks and repair areas, on the eastern side of road M-N, at between 212.00m and 238.20m OD. Additional works undertaken in conjunction with these were the construction of concrete culverts C4/19, C4/20, C4/21, C4/22 and C4/23.

6.127 The natural gleyed orange/brown to blue/grey boulder clay [39] was reached at a depth of 0.38m bgl. Immediately above this was a layer of dark brown peat [38] 0.28m in depth. The uppermost deposit was a silty clay topsoil [37] 0.10m in depth. No archaeological deposits or features were identified, and no artefacts recovered

Leighton Hill echelon

6.128 Leighton Hill echelon consisted of 1.01km of new stone laid over the existing roads, linking a network of vehicle parks and repair areas at between 238.28m and 267.17m OD. Additional works undertaken here comprised the construction of concrete culverts C2/26, C2/27, C2/28, C2/29, C2/30, C2/31, C2/32 and C2/33.

6.129 The natural gleyed orange/brown to blue/grey boulder clay [133] was reached at a depth of 0.37m bgl. Immediately above this was a layer of dark brown peaty silty clay [132] 0.25m in depth. The uppermost deposit was a silty clay topsoil [31] 0.12m in depth. No archaeological deposits or features were identified, and no artefacts recovered.

The environmental evidence

Methods

6.130 Two contexts from Road L-G were sampled for plant macrofossil assessment. Contexts [41] and [23] comprised peat deposits separated by a layer of silt [40] within a glacial hollow. Context [41], the lower peat deposit, also contained a number of pieces of timber.

6.131 A sondage, 1.2m by 1m and 1.2m in depth, was excavated to the south of the new road edge at chainage 910m in order to expose the stratigraphic sequence. The south-facing section was recorded (Figure 8), and an overlapping column sample collected in monolith tins. 30 litre bulk samples were also retrieved from each of the lower [41] and upper [23] peat deposits and three pieces of timber were recovered from [41] for further analysis.

6.132 Five litres of each bulk sample were manually floated and sieved through a 500µ mesh. The residues were retained, described and scanned using a magnet for ferrous fragments. The flots were dried slowly and scanned at x 40 magnification for waterlogged and charred botanical remains. Identification of these was undertaken by comparison with modern reference material held in the Environmental Laboratory at Archaeological Services University of Durham. Total numbers of remains per species were logged and the results were interpreted in their archaeological and palaeoecological contexts. Plant taxonomic nomenclature follows Stace (1997).

Results: bulk samples

6.133 The samples produced flots which were composed of very highly humified, detrital plant material. The only identifiable plant macrofossil was an uncharred sedge seed in context [23]. The contents of the residues and flots are listed in Table 7.

Table 7. Contents of the residues and flots from OTA03.

Context	**23**	**41**
Volume processed (ml)	5000	5000
Volume of flot (ml)	40	600
Volume of flot assessed (ml)	40	200
Flot matrix (relative abundance)		
Decomposed plant material	2	4
Waterlogged remains (total counts)		
(w) *Carex* spp biconvex nutlet (Sedges)	1	-

(w: wetland)
Relative abundance is based on a scale from 1 (lowest) to 5 (highest).

Results: timber samples

Sample 1
Section of trunk from the base of a *Betula* sp (Birch) tree.
Diameter 80mm. Length 0.25m.
Bark present.
Suitable for radiocarbon dating.
No working marks.
Tree rings not easily distinguishable but approximate age of tree 30-50 years.

Sample 2
Section of trunk or large branch of a *Betula* sp (Birch) tree.
Diameter 0.14m. Length 0.4m.
Small section of bark present.
Suitable for radiocarbon dating.

No working marks.
Tree rings not easily distinguishable but approximate age of tree 50-80 years.

Sample 3
Section of trunk or large branch of a *Betula* sp (Birch) tree.
Diameter 0.16m. Length 0.45cm.
Bark absent.
Suitable for radiocarbon dating.
No working marks.
Tree rings not easily distinguishable but approximate age of tree >80 years.

6.134 The large volume of detrital plant material and the single sedge seed reflect the waterlogged environment in which the material accumulated. The absence of any other uncharred seeds may indicate that the sediment underwent periods of drying out. From the unworked timber samples, it is likely that the trees were growing *in situ*, in which case the local vegetation would have been a wet, acid, birch woodland.

6.135 Based on the preservation state of plant macrofossils in the deposits it is considered very likely that pollen grains will also have suffered differential preservation; this favours preservation of the hardiest grains only and would not enable the vegetation history of the site to be determined. Pollen assessment of the monolith samples has therefore not been undertaken.

6.136 Given the virtual absence of identifiable plant remains and the unworked nature of the timber samples no further work is recommended on these samples.

7. Central Maintenance Facility: evaluation and watching brief at Davyshiel

Introduction

7.1 The Central Maintenance Facility (CMF) development, which is located at Davyshiel to the west of Otterburn Camp and to the east of Hopefoot Road, covered an area of 44,000sqm at between 209.79m and 220.45m OD east to west, and 215.72m to 218.56m OD north to south (Figure 7).

7.2 An archaeological watching brief was to be undertaken during topsoil stripping within the footprint of the CMF between June and September 2003. As this was within a designated Archaeological Landscape Area, containing medieval ridge and furrow field systems centred on a derelict medieval and early post-medieval farmstead, nine trial trenches were excavated prior to the soil-strip and watching brief, in order to evaluate and record specific archaeological features (Figure 10). The site code for these works, as for the road improvement works, was OTA03.

7.3 An archaeological watching brief was also maintained during the excavation of cable trenches to the north and south of the CMF in February 2005.

7.4 RPS features DS15 and 16, to the north of the CMF and presumed to be associated with the aforementioned farmstead, were excavated in September and October 2004 (below, Section 8) prior to proposed tree-planting to screen the CMF.

Evaluation trenches **(Figures 11-18)**

7.5 The trenches were excavated by Katie Bell and Mark Douglas. Specialist analyses were conducted by Jason Mole (lithics) and Dr Chris Cumberpatch (ceramics). The trenches were located in order to sample the following features:

Table 8. OTA03 CMF evaluation trenches (DS feature numbers taken from LUAU/NUAP 1997, as shown on Figure 10)

Trench	Dimensions	Orientation	Target
1	6.8 x 1.5m	NW-SE	DS81, NE-SW sod-cast dyke
2	7.4 x 1.5m	NW-SE	as above
3	7.8 x 1.5m	NW-SE	as above, and DS109
4	7.5 x 1.5m	NE-SW	DS82, NW-SE sod-cast dyke
5	16.7 x 1.5m	NW-SE	DS56 ridge and furrow
6	13.5 x 1.5m	NW-SE	DS118 ridge and furrow
7	11.6 x 1.5m	NW-SE	DS118 ridge and furrow
8	15.5 x 1.5m	NW-SE	DS118 ridge and furrow

7.6 Each trench was excavated by machine with a toothless bucket under strict archaeological supervision, and cleaned and recorded by hand. All trench plans show the trenches after initial removal of topsoil, prior to the cutting of sections through upstanding features. A list of contexts with descriptions and

associated finds is provided in Appendix I; stratigraphic matrices are provided in Appendix II.

Trench 1

7.7 Trench 1 (Figure 11) measured 6.8m by 1.5m, orientated north-west to south-east, and was excavated in order to record a north-east to south-west aligned sod-cast dyke DS81. Trenches 1-3 all sampled this prominent boundary feature. The surface level of Trench 1 was between 211.70m and 212.25m OD.

7.8 The natural orange/brown boulder clay [305] was reached at a depth of 0.20m. Immediately above this was a layer of grey/brown silty clay [304] 0.13m in depth. Overlying [304] was a mottled dark grey/orange/brown silty clay [F303] forming the make-up deposit for the bank, 0.43m in depth and orientated north-east to south-west. This was overlain by a dark grey/brown peaty silty clay topsoil [300] 0.07m in depth. No artefacts were recovered from the evaluation trench.

7.9 The bank [F303] contained frequent sub-rounded and sub-angular stone blocks up to 200mm across, increasing in frequency towards the top of the bank. Some of these stones will have been upcast from the boulder clay during excavation of the ditch, while others will almost certainly have been thrown onto the bank during clearance of the adjacent cultivation strips.

7.10 At the north-western end of the trench layer [304] was cut by an existing drainage ditch [F302], 1.0m wide and aligned north-east to south-west, extending beyond the limits of the trench. Ditch [F302] was filled by very dark grey/brown clay silt [301], which was not fully excavated due to waterlogging. The original medieval/post-medieval excavation of the ditch provided the material for the adjacent bank [F303]. This drainage ditch and others in this area have been both widened and deepened over the last 30-40 years (tenant farmer, pers.comm.), thereby removing their original profiles. The LUAU/NUAP report (1997, 28) suggests that the ditch originally followed the course of a natural streamlet.

Trench 2

7.11 Trench 2 (Figure 11) measured 7.4m by 1.5m, orientated north-west to south-east, and was excavated in order to record the north-east to south-west aligned sod-cast dyke, DS81. The surface level of Trench 2 was between 214.70m and 215.20m OD.

7.12 The natural orange/brown boulder clay [403] was reached at a depth of 0.21m. Immediately above this was a layer of grey/brown silty clay [402] 0.11m in depth. Overlying [402] was a mottled dark grey/orange/brown silty clay [F401] forming the make-up deposit for the bank, 0.41m in depth and orientated north-east to south-west. The uppermost deposit was a dark grey/brown peaty silty clay topsoil [400] measuring up to 0.10m in depth. Again, the make-up of the bank contained frequent sub-rounded and sub-angular stone blocks up to 200mm in size, increasing in frequency towards the

top. No other archaeological deposits or remains were identified and no artefacts were recovered.

Trench 3

7.13 Trench 3 (Figure 12) measured 7.8m by 1.5m, orientated north-west to south-east, and was also excavated in order to evaluate the north-east to south-west aligned sod-cast dyke DS81. This trench also sampled the location of a possible circular feature DS109, previously recorded on a topographic survey (LUAU/NUAP 1997, 28). The surface level of Trench 3 was between 215.90m and 216.30m OD.

7.14 The natural orange/brown boulder clay [503] was reached at a depth of 0.19m. Immediately above this was a layer of grey/brown silty clay [502], 0.11m in depth. Overlying context [502] was a dark grey/orange/brown silty clay [F501] forming the make-up deposit for sod-cast dyke, 0.40m in depth and orientated north-east to south-west. The uppermost deposit was a dark grey/brown peaty silty clay topsoil [500] 0.08m in depth. No evidence for the possible circular structure was identified. This feature was previously recorded as cutting the ridge and furrow remains and was interpreted as possibly being a watering hole or sheepwash (LUAU/NUAP 1997, 28). No other archaeological deposits or remains were identified, and no artefacts recovered.

Trench 4

7.15 Trench 4 (Figure 12) measured 7.6m by 1.8m, orientated north-east to south-west, and was excavated in order to evaluate a north-west to south-east aligned sod-cast dyke DS82 in the northern part of the CMF area. This feature was perpendicular to and smaller than the main boundary feature DS81. The surface level of Trench 4 was between 212.70m and 213.50m OD.

7.16 The natural orange/brown boulder clay [605] was reached at a depth of 0.27m. Immediately above this was a layer of grey/brown silty clay [604] 0.22m in thickness. Overlying [604] was a mottled dark grey/orange/brown silty clay [F603] forming the make-up deposit for the sod-cast dyke, which measured 0.56m in depth and was orientated north-west to south-east. The uppermost deposit was a dark grey/brown peaty silty clay topsoil [600] 0.05m in depth. On the south-western side, the bank [F603] was truncated by a drainage ditch [F602], at least 0.70m wide. The ditch [F602] was filled by very dark grey/brown clay silt [601], which was not fully excavated due to waterlogging. No other archaeological deposits or remains were identified, and no artefacts recovered.

Trench 5

7.17 Trench 5 (Figure 13) measured 16.7m by 1.5m, orientated north-west to south-east, and was excavated in order to evaluate north-east to south-west aligned ridge and furrow earthworks, DS 56, parallel to the main boundary feature DS 81. The surface level of Trench 5 was between 215.50m and 215.70m OD.

