



Northborough Neolithic Causewayed Enclosure, Peterborough, Cambridgeshire

Archaeological Evaluation and Assessment of Results



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**NORTHBOROUGH
NEOLITHIC CAUSEWAYED ENCLOSURE,
PETERBOROUGH, CAMBRIDGESHIRE**

**ARCHAEOLOGICAL EVALUATION
AND ASSESSMENT OF THE RESULTS**

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ARCHAEOLOGICAL EVALUATION AND ASSESSMENT OF THE RESULTS

Summary

Wessex Archaeology was commissioned by Videotext Communications Ltd to carry out archaeological recording and post-excavation analysis on an archaeological evaluation by Channel 4's 'Time Team' at the Northborough Neolithic causewayed enclosure, Cambridgeshire (centred on NGR 515570 308450). The site, identified from cropmarks in 1996, has had no previous work undertaken, but lies just 1.8km east of the excavated causewayed enclosure at Etton. The main aim of the evaluation was to ascertain the character, date and condition of the site, as well as the extent of preservation and waterlogging in the ditches. The work was carried out from 7th-9th September 2004.

The air photographic transcription showed that the enclosure comprises two pairs of concentric circuits of short ditch segments and causeways, forming an inner and an outer enclosure. It is one of five causewayed enclosures within a 10km wide area, with other probable prehistoric features, including cursus monuments, ring ditches, and field systems also identified in air photographs. All of the sites are located on the wide, low-lying plain that fringes the fenland north of Peterborough.

The evaluation included a geophysical survey of the site comprising of *c.* 6ha of magnetometer survey, and seven evaluation trenches. The geophysical survey successfully defined the inner enclosure but most of the outer enclosure was less clearly defined, perhaps due to the variable nature and distribution of activities across the site.

The results of the geophysical survey were used to identify suitable locations for the evaluation trenches. Four of the trenches (Trenches 1, 2, 4 and 6) were positioned so as to investigate the ditches of the inner enclosure, but in each case revealed only one of the pair of ditches. In Trenches 1, 4 and 6 the ditches appear to have silted up naturally, and the limited evidence of post-construction activity includes a few sherds of pottery and charcoal on the base of the ditch, and possible dumps of soil – one organic-rich, another containing animal bone – into the infilling ditch. In Trench 2 at the west, however, there was evidence of more concentrated activity following a re-cutting of the largely silted up ditch. This may have been focussed on a wide causeway between ditch segments, possibly an entrance. The re-cut ditch contained a series of layers containing burnt clay and charcoal, and was sealed by a layer of material possibly from a levelled bank, these activities perhaps representing the formalised 'closing' of the site.

A further two trenches investigated the outer enclosure, although it was recorded only in Trench 7, and again only one of the pair of ditches was identified. This consisted of a series of short segments 1.1-4.4m long – considerably shorter than suggested by the air photographs. A marked kink in the circuit at the point of a 3m wide causeway (with a central possible posthole) may also mark a point of access. This interpretation

is given some weight by the presence of bone deposits (including domestic cattle and aurochs) placed on the base of the adjacent segments.

A few sherds of Early (and possibly Later) Neolithic pottery were recovered, along with a broken leaf-shaped arrowhead and a number of flint flakes. The small animal bone assemblage, which included mainly cattle, with some pig and one sheep, and a piece of antler, provided little information about on-site activities, while the plant remains included a few cereal grains, hazelnuts and weeds possibly indicating cultivation. Phosphate analysis of the pre-alluvial deposits suggests more intensive stock-related activities in the eastern part of the site, but these cannot be securely associated with the Neolithic enclosure.

Three radiocarbon determinations have been obtained and a further two are awaited. Hazelnuts from the secondary fill of a ditch segment of the outer enclosure provided a radiocarbon date range of 3710-3640 cal BC (4877 ± 25 BP). A sample from a primary fill of a ditch segment of the inner enclosure provided a date range of 3630-3520 cal BC (4743 ± 25 BP), while a burning event in the secondary fill of the re-cut inner enclosure ditch provided a date range of 3630-3380 cal BC (4795 ± 38). These results, which are statistically indistinguishable at the 95% confidence level, suggest that the causewayed enclosure was used for a relatively short period and was broadly contemporary with the nearby enclosure at Etton.

Acknowledgements

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Surveying was undertaken by Henry Chapman, University of Hull, and the geophysical survey was undertaken by GSB Prospection. Phosphate analysis was undertaken by Paul Middleton, Peterborough Regional College, and the pollen analysis by Rob Scaife, University of Southampton.

The archive was collated and all post-excavation assessment and analysis undertaken by Wessex Archaeology, including management (Nick Cooke), finds (Stephanie Knight, Lorraine Mephram), environmental assessment (Mike Allen, Cathie Chisham, Chris Stevens), report (Andrew Powell), and illustrations (Matthew McMurray).

NORTHBOROUGH NEOLITHIC CAUSEWAYED ENCLOSURE, PETERBOROUGH, CAMBRIDGESHIRE

ARCHAEOLOGICAL EVALUATION AND ASSESSMENT OF THE RESULTS

1 INTRODUCTION

1.1 Description of the site

1.1.1 Wessex Archaeology was commissioned by Videotext Communications Ltd to undertake a programme of archaeological recording and post-excavation analysis on an archaeological evaluation by Channel 4's 'Time Team' at the Northborough Neolithic causewayed enclosure, Cambridgeshire. There has been no previous archaeological work at the site, which was identified from cropmarks in 1996.

1.1.2 The site lies north-east of the village of Northborough, approximately 10km north of the centre of Peterborough (**Fig. 1**). It is situated at *c.* 6m OD on flat ground within Pasture Lane Field, centred on NGR 515570 308450. The River Welland runs north-west to south-east approximately 1km to the north and 1.2km to the east of the site.

1.1.3 The site lies on alluvium amongst freely draining sands and gravels of the River Welland First and Second Terraces (BGS England and Wales sheet: 158 Solid and Drift Edition: Peterborough). The air photographs show that the western edge of the enclosure is covered by a greater depth of alluvium, with the result that no cropmarks were visible in that area. The enclosure is effectively positioned on a low 'island' with water channels to the north and south. The field is used for growing wheat.

1.2 Archaeological and historical background

1.2.1 The site was identified from cropmarks in 1996 by Jim Pickering, an amateur aerial photographer. From these photographs, the Royal Commission on the Historical Monuments of England (RCHME), transcribed, analysed and reported on the monument (RCHME 1997) (**Fig. 1C**). This showed that the enclosure is oval in shape, with its long axis oriented approximately east-west. It comprises two pairs of concentric circuits of short ditch segments and causeways, which appear to form an inner and an outer enclosure.

1.2.2 The inner enclosure measures *c.* 170m by 130m with its two ditch circuits lying between 4m and 6m apart. The ditch segments appear to be *c.* 4m to 18m long (the inner segments appearing to be more substantial), and the causeways between them are *c.* 1m to 5m wide. The outer enclosure measures *c.* 230m by 180m. The enclosures are approximately concentric, although the distance between them varies between *c.* 14m and 26m. The ditch segments in the outer enclosure often appear to match, and there are suggestions of a possible third circuit at the south, although this is far from certain. A number of pit-like features are also visible in the air photographs.

- 1.2.3 The enclosure is one of five causewayed enclosures of similar plan and size that are known within a 10km wide area (the others being Barholm, Etton, Uffington and Upton), with a sixth at Southwick 20km to the south-west, making this potentially the largest concentration of these monuments in northern Europe (**Fig. 1A**). The only one to have been excavated, and the closest, is Etton, which lies just 1.8km to the west (Pryor 1998) (**Fig. 1B**).
- 1.2.4 Other probable prehistoric features, including a cursus monument, a henge, ring ditches, and field systems have also been identified in air photographs. All of the sites are located on the wide, low-lying plain that fringes the fenland north of Peterborough. The Northborough enclosure is bisected by a Roman waterway known as the 'Car Dyke', which comprised a ditch and banks.

2 METHODS

2.1 Introduction

- 2.1.1 A project design for the work was compiled by Videotext Communications (Videotext Communications 2004), providing full details of the circumstances and methods of the project, as summarised here.

2.2 Aims and objectives

- 2.2.1 The main aim of the evaluation was to ascertain the character, date and condition of the site. It sought to determine the depths of deposits, the dimensions of any internal and external archaeological features and the extent of preservation and waterlogging in the ditches.
- 2.2.2 One aim was to identify when the enclosure was constructed (whether as a single event or over a period of time) and to determine for how long it was in use, including the possibility of seasonal occupation. The evaluation also sought to understand the kinds of activities, including possibly the deposition of artefacts, that took place within and around the enclosure and in the surrounding landscape, and to examine the site's relationship to other causewayed enclosures and monuments in the area.

2.3 Fieldwork methodology

- 2.3.1 A geophysical survey of the site by GSB Prospection Limited (GSBP) comprised 6ha of detailed gradiometer survey. The aim was to determine the extent of the enclosure, and to help identify features where the evaluation trenches might seek to answer specific questions.
- 2.3.2 Seven evaluation trenches of varying size were excavated over features identified in the air photographs and geophysical survey, using a tracked excavator fitted with a toothless ditching bucket. All machine work was undertaken under constant archaeological supervision and ceased at the identification of significant archaeological deposits. All trenches were then cleaned by hand and archaeological deposits were excavated. The deposits were recorded using Wessex Archaeology's *pro forma* record sheets, and

drawn at a scale of 1:20 for plans and 1:10 for sections. A photographic record was kept of the investigations and of individual features. The trenches were located using a Trimble Real Time Differential GPS survey system, and the principal contexts were related to Ordnance Survey datum.

- 2.3.3 The work was carried out from 7th-9th September 2004, following which all trenches were reinstated using the excavated spoil. All artefacts were taken to the offices of Wessex Archaeology at Salisbury where they were processed and assessed.

3 RESULTS

3.1 Introduction

- 3.1.1 Details of individual excavated contexts and features, the full geophysical report (GSB 2004) and results of artefact and environmental sample analyses are retained in the archive.

3.2 Geophysical survey

- 3.2.1 Although the causewayed enclosure is Neolithic in date, located on weakly magnetic gravels and covered by a metre or more of alluvium, the survey revealed unusually strong magnetic anomalies, and successfully defined the inner enclosure, including at the north-west where the depth of alluvium prevented the ditches showing as cropmarks (GSB 2004) (**Fig. 2**). This may be a reflection of the evidence (below) of burning associated with a possible clearing episode, or other activities focussed on the inner enclosure ditches. Other sections of the ditches, including most of the outer enclosure, were less clearly defined, perhaps due to the variable nature and distribution of activities across the site.

