ISSN 1478-7008

ENGLISH HERITAGE

Prehistoric embanked pit-alignments on Ebberston Low Moor, Ryedale, North Yorkshire

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SURVEY REPORT

Archaeological Investigation Report Series AI/7/1999

PREHISTORIC EMBANKED PIT-ALIGNMENTS ON EBBERSTON LOW MOOR, RYEDALE, NORTH YORKSHIRE

Archaeological Investigation Report Series AI/7/1999

NMR Nos: SE 98 NW 10, 11, 5 and 112
NGR: SE 905 887
RSM: not scheduled

Surveyed January - March 1999
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ISSN 1478-7008

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1. INTRODUCTION AND BACKGROUND TO THE SURVEY

Between January and March 1999, a field investigation team from the York office of the Royal Commission on the Historical Monuments of England (RCHME) undertook a 1:1000 scale earthwork survey of a series of well-preserved pit-alignments on Ebberston Low Moor, North Yorkshire (NGR SE 905 897), which is located approximately 10kms north-east of Thornton-Le-Dale, on the northern fringe of the Tabular Hills (Figure 1). This type of prehistoric territorial boundary is generally known from aerial photography, with some limited excavation; few examples have been recorded by surface survey (see Waddington 1997). However, on Ebberston Low Moor, the high quality of earthwork preservation suggests this group may be of outstanding importance in understanding the evolution of this type of monument during the prehistoric period.

The survey was initially requested and partially funded by the North York Moors National Park to assist in the development of an appropriate management and conservation strategy; additional funding was provided by English Heritage. Although recorded since the 19th Century, the pit-alignments were not scheduled at the time of this survey. Following the completion of the survey, and before this report was prepared, the RCHME was merged with English Heritage, and this report is presented as the work of the succeeding organisation.

Prior to the commencement of the survey, two roughly parallel, 'possible' pit-alignments oriented roughly north-south, and an east-west oriented 'linear earthwork' were already established in the National Monuments Record (NMR Nos. SE 98 NW 10, 11 and 5 respectively). This new survey has confirmed the

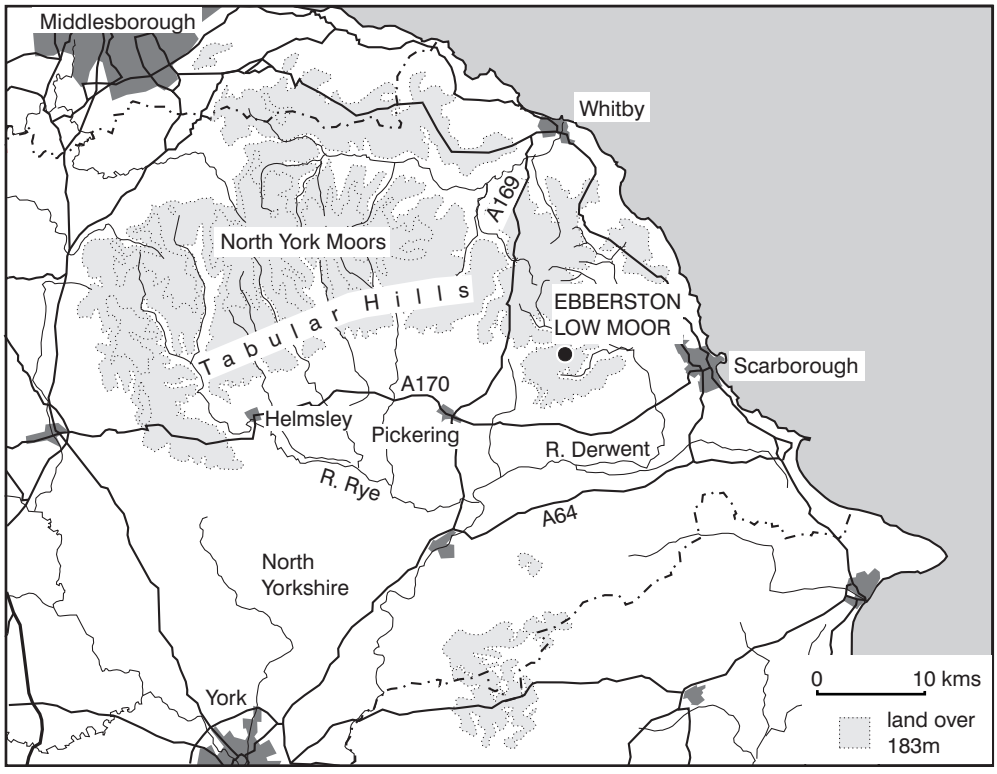

Figure 1. Location

identification of the two 'possible' pit-alignments as *embanked* pit-alignments and demonstrated that they differ from each other in form and date and have a relative chronology. Previously unrecorded lengths of this pair have also been identified for the first time. In both instances the exceptionally high standard of earthwork preservation allows the identification of substantial banks running alongside the pit-alignments. These clearly contributed significantly to the form and appearance of the boundaries, and may arguably be regarded as being of equal, if not greater importance than the pits themselves. The term *embanked* pit-alignment is therefore used throughout this report. The survey has further demonstrated that the other 'linear earthwork' is also an *embanked* pit-alignment, part of the same network and comparable in form to the last phase of the other two. Significantly, this latter embanked pit-alignment is partially overlain by a round barrow of probable Bronze Age date (NMR No. SE 98 NW 17), suggesting that these alignments may be late Neolithic or at latest Bronze Age in date. The survey has also identified a completely unrecorded *embanked* pit-alignment to the west of, and parallel to, the two north-south alignments that were previously recorded, and remnants of two other possible alignments. Other prehistoric activity has been identified, and a number of post-medieval monuments have been recorded for the first time, including hollow-ways, quarries and an isolated boundary stone (see Figure 32).