7.18 The natural orange/brown boulder clay [702] was reached at a depth of 0.28m. Immediately above this was a layer of grey/brown silty clay [701] 0.21m in depth. The uppermost deposit was a dark grey/brown peaty silty clay topsoil

[700] 0.07m in depth. The profiles of three furrows were recorded in section, at *c*.6m intervals. Some of the furrows contained a gravel fill, presumably laid more recently to aid drainage. No other archaeological deposits or remains were identified, and no artefacts recovered.

Trench 6

7.19 Trench 6 (Figure 13) measured 13.5m by 1.5m, orientated north-west to south-east, and was excavated in order to evaluate a north-east to south-west aligned ridge and furrow field system, DS 118, to the south of the main boundary feature DS 81. The surface level of Trench 6 was between 216.60m and 216.90m OD.

7.20 The natural orange/brown boulder clay [802] was reached at a maximum depth of 0.20m. Immediately above this was a layer of grey/brown silty clay [801] up to 0.13m thickness. The uppermost deposit was a dark grey/brown peaty silty clay topsoil [800] up to 0.11m in depth. Very shallow undulations noted in the trench section are presumed to reflect former ridge and furrow profiles. No other archaeological deposits or remains were identified, and no artefacts recovered.

Trench 7

7.21 Trench 7 (Figure 14) measured 11.6m by 1.5m, orientated north-west to south-east, and was excavated in order to evaluate north-east to south-west aligned ridge and furrow earthworks DS 118 at the southern end of the CMF area. The surface level of Trench 7 was between 216.40m and 216.60m OD.

7.22 The natural orange/brown boulder clay [902] was reached at a depth of 0.22m. Immediately above this was a layer of grey/brown silty clay [901] 0.13m in depth. The uppermost deposit was a dark grey/brown peaty silty clay topsoil [900] 0.09m in depth. Very shallow undulations were noted in the trench section, and these are presumed to reflect former ridge and furrow profiles. A flint flake was recovered from the interface between contexts [901] and [900] (below, para. 7.39), however, no associated features or remains were identified.

Trench 8

7.23 Trench 8 (Figure 14) measured 15.5m by 1.5m, orientated north-west to south-east, and was excavated in order to evaluate north-east to south-west aligned ridge and furrow remains DS 118. The surface level of Trench 8 was between 219.60m and 219.90m OD.

7.24 The natural orange/brown boulder clay [1002] was reached at a depth of 0.17m. Immediately above this was a layer of grey/brown silty clay [1001] 0.09m in depth. The uppermost deposit was a dark grey/brown peaty silty clay topsoil [1000] 0.08m in depth. A profile of the ridge and furrow remains was recorded (Figure 14). No other archaeological deposits or remains were identified, and no artefacts recovered.

Trench 9

7.25 Trench 9 (Figure 15) measured 5.0m by 1.5m, orientated north-south, and was excavated in order to record a slight north-east/south-west aligned bank at the north end of the CMF site. The surface level of Trench 9 was between 215.30m and 215.60m OD.

7.26 The natural orange/brown boulder clay [1102] was reached at a depth of 0.28m. Immediately above this was a layer of grey brown silty clay [1101] 0.18m in depth. The uppermost deposit was a dark grey/brown peaty silty clay topsoil [1100] 0.10m in depth. The bank was not identified as a discrete deposit, but rather as a thickening of the silty clay layer [1101]; this appears to have formed as a headland to the ridge and furrow on the north side. No other archaeological deposits or remains were identified and no artefacts recovered.

The CMF watching brief

7.27 An archaeological watching brief was maintained during the soil-strip for the CMF construction and during the excavation of two cable trenches to replace overhead cables. The main CMF watching brief was hindered by the waterlogged nature of the ground and by the use of bulldozers and machines with toothed buckets for the first half of the strip.

7.28 In the north-eastern corner of the CMF area, north of the Otter Burn, 0.2m of turf overlay brown peat to a depth of 0.8m, which in turn overlay well-humified dark brown/black peat to a maximum depth of 1.5m. The peat overlay a white/grey sandy clay.

7.29 Across the rest of the area, natural orange/brown boulder clay [202] was reached at a depth of 0.27m to 0.45m. Immediately above this was a layer of grey/brown silty clay [201] between 0.26m and 0.34m in depth. The uppermost deposit was a dark grey/brown peaty silty clay topsoil [200] 0.11m in depth. Layer [201] contained medieval and post-medieval pottery fragments along with fragments of post-medieval clay-pipe and a lead musket ball.

7.30 Ridge and furrow remains were evident throughout much of the CMF area. Furrows were spaced at between 4-7m intervals and ridges survived to a height of 0.25-0.30m. Typically every second or third furrow had been deepened, and had had plastic pipe laid in, in the last 30-40 years, creating adjacent ridges of upcast spoil; these features are particularly prominent on aerial photographs taken by Tim Gates (*ibid*.). Some furrows contained a gravel fill, presumably also laid more recently to aid drainage. Some features previously recorded on the topographic survey and aerial photographs were not discernible in the field due to the dense bog-grass vegetation cover.

Material filling crop pit

7.31 Context [200] was cut by two crop pits [F204] and [F206], each measuring *c*.5m in diameter and at least 0.63m in depth, which were filled by a very dark brown peaty clay silt [203] and [205]. The pits had been filled with early to mid-20th century refuse including a metal bedstead, a torch and various glass bottles and jars (not retained). The crop pits are part of a line of at least ten such features here, following the line of the coal outcrop, and are best seen on aerial photographs (for example Gates 1997, TMG16537/26).

CMF artefacts

7.32 Few artefacts were recovered during the works at the CMF. The majority of those recovered were found during the soil-strip operation. Occasional modern materials were found throughout the CMF area, particularly within the crop pits; these have been discarded. The approximate findspot locations of retained artefacts are shown on Figure 10.

Table 9. Artefacts from CMF evaluation and watching briefs

Context	SF no.	Quantity	Artefact
200	G	1 sherd	Everted jar / cooking pot rim (29g), coarse sandy buff fabric
”	E	1 fragment	Clay pipe bowl
201	B	2 fragments	Clay pipe stem
”	A	1 sherd	Rod handle (45g), fine buff to brown oxidised sandy ware
”	C	1 sherd	Body sherd (22g), distinctive orange and grey streaky fabric
901, T7	D	1	Flint flake

203/205	-	various	20th century domestic refuse (discarded).
unstrat.	B	1 fragment	Daub
”	H	1 fragment	Clay pipe stem
”	F	1	Lead musket ball, 15mm diameter
”	-	various	Modern ceramics (discarded)

Lithics

7.33 A single flint flake was recovered the trial trench evaluation, Trench 7, context [901]. This piece is not diagnostic of any particular period:

A single flake, with a feathered termination and some possible evidence for trimming or platform preparation. The flint is light brown and is beginning to repatinate in particular on its dorsal side. The lack of a defined bulb of percussion on the ventral side may indicate the use of a soft hammer but may also be the product of an imperfection within the material itself. The broad and short nature of the flake may invite speculation of a Later Neolithic/ Bronze Age date for the flake but this is not conclusive.

7.34 Due to the residual nature of this find no further work is recommended.

Ceramics

7.35 Three sherds of pottery were recovered from contexts [200] and [201] during the machine stripping for the CMF:

[200] Everted jar / cooking pot rim (29g) with groove around outer edge in a coarse sandy buff fabric with a reduced core containing moderate to abundant quantities of rounded quartz grit up to 1mm.

[201] Rod handle (45g) in a fine buff to brown oxidised sandy ware with a reduced core containing moderate quantities of rounded quartz grit up to 0.5mm and occasionally up to 1mm.

[201] Body sherd (22g) in a distinctive orange and grey streaky fabric with dull buff internal and external margins. The fabric contains moderate quantities of fine (up to 0.5mm) quartz grit and occasional large (up to 1.5mm) non-crystalline red ferrous grit. The sherd has small spots of possible splashed glaze externally.

7.36 As noted in earlier reports on pottery from Otterburn (Cumberpatch in Archaeological Services 2004, 64-67), the area is poorly served by established type series but the material from OTA03 would appear to be comparable, at least in general terms, with that from the 2002 excavations at Bellshiel Road and Potts Durtrees. The buff finish would appear to place the material within the wider regional tradition of buff sandy wares, which can be seen in different forms in the north-east region. It is difficult to ascribe a definite date to the sherds from OTA03, but it is probable, on the basis of the wider dating of the buff sandy ware tradition and the vessel forms, that they belong to the later 11th, 12th or 13th centuries. This may be supported by the spots of possible ‘splashed’ glaze on the body sherd, although these are too small for identification to be certain.

7.37 A small fragment of daub or poorly-fired hand-made brick was recovered, unstratified, during machining of the south-eastern part of the CMF.

7.38 No further work is recommended on this limited ceramic assemblage.

CMF dating

7.39 The limited occurrences of medieval pot within both the topsoil [200] and B-horizon [201] are likely to be the result of manuring practices and suggest that this land was in cultivation in the medieval period; post-medieval artefacts in the same deposits suggest ridge and furrow cultivation in that period also. The earthen banks in this area appear to be post-medieval in origin as they overlie deposits containing both medieval and post-medieval material ([201] and its equivalent contexts within the trial trenches). The ditches alongside the banks, as they existed during the fieldwork, were modern. Although they undoubtedly followed the courses of earlier ditches, they had been both widened and deepened in recent years, removing the profiles and contents of their earlier forms.

7.40 The flint flake was not found in association with any features, and thus is of limited value, other than to attest to a human presence in the Otterburn Training Area during the Late Neolithic to Early Bronze Age periods.

8. Central Maintenance Facility: excavation of features DS15 and DS16, Davyshiel

Introduction

8.1 The angle of the roads north and west of the CMF contains a number of earthwork and masonry structures of differing periods (Figure 10). The remains of a probable medieval or post-medieval farmstead, field banks and ridge and furrow are evident, as well as more poorly defined earthworks interpreted as a medieval or later corn-drier (DS15) and an associated feature (DS16). These features were recorded during a topographic survey conducted by Lancaster University Archaeological Unit in 1996 (LUAU/NUAP 1996).

8.2 The corn-drier lay at NGR: NY 88809615, outside the CMF footprint but within an area of proposed screen planting. The objective of the archaeological work was to expose, excavate and record the corn-drying kiln, in accordance with a brief prepared by RPS Group. It is now understood that tree-planting will not be undertaken over the actual corn-drier, which will be left partly exposed and fenced off from the area of planting. The excavated structure was therefore backfilled to within 0.3m of the top of the walls and is preserved *in situ*.

8.3 Archaeological excavation was undertaken between 8th September and 1st October 2004 by Andy Willis and Sam Roberts, supervised by Alan Rae. This report was prepared by Alan Rae. Specialist analysis was conducted by Dr Charlotte O'Brien (plant macrofossils).

8.4 The site code was OMF04, for Otterburn Maintenance Facility 2004.

The excavation

8.5 A trench covering 100sqm was hand-excavated to expose the remains of a sub-circular corn-drying kiln (Figures 16 & 17). Some topsoil removal was undertaken by machine on the western side of the structure, under strict archaeological supervision. The corn-drier was built into the side of a low bank, and consisted of a circular stone-built drying chimney with a linear flue also constructed in stone. The remains of the corn-drier were excavated and recorded by hand. A list of contexts with descriptions and associated finds is provided in Appendix I; the stratigraphic matrix is provided in Appendix II.

8.6 The natural gleyed orange/grey boulder clay [14] was reached at a depth of 220.04m OD except where cut by [F16], the construction cut for the corn-drier [F4]. Cut [F16] was not fully excavated but appeared to continue to the edge of the slope into which the drier had been constructed. Overlying this was a grey/brown clay silt [15] containing small to medium-sized stones, which formed the packing between construction cut [F16] and the corn-drier structure [F4]. The drier measured 6.2m north-east to south-west and 5.4m north-west to south-east, and consisted of six courses of unworked and roughly worked stones and boulders, forming a sub-circular drying chimney with a short linear stoke hole/passage exiting the bowl on its south-western side. The internal base of [F4] was reached at a depth of 219.69m OD and consisted of rough flagstones [F9] forming a floor across the interior of the

structure. The level at the top of [F4] was 220.97m OD, giving a surviving bowl depth of 1.28m.