3.3 Evaluation trenches

- 3.3.1 A sequence of similar deposits was found sealing the Neolithic levels across the site. The uppermost, the modern ploughsoil, overlay a thick layer of grey silty clay representing an alluvial deposit laid down from the Roman period. The alluvium in turn sealed a dark brown silty clay representing the remains of a truncated buried subsoil into which the features were cut, above the natural gravels. The post-Neolithic topsoil had been truncated by the later alluvial processes.

Trench 1

- 3.3.2 Trench 1 had an irregular shape, aligned approximately east-north-east/west-south-west, with maximum dimensions of 24m by 9.5m. It was targeted on the ditch(es) of the inner enclosure on the north-east side (**Fig. 2**), and revealed two segments of the innermost circuit, reportedly separated by a 0.8m wide causeway (**Fig. 3**), although the drawn plan suggests they may have been connected. The southern segment was 3.2m wide ending at a rounded terminal. The northern segment was 2.2m wide, narrowing to just 1.1m at the northern edge of the trench.

- 3.3.3 Two sections were fully excavated across the southern ditch segment (108 and 113) and one across the northern segment (114). Each revealed a similar gently concave profile, with depths of between 0.4 and 0.55m. There was some variation, however, in the fills. In ditch section 108 (**Fig. 3A**), there was a small localised deposit of decorated grog-tempered early prehistoric pottery (very degraded) and charcoal on the base of the ditch, above which was a rapidly accumulated primary fill (107) producing animal bone (cattle, sheep/goat and pig). Two samples of the charcoal were submitted for radiocarbon dating, one of which produced a date of 3630-3520 cal BC (4743±37, OxA-14469); the results of the second sample are awaited. The secondary (106) and tertiary (105) fills appear to have accumulated more slowly.
- 3.3.4 In ditch sections 113 and 114 (**Fig. 3B and C**), in contrast, the lowest layers were bands of redeposited gravel (141 and 147) overlain by thin layers of dark organic and charcoal-rich soil (112 and 146), context 146 also producing animal bone. In both ditch sections, these layers appeared to derive from the south-west (inner) side of the ditch, and were overlain by a rapidly accumulated fill (138 and 145) comparable to 107 and also containing animal bone. Overlying this, on the inner edge of ditch section 113, there was a localised deposit of gravelly clay (111) containing animal bone (including cattle bones of relatively high meat value) and flecks of charcoal, and there was a similar layer (144) on the outer edge in ditch section 114. As in ditch section 108, the upper fills in these sections appear to have accumulated more slowly through natural silting.
- 3.3.5 Towards the north side of the trench, a 1.6m diameter circular pit (115) had been cut into the upper ditch fill. It was 0.4m deep with a concave profile, and was filled, possibly backfilled, with a yellowish brown clay silt (128). An upper fill of grey clay (127) on the south-west side appears in section to have been the fill of a smaller concave feature cutting 128, but the plan view suggests that this simply indicates differential material used to backfill the pit.
- 3.3.6 A shallow and very irregular curvilinear feature (118/119) ran north-east to north from just outside the terminal of the southern ditch segment. It was up to 1.3m wide and 0.13m deep, with a single fill (132/133) of orange brown silty clay. It appeared to have been cut by feature 117, possibly a tree throw.
- 3.3.7 Two small oval features were recorded in the angle formed by the south ditch segment and feature 118/119. Feature 120 measured 0.8m by 0.46m, while feature 121 measured 0.55m by 0.4m. Both were less than 0.1m deep with shallow concave profiles, and single fills of greyish brown silty clay (150 and 151). A third feature (122), extending beyond the eastern edge of the trench, was at least 1m wide and 0.17m deep with concave profile and a similar fill (130), while a small irregular cut (123) immediately to its north may be a natural feature.
- 3.3.8 Some 3m inside the enclosure ditch, there was a small concave cut (124), 0.2m in diameter and 0.06m deep with a dark grey/black fill (129). A further 10m to the west, and extending beyond the trench, feature 125 was at least

0.5m wide and 0.18m deep with vertical sides and a slightly concave base, and filled with a single light grey silty clay fill (148). Two irregular cuts in the western part of the trench proved to be natural features.

Interpretation

- 3.3.9 The two ditch segments correspond to the inner causewayed ditch of the inner enclosure (i.e. the innermost of the four segmented ditches). The causeway, however, was too narrow to show on the air photographs, and it is possible that the long ditch segments, as they appear in the air photographs, were in fact made up of short lengths of smaller, closely-spaced segments (a similar situation was recorded in the outer enclosure in Trench 7, below). The fact that the bands of gravel on the base of sections 113 and 114 derived from inside the enclosure may indicate the presence of internal banks built up from the material excavated from the ditch, rapidly eroding back into it.
- 3.3.10 In addition to the natural ditch silts, there were a number of deposits that may not have accumulated naturally, although it was not possible to determine whether there was any formalised dimension to their deposition. The small deposit of charcoal and pottery on the base of ditch section 108, for instance, may or may not have been deliberately placed there. Similarly, the bands of organic-rich soil in sections 113 and 114 either derived from activity immediately inside the ditch circuit and had spread into it through natural processes, or else had been collected from some location within the enclosure interior and then dumped/deposited in the ditch. Unfortunately, the only features recorded within the interior produced no finds or evidence as to their functions.
- 3.3.11 While the localised gravelly deposits above the primary fills, recorded against both the inner and outer sides of the ditch, have the appearance of deliberate dumps of soil into the ditch, it is again not possible to say whether the ditch simply provided a convenient dumping place for waste (including feasting waste) or whether it had some specific significance that made it the appropriate contexts for acts of symbolic deposition.
- 3.3.12 The nature of gully 118/119 is unclear. While the air photographs show a segment of the inner enclosure's outer circuit immediately north of the trench, there is no clearly visible segment either within the trench or to its immediate south. As the outer circuit appears to follow quite an irregular line on the north-east side of the enclosure, it is possible that the gully represents part of that circuit curving in towards the inner circuit.

Trench 2

- 3.3.13 Trench 2 was excavated on the line of the inner enclosure ditches on its west side, at the location of particularly strong geophysical anomalies (**Fig. 2**) (the depth of alluvium in this area – almost 1m – meant that this part of the enclosure was not visible as a cropmark). The trench was approximately 14m by 10m, aligned north-south. Excavation revealed the terminals of two adjacent ditch segments, separated, in the initial phase, by a 7.7m wide gap (**Fig. 4**). No finds were recovered from either ditch segment.

- 3.3.14 The southern ditch segment, in its initial phase (203), was up to 3.8m wide and 0.8m deep, concave towards the base but flattening out towards the top (**Fig. 4A**). The lowest fill (213) was a 0.6m thick layer of slowly accumulated grey silty clay, very similar to the subsoil into which it was cut. Above this, on the east side of the ditch, were two further layers of silty clay (212 and 211) representing the upper secondary and tertiary fills.
- 3.3.15 Only 1.6m of the northern ditch segment (253) was recorded on the northern side of the trench, and its full width was not determined (**Fig. 4B**). Its terminal, which was 0.6m deep, had a moderately steep, slightly concave side and a flat base, and its two silty clay fills (263 and 262) appeared to have accumulated naturally. Immediately south of the terminal was a 1.2m wide cut (265 – recorded only in the west face of the slot excavated along the line of the ditch, see **Fig 4A**) with moderately steep sides and a flat base, and with a light yellowish brown silty clay fill (263).
- 3.3.16 The southern ditch segment was subsequently partially re-cut (**Fig. 4A**). At the southern edge of the trench the re-cut (210) was 1.8m wide and 0.45m deep, with a V-shaped profile shallower on its outer side than on the inner. Its lowest fill (209), a 0.2m thick layer of grey silty clay containing lenses of charcoal, was overlain by a deposit of burnt clay (208) up to 0.08m thick, then by a similar deposit (207) containing a large quantity of charcoal. Neither deposit appeared to be the result of *in situ* burning. Two samples of charcoal from layer 207 were submitted for radiocarbon dating, one of which produced a date of 3630-3380 cal BC (4743±37, OxA-14470); the results of the second sample are awaited. The burnt layers were sealed by a layer of yellowish brown silty clay (206), a product of natural silting. This was in turn overlain by a 0.1m thick gravelly layer of grey brown silty clay (205), which extended over the fills of the original ditch and appeared to have been deliberately laid down.
- 3.3.17 The re-cut appeared to extend *c.* 2.5m beyond the original ditch terminal, increasing in width to 2.9m, and on a slightly different alignment. Within its terminal there appeared to be a mound of unexcavated natural, 1.2m wide, this, in effect, being surrounded by a 0.6m-1m wide gully (246/260), up to 0.25m deep. A localised primary fill (245), eroded from the side of the gully, was confined to the eastern side of the terminal, but elsewhere only a single, although variable, silty clay fill was recorded (232 and 261). On the eastern side of the terminal, a 0.5m wide elongated feature (247 – not shown on plan), was cut into this fill and contained a dump of burnt clay and charcoal (228) with four fragments of Early Neolithic decorated pottery, a single flint flake, burnt flint and animal bone. The terminal was then sealed by a 0.1m thick layer of dark grey brown silty clay (227) similar to layer 205, also producing animal bone.
- 3.3.18 There was no comparable re-cut of the northern ditch segment, although a small flat bottomed feature (269), 0.9m wide and 0.3m deep with moderately steep sides and a brown silty clay fill (268), was visible in section immediately inside the ditch, and a small deposit of material (266) piled over the edge of the silted up ditch appears to have derived from it (**Fig. 4B**).

- 3.3.19 However, the northern ditch segment and feature 265 were sealed by a 0.15m thick layer of dumped dark red brown/black silty clay (250) containing mixed burnt clay and charcoal, and including a small area of possibly *in situ* burning (252) (**Fig. 4B**). This abutted, but did not cover the pile of soil on the edge of the ditch, on the other side of which there was a similar layer (267) overlying feature 269 and thinning out towards the interior. These burnt layers were overlain, at the north edge of the trench, by a layer, up to 0.15m thick, of gravelly silty clay (251), possibly redeposited natural, which appeared to have been deliberately laid down over the silted up ditch terminal, forming a clearly visible mound over the line of the former ditch.
- 3.3.20 The mixed burnt layer (250) was cut at the south by an oval feature (248) measuring 1.9m by 1.3m, with moderately steep sides and a flattish base 0.3m deep. It had filled naturally with a brown silty clay (249).
- 3.3.21 A number of small features, between 0.14m and 0.4m in diameter and up to 0.15m deep, were recorded in the trench (218, 220, 222, 224, 230, 233/236, 254, 256 and 258). Only one (222) had more than one fill, and most had the appearance of small postholes. Worked flint was recovered from feature 220, while feature 224 contained flecks of charcoal and burnt/cremated bone. Although some of these features were closely associated, only one had a stratigraphic relationship to any other deposit, feature 254 being overlain by a dumped layer of brown silty clay (229) containing animal bone and a broken leaf-shaped flint arrowhead, east of the northern ditch terminal. Other larger and less regular features (216, 241 and 243) may be natural in origin.