Historically, a number of identifiers have been applied to the pit-alignments and linear monuments on Ebberston Low Moor. To aid clarity of description and referencing in this report these have been replaced by a single unique identifier for each monument (eg Embanked Pit-Alignment 1 is referred to as EPA1 etc), and a concordance of numbers given (Appendix 3).

2. GEOLOGY, TOPOGRAPHY AND LAND-USE

The Tabular Hills are formed by calcareous Corallian grits and limestones of the Upper Jurassic Series. The northern edges of the range are characterized by steep north-facing escarpments cut by deep north-south valleys and dales, resulting in the formation of discrete plateau-like areas. Overall, these gently dip to the south where they disappear below the post-glacial alluvial deposits which form the Vale of Pickering (Wilson 1971; Spratt 1989). Ebberston Low Moor, which attains a maximum height of 244m above OD is one of these plateau areas.

The main valleys and dales which define the discrete topography of Ebberston Low Moor are the Long Grain valley at the south, which from its head, close to Ebberston Common Farm, opens southwards into the deeply incised valley of Trouts Dale, to the east by a valley-head off Rosekirk Dale, and to the north by the valley-head of an

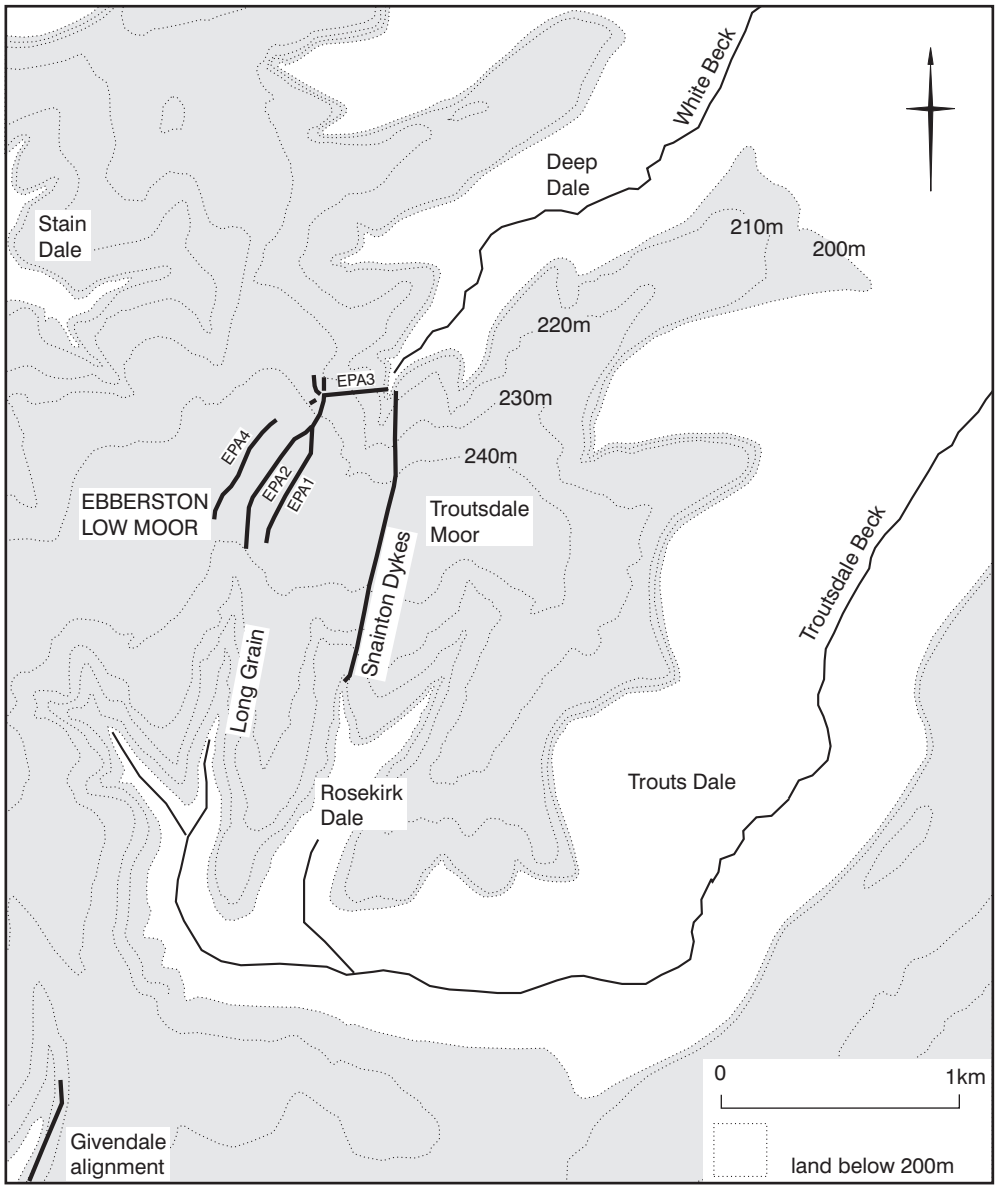

Figure 2. Topography of Ebberston Low Moor

offshoot of Deep Dale (Figure 2). At a point between these two latter valley-heads, which are only *c* 700m apart on a rough north-south line, a watershed runs approximately in an east-west direction with gentle falls to the north and south. To the west the ground is generally level for *c* 1 km before the dendritic spur valleys off the east-west oriented Stain Dale are encountered. Three embanked pit-alignments (EPA1, EPA2, EPA4) cross this watershed roughly in a north-north-east -south-south-west direction effectively linking the valley-head of the Long Grain and two offshoot valleys at the southern end of Deep Dale. The eastern of these two valleys, which runs in a north-south direction, is narrow and deeply incised at the point where the fourth main embanked pit-alignment (EPA3) runs transversely across and down its west side. This contrasts with the other terminals of the embanked pit-alignments which end or appear to end at, or close to, valley-heads that possess open, generally smooth and wider profiles.

Within the area of survey, an understanding of the archaeological earthworks is complicated by a combination of underlying geology, patterns of land improvement, modern land-use, and impeded drainage. These factors have all influenced the survival and form of the monuments. The underlying joint pattern of the limestone geology on the watershed is reflected on the surface by a dense rectilinear pattern of natural clayey soil-covered humps and hollows; in some places, localised deposits of sand above the limestone are visible. In Field 1 (see Figures 3 and 8), which at the time of survey was defined by a post and wire fence, there has been no modern land improvement, with many of the limestone joint lines being water-filled and boggy, thereby isolating a number of drier 'islands' which generally host a mixture of rough grasses. During periods of heavy rain and after snow-melt, this whole area is subject to more widespread flooding. A number of sink-holes into the underlying limestone are evident in this area, but these are generally confined to the line of the embanked pit-alignments and therefore probably result from collapse of artificially dug pits into joints in the limestone. Within this unimproved area are two irregularly-shaped ponds which were dug within recent years to attract wildfowl. Across the southern end of this unimproved area is a thin strip of coniferous woodland known as Ebberston Common Plantations. Much of the plantation is unmanaged and in poor condition with considerable numbers of fallen trees lying rotting on the surface, which is generally boggy.

Air photography indicates that the fields to the east, north and west of Field 1 were improved from poorly drained moorland (similar to Field 1) to grassland at sometime between 1953 and 1971 (RAF 1953; Ordnance Survey 1971) and at the time of survey Fields 2 and 3 were down to grass pasture for sheep. These fields have been drained, although some of the deeper hollows still retain water and become liquid mud after periods of heavy rain. To the south-east of Ebberston Common Farm, Field 4 (crossed by two roughly metalled tracks) and Field 5 are also down to grass pasture for sheep, although as they are on south and west sloping ground they are better drained. To the north, Field 6, which was also converted from moorland to grassland between 1953 and 1971 (*ibid*), had been ploughed shortly before the survey and planted with a cereal crop, although the surface was still visible. At the very north and north-east of the survey area are two areas of coniferous woodland, both of which showed evidence of clearance within recent years. Two main areas of abandoned quarries have been identified; these are described below.