Corn-drier under excavation

General view of corn-drier looking NE

8.7 Built into the lowest course of the internal face of [F4] were two small niches: [F10] was located in the north-eastern wall; [F11] was located in the south-western wall next to the stoke hole/passage. Neither [F10] nor [F11] continued through the fabric of [F4] and their purpose within the structure is unclear.

8.8 A short wall [F12] of rough stone was built between the passage and the bowl. This may have been built to introduce fuel or regulate the flow of air into the chimney, as it did not completely block the stoke hole/passage, there being a gap of 0.25m between the base of [F12] and the upper surface of the floor [F9]. At the time of excavation this gap was filled by [8], a very dark brown/black organic sandy silt with occasional twigs, which formed the primary fill of [F4]. Above [8] was a compact blue/grey sandy clay fill [7], the secondary fill of [F4], which was overlain by a soft orange/grey sandy clay silt [6], the uppermost fill.

Partition wall [F12] between bowl and passage

8.9 A short section of additional walling [F13] was present on the internal north face of the bowl. This had been keyed into the bowl structure [F4] and appeared to represent either a repair or consolidation of [F4].

8.10 Continuing south and west from the top of the corn-dryer were two low walls [F17] and [F18], which consisted of two courses of rough stones laid directly onto the surface of the boulder clay [14]. The walls appeared to have been built contemporary with [F4] and to have formed two sides of a walled enclosure, extending beyond the limit of excavation. Above both [F17] and [F18] and the upper fill [6] of the drier was context [3], a layer of rubble which covered the whole trench area. This was in turn overlain by a mottled

orange/grey/brown layer [2]. Uppermost across the whole site was a layer of dark grey/brown silty clay topsoil and turf [1], 0.15m in thickness.

View of corn-drier looking SW; wall repair [F13] can be seen bottom-right.

8.11 No artefacts were recovered during the course of the excavation.

The environmental evidence

Methods

8.12 The three fill layers within the stone-lined bowl, contexts [6], [7] and [8], were assessed for plant macrofossil remains. Five litres of each bulk sample were manually floated and sieved through a 500µ mesh. The residues were retained, described and scanned with a magnet for ferrous fragments. The flots were dried slowly and scanned at x 40 magnification for waterlogged and charred botanical remains. Identification of these was undertaken by comparison with modern reference material held in the Environmental Laboratory at Archaeological Services University of Durham. Total numbers of remains per species were logged and the results were interpreted in their archaeological and palaeoecological contexts. Plant taxonomic nomenclature follows Stace (1997).

Results

8.13 The samples produced volumes of flot ranging from 200-350 ml. They contained few charred plant remains, however, uncharred seeds were abundant. These were predominantly from ruderal and wetland habitats. Roots, wood and insect fragments were also present, and a small amount of charcoal was present in the sample from context [6]. The contents of the residues and flots are listed in Table 10 below.

Table 10. Contents of the residues and flots from OMF04.

Context	**6**	**7**	**8**
Sample	**1**	**2**	**3**
Volume processed (ml)	5000	5000	5000
Volume of flot (ml)	200	200	350
Volume of flot assessed (ml)	200	200	350
Flot matrix (relative abundance)			
Charcoal	1	-	-
Roots	3	2	2
Insect	1	1	1
Wood	-	2	2
Charred remains (total counts)			
(c) *Avena* sp grain (Oat species)	-	2	2
(x) Poaceae sp (>2mm) (Grass)	-	-	1
Waterlogged remains (total counts)			
(a) *Chenopodium album* (Fat-hen)	-	1	1
(a) *Chrysanthemum segetum* (Corn marigold)	-	2	3
(r) *Atriplex* sp (Orache)	-	-	1
(r) *Galeopsis* c.f. *tetrahit* (Hemp-nettle)	-	1	1
(r) *Lapsana communis* (Nipplewort)	-	3	3
(r) *Polygonum aviculare* (Knotgrass)	-	1	1
(r) *Sonchus asper* (Prickly sow-thistle)	-	-	1
(r) *Sonchus*c.f. *oleraceus* (Smooth sow-thistle)	-	1	2
(r) *Stellaria media* (Common chickweed)	1	1	2
(r) *Urtica dioica* (Common nettle)	-	-	1
(t) *Rubus idaeus* (Raspberry)	-	-	1
(w) *Carex* spp (Sedges - biconvex nutlet)	1	3	-
(w) *Carex* spp (Sedges – triogonous nutlet)	-	3	3
(w) *Persicaria lapathifolium* (Pale persicaria)	-	1	1
(w) *Prunella vulgaris* (Self-heal)	-	-	2
(x) Asteraceae sp (Daisy family)	-	1	1
(x) Brassicaceae indeterminate (Cabbage family)	-	1	3
(x) *Cirsium* spp (Thistle)	-	1	-
(x) Poaceae sp (<2mm) (Grass)	1	-	1
(x) *Potentilla* sp (Cinquefoil)	-	2	1
(x) *Ranunculus* subgenus *Ranunculus* (Buttercup)	-	1	1
(x) *Rumex* spp (Dock)	1	3	3
(x) *Viola* sp (Violet)	-	1	1

(a: arable weed; c: cultivated plant; r: ruderal; t: trees/shrubs; w: wetland; x: wide niche). Relative abundance is based on a scale from 1 (lowest) to 5 (highest).

8.14 The only charred plant remains which occurred were two oat grains in context [7], and two oat grains and a grass caryopsis in context [8]. These may indicate that oats were dried in the corn-drier or that wild oats were growing near it. The grass may have been harvested with the oats or may also have been growing wild nearby.

8.15 The waterlogged conditions at the site allowed the preservation of a large number of uncharred seeds in all of the contexts. These reflect the natural environment as the corn-drier filled with sediment following its disuse. Most of the seeds were from ruderals such as hemp-nettle, nipplewort, sow-thistles, common nettle and chickweed which most often grow in open, disturbed habitats. Plants which favour damp conditions, including sedges, pale persicaria and self-heal, were abundant. Docks, buttercups, thistles, cinquefoil and grasses were also recorded.

8.16 Seeds of arable weeds such as fat-hen and corn marigold may have grown and been harvested with crops which were dried in the corn drier, or they may have been growing as ruderals in open habitats nearby.

8.17 No further work is recommended on these samples.

Corn-drier discussion

8.18 The virtual absence of charred plant macrofossils within the structure indicates that the bowl was thoroughly cleaned out following its last use as a drying kiln. Oats may have been dried in the corn-drier or may have grown wild nearby. The natural environment at the site following the disuse of the corn-drier was dominated by open, disturbed areas and wetland habitats, as is still the case today.

8.19 Corn-drying kilns recorded within the Coquetdale and Redesdale areas of the Otterburn Training Area, and the wider National Park, consist of two distinct structural styles (Frodsham 2004). The earlier ones are bowl kilns, comprising a stone-lined bowl dug into an earthen bank, normally on the periphery of a small settlement or farm. These are dated to the late-medieval and early post-medieval periods; the Loaning Burn kiln dates from at least the 17th century (Charlton & Day 1982). The later kilns are free-standing, incorporated within a farm complex or corn mill, and date from the late post-medieval period; the example from Barrow Mill dates from the early 19th century (Charlton 1996).

8.20 On structural grounds the bowl kiln excavated at Davyshiel lies within the earlier group, having a similar shape and dimensions to those recorded at Dumbhope, Wanlass Durtrees, Linbrig, Linbriggs, Rennies Burn and Sills Burn (Charlton 1996), and the excavated bowl kiln at Loaning Burn (Charlton & Day 1982). Overall dimensions vary, but all the recorded bowl kilns have an internal bowl diameter of between 3.8m and 4m, an overall diameter of 5.6m to 6m, and a depth of 0.79m to 4m, typically up to 1.25m in depth. In comparison, the free-standing corn driers had a maximum external bowl diameter of 5.5m. All the bowl kilns recorded are sub-circular in shape with a sub-rectangular stokehole or flue radiating from one side of the structure. At Loaning Burn the stokehole is orientated away from the earthen bank, while at

Davyshiel the stokehole was constructed into the earthen bank. No comparison could be made with the other kilns mentioned as these have not been fully excavated. No evidence for the superstructures of the corn-drying kilns has been found, however, it is assumed that a wooden platform was constructed over the bowl, on top of which was laid a horsehair mat or layer of brushwood, on which the grain was placed for drying. The purpose of the corn-drying kilns was either to dry corn prior to threshing (in climates where a lack of sunlight prevented the ripening of crops) or to dry damp grain before milling.

8.21 The presence of corn-drying kilns in the Coquetdale and Redesdale areas attests to the cultivation and processing of cereal crops in an area not now associated with cereal cultivation, and where present climatic conditions would seriously limit any growing season (Lamb 1977). Bowl kilns of the type excavated at Davyshiel and Loaning Burn suggest that grain cultivation in the upland areas of Northumberland in the late-medieval/early post-medieval period had evolved beyond that needed by the local economy or for immediate subsistence, and that a sufficient surplus was being produced for sale in the wider economy. It has been suggested that the rise in grain production was as a consequence of the Napoleonic Wars (MacDonald 1980), however, the evidence points to a peak in grain production in the mid to late 18th century. The free-standing corn-driers such as that at Barrow Mills are dated from the latter part of the 18th century and the early 19th centuries, and appear to be a direct response to the changing agricultural practices of the Agricultural Revolution rather than any rise in demand for grain (Rackham 1986). Grain production was in decline by the middle of the 19th century and ended in the Coquetdale and Redesdale areas by the early 20th century as the land was given over firstly to sheep-rearing and later to grouse moor and military training.

9. Central Maintenance Facility: watching brief during excavation of cable trenches

Introduction

9.1 The development comprised the excavation of cable trenches to the north and south of the CMF (Figure 10). The site was bounded by Otterburn Camp to the east and rough grazing to the north, south and west. The cable trenches cut through fields containing ridge and furrow cultivation remains and earthen banks.

9.2 Fieldwork and reporting were conducted by Andy Willis in February 2005. The site code is OTA05, for Otterburn Training Area 2005.

Trench 1

9.3 This cable trench was excavated to the south of the CMF and measured 0.5m in width by 1m in depth and 150m in length (Figures 10 & 18). The trench cut through ridge and furrow and field bank remains. The natural orange/brown boulder clay with occasional irregular stones was reached at a depth of 0.45m bgl. Another stiff brown clay deposit with occasional irregular stone inclusions was reached at 0.85m bgl.

Cable trench 1, looking SW

9.4 The cultivation ridges ranged in width from 3.5m to 5m with a maximum height of 0.45m. The furrows between the ridges contained grey/brown silt with occasional small stone inclusions. Two representative sections were recorded across the ridge and furrow (Figure 18): the trench cut diagonally across some remains exposing an elongated section 8m in length (Section 3); Section 4 measured 6m in length.

9.5 Trench 1 cut through a bank feature in two separate places (Sections 1 & 2, Figure 18). It is likely that the bank is a post-medieval field boundary. The bank consisted of grey/brown soft silty sand with occasional small stone inclusions to a maximum depth of 0.65m. No archaeological artefacts were recovered during the excavation of cable trench 1.

Trench 2

9.6 This trench, to the north of the CMF, was excavated along a furrow between two ridges and measured 0.50m in width by 1m in depth and 170m in length (Figures 10 & 18). Natural orange/brown boulder clay with occasional irregular stones was reached at a depth of 0.45m. Stiff brown clay with occasional irregular stone inclusions was reached at 0.85m below the surface. The furrow was filled with grey/brown soft silt with occasional small stone inclusions. No artefacts were recovered during the excavation.

Cable trench 2, looking NNW

10. Redesdale Camp: watching brief during perimeter fence removal

Introduction

10.1 The aim of the watching brief was to enable the recording of any archaeological features encountered during the removal of a section of perimeter fence on the north side of Redesdale Camp. The works were located at NZ 885 825, at a mean elevation of *c*.180m OD, and were bounded by the demolished Redesdale Camp to the south and open grassland to the east, west and north (Figure 7). The fence removal lay close to a Roman Camp.

