

Sturdy Spring burnt mound, Feldom Range, Richmond, North Yorkshire

archaeological excavation

on behalf of

Landmarc Support Services Ltd

For

Defence Estates

Report 1569

February 2007

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Defence Estates Training Estate Environmental Support Team

Gough Road, Catterick Garrison, North Yorkshire, DL9 3EJ

Contents

1. Summary	1
2. Project background	2
3. Landuse, topography and geology	3
4. Historical and archaeological background	3
5. The excavation	4
6. The finds	5
7. The environmental evidence	6
8. GCMS analysis	7
9. Conclusions	9
10. Sources	9
Appendix 1: Context data	11
Appendix 2: Data tables	12
Appendix 3: Stratigraphic matrix	14
Appendix 4: Project specification	15

1. Summary

The project

- 1.1 This report presents the results of an archaeological excavation conducted at Sturdy Spring on the Feldom Ranges, Defence Training Estate Catterick, North Yorkshire. The works comprised the excavation of a large crescent shaped, almost circular mound, approximately 15m in diameter and 1.5m deep with a shallow depression at its centre. The mound is one of a group of three; a radiocarbon date obtained from mound 3 (Figure 2) of these produced a date of between 2400-2380BC and 2360-2140BC at 2 sigma confidence.
- 1.2 The works were commissioned by the Environmental Support Team at Defence Estates, and conducted by Archaeological Services in accordance with a statement of requirement provided by Defence Estates.

Conclusions

- 1.3 Excavation of this burnt mound uncovered a trough, a hearth and large quantities of burnt sandstone indicative of repeated episodes of firing.
- 1.4 The primary fill of the trough was submitted for lipid analysis in order to identify the presence of plant or animal residues left over from any cooking activities. This analysis has found no evidence to support the use of this trough for cooking.
- 1.5 Charcoal from the hearth was submitted for radiocarbon dating; a date of 1430-1260BC at three sigma confidence was returned placing the final use of this hearth in the middle of the Bronze Age. This date is substantially later than that attained for mound 3 and may indicate a chronologically linear sequence to the Sturdy Spring mounds, or that the sites were in use for a substantial period of time.

2. Project background

Location (Figure 1)

- 2.1 The site is located at Sturdy Spring on the Feldom Ranges, Defence Training Estate Catterick, North Yorkshire (NGR: NZ 1350 0516). The site comprised a large crescent-shaped, almost circular mound, approximately 15m in diameter and 1.5m deep, with a shallow depression at its centre. This is one of a group of three mounds, found by Paul Brown and described by Laurie (2004). The excavation targeted the northern mound of this group. The mound was bounded to the east by a small stream, to the northwest by a small track way and to the south by open moorland.

Objective

- 2.2 The objective of the excavation was to identify, excavate and record any significant archaeological features within the area of survey to seek evidence of the use and development of the mound, and to obtain dating evidence for the mound.

Methods statement

- 2.3 The works have been undertaken in accordance with statement of requirement as provided by the Environmental Support Team at Defence Estates and a written scheme of investigation provided by Archaeological Services (RA06.217).

Dates

- 2.4 Fieldwork was undertaken between 16th and 27th October 2006. This report was prepared between 2nd November 2006 and 12th February 2007.

Personnel

- 2.5 Fieldwork was conducted by Janice Adams, Janet Beveridge, Avril Gibson, Becky Goulding, Tim Laurie, Natalie Swann, Virginia Thelin and Jason Mole, the projects supervisor. This report was prepared by Jason Mole, with illustrations by Janine Wilson. Specialist analysis was conducted by Jason Mole (lithics), Dr Charlotte O'Brien (macrofossil analysis) and Ben Stern (gas chromatography-mass spectrometry analysis). The Project Manager was Richard Annis.

Archive/OASIS

- 2.6 The site code is **FBM06**, for **Feldom Burnt Mound 2006**. The archive is currently held by Archaeological Services and will be transferred to The Yorkshire Museum at York in due course. Archaeological Services is registered with the **Online AccesS** to the **Index** of archaeological investigationS project (OASIS). The OASIS ID number for this project is **archaeol3-23617**.

Acknowledgements

- 2.7 Archaeological Services is grateful for the assistance of Avril Gibson, Becky Goulding, Tim Laurie and Virginia Thelin in facilitating this scheme of works.

3. Landuse, topography and geology

- 3.1 At the time of the excavation the survey area was part of a Defence Estates firing range.
- 3.2 The Sturdy Spring site has a mean elevation of *c.*258m OD. The site is based on a solid geology of Carboniferous limestone overlain by boulder clay and morainic drift.
- 3.3 The mound was bounded to the east by a hill and a small stream flowing south south west to north north east; to the northwest by a small trackway and to the south by open moorland.

4. Historical and archaeological background

- 4.1 Burnt mounds are features, generally attributed to the Bronze Age, which as their name suggests largely comprise heaps of fired stone. They are generally oval, circular or crescent-shaped in plan, and normally have a hearth alongside a sub-oval or rectangular cut feature, interpreted as a trough, in close proximity. Mounds can range in size from approximately 4m to 15m in diameter and 0.3m to 2m in height. The majority of burnt mounds identified today are found in upland locations, generally above 250m, and often on the brim of, or in close proximity to, a small stream (Laurie 2004).
- 4.2 Burnt mounds or *fulachta fiadh* have been recognised as a distinctive type of archaeological site since the mid-19th century (Barfield and Hodder 1987). They have been recorded all over Britain and Ireland with large concentrations in the northern Scottish Isles, the west Midlands, southwest Wales and southwest Ireland (Ehrenberg 1991).
- 4.3 Early interpretations of these sites saw them as cooking places, where stones would be heated on a hearth and placed into the water-filled trough in order to boil the water. An experiment conducted in Ireland on this method of use found that a wood-lined trough containing one hundred gallons of water could be brought to boiling point in around thirty minutes. Irish literary sources also describe the use of *fulachta fiadh* during the hunting season with meats roasted on spits as well as cooked in troughs using heated stones (Ó Ríordáin 1979).
- 4.4 Arguments have been made against this interpretation, supported by the lack of large quantities of animal bones found during the excavation of these features. The proximity to a water source and the enclosed nature of sites such as Liddle Farm in Orkney, along with extensive ethnographic research, has led to speculation of the use of these sites as ‘sweat baths’ (Barfield 1991).
- 4.5 A number of other possible explanations for the use of these sites have been put forward including metalworking (Ehrenberg 1991) and fulling (Jeffery 1991).

- 4.6 The first burnt mounds in Western Yorkshire were recognised in 1993, and since that time close to one hundred mounds have been recognised in Wensleydale and Swaledale, with more being added to the list on a regular basis. A series of three mounds was identified on the same stream at Sturdy Spring during field walking by Paul Brown and published by Tim Laurie (2004). A fourth mound in the series was identified during the process of this excavation but remains unpublished.
- 4.7 A radiocarbon date has been acquired from Sturdy Spring mound 3, approximately 90m to the southeast of the current excavation; the security of the context information for this date is not known, but a calibrated date of between 2400-2380BC and 2360-2140BC at 2 sigma confidence has been recorded for material within the mound (pers. comm. Virginia Thelin).

5. The excavation

- 5.1 A single trench of 35 sq m was positioned over a plateau in the east of the mound, adjacent to the stream, in order to sample any structural deposits or working surfaces within the mound (Figure 2). The initial stripping of topsoil and vegetation was carried out by mini excavator, provided by Landmarc Support Services Ltd. Subsequent excavation was carried out by hand.

Early features

- 5.2 A natural glacial till was identified below the southern horn at 0.69m below the present ground surface; it varied from a stony sand to firm impermeable boulder clay. Cut through a patch of clay in the west of the trench were the remains of a rectangular trough [F17: 2.2m long by 1.08m wide and 0.36m deep] (Figure 10); this was filled by a light grey clay silt [21: 0.52m wide by 0.27m deep] with degraded sandstone inclusions (Figures 4 and 7). This deposit was submitted for lipid analysis in order to detect the presence of any plant or animal fats left over from previous activities such as cooking. No significant results were recorded from this analysis.
- 5.3 In the east of the mound the glacial natural had been altered [20] to a depth of 0.17m by successive episodes of burning, leaving a compacted laminated red-orange crust of burnt, almost vitrified, sand and sandstone, with small flecks of charcoal. On the surface of this were the remains of a small sub-oval hearth [F15: 0.8m long by 0.58m wide by 0.02m deep] (Figure 11) filled by a dark grey-black clay silt with frequent flecks of charcoal. Charcoal removed from the hearth was sent for radiocarbon dating and returned a calibrated date of 1430-1260BC at three sigma confidence (Lab code: SUERC-12318). Immediately to the east of this was a shallow scoop [F19: 2.04m long by 1.61m wide by 0.16m deep] filled by a black clay silt deposit [18] with frequent flecks of charcoal; no signs of burning were present in the subsoil below this scoop indicating that this was a secondary deposit of burnt material, possibly raked out from the nearby hearth (Figures 4 and 7).
- 5.4 Overlying the shallow scoop was a small sub-oval mound of burnt stone [8: 2.44m long by 1.48m wide by 0.21m deep].