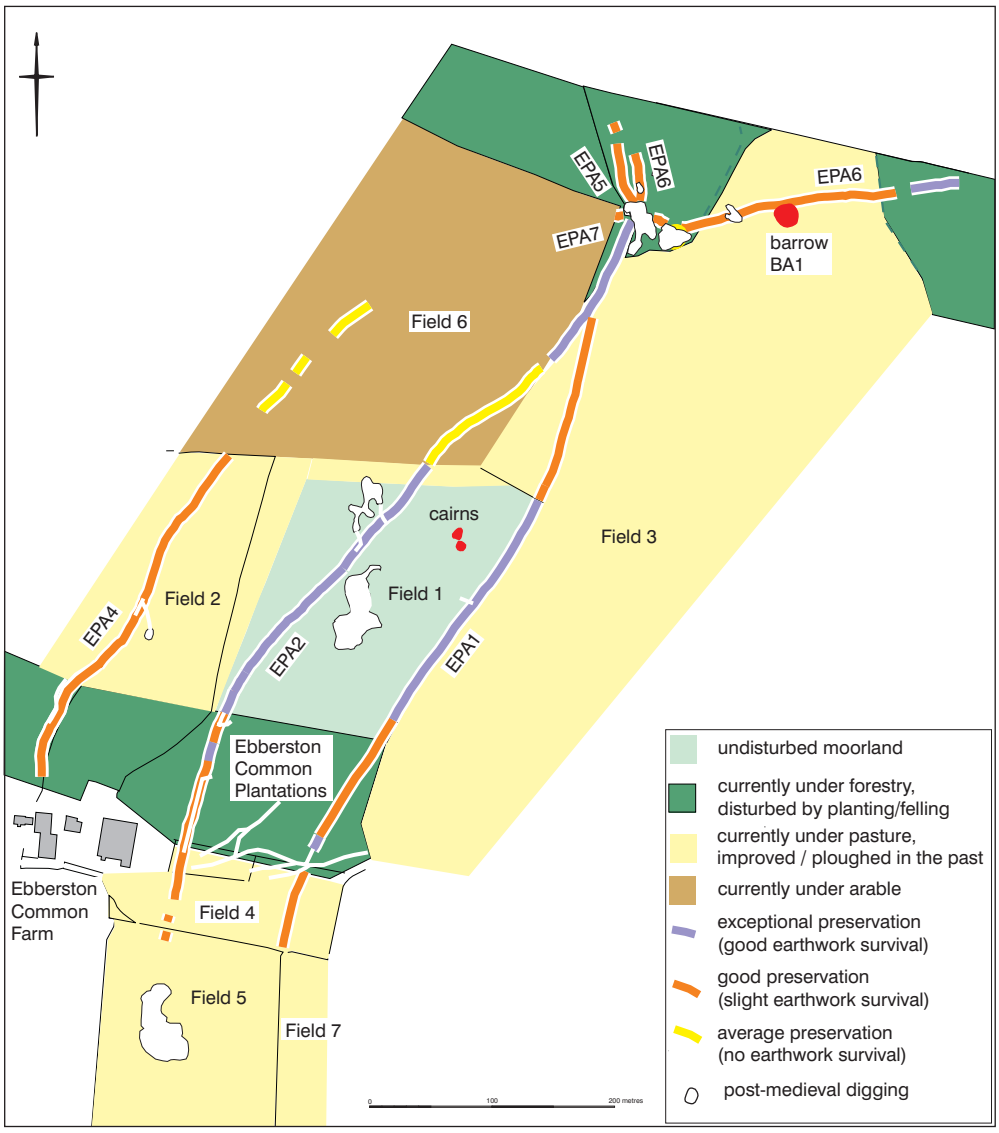

Figure 3. Land-use and monument condition

3. HISTORY OF RESEARCH

The first reference to pits on Ebberston Common is by Young (1817), and although he is almost certainly referring to the group which is the subject of this survey, his description is not particularly revealing. As was the antiquarian fashion of the day, the pits were interpreted as 'human abodes of a very ancient date', an interpretation followed by other commentators (Atkinson 1865; Greenwell 1865). Alternative explanations were offered by geologists of the day, who variously interpreted the pits as explorative quarrying for ironstone and natural features (Fox-Strangways 1882; 1893 - quoted in Mortimer 1895, 267).

The first cartographic record of linear monuments on Ebberston Low Moor appears to be by the Ordnance Survey when this area was surveyed at 1:10560 scale in 1848