Interpretation

- 3.3.22 The width of the gap between the two original ditch terminals suggests that they may have formed an 'entrance' into the enclosure, distinct from most other causeways between ditch segments. The location and stratigraphic position of pit 265 would suggest it was associated with the entrance. While the lack of any finds from these features suggests that this area may not have been a particular focus for activity in the initial phase, the array of small features may have been contemporary with it, perhaps representing markers or slight structures at the entrance. There were no indications in the ditch fills of any bank, although layer 229 was interpreted as possibly the remains of an internal bank.
- 3.3.23 There would appear to have been a relatively long interval between the initial construction of the enclosure and the later re-cut of the possibly fully silted southern ditch segment. The re-cut represents the start of a period of more intense activity, and although a relationship between the different layers of burnt clay and charcoal could not be demonstrated with certainty, it seems likely that they are related.
- 3.3.24 Apart from the evidence of burning there are few clues as to the nature of the activity producing this material. Although there was small area of *in situ* burning within the trench, the quantity of burnt material suggests that it may have derived from more widespread activity across the site, in which case it would seem to have been deliberately collected and deposited within and

over the ditch, possibly associated with re-deposition of gravelly soil, perhaps from a levelled bank, over the ditch.

Trench 3

3.3.25 Trench 3, which was 10m by 4.6m aligned east-west, was excavated over the position of a geophysical anomaly within the interior of the causewayed enclosure (**Fig. 2**). A single subcircular feature (308), measuring 0.6m by 0.7m and 0.16m deep with a concave profile, was recorded cutting the subsoil (306). Possibly a small pit or posthole, it had a single grey brown silty clay fill (307) containing a small amount of charcoal. The subsoil produced a fragment of prehistoric pottery.

Trench 4

3.3.26 Trench 4, which was 15m by 8m aligned north-south, was targeted on the north side of the inner enclosure (**Fig. 2**). This appeared from the air photographs to comprise only a single ring of ditch segments at this point (**Fig. 1**), although the geophysical survey suggested a less substantial outer ring.

3.3.27 A ditch, running across the northern end of the trench, was investigated in two sections, although the high water table meant that neither could be fully excavated. In section 408, against the west side of the trench, the ditch was 1.9m wide with moderately steep sides, and at least 0.4m deep. To the east, the ditch appeared to bulge out on both sides to a maximum width of 4.5m. A section dug into the bulge on the north side (410) indicated a shallow sloping side. Only single fills of orange grey sandy clay (407 and 409) were recorded in each section, 407 producing fragments of animal bone.

3.3.28 The only other feature was a shallow irregular feature (412) approximately 2m wide and immediately inside the ditch, whose fill consisted of a mix of burnt clay and charcoal (411).

Trench 5

3.3.29 Trench 5, which measured 14m by 2m aligned north-east/south-west, was intended to investigate the outer enclosure on its north side (**Fig. 2**). However, no ditch was recorded in the trench – possibly because the trench was located too far north or alternatively because it lay on the line of a 2m or wider causeway between ditch segments. Because the trench filled rapidly with water, causing the sides to collapse, recording was done from outside the trench.

Trench 6

3.3.30 Trench 6, which measured 17.3m by 4.3m aligned north-south, was targeted on the inner enclosure on its south side (**Fig. 2**). The excavation revealed the inner of the two ditches (608). It was 5.1m wide with shallow sides, and was excavated to a depth of 0.7m. There was a primary fill of gravelly clay silt (604) lying against the northern (inner) edge of the ditch. The composition of the secondary fill of orange brown silty clay (607) suggests episodes of rapid erosion into the ditch interspersed with periods of slower silting. This was overlain by a 0.04m thick layer of dark brown silty loam (606), and an upper

fill of mid grey brown silty clay (603) which produced cattle bones, a piece of antler and a flint flake.

Interpretation

- 3.3.31 The gravelly primary fill may have eroded from an internal bank, while the secondary fill indicates natural silting leading to the gradual stabilisation of the ditch and the formation of a soil across it. It was unclear whether the upper fill had accumulated naturally or had been dumped into the ditch.

Trench 7

- 3.3.32 Trench 7 had an irregular shape as the excavation followed the line of ditch segments, with maximum dimensions of *c.* 18m by 22m. It was targeted on the outer enclosure on its north-east side (**Fig. 2**), where it appears from the air photographs to follow a slightly irregular course (**Fig. 1**). The trench revealed a line of six short segments aligned approximately south-east to north-west, the most westerly of which was clearly out of line with the others (**Fig. 5**).
- 3.3.33 The segment against the south-eastern edge of the trench was not excavated, but was at least 1.4m wide. This was separated by a gap of just 0.45m from segment 713, which was 2.7m long and up to 1.4m wide. It had moderate to steep sides and a concave base, 0.25m deep. It had a single fill of mid brown silty clay (714).
- 3.3.34 A gap of 0.35m separated 713 from segment 708/712, which was 3m long, 1m wide and 0.2m deep, with moderately steep sides and a slightly concave base. Both ends of the segment were excavated, the southern end producing two cattle humeri.
- 3.3.35 There was a further gap of 0.4m before a subcircular segment (716), 1m-1.1m in diameter and 0.1m deep. This was connected to a 2.7m long segment (717/710) and both were recorded as having the same fill (715). Segment 717/710 was 1.1m wide and 0.26m deep with moderately steep sides and a flat base.
- 3.3.36 There was a 3m gap between segment 717/710 and segment 720, which was offset to the west from the line of the other segments. There was a small circular feature (718), 0.5m in diameter and 0.15m deep with a concave profile, in the middle of the gap.
- 3.3.37 Segment 720 was 4.4m long, 1.5m wide and 0.5m deep with moderately steep sides and a flat base, on the base of which had been placed a large aurochs bone. It was the only segment with more than one fill, the lower fill (721), a yellowish brown silty clay up to 0.2m thick overlain by a mid brown silty clay (722) containing charcoal, including a 'cache' of over 30 charred hazelnut fragments (**Fig. 5A**). Samples from both the aurochs bone and the hazelnuts were submitted for radiocarbon dating. The hazelnuts provided a date of 3710-3640 cal BC (4877±25 BP, NZA-21960); the bone failed to produce a date.

Interpretation

- 3.3.38 The air photographs do not show clearly the line and form of the ditch segments of the outer enclosure in this part of the site, although it would appear to consist of two rings of segments about 5m apart, as around the rest of the circuit. Because only one line of ditch segments was recorded along the long south-eastern side of the trench it is possible that the trench in this area lay across a causeway, at least 2m wide, of the other ring.
- 3.3.39 The marked kink in the line of the segments may have some significance. While it is possible that segment 720 is part of the inner ring of segments and the rest are part of the outer ring, no ditch segments were recorded in Trench 5 to the north-west and it would appear that the enclosure turned quite sharply to the west at this point. Instead, the break in the line may have marked a point of special access across the boundary, reflected not only by the small pit or posthole in its centre, but also by the apparently deliberate placing of the aurochs bone on the base of segment 720. The two broken cattle humeri in the south end of segment 708 may also have been deliberately placed.
- 3.3.40 This was the only trench in which the outer enclosure was recorded, and the short lengths of these segments are in marked contrast to the majority visible in the air photographs, those lying to the west for example being up to c. 18m in length. They are also much shallower than the excavated sections of the inner enclosure's inner ditch (although perhaps comparable to feature 118/119 in Trench 1). While it is possible that this part of the outer enclosure is atypical, it is also possible that other apparently single segments of the outer enclosure are in fact made up of a similar series of very closely spaced small segments which cannot be distinguished in the air photographs (as suggested also in Trench 1).
- 3.3.41 The moderately well-sorted fills in the ditch segments indicate that they silted up naturally.

4 FINDS

- 4.1.1 A small quantity of finds was recovered from six of the trenches (none was recovered from Trench 5). Animal bone makes up the bulk of the finds assemblage, with very small quantities of pottery and worked and burnt flint. Finds totals by trench are given in **Table 1**.

4.2 Animal bone

- 4.2.1 One hundred and thirty pieces of animal bone were recovered and, with the exception of that from contexts 202 and 601 (medieval and post-medieval) it was all Neolithic in date and associated with the causewayed enclosure. It is almost all in poor condition, suffering from cracking, erosion of the bone surface, concretion and breakage both in antiquity and during or after excavation. Evidence of gnawing was not common (1%), suggesting that dogs may not have been present at the site (none of their remains were found). Alternatively, it may be because the bones were covered soon after

deposition, much of it coming from either primary ditch fills that appear to have accumulated quite rapidly, or from layers of dumped or redeposited material. The incidence of loose teeth was very low (1%).

- 4.2.2 Less than a quarter of the bones (31) could be identified to species, and of these the majority (81%) was from cattle, with only a very small number of pig and a single sheep bone. Deer was represented by one antler fragment, which may have been from red deer but was too abraded to identify with any certainty. Of the identified bones, 22 could be aged. Most cattle bones were from mature individuals, and although several immature cattle bones were noted, there were none under the age of 12 months.
- 4.2.3 Although only four bones could be measured to indicate animal size, it was noted that cattle bones were relatively large. One very large distal femur from the outer enclosure was probably from an aurochs, while a very long but slender metatarsal was also bigger than is usual for Neolithic domestic cattle at Windmill Hill and Durrington Walls (Grigson 1999; Harcourt 1971), but probably not the stature of an aurochs; its dimensions indicate that it could be from a castrate. The sheep and pig bones were small.
- 4.2.4 Butchery marks were frequently observed, and were most often a result of careful disarticulation with a fine tool. They were noted mainly on the pelvis, but cuts on an atlas from decapitation, and on a humerus to separate the upper and lower limb, were also noted. One humerus had a helical fracture midshaft, indicating breakage for marrow, but in general the identifiable bone fragments were fairly large, which indicates relatively non-intensive exploitation. Seven bones had been burnt, although only one of these, a distal femur, was identifiable. The position of the burning, on a part of the bone that would have been exposed after disarticulation of the lower limb, might indicate that meat was roasted on the bone, but since it was partially calcined, indicating very high temperatures for a long period of time, it is also likely to have been burnt after consumption of the meat.
- 4.2.5 A number of bone groups may indicate feasting. For instance, cattle bones of relatively high meat value were recovered, in relatively large pieces, from a dump of material in the partly silted up inner ditch circuit (context 111). Moreover, all the pig bones were of high meat value. Although the sample was very small, there were no bones with very low meat values, such as skulls and phalanges.
- 4.2.6 Other bones appear to have been deliberately placed in the ditch segments. These include two right distal humeri, broken (at least one deliberately) at the same point midshaft, from segment 708, and the aurochs bone from the primary fill of segment 720; both segments were part of the outer enclosure.
- 4.2.7 The sample is too small to make reliable comparisons with other sites, although the high proportion of mature cattle, with a very small number of sheep and some pig, is similar to the species proportions at Windmill Hill (Grigson 1999). There may be intra-site variation with species being spatially differentiated for symbolic reasons (Pollard 1995) – it may be significant, for instance that the two clearest instances of placed bone deposits were from the

outer enclosure, although whether there was some significance in the proximity of both wild and domesticated cattle bones at this location remains a matter of speculation.