- 5.5 The burnt mound, as previously stated, was crescent shaped; the positioning of the trench over the central depression meant that the burnt stone material appeared as two ‘horns’ running into the trench, one in the north and one in the south.
- 5.6 The southern horn was very compacted and comprised two separate deposits of burnt stone; the earliest [23: 1.85m wide by 0.28m deep] was a black deposit of mainly fire-cracked sandstone with sand, silt and charcoal. This was overlain by a dark grey-black deposit of similar material [5: 2.52m long by 1.89m wide by 0.69m deep].
- 5.7 The northern horn was less compacted and contained fewer sandstone fragments; it comprised three deposits. The primary deposit was a pink-yellow deposit of highly fired sand, small fragments of sandstone and flecks of charcoal [13: 1.01m wide by 0.28m deep]. Overlying this was a friable black deposit of fire-cracked sandstone, sand and tiny charcoal flecks [27: 1.08m wide by 0.32m deep]. The top layer of the mound comprised a friable deposit of grey-black fire-cracked sandstone, sand, silt and charcoal [6: 3.87m long by 1.86m wide by 0.81m deep]. Within this deposit was a lens of burnt sand [31: 0.9m long by 0.15m deep]; this is probably the rake-out of a burning episode, indicating that this portion of the mound was created by more than one event (Figures 5 and 7).
- 5.8 Covering the centre and lower flank of the mound was a layer of dark red-brown slumped mound material [16/9/29/30] (Figure 8), which was 0.38m deep in parts. Cut through this layer of tumble was a shallow northeast-southwest aligned gully [F11: 2.74m long by 0.46m wide by 0.07m deep] filled by a dark grey-black clay silt with frequent burnt stone inclusions [12]. The northeast end of this gully grew gradually shallower before ending in a leaf-shaped terminal, indicative of horizontal truncation (Figures 5 and 7).
- 5.9 In the depression in the centre of the mound was a build-up of laminated grey and black silt [7: 4.1m wide by 0.46m deep] (Figure 9), probably formed by the accumulation of waterlogged decomposed vegetation, over the area of impermeable clay identified towards the centre of the mound (Figures 6 and 7).
- 5.10 The entire trench was overlain by a black deposit of root mat and decomposing vegetation [24: 0.6m deep], which itself was covered by a thin layer of topsoil and grass [1: 0.05m deep].

6. The finds

Lithic assessment

- 6.1 A single blade of light brown flint, measuring 22mm long by 8mm wide by 3mm thick, was recovered from the surface of context [20]. The blade had a flat simple platform and was snapped just at the point of its distal end. The ventral side showed a diffuse bulb of percussion indicating its removal by either a soft hammer or indirect percussion. The dorsal side showed evidence

of platform preparation in the form of core trimming at the proximal end. Post-depositional damage was identified on the right hand margin and the distal end of the blade. While little can be inferred from a single piece, the size and shape of the blade, as well as the use of core trimming, leads to speculation of a later Mesolithic or early Neolithic origin. The edge damage, probably the result of transportation, and the recovery of this piece from the base of a burnt mound, would indicate that this find was residual. No further work is recommended.

7. The environmental evidence

Plant macrofossils

- 7.1 Sample processing was undertaken by Dr David Webster. Plant macrofossil assessment and report preparation was conducted by Dr Charlotte O'Brien.

Methods

- 7.2 Plant macrofossil assessment was undertaken on 16 bulk environmental samples. In each case, the entire sample was manually floated and sieved through a 500 µm mesh. The residue was retained, described and scanned using a magnet for ferrous fragments. The flot was 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 Durham University. Plant taxonomic nomenclature follows Stace (1997).

Results

- 7.3 Charcoal was present in all of the samples, and a few charred heather twigs occurred in contexts [2] and [7]. The only other charred plant remains were a hazelnut shell fragment in each of contexts [16] and [18] and wild members of the pea family in [7]. The few uncharred remains included bramble, bugle, sedges, thistles, cinquefoils, wild peas and violets. Gorse spines and soil fungus resting bodies were also present. The contents of the residues and flots are listed in Appendix 2.1.

Discussion

- 7.4 The few charred plant remains provide little information about the site other than that hazelnuts appear to have formed a part of the diet. The charred heather twigs in contexts [2] and [7] may indicate the use of heather for fuel, or may relate to clearance activities. The charred Fabaceae seeds in [7] could be from taxa such as clovers or gorse; the latter being abundant at the site today.
- 7.5 Uncharred gorse spines and cinquefoil achenes reflect the acid soil conditions, and bugle and sedges indicate areas of damp ground. Brambles, thistles and violets were also growing at the site. Sclerotia (resting bodies) of the soil fungus, *Cenococcum geophilum*, occurred in several of the contexts. This is an ectomycorrhizal species which has mutualistic associations with some tree roots (Hudson 1986), and therefore suggests the presence or former presence of woodland or scrub. The abundance of roots in the samples indicates the

shallow nature of the features. These shallow, non-waterlogged conditions may indicate that the uncharred seeds are modern.

Charcoal

- 7.6 Charcoal assessment and report preparation was conducted by Dr Charlotte O'Brien.

Methods

- 7.7 The hand-recovered charcoal was identified by examining the transverse, radial and tangential sections under x200 magnification. The identification guide of Hather (2000) was also used, and the samples were compared to modern reference material held in the Environmental Laboratory at Archaeological Services Durham University.
- 7.8 The largest pieces of charcoal from the bulk sample flots were examined under x50 magnification to determine if they were suitable for radiocarbon dating, *ie* if they were from short-lived tree taxa.

Results

- 7.9 The hand-recovered charcoal from contexts [5], [12], [18] and [20] was alder. A piece of hazel charcoal was recovered from context [6]. All of the flots contained charcoal from short-lived tree taxa, except context [7]. The results are presented in Appendix 2.2.

Recommendations

- 7.10 No further plant macrofossil analysis is recommended due to the low numbers of remains present. The hazelnut shells in contexts [16] and [18], and charcoal from all of the contexts except [7], are suitable for AMS radiocarbon dating.

8. Gas chromatography-mass spectrometry (GCMS) analysis

- 8.1 A sample from context [21], the base deposit of the trough cut into the clay below the mound, was submitted to Bradford University for lipid analysis, to detect the presence of plant and animal fats.

Analysis

- 8.2 1g of sample FBM06 context [21] was sub-sampled with a spatula. This was extracted with three aliquots of ~3 ml DCM:MeOH (dichloromethane: methanol 2:1, v/v), with ultrasonication for five minutes followed by centrifugation (5 minutes at 2000 rpm). Excess BSTFA (N, O-bis(trimethylsilyl) trifluoroacetamide) with 1% TMCS (trimethylchlorosilane) (Pierce) was added to derivatise the sample, which was warmed overnight. Excess derivatising agent was removed under a stream of nitrogen. The samples were diluted in dichloromethane for analysis by GC-MS.
- 8.3 Analysis was carried out by combined gas chromatography-mass spectrometry (GC-MS) using a Hewlett Packard 5890 series II GC connected to a 5972 series mass selective detector. The splitless injector and interface were maintained at 300°C and 340°C respectively. Helium was the carrier gas at constant inlet pressure. The temperature of the oven was programmed from 50°C (2 minutes) to 340°C (10 minutes) at 10°C/min. The GC was fitted with

a 30m x 0.25mm, 0.1µm ZB-5 phase fused silica column (Phenomenex). The column was directly inserted into the ion source where electron impact (EI) spectra were obtained at 70 eV with full scan from m/z 50 to 700.

Results

- 8.4 The results are presented as chromatograms of the BSTFA derivatised solvent extract. These show each separated component of the solvent extract as discrete peaks, the area under each peak being representative of the abundance.

Abbreviations

P = phthalate plasticiser

C = fatty acid, with carbon number.