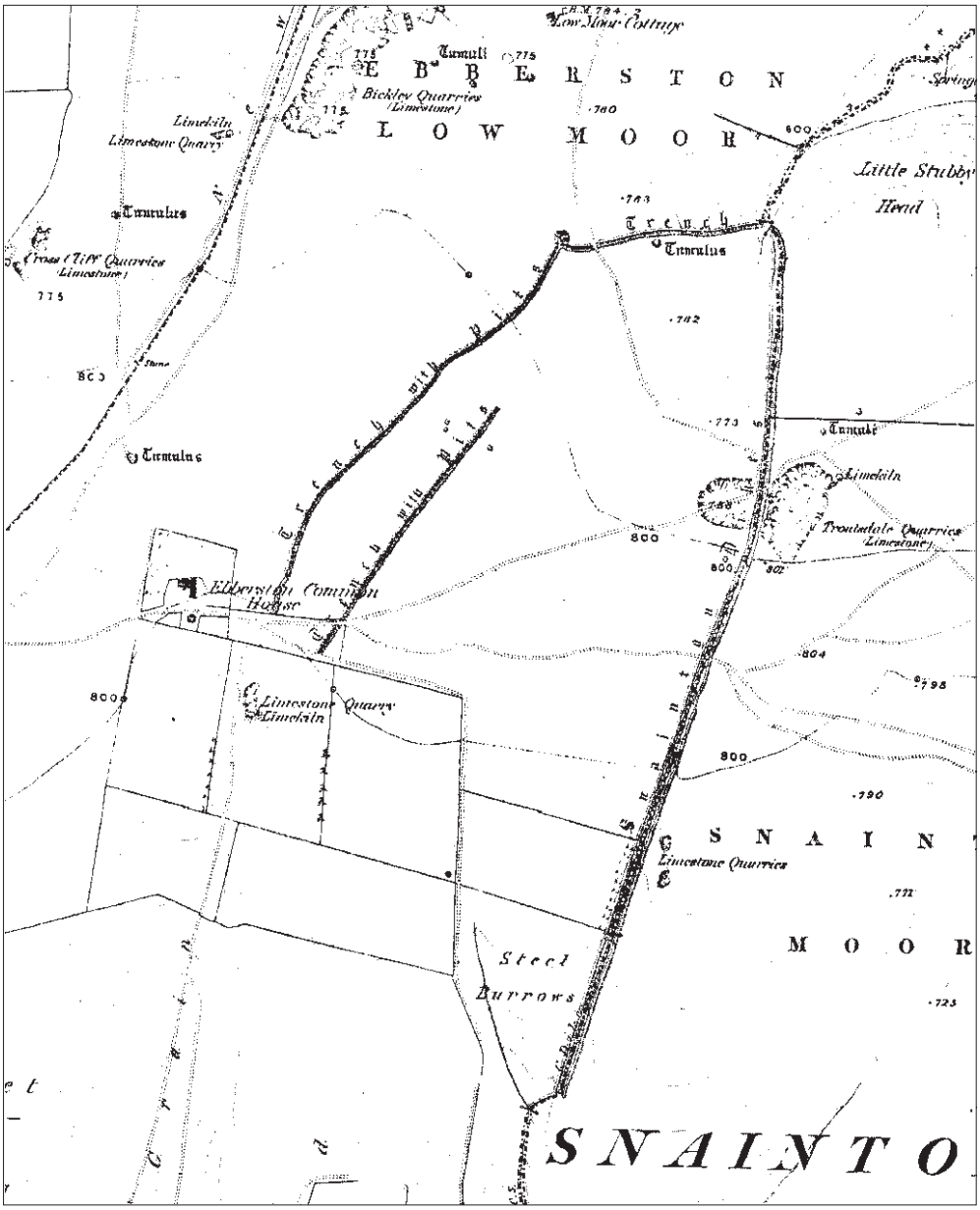

Figure 4. Ordnance Survey 1854: extract from 1:10560 scale map

(Ordnance Survey 1854 - see Figure 4). Embanked pit-alignments EPA1 and EPA2 are annotated 'Trench with Pits', whilst EPA3 is annotated 'Trench', all in the typeface used to denote antiquities. Significantly, this map depicts an almost right-angled joining of EPA2 and EPA3, immediately south of what appears to be a quarry, although this feature is not annotated. At this date, the northern end of EPA1 is shown ending abruptly at the north end of Field 1, and the south end is shown continuing through Field 4, terminating some 30m west of the junction of the eastern boundary of Field 5 and the south-east boundary of Field 4. The 'Tumulus' depicted immediately south of EPA3 is undoubtedly barrow BA1 as recorded in this English Heritage survey. Two unannotated circular features are depicted in the area between EPA1 and EPA2, and another to the east of EPA1. The former correspond to cairns BA3 and 4, and the latter can be presumed to represent a similar monument which has subsequently been robbed and/or levelled by ploughing (BA2).

The earthworks are first described in any detail by J R Mortimer (1895). He describes them thus;

> *In the southern end of the largest of these two excavated lines* [this is probably EPA2] *the pits are very similar in appearance to those on Allerston Warren to the south; but in preceding northwards along the line, they were observed to increase in length; and to run somewhat into each one another. This tendency continued to increase till they finally formed a continuous trench before reaching the north end of a double entrenchment, which met them at right-angles, and the two seem to end in one of the southern branches of Deep Dale.*

From Mortimer's geographical description, the pits on Allerston Common, to which he compares the examples on Ebberston Low Moor, appear to be the Givendale pit-alignments (NMR No: SE 88 NE 19; Spratt 1989 - C24 – see Figure 2); he describes these pits as being 5-6 feet (1.5m-1.8m) in diameter, 9-10.5 feet (2.7m-3.2m) between pit centres with undisturbed ground inbetween measuring 2-3 feet (0.6m-0.9m) in width; he also notes that in a branch to the west the distance between pit centres increases to 12-13.5 feet (3.6m-4.1m). He also recognised in this group that some pits appeared to have been enlarged. The 'double entrenchment' he refers to is the probable prehistoric boundary earthwork known as the Snainton Dykes (NMR No. SE 98 NW 9).

The resurvey of Ebberston Low Moor in 1890 at the larger scale of 1:2500 by the Ordnance Survey (1892), permitted a clearer cartographic representation of the monuments as they appeared at that date (see Figure 5). The majority of EPA2 - still annotated 'Trench with Pits' - is shown as having double banks, with pits along the central depression; the pits appear to be represented schematically. Also annotated 'Trench with Pits', the majority of EPA1 is depicted in a similar way to EPA2. Other significant changes in depiction from the earlier mapping occur at the southern end of EPA1, south of Ebberston Common Plantations, where it is shown only as a ditch, curving toward the eastern boundary of Field 5. This is in contrast to the earlier portrayal where it had a more south-westerly route. EPA3 is shown simply as a narrow 'Trench', and the junction between this and EPA2 is no longer shown, 'Old Quarries' now being depicted in this area. The two cairns (BA3 and BA4) are indicated by symbols and annotated 'Tumuli (Site of)', and BA2 is depicted as a