10.2 Fieldwork and reporting were undertaken by Andy Willis in February 2005.

The watching brief

10.3 The removal of the perimeter fence, which measured 750m in length, was undertaken using a mechanical digger fitted with a grab device. A series of modern post-holes measuring 0.35m by 0.80m was exposed.

10.4 Works to remove the fence did not reveal any archaeological features.

Fence removal operation, looking E

11. Electronic Target Range: evaluation and watching brief at Carrick Heights

Introduction

11.1 This report presents the results of an archaeological evaluation and watching brief conducted prior to and during the construction of an Electronic Target Range (ETR) at Carrick Heights and Leighton Hill (NGR: NY 908 956), Figures 7 & 19. The development comprised topsoil stripping prior to the construction of four firing points and three target lines, a control building and an access track. The archaeological works comprised the excavation of four evaluation trenches across extant but ruined stone walls and subsequent monitoring during the construction works, in accordance with a brief prepared by White Young Green (Appendix III).

11.2 The study area covered *c*.6.8 hectares and was bounded to the north by open moorland, to the south-east by the road from Leighton Hide to Heely Dod, and to the south-west by the road from Leighton Hide to Todlaw Pike.

11.3 The objective of the evaluation was to identify, excavate and record two extant dry stone walls in the southern part of the proposed ETR. The aim of the watching brief was to record any archaeological features encountered during groundworks associated with the ETR development.

11.4 The works prior to construction comprised:

- excavation of three sample sections of the boundary wall (RPS 5)
- excavation of one sample section of the boundary wall (RPS 6)

11.5 The works during construction comprised watching briefs, undertaken at all locations where earthmoving took place, with specific awareness of the following:

- the area of the possible clearance cairn (RPS 1)
- the area of scattered stones (RPS 2)
- the line of the possible track (RPS 7)

11.6 The evaluation was undertaken between January and May 2005. The watching brief was undertaken intermittently between October 2004 and September 2005.

11.7 Fieldwork was conducted by Graeme Attwood, Janet Beveridge and Andy Willis, supervised by Alan Rae. This report was prepared by Alan Rae. Specialist analysis was conducted by Dr Charlotte O'Brien (macrofossil analysis).

11.8 The site code is OFR05, for Otterburn Firing Range 2005.

The evaluation trenches

Methods

11.9 Four trenches were excavated in order to record two extant dry stone field boundary walls within the area of the proposed ETR. The north-south orientated wall (RPS 6) measured 80m in length; the east-west orientated wall

(RPS 5) measured 405m in length. Each trench measured 5m by 3m with the long axis of each trench aligned perpendicular to the wall. Trench locations were ultimately determined by avoiding the most waterlogged areas. An early attempt (March 2005) at excavating the trenches by hand was abandoned due to the rapid rate at which groundwater filled the trenches. The evaluation was re-commenced in May 2005. All the trenches were then excavated using a mechanical excavator equipped with a toothless ditching bucket, under close archaeological supervision, and were cleaned and recorded by hand. A list of contexts with descriptions and associated finds is provided in Appendix I; stratigraphic matrices are provided in Appendix II.

Trench 1

11.10 This trench sampled the north-south dry stone wall RPS 6 (Figure 20). Light grey/brown boulder clay [5] was reached at 254.96m OD. Immediately above the boulder clay was a very dark grey/brown, peaty silty clay layer [4], 0.10m in depth. Above context [4] was the dry stone wall [F3], measuring 0.26m in height and 0.92 in width. Overlying and between [F3] was a very dark brown peaty silty clay layer [2], 0.10m in depth; this was overlain by dark grey/brown silty clay topsoil and turf [1], 0.11m in depth.

Trench 1 looking S

Trench 1 looking W

Trench 1 looking E

Trench 1 looking N

11.11 The wall was constructed directly onto a peaty clay layer rather than being set in a foundation trench. The wall consisted of a single course of undressed stones measuring 0.45m to 0.68m in length, 0.24 to 0.35m in width, and

between 0.15m and 0.37m in height. These stones formed the two outer faces of the wall with rubble infill forming the core of the wall.

11.12 No other archaeological features were identified, and no artefacts recovered.

Trench 2

11.13 This trench, and Trenches 3 and 4, sampled the east-west orientated dry stone wall RPS 5 (Figure 20). Light grey/brown boulder clay [10] was reached at 250.69m OD. Immediately above the boulder clay was a very dark grey/brown, peaty silty clay layer [8], 0.25m in depth. Above context [8] was the dry stone wall [F9], surviving to 0.42m in height, 0.74m in width. Overlying wall [F9] was a very dark brown peaty silty clay layer [7], 0.18m in depth. This was overlain by dark grey/brown silty clay topsoil and turf [6], 0.11m in depth.

Trench 2 looking N

Trench 2 looking W

Trench 2 looking W

11.14 The wall consisted of undressed stones measuring 0.40m to 0.70m in length, 0.25 to 0.38m in width, and between 0.15m and 0.40m in height, forming the two outer faces of the wall, with rubble infill forming the core of the wall. The single remaining course of stone wall sat on top of a single-course offset

foundation of similarly-sized stones. The offset foundation was laid directly onto a peaty clay layer rather than being set in a foundation trench. No other archaeological features were identified, and no artefacts recovered.

Trench 3

11.15 Light grey/brown boulder clay [15] was reached at 250.56m OD (Figure 21). Immediately above the boulder clay was a very dark grey/brown peaty silty clay layer [14], 0.23m in depth. Above context [14] was the dry stone wall [F13], 0.46m in height and 0.79m in width. Overlying the wall was a very dark brown peaty silty clay layer [12], 0.16m in depth. This was overlain by dark grey/brown silty clay topsoil [11], 0.10m in depth.

Trench 3 looking W

Trench 3 looking W

11.16 The wall consisted of a single course of undressed stones measuring 0.35m to 0.57m in length, 0.20 to 0.30m in width, and between 0.10m and 0.40m in height. These stones formed the two outer faces of the wall, with rubble infill forming the core of the wall. The single remaining course of stone wall sat on top of a single course offset foundation of similarly-sized stones. The offset foundation was laid directly onto a peaty clay layer rather than being set in a foundation trench. No other archaeological features were identified, and no artefacts recovered.

Trench 4

11.17 Light grey-brown boulder clay [20] was reached at 250.65m OD (Figure 21). Immediately above the boulder clay was a very dark grey/brown, peaty silty clay layer [19], 0.04m in depth. Above context [19] was the dry stone wall [F18], 0.39m in height and 0.74m in width. Overlying wall [F18] was a very dark brown peaty silty clay layer [17], 0.13m in depth. This was overlain by dark grey/brown silty clay topsoil [16], 0.10m in depth.

11.18 The wall consisted of a single course of undressed stones measuring 0.40m to 0.60m in length, 0.20 to 0.30m in width, and between 0.15m and 0.30m in height, forming the two outer faces of the wall, with rubble infill forming the core of the wall. The single remaining course of stone wall sat on top of a single-course offset foundation of similarly-sized stones. The offset foundation was laid directly onto a peaty clay layer rather than being set in a foundation trench. No other archaeological features were identified and no artefacts recovered.

Trench 4 looking N

Trench 4 looking W

Trench 4 looking W

The watching brief

11.19 The watching brief was maintained during all groundworks for the ETR construction. The foundation trenches for the firing points and target lines were all aligned east-west and measured 75m in length and 5m in width; the area stripped for the control building covered 50sqm. All areas were stripped using a 360˚ excavator equipped with a toothless ditching bucket, under close archaeological supervision.

11.20 In each of the foundation trenches and stripped areas the sequence of topsoil, subsoil and boulder clay was the same. Natural subsoil, a light grey/brown

boulder clay [23] was reached at between 247.16m and 259.59m OD. Immediately above the boulder clay was a very dark grey/brown, peaty silty clay subsoil [22], between 0.10m and 0.25m in thickness. Overlying the subsoil was dark grey/brown silty clay topsoil [21], 0.10m to 0.16m in depth. No archaeological deposits were identified, and no artefacts recovered.

The artefacts

11.21 No artefacts were recovered during the course of the evaluation and watching brief.

The environmental evidence

Methods

11.22 Contexts [4], [8] and [14] from Trenches 1, 2 and 3 respectively were assessed for plant macrofossils. These contexts directly underlay the wall in each trench. 500ml of each were wet-sieved through a 500 µ mesh and scanned at x 40 magnification for waterlogged and charred botanical remains.

Results

11.23 The contexts were composed of very well-humified peat. Small fragments of charcoal, monocot roots, mosses and wood were present, but other plant remains were absent. The contents of the samples are listed in Table 11.

Table 11. Contents of the flots from OFR05.

Context	**4**	**8**	**14**
Sample	**1**	**2**	**3**
Volume processed (ml)	500	500	500
Volume assessed (ml)	200	200	200
Flot matrix (relative abundance)			
Charcoal	1	1	-
Monocot roots	1	1	-
Moss fragments	-	1	-
Insect	1	1	1
Sand	-	-	1
Wood	1	1	1

Relative abundance is based on a scale from 1 (lowest) to 5 (highest).

11.24 The absence of identifiable plant remains reflects the well-humified nature of the peat, which is likely to have accumulated at a slow rate. The samples provide no chronological, palaeoecological or economic information about the site due to the poor preservation of plant remains.

11.25 No further plant macrofossil analysis is recommended and material suitable for radiocarbon dating is absent. Pollen analysis is not recommended as grains are likely either to be absent or differentially preserved.

Discussion

11.26 In the absence of other dating evidence from either fieldwork or cartographic sources, the walls RPS 5 and 6 are presumed to be of late post-medieval date, contemporary with the ridge and furrow earthwork remains on the slopes and

the slight hill-top to the east of the firing lanes of the ETR (RPS 4). These earthworks are believed to date from the 18th or 19th centuries on morphological grounds; the swing plough, which was introduced in the 1760s, produced ridge and furrow no more than 5m wide, as here (RPS 2004, 3)

11.27 RPS 5 forms part of the parish boundary between Otterburn and Hepple parishes, while RPS 6 is an enclosure wall.

11.28 Features RPS 1 (a possible clearance cairn), RPS 2 (an area of scattered stones), RPS 3 (a possible mining pit) and RPS 4 (ridge and furrow) were all outside the areas of groundworks and so were not impacted upon by the works. Feature RPS 7 (the course of a possible track) was not expected to be impacted by the works except where crossed by the ETR access track, however, no evidence for the track was identified during the watching brief.

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Appendix I: Context information

Summary lists of contexts. The • symbols in the columns at the right indicate the presence of finds of the following types: P pottery, B bone, M metals, F flint, S slag, O other materials.