4.3 Pottery

4.3.1 Of the 11 sherds of pottery, ten are small and heavily abraded in friable fabrics. Their poor condition has hampered identification of the fabrics, but most if not all appear to be in shelly fabrics. A decorated rim sherd (from the burnt fill (228) of inner circuit re-cut) can be identified as Early Neolithic, with comparable forms being known from the large Mildenhall style assemblage from Etton (Kinnes 1998). Three decorated body sherds (104) are insufficiently diagnostic and could be either Early Neolithic or of the later Neolithic Peterborough or Grooved Ware ceramic traditions. The remaining three sherds (contexts 306, 604) are completely undiagnostic, but on fabric grounds are likely to be of Neolithic date, although of unknown ceramic tradition.

4.3.2 One sherd (context 202) in a glazed sandy fabric is of medieval date.

4.4 Worked and burnt flint

4.4.1 The worked flint comprises a broken leaf-shaped arrowhead of Neolithic type (context 229) and four flakes which although not chronologically distinctive could be of similar date. The burnt, unworked flint is presumed to be prehistoric.

4.5 Potential for further analysis

4.5.1 Due to its small size and poor condition, further analysis of the animal bone assemblage is unlikely to provide any useful information on animal husbandry or butchery practices. Similarly, there was too little pottery and flint to warrant further detailed analysis, although the diagnostic pottery sherds and possibly the flint arrowhead should be illustrated for any proposed publication report.

5 PALAEOENVIRONMENTAL EVIDENCE

5.1.1 Twelve bulk samples of between 2 and 20 litres, and three monoliths, were taken to provide information about the Neolithic environment and economy, and help date the construction and use of the causewayed enclosure. The bulk samples were taken from the primary and tertiary fills, and from the fills of a re-cut, within the ditches of the inner enclosure, from the secondary fills of one of the ditches of the outer enclosure and an adjacent tree throw, and from a pit/posthole in the interior of the enclosures.

5.1.2 The bulk samples were processed by standard flotation methods and the results are presented in **Table 2**. The flots were generally small and only two were larger than 100ml. Roots were quite high in a few samples, although those from the ditches had generally fewer roots. Some of the samples (in particular sample 14 from context 107) had remains of modern cereals and

leaves. It is possible that such remains came into the sample through their proximity to the topsoil, although it may also be that they entered the samples through the tops of the bags.

5.2 Charred plant remains

- 5.2.1 Relatively few of the flots contained identifiable plant macrofossils. In terms of food resources, cereal remains were sparse with a probable grain of wheat recovered from the secondary fill of the ditch 720 (context 722) of the outer enclosure, and an unidentifiable cereal grain from the tertiary fill of the inner enclosure's inner ditch 114 (context 109). Fragments of hazelnut shell (*Corylus avellana*) were more common especially in context 722, and a possible fragment of sloe (*Prunus spinosa*) was recovered from the inner enclosure ditch re-cut (context 229).
- 5.2.2 Several probable small charred tubers about the same size as grain were recovered, as well as fragments of parenchyma (soft plant tissues). Also recovered were a seed of probable cleavers (*Galium aparine*), which is commonly found in samples of this date and represents a probable weed of Neolithic crops, and one of a probable leguminous species although more precise identification was not possible.
- 5.2.3 Neolithic causewayed enclosure ditches are often poor in both cereal and hazelnut remains, e.g. Etton (Nye and Scaife 1998), Windmill Hill (Fairbairn 1999) and Robin Hoods Ball (Moffett *et al.* 1989), possibly indicating that few domestic activities were conducted at these sites. The predominance of wild food remains, including tubers, may indicate the importance of wild food resources during the Neolithic (Moffett *et al.* 1989).
- 5.2.4 The charred plant remains have little further potential, as the remains from the flots have been identified and largely reported upon here, and no further work is recommended. It is possible that further identifications might be made on the tubers, which would reveal the range of wild plants exploited.

5.3 Charcoal

- 5.3.1 Several of the samples were reasonably rich in wood charcoal, in particular that from the dump of material (context 207) in the re-cut (210) of the inner enclosure ditch. Fragments of both twig wood and bark were seen. A small deposit of charcoal associated with sherds of pottery was recorded on the base of the inner enclosure ditch (context 107). While the tree-throw (412) in Trench 4 and the post-pit in the interior of the monument also contained quite high quantities, other samples contained generally little charcoal.
- 5.3.2 The charcoal from context 207 has the potential to inform on aspects of the local environment or, more likely, on selection of wood and its domestic or economic use. Therefore the identification of the remaining charcoal from this context 207 and primary fill (context 107) is suggested.

5.4 Land snails

- 5.4.1 Land snails were almost absent from the samples although the sample from ditch 270 of the outer enclosure contained a few shells of burrowing snails *Cecilioides acicula*, as well as a fragment of probable *Helicella itala*. There is no further potential to study these remains.

5.5 Sediments

- 5.5.1 Sediments from the three monoliths were examined (**Table 3**). Monolith 1 (0.51m long) was taken through the fills of the inner enclosure ditch (ditch 203 and re-cut 210), and monolith 6 (0.32m long) through the alluvium adjacent to the ditch (**Fig 4A**). Monolith 8 (0.4m long) was taken through a suggested soil buried under alluvium in Trench 7. The monoliths were cleaned and the sediments described using standard methodology following to Hodgson (1976).
- 5.5.2 The primary fill of ditch 203 (context 213), was a yellowish brown friable silt loam and this represents sediment weathered from the stabilising edges of the ditch (context 204) and washed in from the local surroundings. It has been affected by post-depositional processes but is not organic and has no well-developed structure. Its sediment was similar to the weathered pre-enclosure deposits at the base of monolith 6 (context 204) to the immediate west of the ditch, and monolith 8 from trench 7 (context 705).
- 5.5.3 Context 209 formed the primary fill of the re-cut ditch 210 and comprised water laid in-wash of fine sediments, occasional charcoal being noted by the excavators. The overlying fills (contexts 207 and 208) comprised archaeological dumps of sediment containing fired clay, daub and a substantial quantity of charcoal. An upper secondary fill (context 206) of yellowish brown friable silt loam, similar to both context 213 and the weathered pre-enclosure material (context 204), consists of sediment derived from the local surroundings.
- 5.5.4 The tertiary fill of the re-cut ditch (context 205) comprised a dark greyish brown humic clay loam, with abundant poorly sorted small to medium stones. It was described on-site as dumped bank material forming the final fill and creation of mound over ditch. It is noted here that the layer has been subject to soil formation processes since its deposition and apparently prior to being sealed by the overlying alluvium, with the formation of a weak blocky structure. A similar sediment also showing signs of early soil formation was recorded at the base of the post-enclosure alluvium in monolith 6 adjacent to the ditch. This layer was not defined in the field, and may have been incorporated into the lower portion of the post-enclosure alluvium.
- 5.5.5 Monolith 8 (trench 7) sampled the alluvial sequence over the sands and gravels of the River Welland first and second terraces. Beneath the modern alluvial soil profile was a slightly organic soft friable brown silty clay loam (context 704) akin to weathered natural (context 204), and the primary fill of ditch 203 (context 213). The excavators suggested that this layer was a

possible Neolithic buried topsoil/turflin. No evidence was found of a soil A horizon, however, and the formation of weak blocky structure and common iron mottles suggests this could be the remains of a buried B horizon. There is clear evidence for truncation and soil subsumed into the overlying alluvium as indicated by the gradual boundary with the overlying alluvium. It is unlikely that layer 704 is Neolithic – it probably forms part of the post-Neolithic, and post-enclosure landscape.

- 5.5.6 A body of massive silt clay overbank alluvium (contexts 202 and 703) overlies the three sequences examined, consequently sealing and preserving the ditch fills. It is clearly extensive and was formed in floodplain conditions. This layer, suggested to be of Late Iron Age/Roman date (Pryor pers. comm.), has dried out since deposition and is now subject to soil formation processes in the modern soil profile.
- 5.5.7 The sediments have little potential for further analysis. Their description and interpretation has been undertaken and a depositional history comprising a sequence of fills and dumping episodes has been described for the enclosure ditch.

5.6 Pollen

- 5.6.1 Eight samples were taken in 10mm slices from undisturbed deposits (monolith 1) sampled through inner enclosure ditch 203 and its re-cut 210 (**Table 3**), with the hope, as was the case at Etton (Scaife 1998), that it might provide information about the vegetational history of the site. However, pollen was poorly preserved, and absolute pollen frequencies are very low. In spite of this, the data demonstrate a locally open herbaceous environment with evidence of grassland and possibly cereal cultivation. It is not considered feasible, nor would it be of value, to pursue any subsequent analysis of this profile.

5.7 Phosphate analysis

- 5.7.1 Phosphate analysis was undertaken in the hope that it would provide some evidence as to the relative intensity of human and animal activity across the enclosure. Due to the depth of alluvium (*c.* 0.8m), a plan to grid sample the pre-alluvial horizon (considered at the time to be a buried Neolithic soil) across the enclosure was replaced by a 300m east-west transect, with samples of the topsoil taken at 10m intervals and cored samples of the pre-alluvial horizon at 20m intervals. In addition, five samples of the pre-alluvial horizon were taken along each of three short north-south transects (south from 60m east, and north from 140m and 220m east) in order to maximise coverage of the enclosure's interior. Samples were also taken from six of the trenches.
- 5.7.2 Bulk samples were collected and processed wet on site. They were subsequently air dried, ground and sieved to 2mm, in the laboratory. Weighed samples were then treated using a hydrochloric acid digestion method, adapted from Dick and Tabatabai (1977). Total phosphate levels were established colorimetrically by the standard molybdenum blue method,

described by Murphy and Riley (1962), and quantified by reference to a standard curve.