WE = wax ester, with carbon number

● = n-alkane, with carbon number

□ = n-alkene, with carbon number

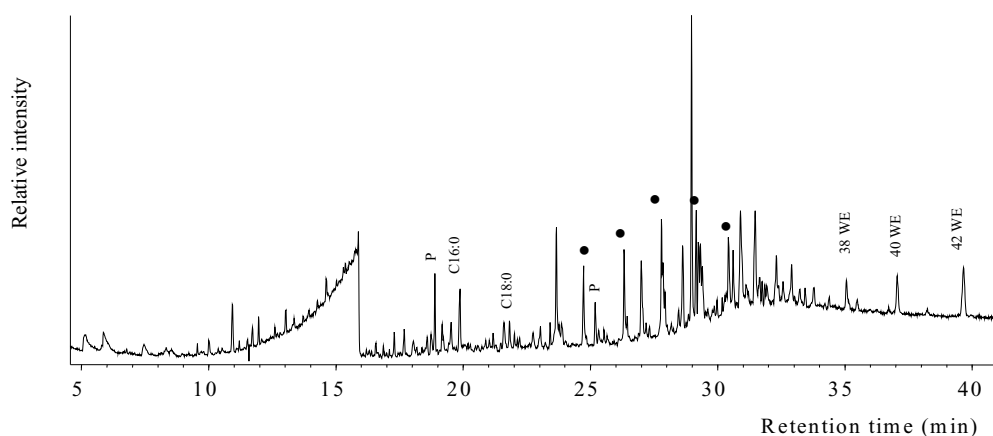


Figure 12 Total ion chromatogram of the BSTFA derivatised solvent extract of sample FBM06

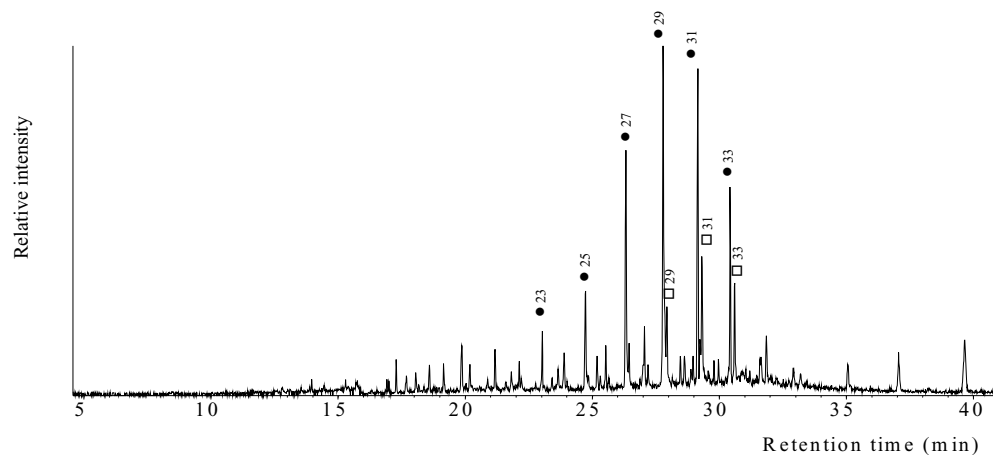


Figure 13 m/z 71 ion chromatogram (selective for the n-alkanes) of the BSTFA derivatised solvent extract of sample FBM06

Discussion

- 8.5 Overall this sample yielded a complex chromatogram (Figure 12), with a number of compounds typical of a soil. Of the components identified, fatty acids (C16:0 and C18:0) were extracted in relatively low abundances. These fatty acids are ubiquitous and therefore cannot be used for further sample identification. Wax esters (C38 to C42, in even carbon numbers) are typical in soil samples and probably represent an input from higher plant leaf waxes. In addition, n-alkanes (C23 to C33, dominated by odd carbon numbers) and n-alkenes (Figure 13) were extracted. Their distribution pattern indicates a biological origin (odd carbon number dominance) again indicative of higher plant leaf waxes. In the analysis of archaeological organic residues at trace levels, many of the components extracted are known contaminants e.g. modern synthetic phthalates (P). These originate from a number of sources including packaging materials and sample preparation. However, this contamination is easy to recognise and does not interfere with the analysis of any authentic lipids.

9. Conclusions

- 9.1 Excavation of this burnt mound uncovered a trough, a hearth and large quantities of burnt sandstone indicative of repeated episodes of firing.
- 9.2 The primary fill of the trough was submitted for lipid analysis in order to identify the presence of plant or animal residues left over from any cooking activities. This analysis has found no evidence to support the use of this trough for cooking.
- 9.3 Charcoal from the hearth was submitted for radiocarbon dating; a date of 1430-1260BC at three sigma confidence was returned placing the final use of this hearth in the middle of the Bronze Age. This date is substantially later than that attained for mound 3 and may indicate a chronologically linear sequence to the Sturdy Spring mounds, or that the sites were in use for a substantial period of time.

10. Sources

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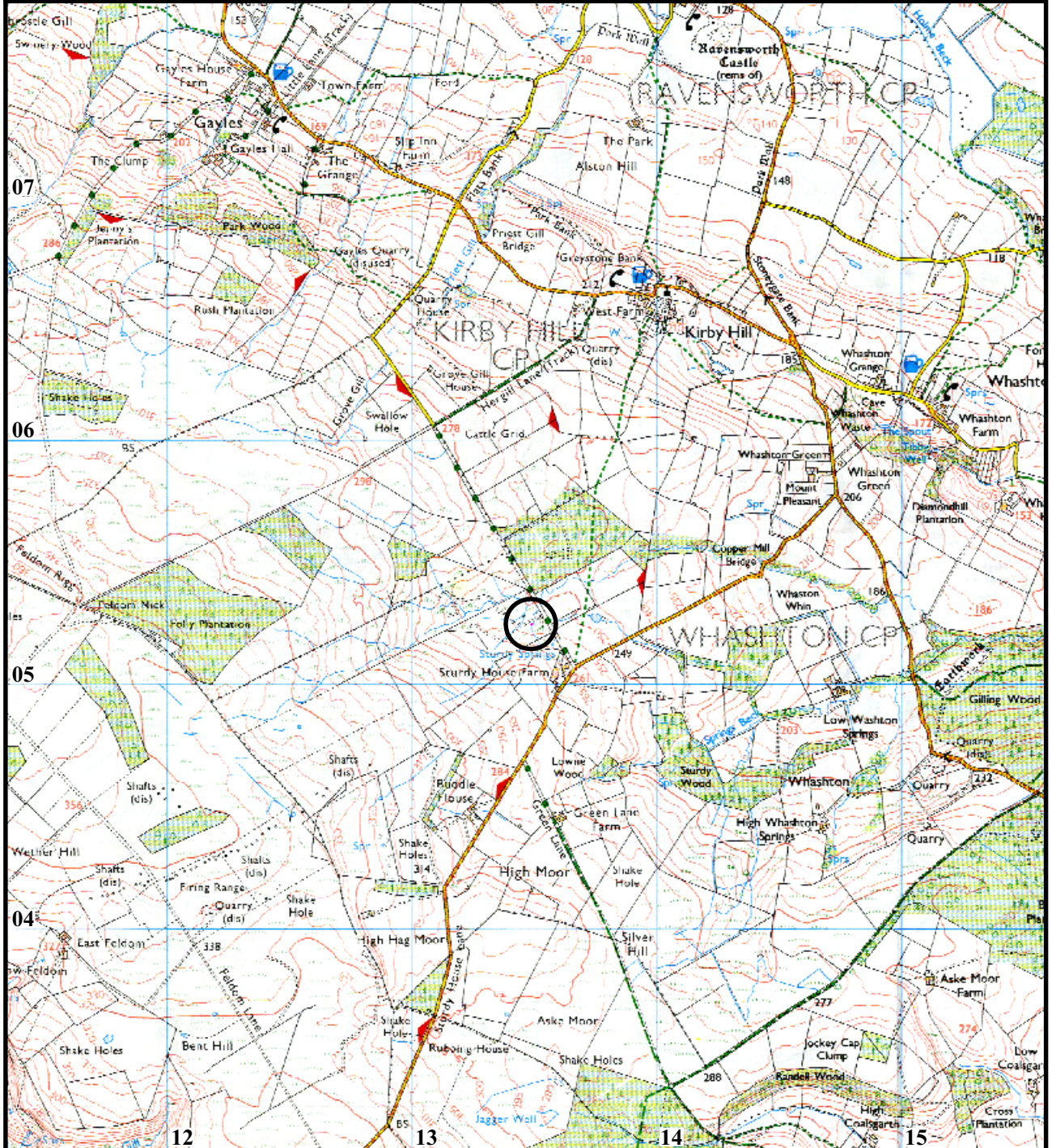
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Figure 1

Location map

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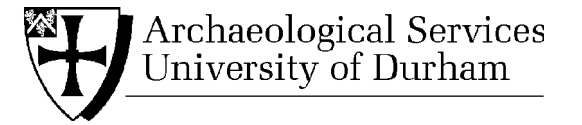
 location of study area