Road improvement and associated works: OTA03 watching brief

No	Description	P	B	M	F	S	O
1	Topsoil grey/brown silty clay						
2	Firm grey/brown clay silt						
3	Natural orange/brown clay						
4	Topsoil grey/brown silty clay						
5	Firm grey/brown clay silt						
6	Natural orange/brown clay						
7	Topsoil grey/brown silty clay						
8	Firm dark grey/brown clay silt						
9	Natural orange/brown clay						
10	Topsoil grey/brown silty clay						
11	Friable dark brown peaty silty clay						
12	Natural orange/brown to blue-grey clay						
13	Topsoil grey/brown silty clay						
14	Firm orange/brown clay silt						
15	Natural orange/brown clay silt						
16	Topsoil grey/brown silty clay						
17	Firm grey/brown clay silt						
18	Natural orange/brown clay						
19	Topsoil grey/brown silty clay						
20	Friable very dark brown peaty silty clay						
21	Natural orange/brown clay						
22	Topsoil grey/brown silty clay						
23	Friable dark brown peaty silty clay						
24	Natural orange/brown to blue-grey clay						
25	Topsoil grey/brown silty clay						
26	Natural orange/brown boulder clay						
27	Topsoil grey/brown silty clay						
28	Natural orange/brown clay						
29	Topsoil grey/brown silty clay						
30	Natural orange/brown boulder clay						
31	Topsoil grey/brown silty clay						
32	Friable dark brown peaty silty clay						
33	Natural orange/brown to blue/grey clay						

No	Description	P	B	M	F	S	O
34	Topsoil grey/brown silty clay						
35	Firm orange/brown silty clay						
36	Natural orange/brown to blue grey clay						
37	Topsoil grey/brown silty clay						
38	Friable dark brown peaty silty clay						
39	Natural orange/brown to blue-grey clay						
40	Plastic light grey clay silt						
41	Firm very dark grey/brown peat						•
42	Firm grey/brown clay silt						
43	Natural orange/brown clay silt						
44	Topsoil dark grey/brown silty clay						
45	Firm grey/brown clay silt						
46	Natural orange/brown clay						
47	Topsoil dark grey/brown silty clay						
48	Firm grey/brown clay silt						
49	Natural orange/brown clay						
50	Topsoil dark grey/brown silty clay						
51	Firm grey/brown clay silt						
52	Natural orange/brown clay						
53	Topsoil dark grey/brown silty clay						
54	Firm grey/brown peaty clay silt						
55	Natural orange/brown clay						
56	Topsoil dark grey/brown silty clay						
57	Firm grey/brown peaty silty clay						
58	Natural orange/brown to blue/grey clay						
59	Topsoil dark grey/brown silty clay						
60	Firm grey/brown peaty silty clay						
61	Natural orange/brown to blue/grey clay						
62	Topsoil dark grey/brown silty clay						
63	Firm grey/brown peaty silty clay						
64	Natural orange/brown to blue/grey clay						
65	Topsoil dark grey/brown silty clay						
66	Firm grey/brown peaty silty clay						
67	Natural orange/brown to blue/grey clay						
68	Topsoil dark grey/brown silty clay						
69	Firm grey/brown peaty silty clay						
70	Natural orange/brown to blue-grey clay						
71	Topsoil dark grey/brown silty clay						
72	Firm grey/brown peaty silty clay						

No	Description	P	B	M	F	S	O
73	Natural orange/brown to blue/grey clay						
74	Topsoil dark grey/brown silty clay						
75	Firm grey/brown peaty silty clay						
76	Natural orange/brown to blue/grey clay						
77	Topsoil dark grey/brown silty clay						
78	Firm grey/brown peaty silty clay						
79	Natural orange/brown to blue/grey clay						
80	Topsoil dark grey/brown silty clay						
81	Firm grey/brown clay silt						
82	Natural orange/brown to blue/grey clay						
83	Topsoil dark grey/brown silty clay						
84	Firm grey/brown clay silt						
85	Natural orange/brown to blue/grey clay						
86	Topsoil dark grey/brown silty clay						
87	Firm grey/brown clay silt						
88	Natural orange/brown to blue/grey clay						
89	Topsoil dark grey/brown silty clay						
90	Firm grey/brown clay silt						
91	Natural orange/brown to blue/grey clay						
92	Topsoil dark grey/brown silty clay						
93	Firm grey/brown clay silt						
94	Natural orange/brown to blue/grey clay						
95	Topsoil dark grey/brown silty clay						
96	Firm grey/brown clay silt						
97	Natural orange/brown to blue/grey clay						
98	Topsoil dark grey/brown silty clay						
99	Firm grey/brown clay silt						
100	Natural orange/brown to blue/grey clay						
101	Topsoil dark grey/brown silty clay						
102	Firm grey/brown clay silt						
103	Natural orange/brown to blue/grey clay						
104	Topsoil dark grey/brown silty clay						
105	Firm grey/brown clay silt						
106	Natural orange/brown to blue/grey clay						
107	Topsoil dark grey/brown silty clay						
108	Firm grey/brown clay silt						
109	Natural orange/brown to blue-grey clay						
110	Topsoil dark grey/brown silty clay						

No	Description	P	B	M	F	S	O
111	Firm grey/brown clay silt						
112	Natural orange/brown to blue/grey clay						
113	Topsoil dark grey/brown silty clay						
114	Firm grey/brown clay silt						
115	Natural orange/brown to blue/grey clay						
116	Topsoil dark grey/brown silty clay						
117	Firm grey/brown clay silt						
118	Natural orange/brown to blue/grey clay						
119	Topsoil dark grey/brown silty clay						
120	Firm grey/brown clay silt						
121	Natural orange/brown to blue/grey clay						
122	Topsoil dark grey/brown silty clay						
123	Firm grey/brown clay silt						
124	Natural orange/brown to blue/grey clay	•					
125	Topsoil dark grey/brown silty clay						
126	Firm grey/brown clay silt						
127	Natural orange/brown to blue/grey clay						
128	Topsoil dark grey/brown silty clay						
129	Firm grey/brown clay silt						
130	Natural orange/brown to blue/grey clay						
131	Topsoil dark grey/brown silty clay						
132	Firm grey/brown clay silt						
133	Natural orange/brown to blue/grey clay						
134	Natural orange/brown to blue/grey clay						
135	Natural orange/brown to blue/grey clay						
136	Topsoil dark grey/brown silty clay						
137	Topsoil dark grey/brown silty clay						
138	Firm very dark brown peaty silty clay						
139	Natural orange/brown to blue/grey clay						
140	Topsoil dark grey/brown silty clay						
141	Firm very dark brown peaty silty clay						
142	Natural orange/brown to blue/grey clay						
143	Topsoil dark grey/brown silty clay						
144	Firm very dark brown peaty silty clay						
145	Natural orange/brown to blue/grey clay						
146	Topsoil dark grey/brown silty clay						
147	Firm very dark brown peaty silty clay						
148	Natural orange/brown to blue/grey clay						

No	Description	P	B		F	S	O
149	Topsoil dark grey/brown silty clay						
150	Firm very dark brown peaty silty clay						
151	Natural orange/brown to blue/grey clay						
152	Topsoil dark grey/brown silty clay						
153	Firm very dark brown peaty silty clay						
154	Natural orange/brown to blue/grey clay						
155	Topsoil dark grey/brown silty clay						
156	Firm very dark brown peaty silty clay						
157	Natural orange/brown to blue/grey clay						
158	Topsoil dark grey/brown silty clay						
159	Firm very dark brown peaty silty clay						
160	Natural orange/brown to blue/grey clay						
161	Topsoil dark grey/brown silty clay						
162	Firm very dark brown peaty silty clay						
163	Natural orange/brown to blue/grey clay						
164	Topsoil dark grey/brown silty clay						
165	Firm very dark brown peaty silty clay						
166	Natural orange/brown to blue/grey clay						
167	Topsoil dark grey/brown silty clay						
168	Firm very dark brown peaty silty clay						
169	Roman road						
170	Natural orange/brown to blue/grey clay						
171	Topsoil dark grey/brown silty clay						
172	Firm very dark brown peaty silty clay						
173	Natural orange/brown to blue/grey clay						
174	Topsoil dark grey/brown silty clay						
175	Firm very dark brown peaty silty clay						
176	Natural orange/brown to blue/grey clay						
177	Topsoil dark grey/brown silty clay						
178	Firm very dark brown peaty silty clay						
179	Natural orange/brown to blue/grey clay						

CMF: watching brief

No	Description	P	B	M	F	S	O
200	Topsoil dark grey/brown peaty silty clay	•					•
201	Firm grey/brown silty clay	•		•			•
202	Natural orange/brown clay						
203	Soft very dark grey/brown silty clay fill of [F204]	•		•			•
F204	Cut for crop pit						
205	Soft very dark grey/brown silty clay fill of [F206]	•		•			•
F206	Cut for crop pit						

CMF: evaluation trenches

No	Description	P	B	M	F	S	O
300	Topsoil dark grey/brown peaty silty clay						
301	Soft very dark grey/brown clay silt fill of [F302]						
F302	Cut for ditch						
F303	Sod-cast dyke/field boundary						
304	Firm grey/brown silty clay						
305	Natural orange/brown clay						
400	Topsoil dark grey/brown peaty silty clay						
F401	Sod-cast dyke/field boundary						
402	Firm grey/brown silty clay						
403	Natural orang/-brown clay						
500	Topsoil dark grey/brown peaty silty clay						
F501	Sod-cast dyke/field boundary						
502	Firm grey/brown silty clay						
503	Natural orange/brown clay						
600	Topsoil dark grey/brown peaty silty clay						
601	Soft very dark grey/brown clay silt fill of [F602]						
F602	Cut for ditch						
F603	Sod-cast dyke/field boundary						
604	Firm grey/brown silty clay						
605	Natural orange/brown clay						
700	Topsoil dark grey/brown peaty silty clay						
701	Firm grey/brown silty clay						
702	Natural orange/brown clay						
800	Topsoil dark grey/brown peaty silty clay						
801	Firm grey/brown silty clay						
802	Natural orange/brown clay						
900	Topsoil dark grey/brown peaty silty clay						
901	Firm grey/brown silty clay				•		•

902	Natural orange/brown clay						
1000	Topsoil dark grey/brown peaty silty clay						
1001	Firm grey/brown silty clay						
1002	Natural orange/brown clay						

CMF: DS15/16 corn-drier excavation OMF04

No	Description	P	B	M	F	S	O
1	Topsoil						
2	Subsoil						
3	Rubble spread overlying [F4]						
F4	Stone bowl of corn-drier						
5	Same as [3]						
6	Upper fill of [F4]						
7	Secondary fill of [F4]						
8	Secondary fill of [F4]						
F9	Flagstone floor						
F10	Niche/flue in NE corner of [F4]						
F11	Niche/flue in SW corner of [F4]						
F12	Blocking wall inside [F4]						
13	Wall re-build within [F4]						
14	Natural boulder clay						
15	Fill of construction cut [F16]						
F16	Construction cut for [F4]						
F17	Stone wall						
F18	Stone wall						

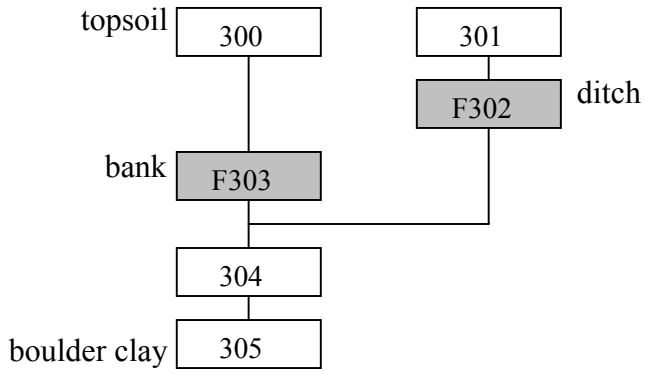
ETR: evaluation trenches (OFR05)

No	Description	P	B	M	F	S	O
1	Topsoil dark grey/brown silty clay						
2	Subsoil very dark grey/brown peaty silty clay						
F3	Dry stone wall						
4	Subsoil very dark grey/brown peaty silty clay						
5	Natural light grey/brown sandy clay						
6	Topsoil dark grey/brown silty clay						
7	Subsoil very dark grey/brown peaty silty clay						
8	Subsoil very dark grey/brown peaty silty clay						
F9	Dry stone wall						
10	Natural light grey/brown sandy clay						
11	Topsoil dark grey/brown silty clay						
12	Subsoil very dark grey/brown peaty silty clay						
F13	Dry stone wall						
14	Subsoil very dark grey/brown peaty silty clay						
15	Natural light grey/brown sandy clay						
16	Topsoil dark grey/brown silty clay						
17	Subsoil very dark grey/brown peaty silty clay						
F18	Dry stone wall						
19	Subsoil very dark grey/brown peaty silty clay						
20	Natural light grey/brown sandy clay						