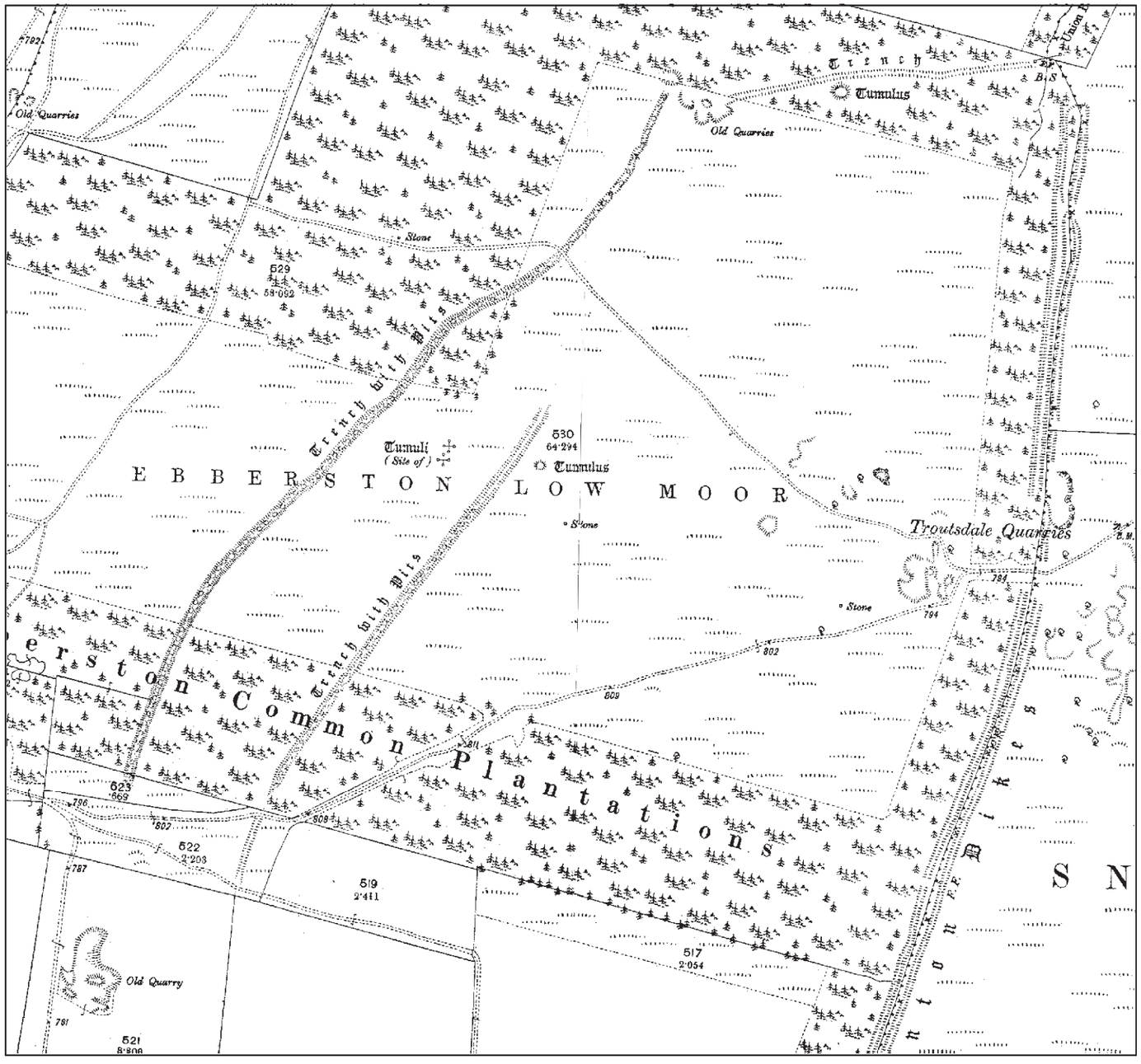

Figure 5: Ordnance Survey 1892:extract from 1:2500 scale map

mound and annotated 'Tumulus'. The appearance on this later map of Ebberston Common Plantations, a large block of coniferous woodland across the north of the survey area, and a number of associated boundaries, indicates that these were all created at some time between 1848 and 1890.

The monuments were next investigated in 1954 by F C Rimmington and J G Rutter (Rutter 1954) as part of a survey of earthworks in north-east Yorkshire. EPA1 is described as the 'Ebberston Common East Dike', EPA2 as 'Ebberston Common West Dike' and EPA3 is described as being simply a ditch between two banks. Rutter, in a later record of 1958, also notes the large round barrow (BA1) has a central pit (NMR No. SE 98 NW 17 - Authority 2) but seems to not have recorded the three other 'Tumuli' sites shown on earlier maps.