- 5.7.3 Samples from the topsoil reveal a background level of 40-50mg P per 100g soil (mean value 49). A cluster of higher values is likely to reflect the disturbance of prehistoric pre-enclosure deposits by the cutting of the Car Dyke during the Roman period, this material then being spread by later ploughing.
- 5.7.4 In contrast, the samples from the pre-alluvial horizon have a mean value of 82mg P per 100g soil. More significantly, the mean value in the eastern half of the main transect is 105, compared to 56 in the western half (**Table 4**), a contrast confirmed in the values from the north-south transects (**Table 5**) and the trenches (**Table 6**).
- 5.7.5 These higher levels are greater than might be expected from general settlement and would be consistent with animal activity. Unfortunately the animal bone assemblage is too small to indicate more than the probable consumption of cattle (with some pig and sheep/goat) within the Neolithic enclosure, and allows no analysis of intra-site variability in animal-related activities. Moreover, although the sampling transects were located so as to reduce 'contamination' by later activity, it is possible that the results reflect activity associated with a prehistoric (possibly Bronze Age) field system visible in air photographs.
- 5.7.6 Nonetheless, it remains possible that the higher phosphate levels in the eastern half of the enclosure indicate variable use of its interior during the Neolithic, and derive from stock-related activities focussed on the fen edge.

5.8 Palaeoenvironmental summary

- 5.8.1 The River Welland floodplain has been an active and continually changing floodplain landscape since at least the earlier Neolithic period. Once clearance had started, relatively widespread colluviation and alluviation processes ensued and affected the floodplain/terrace edge areas, upon which many foci of activity were, or were to be, sited (French 1990). These processes and sedimentation gradually encroached onto higher parts of the terrace during the later Neolithic and Bronze Age until by the post-Roman period, a major blanket of alluvium sealed much of the local and indeed wider landscape (see French 1998; Pryor 1998 etc). On-site alluviation and weathering aided the infill of many of the ditches and is paralleled at Etton (French 1998). The sparse charred plant remains indicate exploitation of wild resources (hazelnuts), typical in Neolithic contexts, and hint at cultivation.

6 RADIOCARBON DATING

- 6.1.1 One sample of hazelnuts, from a dump in the secondary fill (context 722) of the outer ditch 720, was selected and submitted for radiocarbon dating by Wessex Archaeology. This context was considered to be a part of the occupation and use of the monument.

- 6.1.2 In addition, five other samples were selected in conjunction with Prof. A. Whittle, Dr. Frances Healy and Alex Bayliss of the EHRB and English Heritage *Dating Causewayed Enclosures* project. These samples attempt to provide determinations for the construction of the inner and outer ditch circuits, and the duration of infilling of those ditches.
- 6.1.3 The sample from the ‘cache’ of hazelnuts in the secondary fill of the outer enclosure (ditch segment 720) has provided a determination of 4877 ± 25 BP, indicating activity associated with the outer enclosure, some time after its construction, at 3710-3640 cal BC (**Table 7**). The auroch bone from the primary fill of the same ditch segment did not contain enough collagen to yield a radiocarbon determination.
- 6.1.4 One of the samples from a primary fill of the inner enclosure ditch (ditch segment 108) produced a determination of 4743 ± 25 BP suggesting a date of construction of the inner enclosure of 3630-3520 cal BC. The sample from evidence of burning in the secondary fill of the re-cut inner enclosure (ditch segment 210) provided a determination of 4795 ± 38 , dating this activity to 3630-3380 cal BC. These two results are statistically indistinguishable at the 95% confidence level (Ward and Wilson 1978) indicating the ditch was constructed, re-cut and backfilled, with a burning event in its upper fills, over a short period of time (<75 years). The remaining two results from the AHRB and English Heritage supported samples from the same two contexts are awaited.
- 6.1.5 The two sets of ranges obtained so far from the outer and inner enclosures indicate that the outer enclosure seems earlier than the inner, although these ranges, too, are not statistically distinguishable at the 95% confidence level.
- 6.1.6 These results can be compared with those from the causewayed enclosure at Etton (Ambers 1998), of which recent research indicates that only one (BM-2765) is positively archaeologically reliable (Healy pers. comm.) (**Table 7**). Nevertheless it is clear that the Northborough determinations indicate the use of the site at a time broadly contemporary with the construction and use of Etton, that is the earlier Neolithic. However, its precise chronological relationship awaits both the receipt of the submitted samples and re-examination and re-dating of Etton. It will then be possible to determine if the Northborough enclosure pre-dates, is contemporary with, or post-dates Etton.

7 DISCUSSION

- 7.1.1 The evaluation has provided valuable information about the character, date and condition of the causewayed enclosure. The general extent and layout of the monument were well established by RCHME’s air photographic transcription, although the depth of the alluvium on the west side of the monument masked the ditches in that area. This was partly rectified by the geophysical survey, which revealed the full circuit of the inner enclosure, and identified a possible western entrance (GSB 2004).

- 7.1.2 The accumulation of post-Roman alluvium over the site has effectively sealed the monument and protected it from damage by modern ploughing although the Neolithic soil appears to have been truncated by the alluvial processes. As a result, the Neolithic deposits are generally well preserved, including positive features such as the mound of redeposited material, possible from a levelled bank, over the enclosure ditch in Trench 2. The two pairs of ditches may have been dug to provide material for central banks (Oswald *et al.* 2001, 69). However, despite the high water table, no preserved waterlogged organic remains were recorded, such as the wood deposits found in the ditches of the Etton causewayed enclosure.
- 7.1.3 The small pottery assemblage was insufficiently diagnostic to provide dating evidence for the sequence of the monument's construction, use and abandonment, especially as no pottery was recovered from the outer enclosure. In fact, the low level of finds recovered from the site contrasts markedly with the evidence from many other causewayed enclosures (including Etton), where the ditches appear to have been both the focus for the formalised deposition of artefacts and human and animal remains, and a repository for materials deriving from the range of activities undertaken within the enclosures. At Etton, this activity appears to have been intense, although for only a relatively short period (Pryor 1998, 353). It is possible that the lack of comparable evidence at Northborough is due to the limited nature of the excavation. Certainly the deposits of both wild and domesticated cattle bone in the bases of two ditch segments flanking the possible access point of the outer enclosure hint at the potential of more substantial and complex deposits elsewhere around the inner and outer circuits.
- 7.1.4 In general, however, the small finds assemblage was able to shed little light on the range and nature of activities that may have taken place at the enclosure. Clearly a range of wild and domesticated plant and animal food sources was exploited, but the results of the phosphate analysis, which showed more intense animal-related activity in the eastern part of the site, cannot be securely associated with the use of Neolithic enclosure, since later features relating to prehistoric agriculture overlie the site.
- 7.1.5 The re-cutting of the inner enclosure ditch at the western 'entrance' was not witnessed elsewhere around either circuits, and may highlight the significance of this location. The subsequent burnt deposits in and adjacent to the ditch in this area provide the clearest evidence for activity at the monument, although few clues as to the nature of that activity. If these layers are associated with the infilling of the ditch and the levelling of an associated bank, they may represent the final clearing, cleaning and closing of the site, a process which may only be fully understood with reference to the site's chronology in relation to the other enclosures in the area.
- 7.1.6 It is hoped that analysis of the full suite of radiocarbon dates from the site will throw light on the development of the causewayed enclosure. Those presently available suggest that construction of the outer enclosure circuits may pre-date that of the inner enclosure. This would contrast with the sequence suggested for instance at Windmill Hill (Whittle *et al.* 1999), where

the outer enclosure may post-date the inner. The determinations also suggest, however, that the period of use of the causewayed enclosure was of relatively short duration. The irregular line of the circuits, in places, may indicate that construction was a discontinuous process (Oswald *et al.* 2001, 75)

- 7.1.7 The full radiocarbon results will also help establish the chronological relationship between this site and the single circuit Etton enclosure, 1.8km to the south-west, and therefore important aspects of the local landscape history. The proximity of the two enclosures, and the other causewayed enclosures in the area, mean that this site needs to be interpreted within the context of the wider landscape, which was clearly a focus of intensive activity throughout the Neolithic.
- 7.1.8 These sites lie at the boundary between a number of productive ecological zones which, from the Mesolithic, had offered the potential for the exploitation of varied wild, and subsequently domesticated, resources. These zones included the inland oak and lime forests along the fen-edge, woodland margins and clearings on the sand and gravel terraces and islands of the River Welland valley, which provided also areas of well drained soils suitable for cultivation, and the fen carr and reed and sedge fen that merged into saltmarsh and mudflats towards the coast (Coles and Hall 1998).
- 7.1.9 However, this was also a social landscape, and the Northborough enclosure is likely to have played a central role in the processes whereby dispersed and mobile communities seasonally exploiting their varied subsistence strategies, became more firmly wedded to particular areas of land and maintained their ties of kinship and affiliation through communal activities including monument construction, seasonal gatherings, exchange and ritual.
- 7.1.10 In summary, while the evaluation has provided valuable information about a site known previously only from air photographs, further work would be needed in order to realise its potential to throw light on the use of such monuments, the reasons for their concentration in this area of the landscape, the patterns of Neolithic subsistence and settlement and their impact on the contemporary environment (Brown and Murphy 2000).

8 RECOMMENDATIONS

- 8.1.1 Given the above assessment of the results of the evaluation, little further analysis of the finds or environmental data is considered to be necessary. However, further charcoal and plant identifications are recommended to provide information on the local environment and its exploitation.
- 8.1.2 The results of the English Heritage radiocarbon programme will also provide further information as to the chronology of the monument's construction and use, as well as the opportunity for a more specific chronological comparison with Etton.
- 8.1.3 A copy of this report will be submitted to the Peterborough Sites and Monuments Record, and it is recommended that a note summarising the

evaluation and incorporating the results of this assessment and any further analysis, is published in the *Proceedings of the Cambridgeshire Antiquarian Society*.

9 ARCHIVE

- 9.1.1 The archive, which includes all artefacts, written, drawn and photographic records relating directly to the investigation is undertaken, is currently held at the offices of Wessex archaeology under the site code NOB 04 and Wessex Archaeology project no. 55761. The paper archive is contained in one lever arch file. In due course, Time Team will transfer ownership of the archive to Peterborough Museum.