Appendix II: Stratigraphic matrices

CMF: evaluation trenches

Trench 1



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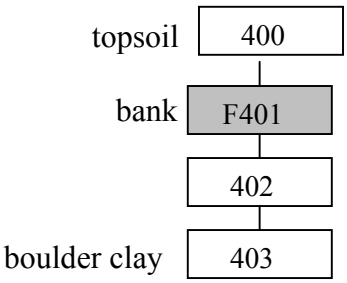
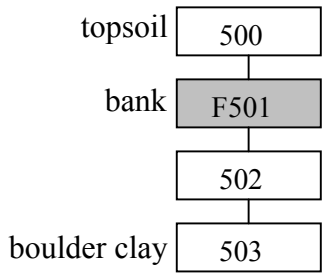
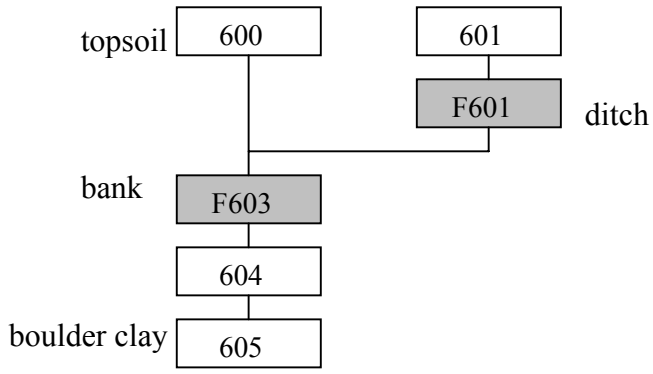


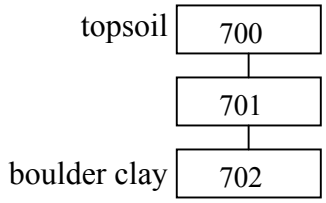
Trench 3



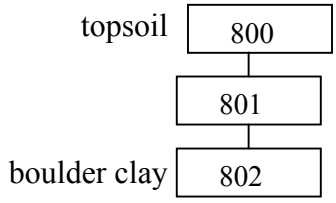
Trench 4



Trench 5



Trench 6



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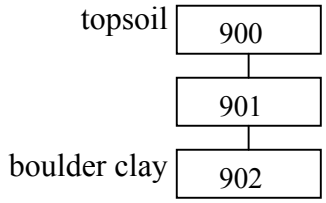
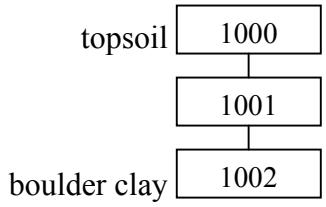
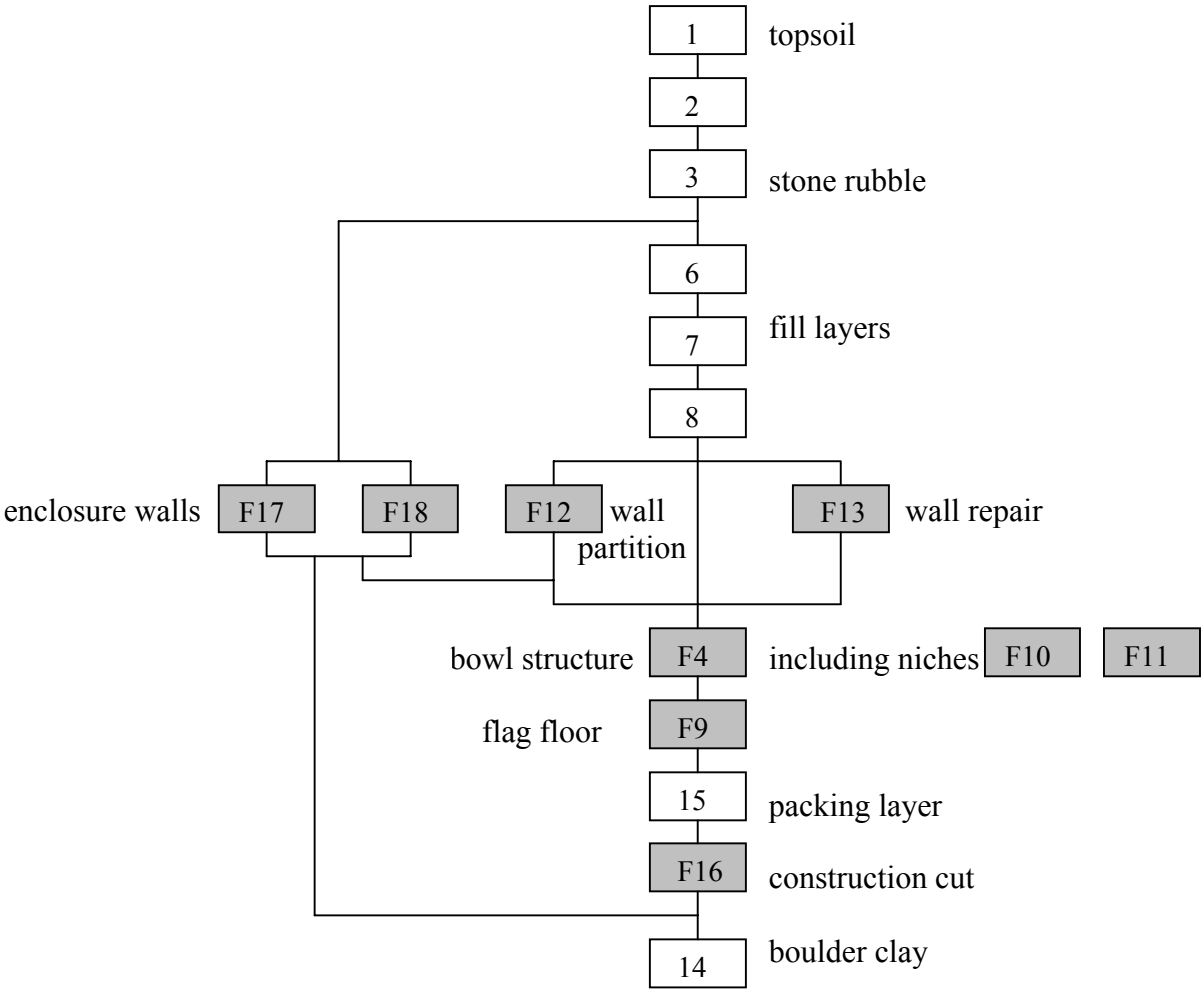


Trench 8

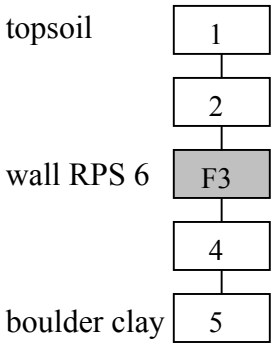


CMF: DS15/16 corn-drier excavation OMF04

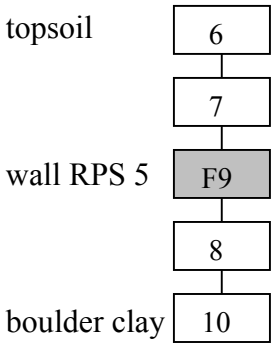


ETR: evaluation trenches

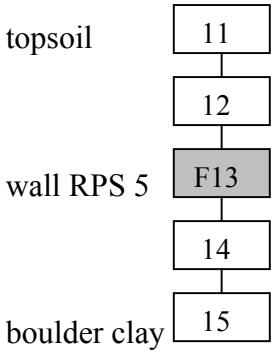
Trench 1



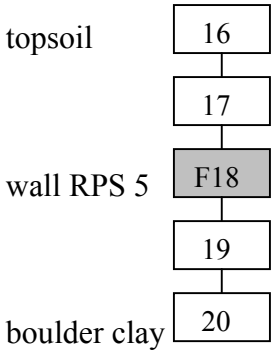
Trench 2



Trench 3



Trench 4



Appendix III: Project specifications

For road improvement works, prepared by Defence Estates (DE15/4445):

SPECIFICATION FOR ARCHAEOLOGICAL WATCHING BRIEF

1.0 Watching Brief

The watching brief will be undertaken along the entire length of the road widening except where more detailed excavation has already been carried out. The archaeological monitoring and recording will conform to the requirements set out in the IFA *Standard and Guidance for Archaeological Watching Briefs* (1999).

2.0 Aims and Objectives

The general aim of an archaeological watching brief is to provide facilities for professional archaeologists to identify, record and retrieve as far as possible archaeological remains that may be located in the course of a development.

The specific aims are to observe and record any significant archaeological deposits, layers or features that are exposed during the earthworks in the parts of the development that fall outside the pre-construction excavations, and to monitor the construction contractor's adherence to the agreed limitations on working methods in certain areas.

3.0 Method Statement

Archaeological observation and recording will take place during the removal of topsoil that occurs outside the pre-construction excavations.

All work will conform to the standards in the Appendix. A full and proper record (written, drawn and photographic as required for the excavations) will be made for all work using pro-forma record forms and sheets, and/or text descriptions appropriate to the work and subject to the circumstances prevalent at the development site. In addition, on-site matrices of the stratigraphical site record will be compiled.

The location of each area monitored under archaeological supervision will be shown on a site plan that will be related to the O.S. grid. The grid north as well as the location of the OS bench mark and the site TBM will be clearly marked on these plans.

All archaeological deposits and/or features will be recorded on scaled sections and plans. If no archaeological remains are identified, plans of the area examined, with spot heights, will be produced.

The contractor and/or site manager or other nominated members of the contractors staff will liase with the archaeologist(s), either in person or by telephone, in order to inform him/her of the construction programme.

The detailed timetable for the observation and recording programme will be discussed and agreed with the Client. It is expected to entail intermittent attendance by the archaeologist(s) over the course of the project.

1

On arrival on site, the archaeologist(s) will report to the site manager or other identified representative of the Client, and comply with their arrangements for notification of entering and leaving the site.

The archaeologist(s) may advise the temporary suspension of work in limited areas in order to undertake necessary recording in the event of unforeseen discoveries being made. Such a temporary suspension may be advised when the archaeologist(s) consider that significant archaeological features are at risk of destruction without record. Any such arrangement shall be discussed with the Northumberland National Park Authority and agreed with the Client prior to its implementation. The archaeologist(s) shall not cause unreasonable disruption of the work schedules of the client.

The agreed mitigation requirement (no. 43) that relates to the scheme design and working methods of the construction contractor would affect the archaeological contractor insofar as these requirements limit the areas of disturbance. The construction contractor's compliance with these requirements will be monitored by the archaeological contractor. Instances of non-compliance would be reported immediately to the Project Sponsor. These aspects of the scheme are:

- restrictions on working widths and the location of the road widening at Todlaw Pike
- location of widening at Deer Law hut circles
- width restrictions and location of widening at Yatesfield
- width restrictions and location of widening at Bellshiel
- location of widening to east of Dere Street north of Middle Golden Pot
- location of widening and width restriction at Countess Well
- location of widening and width restriction adjacent to the western part of High Rochester to Bridge of Aln road
- location of widening in the vicinity of Potts Durtrees medieval building
- width restriction and protection of Watty Bell's Cairn
- location of widening and width restriction at medieval structure 2d
- modification of Highshaw Bastle passing place

The archaeologist(s) will take personal responsibility for checking on a regular basis the progress of work in relevant areas and confirm verbally and/or visually what the programme of work is from day to day.

The archaeologist(s) will keep a record of the date, time and duration of all site visits, the number of staff concerned and any actions taken.

Sufficient and appropriate resources (staff, equipment, accommodation etc) will be used to enable the project to achieve its aims, the desired quality and timetable, and to comply with all statutory requirements. Tenderers should state the day rate for the work, inclusive of post excavation assessment, analysis, archiving and reporting to the standards identified in the Appendix.

2

4.0 Health and Safety

Health and Safety matters will take priority over archaeological matters. Risk assessment must be carried out in accordance with the Management of health and Safety at Work Regulations 1992. The archaeological contractor will not be the main contractor on-site and therefore they must ensure that they have a Health and safety briefing fomr the main contractor and comply with specified site rules.

APPENDIX A

Standards for Excavation in the Watching Brief.