0 1km

scale 1:25 000 - for A4 plot



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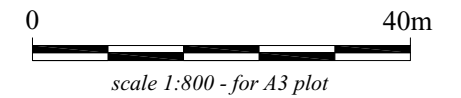
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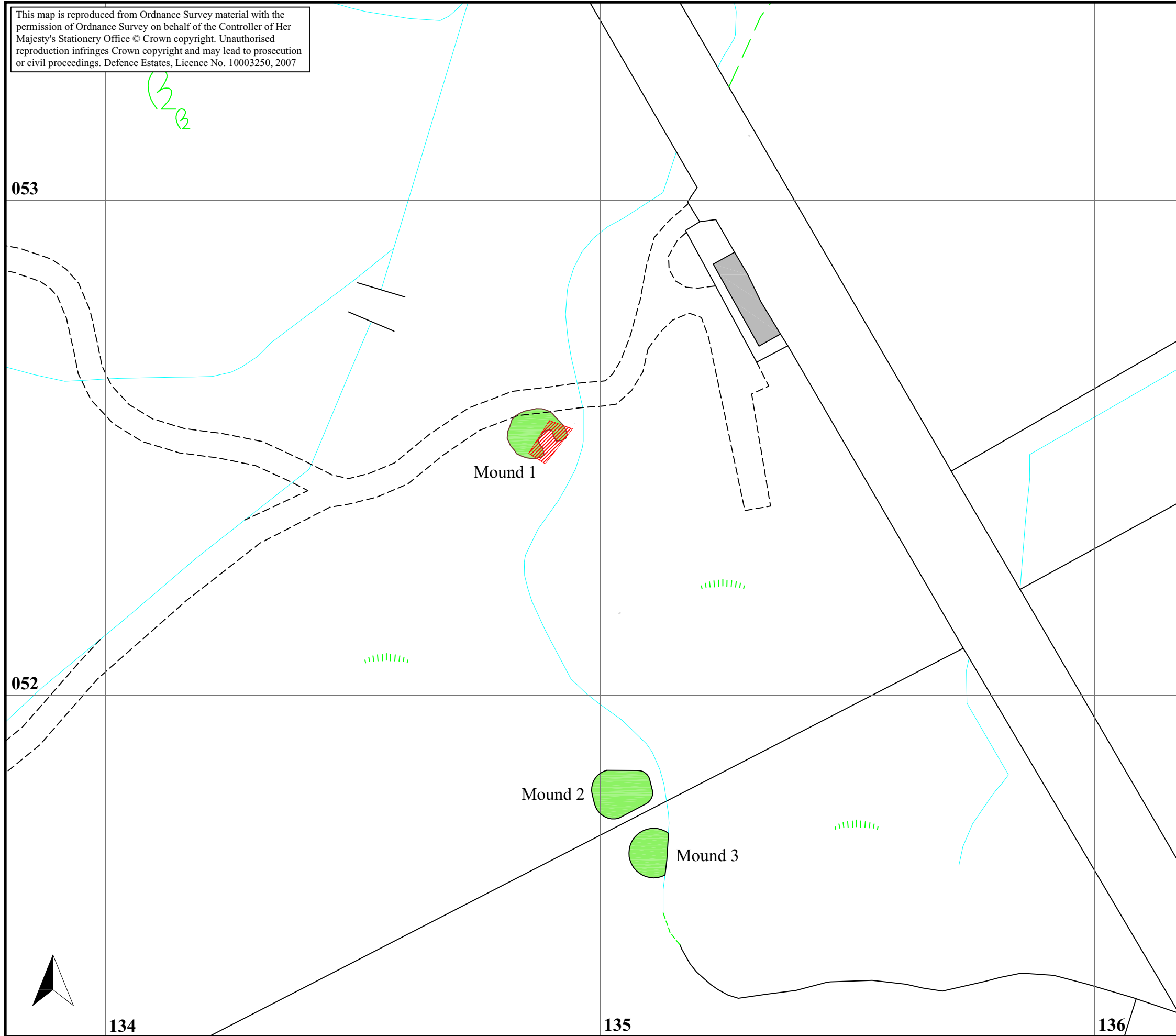
Figure 2

The Sturdy Spring mounds and the excavation area, from Ordnance Survey, Archaeological Services' survey and T. Laurie's report (2004)

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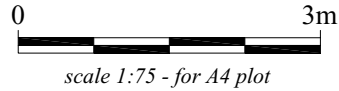
-  burnt mounds
-  trench
-  building
-  range track





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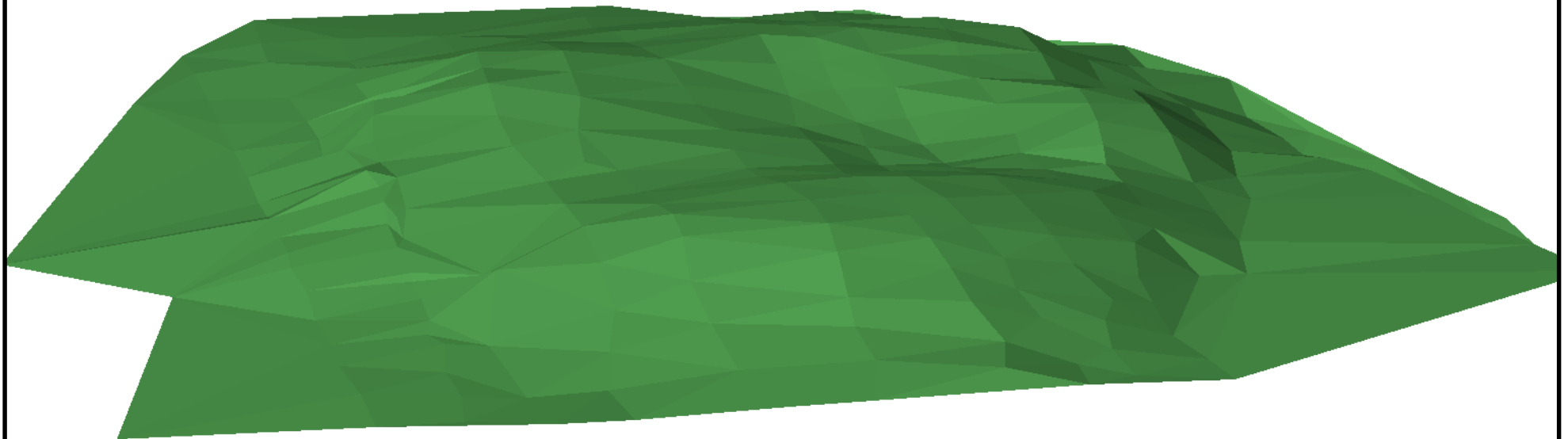
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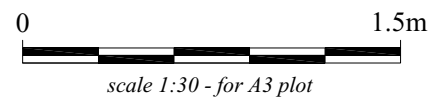


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Report 1569

Figure 3
Digital terrain model of Mound 1 (viewed from the south-west), showing excavation (in red)