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Material / Trench	1	2	3	4	6	7	unstrat.	Total
Animal bone	84 1583	24 238	-	2 9	16 430	4 929	-	130 3189
Pottery	3 3	5 15	1 3	-	2 1	-	-	11 22
Worked flint	-	4 13	-	-	1 10	-	1 43	6 66
Burnt flint	1 107	1 9	-	-	-	-	-	2 116

Table 1: Finds totals (number / weight in grams) by material type and trench

Tr.	Feature	Sample location				Flot						
		Cont.	Sample	Size (l)	Flot size (ml)	Root %	Grain	Chaff	Notes	Charred other	Other	Charcoal >5.6mm
<i>Inner enclosure</i>												
1	Inner ditch 108 (primary)	107	14	12	30	5	-	-	-	-	-	A
	Inner ditch 114 (tertiary)	109 (142)	13	10	40	90	C	-	1x hazelnut; 2x seed/tuber; 1x <i>G. aparine</i> ; 1x grain; 1x legume (lg) indet.	B	-	C
	Inner ditch 113 (tertiary)	110	15	10	15	10	-	-	-	-	-	B
	Ditch re-cut 210	207	2	2	160	2	-	-	-	-	-	A**
		208	3	2	2	90	-	-	-	-	-	-
	?Feature 246 in ditch re-cut	205	4	10	30	90	-	-	-	-	-	A
	Burnt layer over ditch	228	5	15	25	20	-	-	5x hazelnut; 2x tuber; 3x same or grain? 1x parenchyma	B	-	C
	Dumped layer	250	11	7	10	2	-	-	-	C	-	-
		229	9	7	20	25	-	-	1x indet. (possible fragment of sloe)	C	-	C
<i>Outer enclosure</i>												
7	Ditch 720 (secondary)	722	7	8	40	50	C	-	<i>Triticum</i> grain; 30+x hazelnut; 5x parenchyma indet; seed - sloe (<i>Prunus spinosa</i>)	A*	moll (C)	B
4	?Tree throw 412	411	12	12	65	10	-	-	-	-	-	A*
			12m	2	12	10	-	-	-	-	-	-
<i>Interior</i>												
3	Pit/posthole 308	307	10	20	165	60	-	-	Wood parenchyma, hazelnut frg x2.	C	-	A*

KEY: A** = exceptional, A* = 30+ items, A = ≥10 items, B = 9 - 5 items, C = < 5 items; moll = molluscs

Table 2: Assessment of the charred plant remains and charcoal

Depth (cm)	Pollen samples taken (cm)	Context	Description
Monolith 1: fills of the inner enclosure ditch (ditch 203 and re-cut 210). Depth 0cm = c. 73cm below ground. Total length 0.50m			
0-2	0	202 Post-Roman alluvium	10YR 4/1 dark grey massive silty clay, common fine medium Fe mottles (10YR 3/6 dark yellowish brown), no visible inclusions. Clear boundary Alluvium (fine overbank)
2-16	8	205 grey brown silty clay ?dumped bank material as final fill and creation of mound over ditch	10YR 3/2 very dark greyish brown humic clay loam, abundant poorly sorted sub-rounded gravel 3mm-3cm. Common macropores, weak blocky structure decreasing to base of unit. Clear-gradual boundary ?Dump as tertiary fill, subject to soil formation processes post-deposition
16-21	16	206 light yellowish brown silty clay, dump in ditch re-cut	10YR 4/4 dark yellowish brown slightly organic friable silt loam. Rare sub-angular gravel <2cm. Clear boundary Secondary fill (NB sedimentologically the same as unit 7)
21-33	24 32	207 dump including charcoal and burnt clay, in ditch re-cut	10YR 3/2 very dark greyish brown mixed silty clay with abundant charcoal including recognisable fragments wood charcoal up to 1.5cm, abundant red (2.5YR 3/6 dark red) material, likely burnt clay. Clear boundary Dump
33-37	36	208 dump of charcoal and dominant daub/fired clay in ditch re-cut	As above, common burnt clay and charcoal with common friable calcareous silt concretions 2.5Y 8/2 pale yellow: daub. Abrupt boundary Dump
37-41	40	209 grey silty clay, primary fill of ditch re-cut	10YR 4/3 brown massive silty clay, rare rounded flint <0.5cm, occasional fine red mottling (fired clay/ Fe? 2.5YR 3/6 dark red). Sharp boundary Primary fill of ditch 210 comprising fine waterlaid inwash (base is position of ditch re-cut 210)
41-50	48	213 primary ditch fill	10YR 4/4 dark yellowish brown friable silt loam, rare sub-angular flint gravel <2cm. Common vertical voids (root/ worm) filled with overlying silty clay. Primary fill of earlier ditch (203) formed of inwash from the immediate area and ditch sides (colluvial in nature)

Table 3. Sediment descriptions (continued over)

Depth (cm)	Pollen samples taken (cm)	Context	Description
Monolith 6: through a possible buried soil within Trench 2 (adjacent to enclosure ditch 210). Depth 0cm = c. 50cm below ground. Total length 0.32m Section drawing 8			
0-14	none	202 alluvium (Post Roman?)	10YR 4/1 dark grey massive silty clay with common fine medium fine mottles (10YR 3/6 dark yellowish brown) an rare black Mn mottles. Occasional fine rootlets (recent, fleshy). Gradual boundary, with mixing of underlying into base of unit <u>Alluvium (desiccated post-dep)</u>
14-28		202	14-28cm 10YR 4/3 brown slightly organic silt loam, weak granular structure, common rounded-subangular gravel <2cm. Clear-abrupt boundary <u>Alluvium, subject to soil formation processes post-deposition</u>
28-30		204 alluvium; surface cut by enclosure ditch	28-30cm 10YR 4/4 dark yellowish brown friable silt loam. Rare subangular-rounded gravel <1cm. No discernible structure. (The base of this deposit and the underlying deposit was not sampled in the monolith) <u>?Wash from immediate area (colluvial in nature)/ fill or earlier cut</u> Note: field records incorrectly interpreted this as a buried soil.
Depth (cm)	Pollen samples taken (cm)	Context	Description
Monolith 8: through a possible buried soil in Trench 7 (705 seals outer enclosure ditch). Depth 0cm = c. 55cm below ground. Total length 0.40m			
0-12	none	703 alluvium (post-Roman?)	10YR 4/2 dark greyish brown silty clay. Weak blocky structure, common fleshy roots and fine rootlets. Gradual-clear boundary <u>Alluvium (desiccated post-dep and undergoing alteration to become the modern soil B2? horizon)</u>
12-21		704	10YR 4/5 brown slightly organic soft friable silty clay loam. Weak medium blocky structure, common moderate coarse Fe mottling (10YR 3/6 dark yellowish brown). Rare subangular gravel <1cm. Gradual boundary. <u>Putative buried soil B horizon (bB) inundated by alluvium</u> <u>NB underlying "subsoil" and basal terrace sand and gravel deposits not collected by monolith</u>
21-40		705 colluvial/weathered natural	10YR 4/4 dark yellowish brown soft friable silt loam, rare rounded flint gravel <2cm. Occasional vertical voids (worm/ root) filled with sediment from context 704. <u>?Wash from immediate area (colluvial in nature) sedimentologically the same as unit 7 of ditch 210</u>

Table 3 (contd). Sediment descriptions

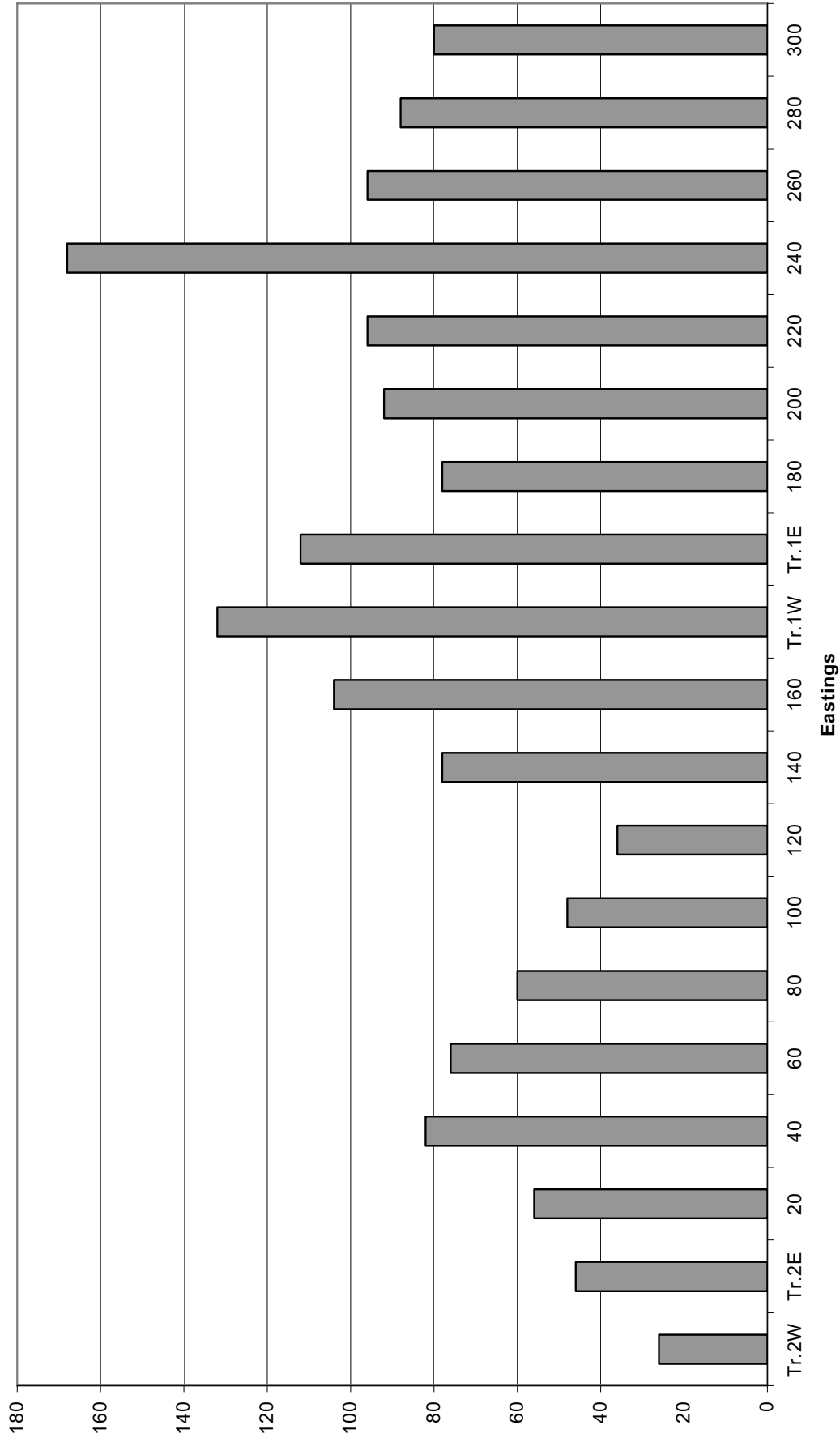


Table 4: Total phosphate in the pre-alluvial horizon along the main east-west transect, and in Trenches 1-2

Sample point	60m east	140m east	220m east
20m	94	56	128
40m	38	110	88
60m	44	102	100
80m	36	44	70
100m	90	102	98
Mean value	60	83	97