Archaeological contractors will submit their proposed recording system for approval to the planning authority. All individual features will be sample excavated including linear features. Soil samples will be collected under the supervision of a named environmental specialist for assessment for environmental potential, including charcoal, small bones, pollen, mollusca, and macro-environmental material.

a) Proposed excavation director and excavation and research experience. The contractor will be monitored by the Client's Agent assisted and advised by the Defence Estates, EH and the NNPA. The Tenderer should name the Project Management and senior site personnel, who should be members of the Institute of Field Archaeologists or have equivalent qualifications and experience.

b) Size and structure of excavation team. The staffing will be left to the contractor, but it would be a necessary part of the Project Design that the team should be sufficient to complete the work within the aims of the project. The extent to which archaeological considerations will be allowed to affect the development schedule should also be stated.The on-site personnel should be experienced in this type of work and familiar with the type of terrain and conditions found at Otterburn.

c) Specialist help and reports. The contractors invited to tender will be required to submit a scheme of work which specifies named experts who would supervise specialist aspects of the programme, including any necessary environmental strategy. Tenderers should submit an environmental strategy for the whole project. A detailed strategy for post excavation including assessment, analysis, archiving and reporting consistent with MAP2 will also be required, and only satisfactory strategies will be considered.

d) Treatment of Finds and Samples. Different sampling strategies for the recovery of finds may be employed according to established research objectives and the perceived importance of the strata under investigation.

The location of significant archaeological finds will be recorded in three dimensions.

Provision will be made for the environmental sampling of appropriate features by a named specialist. Provision will be made for samples to provide C14 dating and archaeo-magnetic dating (if appropriate). Other forms of specialist analysis such as the X-raying of metalwork will be identified at the MAP 2 assessment stage and undertaken as appropriate, but the possibility of the need for such work should be considered and reflected in the bid.

All finds and samples will be recorded, collected and labelled according to their individual stratigraphical contexts. Finds will be allocated to the appropriate archaeological context and individual finds trays and waterproof labels will be used to identify unique individual contexts. Each label will be marked with the appropriate context number in waterproof ink and will be securely attached to each tray. All finds and samples will be exposed, lifted, cleaned, conserved, marked, bagged and boxed

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according to the United Kingdom for Conservation's *Conservation Guidelines No.2* and *First Aid for Finds* (second Edition, 1987).

Finds from unstratified contexts, whether located during machine trenching or during hand excavation, will be collected and recorded separately.

e) Human Remains Should human remains be discovered, the coroner will be informed and the archaeological contractor will obtain a Home Office licence if their removal proves to be necessary.

f) Conservation and storage. Before commencing the fieldwork, the archaeological contractor will confirm in writing to the Client and Client's Agent that arrangements have been made to cover all necessary processing, conservation and specialist analysis, and suitable storage of finds and samples.

Contractors will be required to submit schemes for satisfactory on-site conservation, and subsequent storage, post excavation conservation, archiving and deposition of the excavated material and records in the appropriate museum. Only satisfactory programmes will be considered.

g) Post excavation programme. Contractors will be required to submit costs for a full MAP2-style post excavation process, up to and including archiving and publication. Outline details of the arrangements and costs for post excavation assessment, processing, analysis, archiving, report preparation and publication should be included in the tender submissions. The costs of these phases should be identified and the assumptions on which they are based should be stated (see clause 1.12).

h) Previous work. The contractor will include in the Project Design his proposals for the incorporation of the results of the previous evaluations undertaken in connection with the Options for Change proposals.

i) Publication procedure and programme. Contractors will be required to adhere to the procedures set out in MAP2 as regards dissemination. The following reports will be required:

- the *Assessment Report and Updated Project Design* (following MAP2 style assessment)
- the *academic report(s)* (synthesis following full analysis)
- the *archive report* (fully prepared research archive)
- "*Popular Report*"

Consideration will need to be given to the form of the report, and tenderers should bear in mind the previous survey and excavation work. The contractor will adhere to the report and recording formats set out in the MoD guidelines as follows;

The report(s) should include a site location plan with NGR references, and also be accompanied by additional plans/map extracts to display the noted and recorded archaeological features as appropriate. The report should be prepared to an adequate standard (see *Standard and Guidance for Archaeological Field Evaluations* IFA (1999)

5

The report should be presented in an ordered state prefaced with a contents listing and it should also include an index and cross-referencing where appropriate. Paper copies of the report should be robustly bound within a protective cover or sleeve. The report should contain a title page listing the site and or project name, district and County together with site NGR, the name of the archaeological contractor and client. The report should be page numbered and supplemented with sections and paragraph numbering for ease of reference. Copies of the report will be deposited with the MoD, the defence Estates, the county SMR, the NMR and the Northumberland National Park Authority (NNPA).

j) Arrangements for deposition of original archive. The archaeological contractors, in agreement with the Client, will arrange for the archive and original material to be deposited in the appropriate museum to be agreed with EH and the NNPA. The submitted tender should clearly identify the receiving body for the archive and itemise all associated costs.

6

For excavation of corn-drier DS15 at Davyshiel, prepared by David Freke, RPS:

FAX NO. : 14 Apr. 2004 12:24PM

2.40 Davyshiel Earthwork

2.41 Condition. The angle of the roads north and west of the CMF contains a number of earthwork and masonry structures of differing periods. The area is rough pasture, where the masonry remains of a probable medieval or post-medieval farmstead with the stone banks of an extensive field system and ridge and furrow can be clearly traced. In addition there are less well-defined earthworks, interpreted as possible medieval or later corn drier (DS15) and its associated fuel store or hut (DS16). The latest features is a series of bomb craters. The corn drier and its associated structures are outside the CMF footprint, but will be affected by the screen planting (as shown on Drwg no. H/211 Revision A, entitled Proposed Woodland Planting Central Maintenance Facility, amended in February 2004 to show the agreed planting areas).

2.42 Site reconnaissance and research. The area was surveyed by Lancaster Archaeological Unit in 1996. The sites were designated DS15 and DS 16 in the LAU survey. DS15 is described as a possible corn-drying kiln, of medieval or post-medieval date, in poor condition, 6m in diameter and 0.2m high. It is a circular dished depression 0.1m – 0.3m deep surrounded by a grassed bank with some in situ stone, 0.2m high at its maximum, cut into rising ground to the west, with a possible 0.3m wide break in the bank's east side. DS16 is described as a possible hut of medieval or post medieval date in poor condition, possibly a fuel store for DS15. It is rectangular, 4m long by 2m wide, and 0.1m high, cut into rising ground to the west with low earthworks to the south and east where some stone shows. It appears to abutt DS15 to the north.

2.43 Research Aims. The aim will be to establish the date and function of the features, in order to relate them to the economic development of the area.

2.44 Excavation method and strategy. A single open area excavation trench 10m x 10m should expose the interiors of both structures, enable the enclosing walls/banks and any interior features to be planned and sectioned, and also include sufficient of the area around the structures to ensure that the appropriate context of the features is established.

DF 12.04.2004

For ETR works, prepared by White Young & Green:

OTA: ELECTRIC TARGET RANGE

EXCAVATION AND WATCHING BRIEF

PROJECT BRIEF

1. Introduction

1.1 In agreement with English Heritage and the Northumberland National Park Authority the MoD undertakes to commission a programme of agreed archaeological mitigation measures at OTA in accordance with the approved NoPD. The following Project Brief is for the archaeological programme of works that will be required prior to construction and during construction of the Electric target Range.

1.2 The Agreed Measures related to archaeology are set out in the ES. They can be broken down into:

- works required prior to construction
- works during construction

1.3 Using the numbering in the ES, the works required prior to construction are:

- excavation of 3 sample sections of the boundary wall (RPS 5)
- excavation of 1 sample section of the boundary wall (RPS 6)

1.4 The works required during the construction are related to watching briefs and monitoring. Watching briefs and/or archaeological monitoring are required for the earth moving activities, with specific recommendations related to:

- the area of the possible clearance cairn (RPS 1)
- the area of scattered stones (RPS 2)
- The line of the possible track (RPS 7)

1.5 This Project Brief sets out the areas to be investigated and the general standards and methods to be adopted by the archaeological contractors. The Project Design should include itemised costings for each element of the project including the post excavation phase. The archaeological contractor should prepare costings for assessment, analysis, archiving and publication. These should be identified in the costings. The contractor should set out the assumptions on which he bases these costings, including day rates, timetables and the anticipated levels of work involved.

2. Excavation

2.1 Post Medieval Walls (RPS 5 and 6):

2.2 Condition. The features are ruined and robbed post-medieval boundary walls. Only a few courses of the walls survive, with tumbled stones visible on both sides. Current land use is rough grazing. RPS 5 runs roughly east-west across the lanes of the ETR, midway between the 400m and MFP firing positions. It is about 60cm wide and over a 300m long, and its line continues on the east side of the modern road to Wainfordrigg and High Carrick. A modern drainage channel cuts this wall at the eastern edge of the ETR lanes. RPS 6 is a southern spur wall at right angles to RPS 5. It runs about 70m to the top of a knoll before disappearing, reappearing again to the east of the Wainfordrigg road.

2.3 Site reconnaissance and research. A documentary study and a walkover survey were commissioned by the MoD in 2004, and the results incorporated in the ES. The conclusion was that these were post medieval boundary walls, the east-west wall being on the Elsdon parish boundary. .

2.4 Research aims of excavation. The aim of the investigation is to record the surviving structure of the walls sufficiently to establish, if possible, the date of construction, the method of construction, and the date and process of destruction. The investigation will also check for evidence of any earlier boundary features under or in the immediate vicinity of the walls. Opportunities should be taken for environmental sampling to elucidate earlier land-use, climate etc. The overall aim of the investigations is to contribute to the understanding of the land-use, enclosure and development of the historic landscape.

2.5 Excavation method and strategy. The ETR construction will remove the east-west wall (RPS 5) where it crosses the ETR lanes because of ricochet risks, and the access track on the east side of the ETR will cut the east-west-wall and the north south wall (RPS 6). The east-west wall RPS 5 should be sectioned in three places: at the western extremity of the ETR works, at the centre of the ETR lanes and at the point where the eastern access track cuts it. The north south wall RPS 6 should be sectioned at the point where the eastern access track cuts it. A sufficient length of wall in each case should be removed so that the research aims set out above can be addressed.

2.6 The trenches will each be 3m X 5m straddling the line of the walls, with the long access of the trench at right angles to the line of the wall. In addition, if features are uncovered which extend beyond the trench, and which would require a wider excavated area to understand, the trench would be extended appropriately after consultation and agreement with the National Park Authority and the Project Sponsor. A contingency for such an eventuality should be identified in the Project Design andcostings. The topsoil strip and subsequent excavations of any features revealed would be by hand.

3. Excavations: General Considerations

3.1 The archaeological contractor will submit their proposed recording system for approval to the planning authority. All individual features will be fully excavated including linear features. Soil samples will be collected under the supervision of an environmental specialist for assessment for environmental potential, including charcoal, small bones, pollen, mollusca, and macro-environmental material.

3.2 Duration of the proposed excavations and size of field team. The archaeological contractor will be expected to submit a timetable for the duration of the excavations at each site, dependent upon the decision date.

3.3 Proposed excavation director and excavation and research experience. The excavation contractor(s) will be chosen by tender competition immediately following an Inquiry decision favourable to the MoD. The contractor(s) will be monitored by RPS Consultants, EH and the planning authority. The Project Design should name the Project Management and senior site personnel, who should be members of the Institute of Field Archaeologists or have equivalent qualifications and experience.

3.4 Size and structure of excavation team. The staffing will be left to the contractor, but it would be a necessary part of the Project Design that the team should be shown to be sufficient to complete the work in the timetable required. The on-site personnel should be experienced in this type of work and familiar with the type of terrain and conditions found at Otterburn.

3.5 Specialist help and reports. The contractors will be required to submit a scheme of work which specifies named experts who would supervise specialist aspects of the programme, in particular the environmental strategy. A detailed strategy for post excavation including assessment, analysis, archiving and reporting consistent with MAP2 will also be required.

3.6 Treatment of Finds and Samples. Different sampling strategies for the recovery of finds may be employed according to established research objectives and the perceived importance of the strata under investigation. Close attention will be given to sampling for date, structure and environment. Bulk sieving may be necessary where there is a low incidence of artefacts.

The location of significant archaeological finds will be recorded in three dimensions.

Provision will be made for samples to provide C14 dating and archaeo-magnetic dating (if appropriate). Other forms of specialist analysis such as the X-raying of metalwork will be identified at the MAP 2 assessment stage and undertaken as appropriate, but the possibility of the need for such work should be considered and reflected in the quotation.