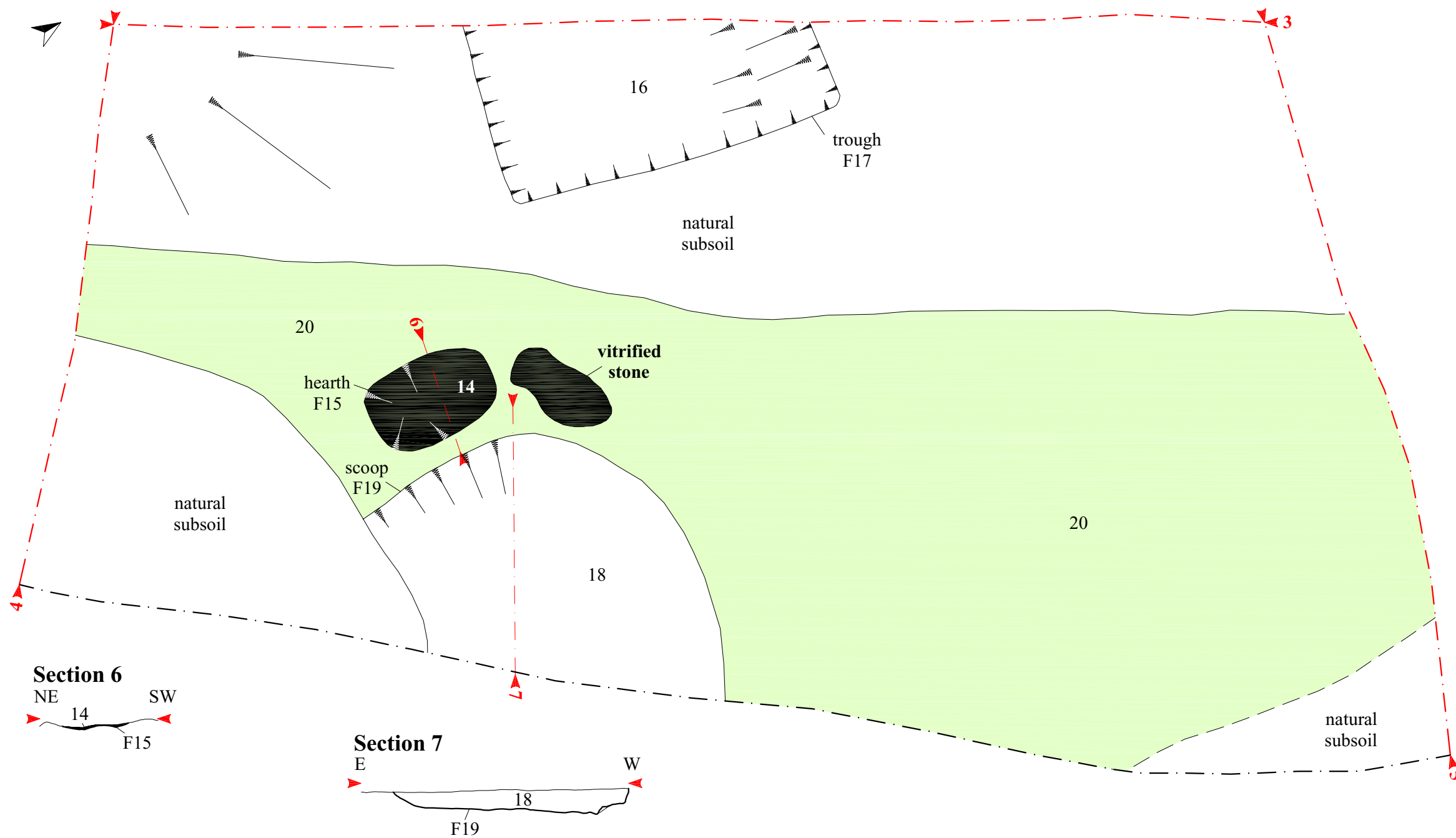
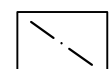





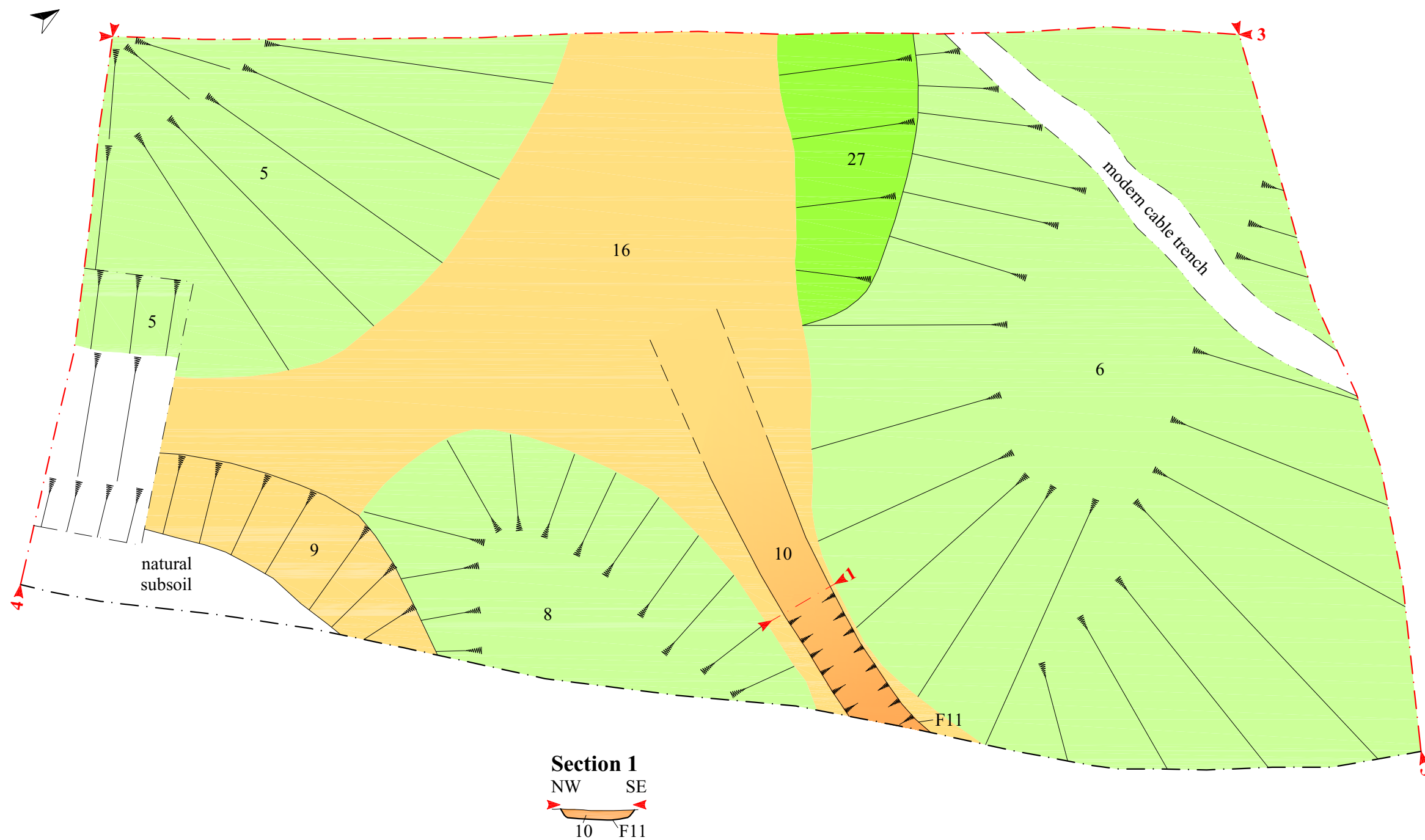
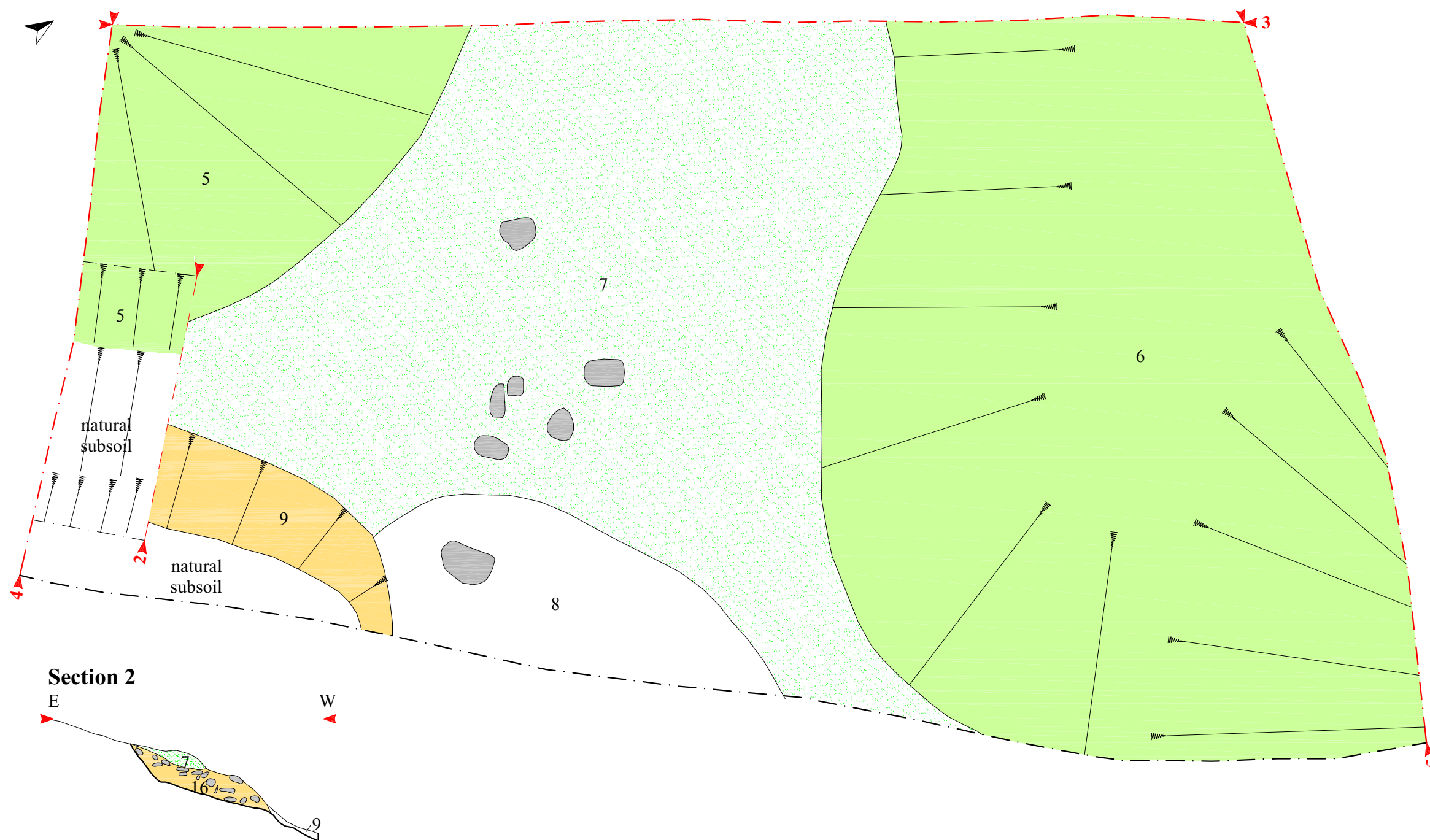
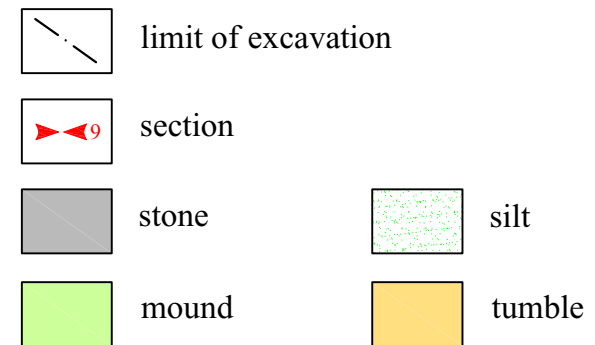
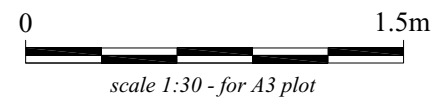
-  limit of excavation
-  section
-  hearth
-  disturbed natural subsoil