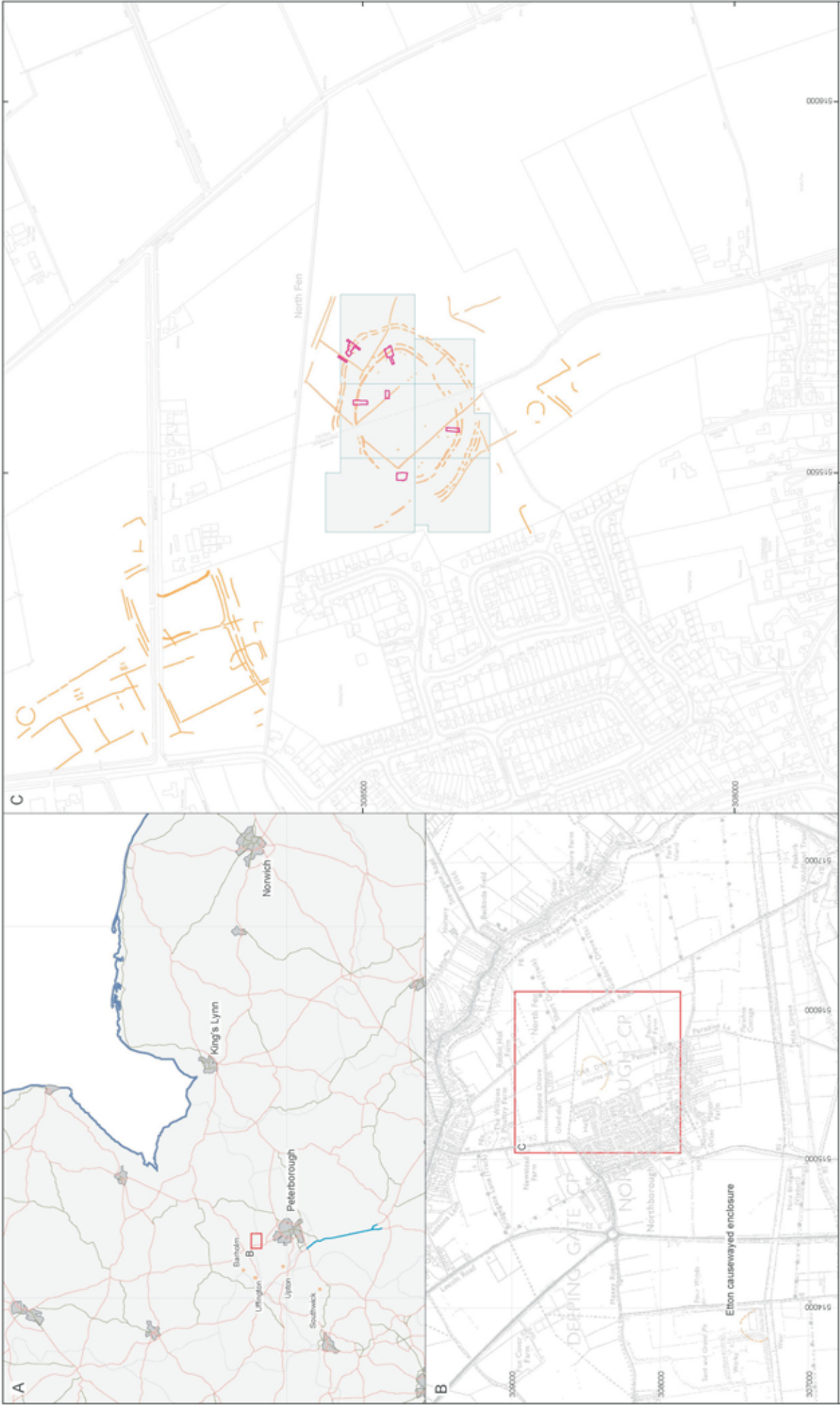
Table 5: Phosphate from north-south transects (mg P per 100g soil)

Trench	Sample point			
	North	South	West	East
1	-	-	66	112
2	-	-	52	56
3	-	-	100	136
4	64	112	96	116
6	-	56	-	-
7	112	-	112	56

Table 6: Phosphate analysis from trenches (mg P per 100g soil)

Circuit	Ditch	Context	Material	result no	result BP	cal date
<i>Northborough</i>						
Inner	108	107 primary	cf. <i>Alnus glutinosa</i>	OxA-14469	4743±37	3630-3520
			cf. <i>Alnus glutinosa</i>	GrA	results awaited	
Inner	210	207 upper	Pomoideae	OxA-14470	4795±38	3630-3380
			Pomoideae	GrA	results awaited	
Outer	720	722 secondary	Hazelnuts	NZA-21960	4877±25	3710-3640
		721 primary	Auroch distal femur	Fail		
<i>Etton</i>						
Base pit cut into ditch seg 6			Roundwood	BM-2891	3680±35	2200-1940
Basal fill ditch seg 5			<i>Bos taurus</i> tibia	BM-2723	4730±90	3560-3360
Butt end seg 3			Roundwood	BM-2889	4840±50	3720-3510
Basal fill ditch seg 11			<i>Bos taurus</i> innominate	BM-2724	4920±70	3940-3530
Basal fill ditch seg 1			Roundwood	BM-2890	4820±45	3710-3510
Basal ditch fill, segment 1			<i>Sus domesticus</i> tibia	BM-2765	4960±90	3970-3530

Table 7: Results of radiocarbon determinations from Northborough and Etton
Shaded = not positively archaeologically reliable (Healy pers. comm.)



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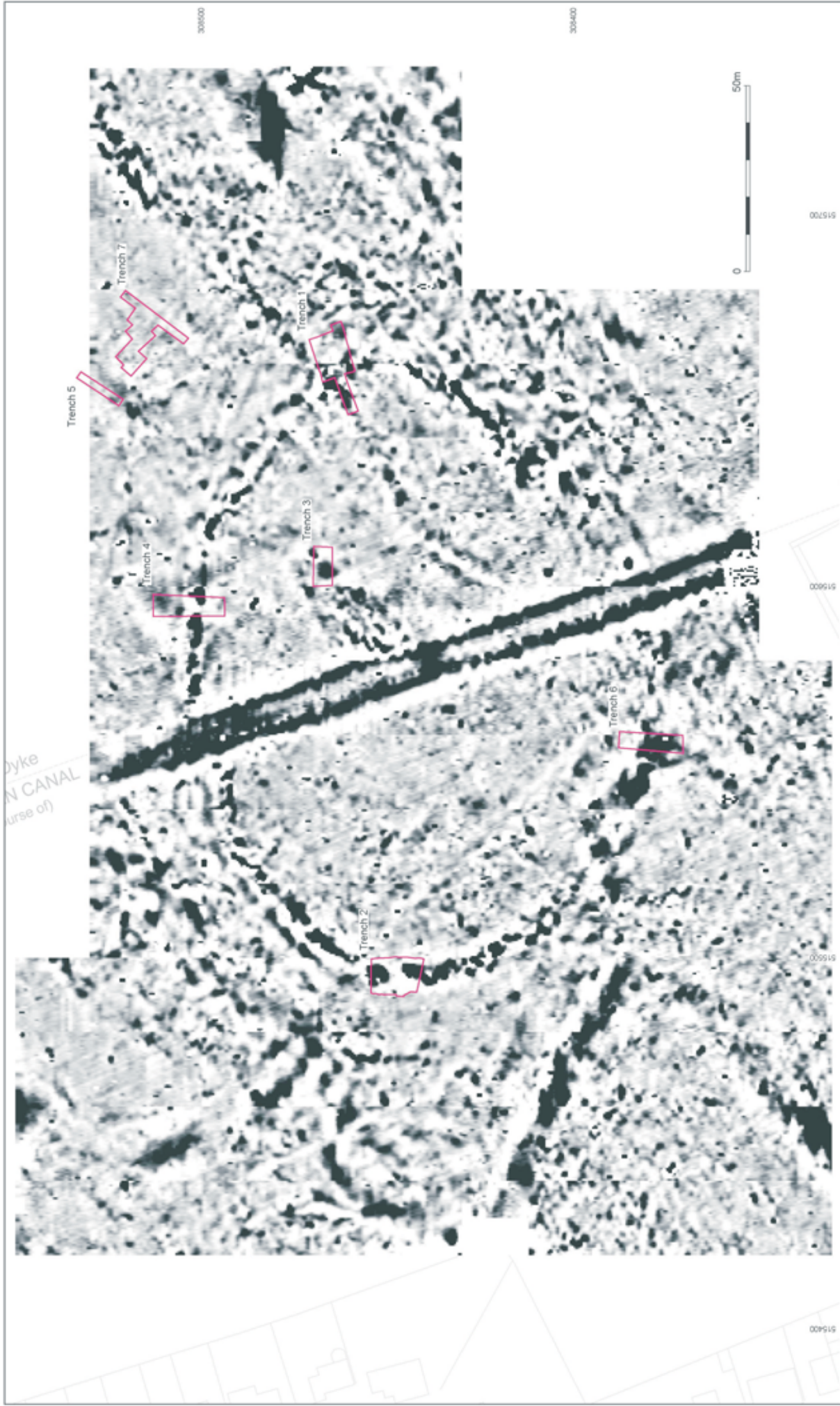
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Legend:
 ■ Geophysical survey area
 — Trenches
 — Cropmarks
 • Causewayed enclosures

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Site location with air photograph plot and trench locations Figure 1