All finds and samples will be recorded, collected and labelled according to their individual stratigraphical contexts. Finds will be allocated to the appropriate archaeological context and individual finds trays and waterproof labels will be used to identify unique individual contexts. Each label will be marked with the appropriate context number in waterproof ink and will be securely attached to each tray. All finds and samples will be exposed, lifted, cleaned, conserved, marked, bagged and boxed according to the United Kingdom for Conservation's *Conservation Guidelines No.2* and *First Aid for Finds* (second Edition, 1987).

Finds from unstratified contexts, whether located during machine trenching or during hand excavation, will be collected and recorded separately.

3.7 Human Remains. Should human remains be discovered, the coroner will be informed and the contractor will obtain a Home Office licence if their removal proves to be necessary.

3.8 Sponsoring organisation for the proposed excavation. The sponsoring organisation will be the MoD; the Project Sponsor within the MoD is Lt Col (Retd) R A Newns.

3.9 Conservation and storage. Before commencing the fieldwork, the archaeological contractor will confirm in writing to the project sponsor that arrangements have been made to cover all necessary processing, conservation and specialist analysis, and suitable storage of finds and samples.

3.10 The Contractor will be required to submit schemes for satisfactory on-site conservation, and subsequent storage, post excavation conservation, archiving and deposition of the excavated material and records in the appropriate museum.

3.11 Post excavation programme. The Contractor will be required to submit costs for a full MAP2 style post excavation process, up to and including archiving and publication. Outline details of the arrangements and costs for post excavation assessment, processing, analysis, archiving, report preparation and publication should be included . The costs of these stages should be ***identified and the assumptions on which they are based should be stated.***

3.12 Publication procedure and programme. The Contractor will be required to adhere to the procedures set out in MAP2 as regards publication. Consideration will need to be

given to the form of the publication. A copy of the final report will be deposited with the MoD, the county SMR and the Northumberland National Park Authority.

3.13 Arrangements for deposition of original archive. The archaeological contractor, in agreement with the project sponsor will arrange for the archive and original material to be deposited in the appropriate museum to be agreed with EH and the planning authority, and a copy deposited in the NMR.

4. Watching Brief

4.1 The watching brief will be undertaken at all locations where there is earth moving. The archaeological monitoring and recording will conform to the requirements set out in the IFA *Standard and Guidance for Archaeological Watching Briefs* (1999).

Aims and Objectives

4.2 The general aim of an archaeological watching brief is to provide facilities for professional archaeologists to identify, record and retrieve as far as possible archaeological remains which may be located in the course of a development.

4.3 The specific aims are to observe and record any archaeological deposits, layers or features that are exposed during the removal of topsoil in the parts of the development that fall outside of the archaeological excavations (including the removal of the walls where they have not been previously sampled), and in particular the areas of the possible track RPS 7, the possible cairn RPS 1, and the stone scatter RPS2.

Method Statement

5.4 Archaeological observation and recording will take place during the removal of topsoil which occur outside of the area excavations.

5.5 A full and proper record (written, drawn and photographic as required for the excavations) will be made for all work using pro-forma record forms and sheets, and/or text descriptions appropriate to the work and subject to the circumstances prevalent at the development site. In addition, on-site matrices of the stratigraphical site record will be compiled.

5.6 The location of each area monitored under archaeological supervision will be shown on a site plan which will be related to the O.S. grid. The grid north as well as the location of the OS bench mark and the site TBM will be clearly marked on these plans.

5.7 All archaeological deposits and/or features will be recorded on scaled sections and plans. If no archaeological remains are identified, plans of the area examined, with spot heights, will be produced.

5.8 Sufficient and appropriate resources (staff, equipment, accommodation etc.) will be used to enable the project to achieve its aims, the desired quality and timetable, and to comply with all statutory requirements. The contractor should state the day rate for the work, and a lump sum to complete it, inclusive of post excavation assessment, analysis, archiving and reporting.

5.9 The construction contractor and/or site manager or other nominated members of the contractor's staff will liase with the archaeologist(s), either in person or by telephone, in order to inform him/her of the construction programme.

5.10 The detailed timetable for the observation and recording programme will be discussed and agreed with the project sponsor. It is expected to entail intermittent attendance by the archaeologist(s) over the course of the project.

5.11 On arrival on site, the archaeologist(s) will report to the site manager or other identified representative of the project sponsor, and comply with their arrangements for notification of entering and leaving the site.

5.12 The archaeologist(s) may recommend the temporary suspension of work in limited areas in order to undertake necessary recording in the event of unforeseen discoveries being made. Such a temporary suspension may be requested when the archaeologist(s) consider that significant archaeological features are at risk of destruction without record. Any such arrangement shall be discussed with the lpa and agreed with the project sponsor prior to its implementation. The archaeologist(s) shall not cause unreasonable disruption of the work schedules of the client.

5.13 The archaeologist(s) will take personal responsibility for checking on a regular basis the progress of work in relevant areas and confirm verbally and/or visually what the programme of work is from day to day.

5.14 The archaeologist(s) will keep a record of the date, time and duration of all site visits, the number of staff concerned and any actions taken.

6. Health and Safety

6.1 All relevant health and safety legislation and codes of practice will be respected. The archaeologists will provide a risk assessment related to the archaeological work and conform to the health and safety procedures carried out by the construction contractor.

6.2 No personnel will work in deep unsupported excavations. Where the installation of temporary support work and other safety equipment is required, this will be provided by the developer as part of the archaeological agreement. Trenches deeper than 1.25 metres will be stepped, battered back or shored.

6.3 All trenches will need to be cleared for unexploded ordnance by the MoD before excavations deeper than 1 metre are commenced, or before any probes, cores or bores deeper than 1 metre are carried out.

6.4 The archaeologist(s) shall at all times wear a safety helmet, reflective jacket and safety boots.

6.5 The archaeologist(s) will not work unaccompanied in a remote area and will inform the Site Manager of his/her working area each day.

6.6 The archaeologist(s) will remain alert and will take due care not to impede the progress of moving machinery. He/she will stand well back from the turning circle of all mechanical excavators, buckets and cabs.

6.7 When observing deep excavations, the archaeologist(s) will remain at a safe distance from the edge of the excavation, especially in waterlogged or unconsolidated areas.

7. Monitoring

7.1 Provision will be made for the Northumberland National Park Authority (NNPA) to monitor the fieldwork during the excavation, and watching brief programmes, and

any other aspect of the archaeological project as required, including the post fieldwork analysis and report preparation stages.

7.2 Any variation to the project programme in terms of work or recording, whether on site or off will be fully discussed and agreed with Northumberland National Park Authority in advance.

7.3 Reasonable access to the excavation site and the watching brief area will be given by the client to Northumberland National Park Authority, for monitoring purposes.

8. Post Fieldwork Methodologies

8.1 At the end of the fieldwork a MAP 2 assessment will be undertaken to determine the appropriate level for the post-fieldwork analysis and publication. The post fieldwork project assessment will ensure that the following requirements are fulfilled:

- provision of adequate finance
- adequate level of human and technical resources
- nomination of relevant specialists
- pre-determined levels of analysis
- clearly defined project management structure

8.2 The assessment will result in the production of a post excavation assessment report and updated project design which sets out post fieldwork proposal for the approval of the project sponsor, advised by NNPA. No post fieldwork analysis will begin until this process has been undertaken.

8.3 A fully integrated and structured site matrix will be produced such that the site may be accurately and comprehensively phased in relation to other dating evidence. This completed matrix will be incorporated into the final excavation and any other subsequent report.

9. Final Publication and Dissemination

9.1 A flexible approach to the ultimate publication strategy is required, as the potential scale and scope of the appropriate publication may not become apparent until the post fieldwork period.

9.2 Two objectives will be met: (i) the production of a research archive and (ii) the production of a report for publication.

9.3 Adequate resources will be allocated to achieve these objectives. The resources will include provision for reviews of the extent to which the objectives are being met, bearing in mind the process of synthesis can often lead to a revision of the original stated aims.

9.4 A final and comprehensive report of the archaeological excavation and monitoring shall be prepared for publication in an appropriate national or local archaeological journal within.1 year of the completion of the archaeological project. The report will include the following:

- A list of contents and of plans and figures used in the report;
- An explanation of the proposed development and the reasons for the archaeological excavation and monitoring of topsoil stripping;
- A non-technical summary that explains the main issues in laymen's terms;
- An overall statement of the archaeological importance of the site in a local and regional context;

- A general introduction to the project, including details of the site location, the planning applicant, the archaeological contractor and the author(s) of the report;
- The aims and objectives of the project;
- The methodology used in the project;
- The identity of the project manager and of the individuals carrying out the work and their previous archaeological experience;
- A description of the archaeological and historical background and context of the site;
- A description of the geology and topography of the site and the results of any previous archaeological fieldwork in the vicinity;
- The methods used to excavate the site;
- Specialists reports on the finds (if appropriate) including significant dating evidence;
- A palaeoenvironmental assessment of the site (if appropriate);
- A description of the results, with a detailed discussion and interpretation on the reliability of the findings;
- Details of the project timetable, with dates and details of the staff structure;
- Details of the location of the project archive and finds at the time of compilation of the report, and the proposed date and location of their eventual deposition;
- Sufficient illustrations to support the text including figures to show the location of the site in a national, regional and local context; the location of the excavation and of the archaeological monitoring areas; the cultural heritage within a 1km radius of the proposed development site; detailed figures of the excavation trench plans and monitored area plans and selected excavated sections and sufficient interpretive drawings to illustrate the main findings;
- Tabulated lists of contexts and finds, matrices, acknowledgements, a bibliography and a glossary of terms for the non-specialist

9.5 Copies of the project report will be made available to the client, Northumberland National Park, the county Sites and Monuments Record within 18 months of the completion of the archaeological project. A copy of the report will be retained with the site archive.

9.6 A report will be submitted to an appropriate publication within one year of the completion of the archaeological project.

10. Copyright

10.1 The archaeological contractor shall retain full copyright of any commissioned report, tender documents or other documents, under the *Copyright, Designs and Patents Acts* (1988) with all rights reserved, excepting that it hereby provides an exclusive licence to the MoD and to the Northumberland National Park Authority for the use of such documents in all matters directly relating to the project.

10.2 Information, including drawings and photographs, can be used without charge by the MoD or the NNPA for future publications and displays, on condition that a credit to the contractor(s) is also displayed.

11. Archive and Finds Deposition

11.1 All retained artefacts will be cleaned, conserved and packaged in accordance with the requirements and guidelines of the United Kingdom for Conservation's *Conservation Guidelines No.2* and *First Aid for Finds* (Second Edition, 1987). Small finds will be boxed separately from the bulk finds.

11.2 Artefacts recovered from the archaeological excavation and watching brief will be taken away from the site at the end of each working day and will be stored in a secure off-site location.

11.3 A contingency will be identified for any unforeseeable finds conservation work which may be required on organic or other material which may be liable to deterioration after recovery.

11.4 Suitable specialists will be used for artefact analysis and environmental analysis.

11.5 Subject to the landowner's consent and to the guidelines and requirements of MAP 2, all artefacts recovered from the archaeological excavation and watching brief and the archive will be deposited in an appropriate museum to be agreed with Northumberland National Park Authority. All recovered artefacts will be fully catalogued.

11.6 The project archive, comprising all records relating to that project will be retained and will be prepared to at least the minimum acceptable standard defined in MAP2.

11.7 The project manager will ensure that every element of the archive is kept clean and secure and that it is stored in a suitable environment.

11.8 The archive comprising written, drawn, photographic and electronic media, will be fully catalogued, indexed, cross referenced and checked for archival consistency.

11.9 A microfilm or microfiche copy of the project archive will be deposited with the RCHME within six months of the completion of the archaeological project.

12. Staffing and Timetable

12.1 The archaeological contractor should ensure that sufficient experienced staff, including the watching brief team, are available to undertake the work.

13. General Matters

13.1 The provisions of the *Treasure Act* (1996) will be complied with.

13.2 A contingency sum should be put aside for unforeseeable circumstances. Normal events, such as the range of weather conditions experienced at Otterburn, should be accommodated within the lump sum. Contractors should also make themselves aware of the implications of live firing for access.