Figure 4
The trough, hearth and burnt ground



- | | | | |
|---|---------------------|---|-----------|
|  | limit of excavation |  | mound |
|  | section |  | fill 27 |
|  | tumble |  | gully F11 |

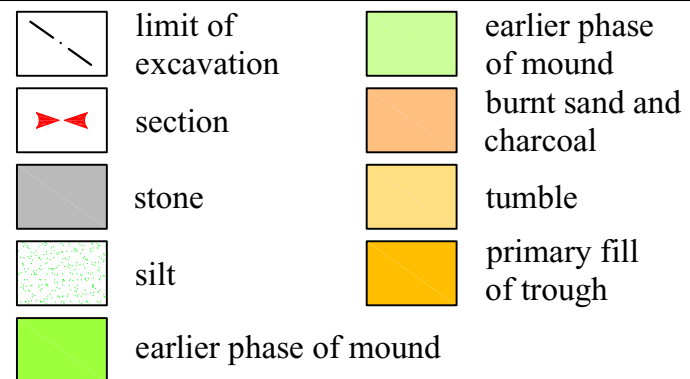
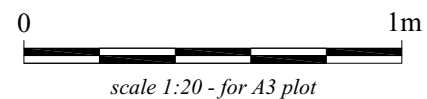






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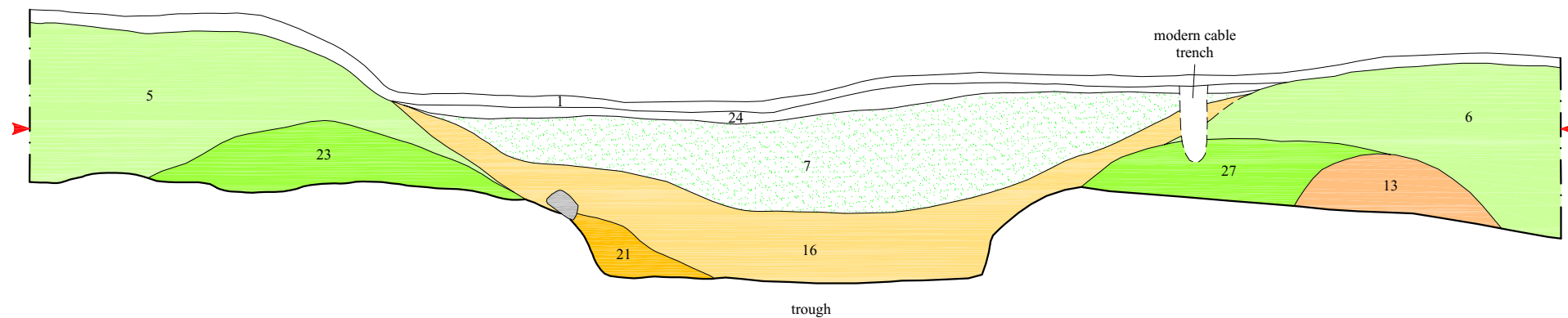
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Richmond, North Yorkshire**

archaeological excavation

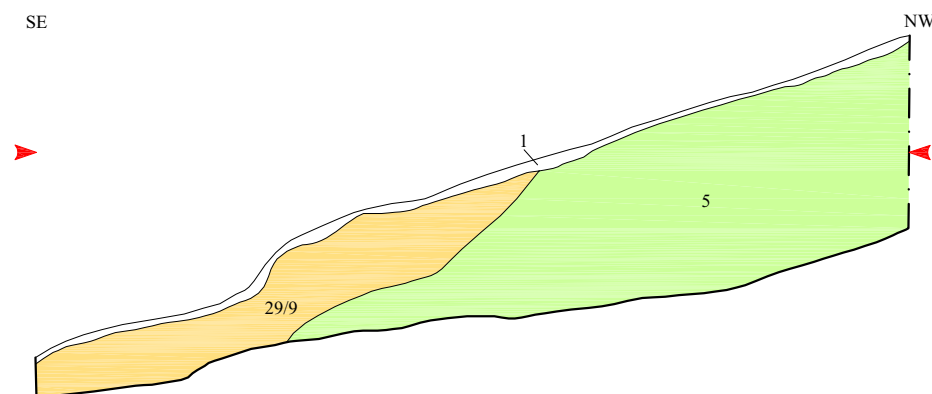
Report 1569

Figure 7
Sections 3, 4 and 5

Section 3
SW NE



Section 4
SE NW



Section 5
NW SE

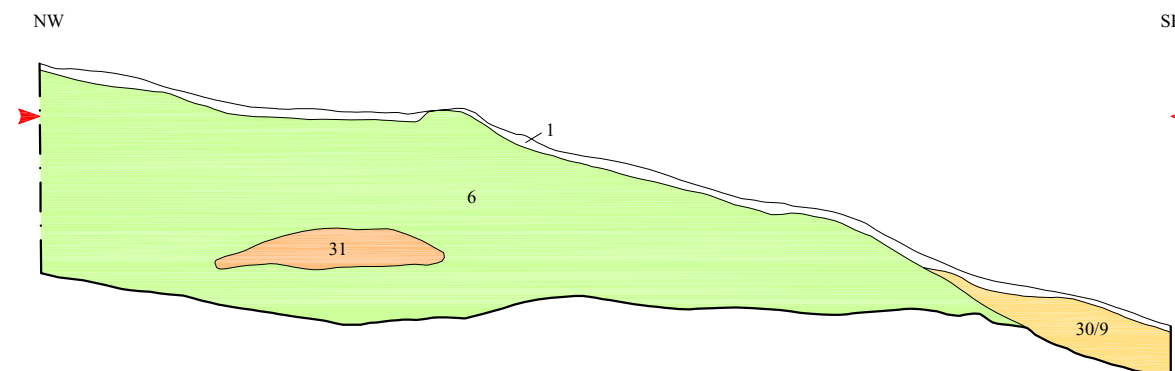




Figure 8 Northwest facing plan shot of mound showing build-up of silt [7]



Figure 9 North facing shot of mound showing north and south horn and slumped material [9/29/30]



Figure 10 Northeast facing shot of trough [F17]



Figure 11 Southwest facing shot of hearth [F15]

Appendix 1: Context data

Summary list 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.