Further descriptions are provided by D Smith, the Ordnance Survey Archaeology Division investigator, in 1972 (NMR No. SE 98 NW 10 - Authority 3). He describes the flanking banks on the 'Ebberston Common East Dike' (EPA1) as being virtually non-existent and the pits as being outstanding features. Smith makes similar comments about the banks on the 'Ebberston Common West Dike' (EPA2) where it passes through Fields 1 and 2, although he describes the ditch with pits as being extant throughout (NMR No. SE 98 NW 11 - Authority 3). As for EPA3, Smith describes its form as being a ditch with flanking banks, although apart from one short stretch these are noted as being very fragmentary (NMR No. SK 98 NW 5 - Authority 3). Depictions on the edition of the 1:2500 map subsequent to this investigation (Ordnance Survey 1973) reflect these changes from the earlier maps. Other 'Tumuli' in close proximity to the alignments were recorded at this time (NMR No. SE 98 NW 17, 61, 62 - BA1, BA2, BA3 and BA4 respectively).

Prior to the English Heritage survey, the most comprehensive assessment of the pit-alignments on Ebberston Low Moor was undertaken by Spratt (1989), as part of a wider study of the linear earthworks of the Tabular Hills. In this study the term 'pit-alignment' is used for the first time and applied to the two 'linear monuments with pits' previously recorded. Spratt also suggests that these pit-alignments on Ebberston Low Moor form sub-divisions of the main system of prehistoric dykes and territorial boundaries (1989, 14).

4. DESCRIPTION AND INTERPRETATION OF THE EARTHWORKS

Embanked Pit-Alignments (see Figures 6-8)

The earthwork remains of four embanked pit-alignments survive on Ebberston Low Moor. Although modern and historical land-use has differentially affected the current physical form and survival of the monuments, overall the quality of preservation is very good, allowing details of constructional morphology and phasing to be determined. There are some differences in the perception of the physical properties of the alignments between the current survey and earlier descriptions and cartographic depictions (Ordnance Survey 1854; 1892; Rutter 1954; NMR records) outlined in **Section 3** of this report.These can all be explained by destruction of parts through land-use change, detail being obscured by moorland vegetation, bog and tree cover before improvement, and absence of analytical observation of a monument type which still is only recently becoming understood in an earthwork form. For ease of description each alignment is divided into sections (see Figure 7).