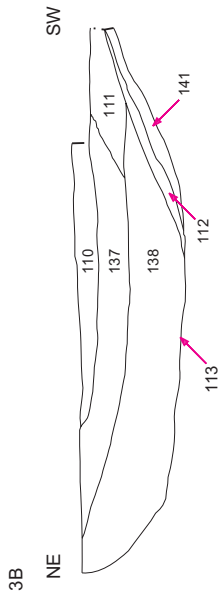
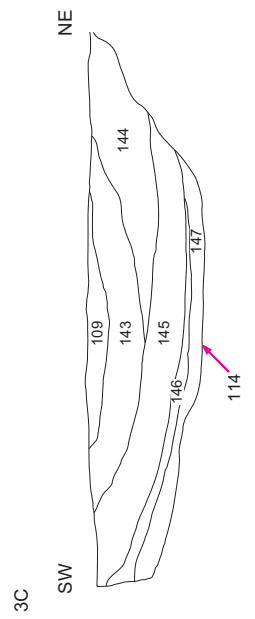
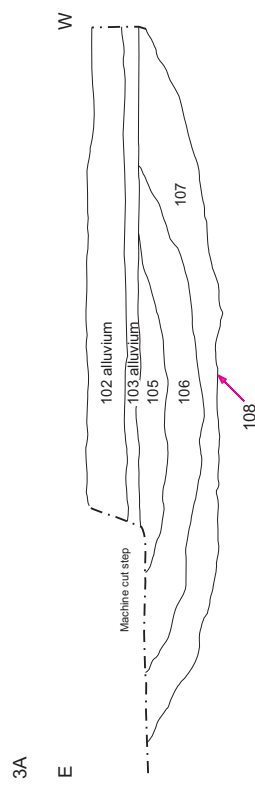
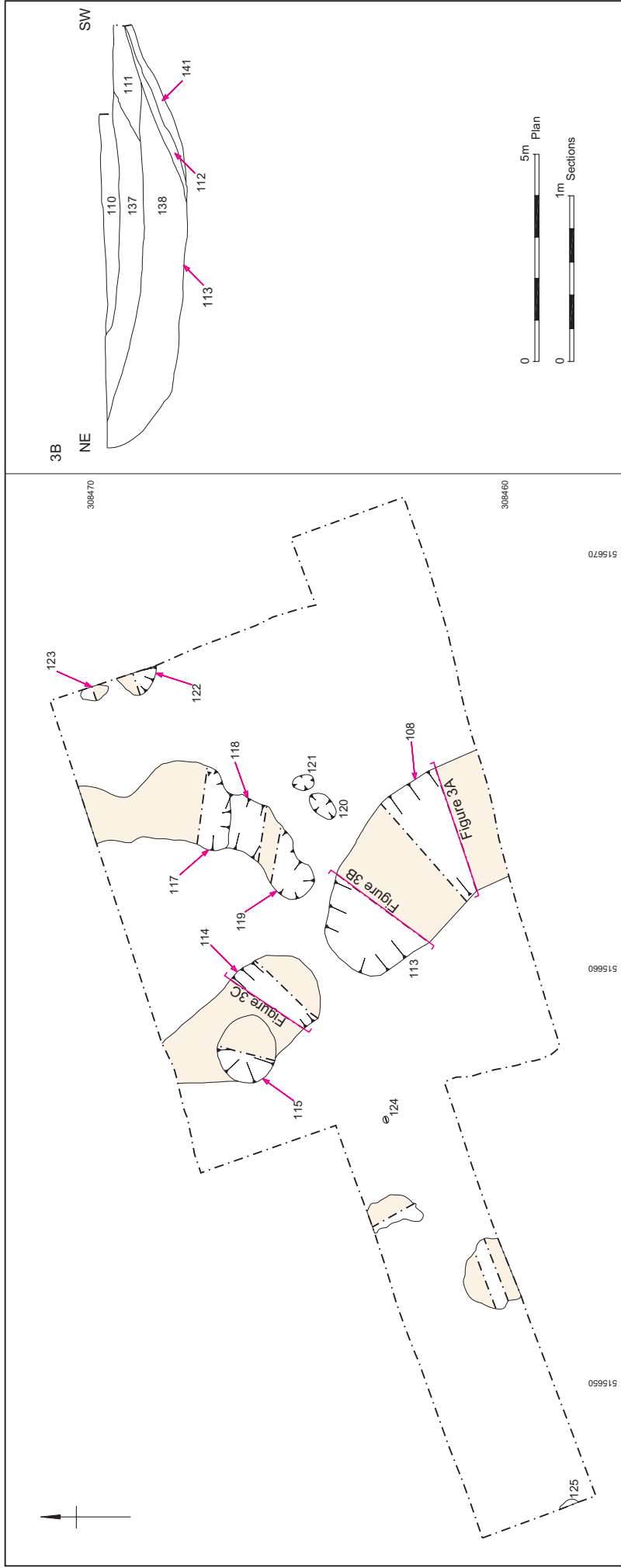


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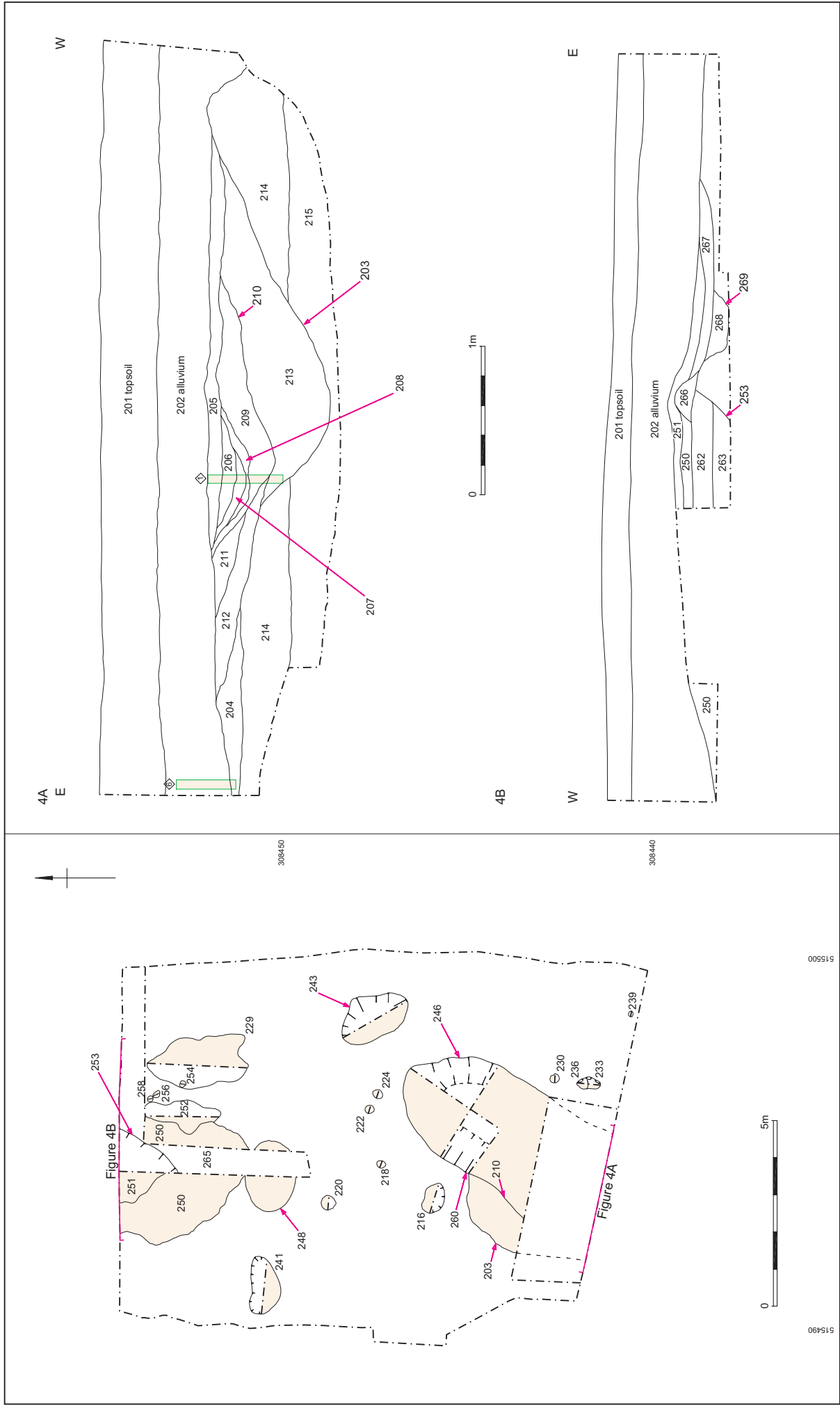
Geophysical survey plot with trench locations





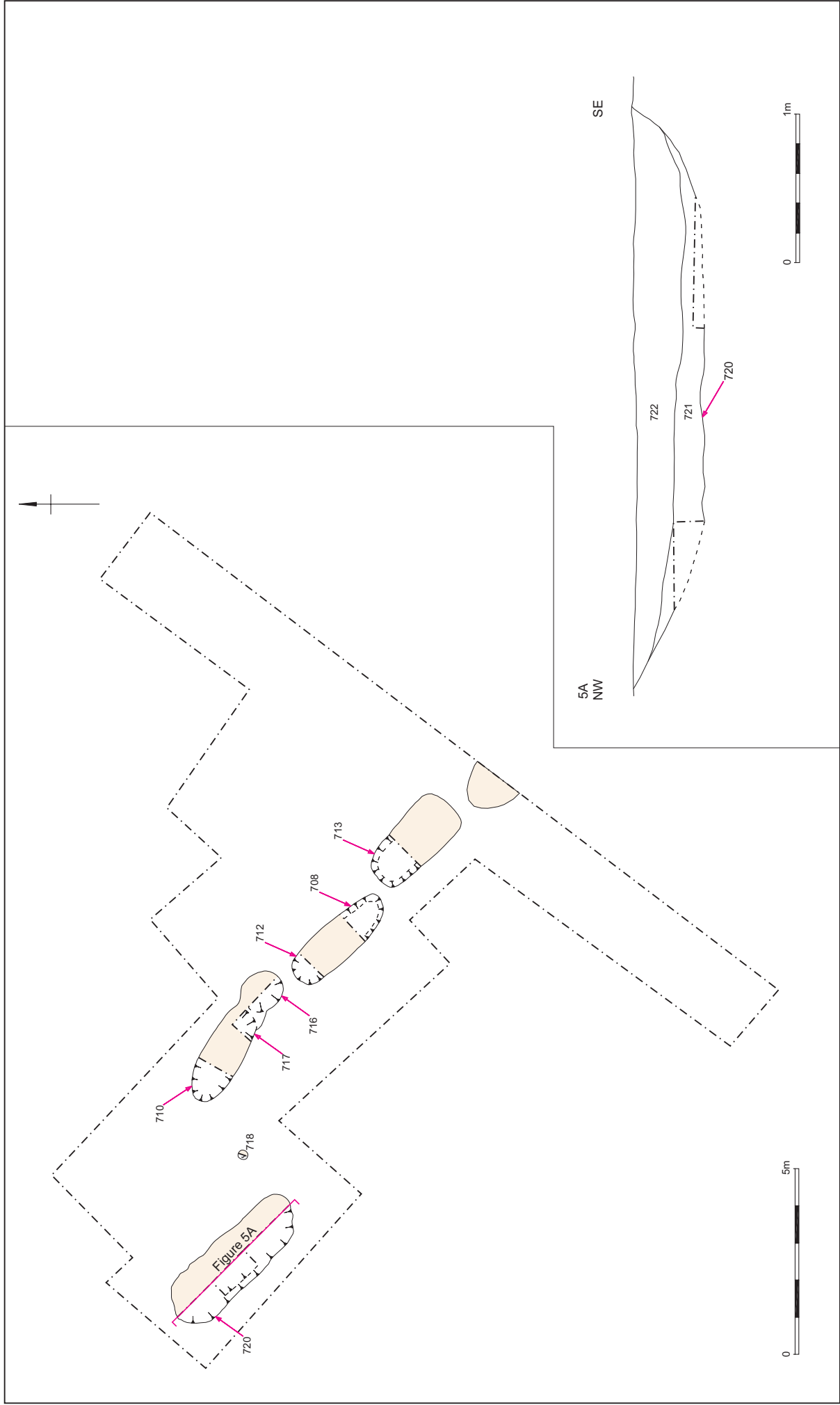
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Trench 2: plan and ditch sections 203 (and re-cut 210) and 253



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