No	Description	P	B	M	F	S	O
1	Topsoil						
2	Void						
3	Void						
4	Void						
5	South horn						
6	North horn						
7	Silt deposit in depression						
8	Small mound in depression						
9	Tumble over south east of mound						
10	Gully fill						
11	Gully cut						
12	Void						
13	Deposit of fired sand and charcoal within north horn						
14	Fill of hearth						
15	Cut of hearth						
16	Tumble; backfill of trough						
17	Cut of trough						
18	Fill of shallow scoop						
19	Cut of shallow scoop						
20	Burnt ground surface				•		
21	Grey silting primary fill of trough						
22	Void						
23	Primary burnt mound under south horn						
24	Black deposit root mat decomposing in mound plateau						
25	Void						
26	Void						
27	Burnt mound north horn						
28	Void						
29	Tumble material southeast of trench						
30	Tumble material northeast of trench						
31	Burnt sand lens within northern horn						

Appendix 2: Data tables

Table 2.1: Plant macrofossils

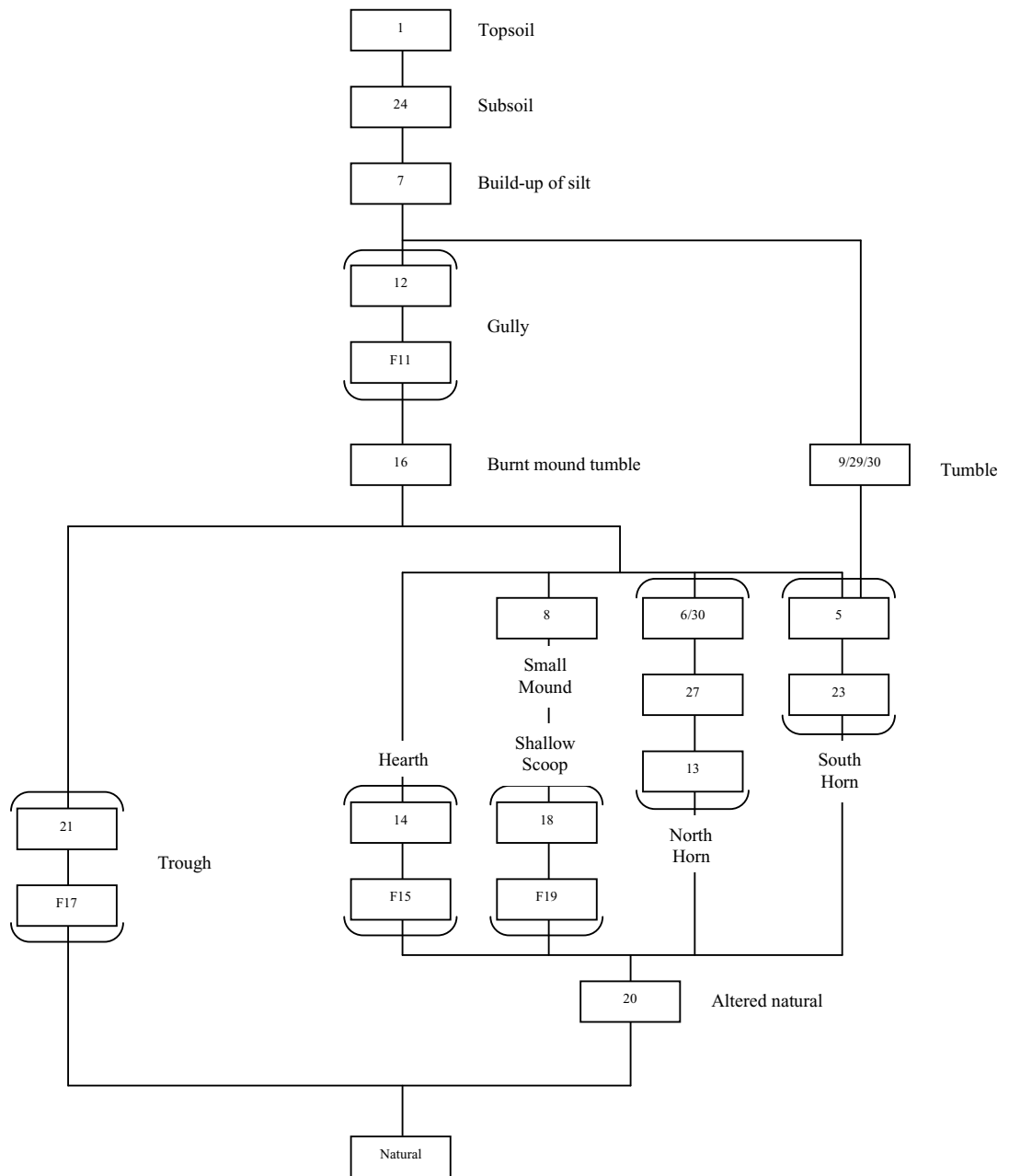
Sample	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	-
Context	2	9	6	5	8	5	6	10	23	13	16	14	18	21	7	20
Volume processed (ml)	22500	16000	15000	15000	20000	7000	9000	14000	14000	10000	30000	1500	30000	5000	18500	16000
Flot volume (ml)	2500	1000	2000	1400	2000	1000	800	1000	1500	800	1600	400	3000	150	800	1200
Volume assessed (ml)	400	1000	1200	1400	2000	1000	800	1000	1500	800	1600	400	3000	150	800	1200
Residue contents (relative abundance)																
Sand	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	✓	✓
Stones	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Flot matrix (relative abundance)																
Charcoal	2	2	2	3	4	3	3	3	4	4	3	1	3	2	-	5
Charred heather twigs	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Coal	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Insects	1	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-
Roots	4	4	4	5	5	4	3	4	4	1	3	4	4	2	4	3
Wood	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Charred remains (Total counts)																
(t) <i>Corylus avellana</i> (Hazelnut)	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
(x) Fabaceae sp (Pea family)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
Waterlogged remains (relative abundance)																
(t) <i>Rubus</i> sp (Bramble)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
(w) <i>Ajuga reptans</i> (Bugle)	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
(w) <i>Carex</i> sp(p) trigonous nutlet (Sedges)	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1	-
(x) <i>Cenococcum geophilum</i> (Soil fungus)	-	2	-	5	3	2	1	-	-	-	-	-	-	-	-	2
(x) <i>Cirsium</i> / <i>Carduus</i> sp (Thistles)	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
(x) Fabaceae sp (Pea family)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
(x) <i>Potentilla</i> sp (Cinquefoils)	-	-	2	4	3	1	-	-	-	-	-	-	-	-	-	-
(x) <i>Ulex</i> sp(p) spines (Gorse)	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	3
(x) <i>Viola</i> sp (Violet)	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-

(t: trees/shrubs; w: wetland; x: wide niche) Relative abundance is based on a scale from 1 (lowest) to 5 (highest)

Table 2.2: Charcoal from FBM06

	Sample	Context	Species	Suitable for C14 dating	Number of pieces	Roundwood
Hand-recovered	-	5	Alder	Yes	10	No
Hand-recovered	-	6	Hazel	Yes	1	Yes
Hand-recovered	-	12	Alder	Yes	2	No
Hand-recovered	11	16	Too small to identify	No	-	-
Hand-recovered	-	18	Alder	Yes	5	No
Hand-recovered	-	20	Alder	Yes	4	No
From bulk sample	1	2	Short-lived	Yes	>10	No
From bulk sample	2	9	Short-lived	Yes	>10	No
From bulk sample	3	6	Short-lived	Yes	>10	No
From bulk sample	4	5	Short-lived	Yes	>10	No
From bulk sample	5	8	Short-lived	Yes	>10	No
From bulk sample	6	5	Short-lived	Yes	>10	No
From bulk sample	7	6	Short-lived	Yes	>10	No
From bulk sample	8	10	Short-lived	Yes	>10	No
From bulk sample	9	23	Short-lived	Yes	>10	No
From bulk sample	10	13	Short-lived	Yes	>10	No
From bulk sample	12	16	Short-lived	Yes	>10	No
From bulk sample	13	14	Short-lived	Yes	>10	No
From bulk sample	14	18	Short-lived	Yes	>10	No
From bulk sample	15	21	Short-lived	Yes	>10	No
From bulk sample	-	20	Short-lived	Yes	>10	No

Appendix 3: Stratigraphic matrix



Appendix 4: Project specification



Training Estate

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Statement of Requirement for archaeological excavation of a Burnt Mound at Sturdy Spring, Feldom Ranges, Defence Training Estate Catterick, North Yorkshire

1.0 Introduction

This document presents a statement of requirement for archaeological excavation of a burnt mound at Sturdy Spring on the Feldom Ranges on Defence Training Estate Catterick in North Yorkshire.

Defence Training Estate Catterick (DTEC) comprises live firing ranges, dry training areas (i.e. all forms of vehicle and infantry training not involving the use of live ammunition) and an urban area used for Operations in Built Up Areas (OBUA). The training areas are located at Catterick and Feldom in North Yorkshire and Battle Hill in County Durham and occupy in total 8000 hectares.

The Ministry of Defence (MoD) occupies land and property solely to support the delivery of defence capabilities. The MOD recognises that there are other interests, especially relating to conservation, agriculture and recreation that need to be taken into account if the Estate is to be sympathetically managed in a way that sustains the various interests.

2.0 Archaeological Background

The archaeology of Burnt Mounds is a relatively new area of investigation and much of our understanding of the mounds on the DTEC, and indeed in North Yorkshire, is a result of the pioneering work of Tim Laurie, a member of the Catterick Conservation Group. Laurie has plotted their distribution and has confirmed that the mounds in this area conform in all respects to the type sites found elsewhere throughout upland Britain. Generally speaking they are usually circular or crescentic, and found in groups of three or four mounds enclosing a central depression that can be thought of as the position of a trough. The mounds are approximately 15m in diameter and around 1m - 1.5m high and the sites are located on the bank of a small stream just below a spring line. The mounds themselves are formed by the gradual accrual of fire-fractured pebbles which have previously been heated on a fire and then immersed in a trough of water, or had water thrown over them. Several excavated sites elsewhere show evidence for a tented structure or shelter sometimes in the form of a levelled top to the mound.

The most convincing interpretation of the sites is that they were sweatshouses or saunas and the mounds have been formed as a by-product of the need for creating the required hot, steamy environment.

3.0 The Site at Sturdy Springs

The site at Sturdy Springs consists of three separate burnt mounds situated on the same spring stream on undulating, rough moorland pasture, which is seasonally wet. The two uppermost mounds are situated close together on the west bank of the stream and the third site is 100m downstream close to a grenade range. The upper sites are centred on NZ 1350 0516, the lower at NZ 1348 0527. Recent site inspections show that the ground around the mounds is extremely wet, and that burrowing by rabbits is causing erosion damage to parts of the mounds.

4.0 Date

As a part of a project to assess the potential for the use of Burnt Mounds as early metalworking sites, Dr Virginia Thelin of University of Durham has obtained a radiocarbon date of c. 2380 +/- 40 cal. BC from hazel charcoal recovered from one of the upper burnt mounds at Sturdy Spring. This is extremely significant and positions the site and others like it, within the later Neolithic/early Bronze Age period.

5.0 Aims and objectives

The aim of the field investigation is to undertake partial excavation of the mound and an adjacent area in order to recover information which increases an understanding of the function, extent and date of Burnt Mound sites.

The recovery of environmental material, artefacts and features is instrumental in establishing the purpose of the site and the location of the mounds close to wet ground may help preserve organic deposits such as a trough or any tent/building features.

The use of volunteers and/or students for training purposes on the excavation will be regarded as a positive development.

On completion of the fieldwork an excavation report prepared to modern professional standards should be compiled and submitted to the client.

6.0 Location and Size of Excavation Trenches

Contractors are asked to provide a price based on the excavation of a quadrant of the mound and an area of adjacent flat ground. The maximum total area of excavation will be approximately 75 square metres.

The precise location, size of trenches and combination of trial pits/trenches is to be agreed between the contractor and the Defence Estates archaeologist and Conservation Group Archaeologist. A site visit by the contractor accompanied by DE/Conservation group staff will be required to finalise these details before the submission of the contractor's project design.

For the purposes of plotting the location of the trenches, digital OS mapping data can be supplied by Defence Estates upon request.

7.0 Required Archaeological Work

Archaeological work is required in two integrated parts. Sample excavation of one of the mounds and an adjacent area of flat ground as described above. To be followed by the compilation of a report which conforms to modern professional standard, presenting the results of the excavation.

7.1 Archaeological excavation

The purpose of the excavation is to sample an area of the site, in accordance with Sections 5 and 6 above, to establish whether features of archaeological significance are present and, if so, to ascertain their nature, extent, condition, depth and date if possible.

Contexts will be sampled for dating as appropriate. This may include C14 dating, archaeomagnetic dating, dendrochronological dating or TL dating. Samples for archaeomagnetic dates would be taken on site by the relevant specialist. Samples for dendrochronological dates would be taken either on site or from recovered timbers by the relevant specialist in accordance with published guidelines (English Heritage, no date). Samples would be processed subsequent to initial post-excavation assessment.

A strategy for the recovery and sampling of environmental remains should be agreed with an environmental consultancy in advance of the project (see *Environmental Archaeology and Archaeological Evaluations - Recommendations Concerning the Environmental Archaeology Component of Archaeological Evaluations in England*: Association for Environmental Archaeology 1995). Opportunity should be afforded to the environmental specialist to visit the site during the evaluation to discuss the sample collection strategy.

7.2 The report

On completion of the fieldwork a report presenting the results of the project work should be prepared to an adequate standard (see *Standard and Guidance for Archaeological Field Evaluations* (IFA 1994) and should include the following:

- location plan with NGR references
- a narrative of the archaeological features present in each trench accompanied by detailed plans and sections of each trench drawn at an appropriate scale
- finds and context catalogues
- specialist contributions
- an interpretation and discussion of the results
- recommendations to mitigate the impact of any future development on the site

A conservation assessment will be undertaken of finds and other material recovered following procedures outlined by English Heritage (1991). The assessment will inform on the level and quality of the preservation of the material and whether the material can contribute to the overall aims of the evaluation

7.3 Report Format and production

The report should be presented in an ordered state prefaced with a contents listing and 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.

Five bound paper copies of the report will be required. In addition the report should be provided in digital format on CD (3 copies), as both a text only rtf. file and with digital images of figures and illustrations as presented as tiff files. All images should be either digital originals saved as high and low resolution images or scanned at both high and low resolution, where high equates to 800-1200 dpi and low to 200dpi. The whole document should also be provided on the CD as a complete text and image file in pdf. format. The CD should also contain the digitised survey information geo-referenced to the OS. This should be provided in ArcView shape file format.

Meta-data providing copyright information as described below, together with a written description of conventions used in the survey and the digital presentation of GIS information and an intuitively based GIS file naming format should also be provided. Mapping data should also include details on source and scale, method of survey and/or data capture, accuracy levels achieved and description of data attributes and fields.

Accuracy of digitised mapping data should conform to Defence Estates adopted practice. In particular;

Grid reference should be 12 figure numerical in all cases and where possible also presented using OS grid 100KM square letter prefixes.

Digitising accuracy should +/- 0.2metres at base scale

Monument/building surveys should achieve a minimum accuracy of +/- 2 metres in relation to OS background, although obviously survey information itself will be expected to be significantly improved on this.

7.4 Copyright

Under the Copyright, Designs and Patents Act 1988, all material and supporting data generated by this contract shall be passed to Defence Estates unless and except where such material or data is existing material or data acquired from a third party. In the latter case, the contractor will supply details of data sources, a description of what the data shows, the terms under which the material or data was acquired and where possible a contact name and address.

8.0 Project Design

A costed project design and method statement for the work should be forwarded to, and agreed with, the DE Archaeologist prior to the commencement of the work.

9.0 Timetable

The timetable for the work has yet to be finalised, but a start date in either July or August 2006 is most likely.

10.0 Monitoring

No work should commence until authorised by the DE Environmental Advisor (Archaeology) at Catterick. One week's notice will need to be given to the DE Archaeologist who will be allowed access to the site at all times.

11.0 Site Access

Access to DTEC is restricted and will need to be arranged through the DE Environmental Advisor (Archaeology) at Catterick and Range Control at Wathgill Camp.

12.0 Health and Safety

In line with the Health and Safety at Work Act 1974, The Management of Health and Safety Regulations 1992 and The Construction (Design and Management) Regulations 1994 DE will require to see copies of contractors Health and Safety Policies and project specific Risk Assessments prior to the commencement of work. Each site should have a nominated safety officer, and appropriate provision of first aid, telephone and safety clothing as advised in the SCAM manual on archaeological health and safety and further identified in the site specific risk assessment.

Contractors are expected to carry their own appropriate insurance for public liability and staff, brief details should be included in any tender or project proposal submitted to DE.

13.0 Deposition of Archive and Results

An agreement with the relevant museum to accept any artefacts/archive should be finalised before commencement of the fieldwork. In this instance this will be the Richmondshire Museum. Contractors should note that a copy of the report will be lodged by Defence Estates with the North Yorkshire County Council SMR.

14.0 Consents

There are no scheduled monuments within the area of the site and no consents from English Heritage are required. The contractor will inform the North Yorkshire County Council Heritage Unit of the intention to commence work.

15.0 Contact

All correspondence on this matter should be addressed to:

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PA/DE May 2006