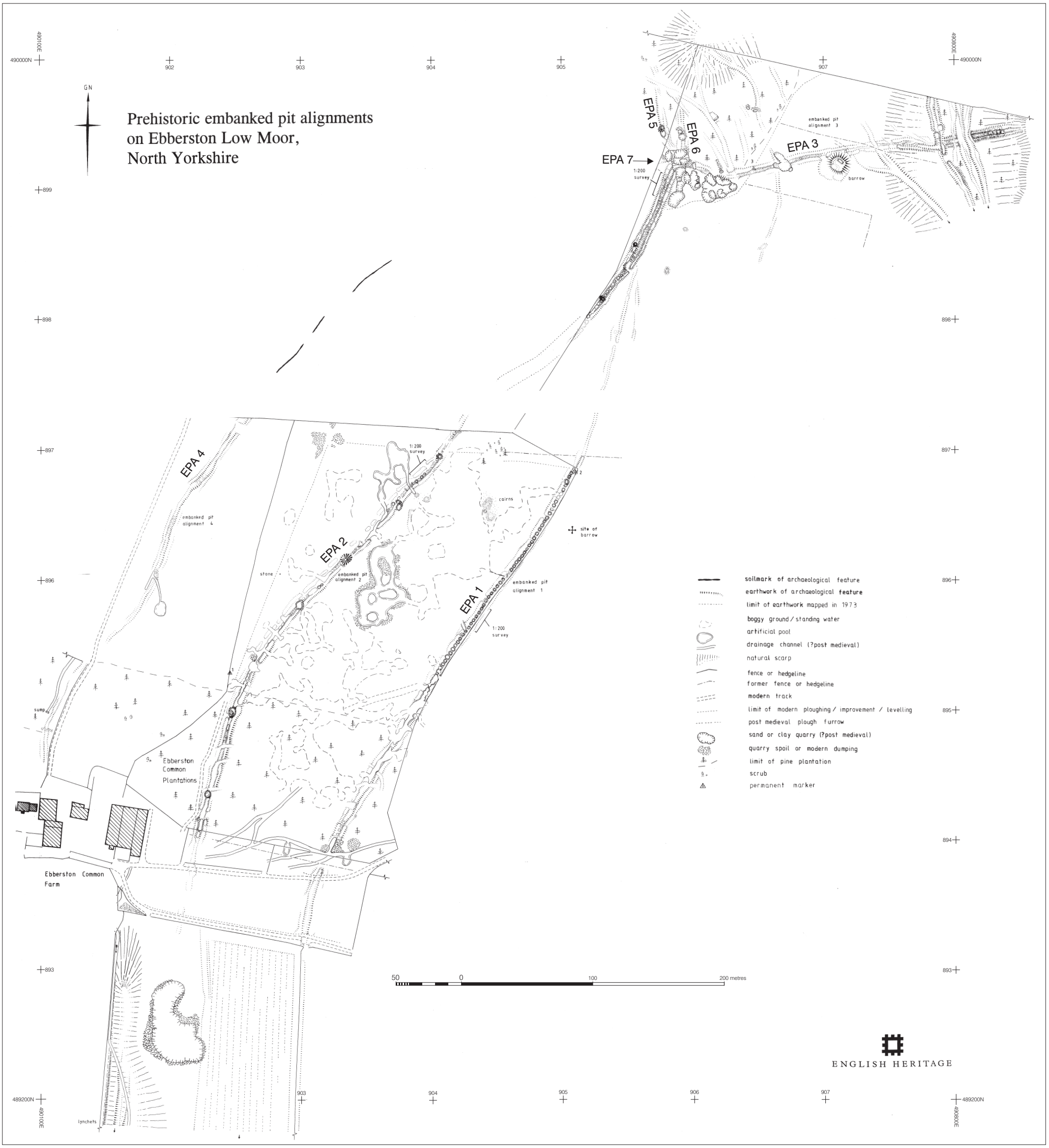

Figure 6: The English Heritage survey (reduced from the original at 1:1000 scale)

Figure 7: Key to sections described in the report

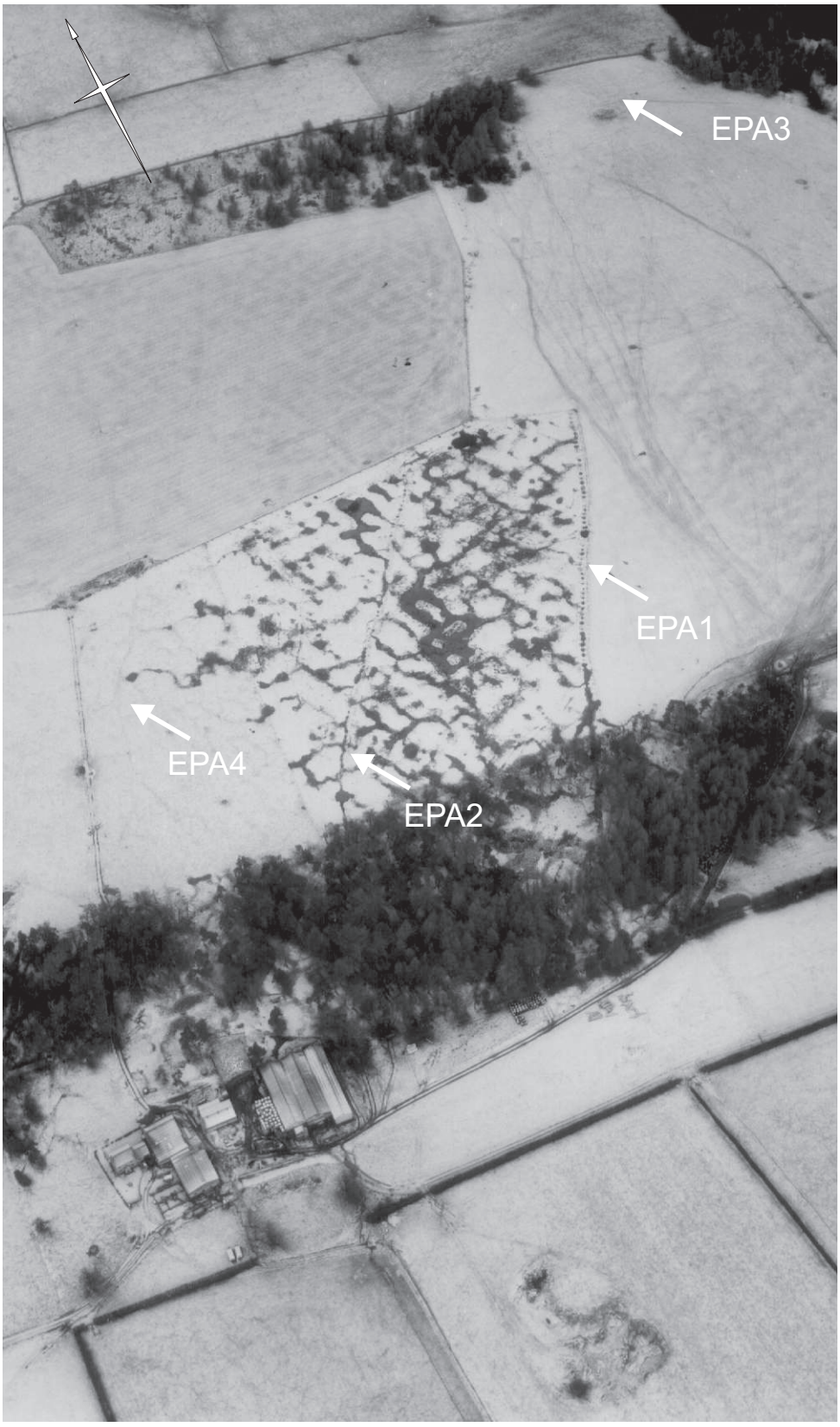

Figure 8.
Air photograph of Ebberston Low Moor from the south (NMR 17210/44)

Embanked Pit-Alignment (EPA1): NMR No. SE 98 NW 10

NGR SE 90300 89318 - SE 90557 89845

This embanked pit-alignment survives as a surface earthwork for *c* 590m. Its original form is best preserved in Section D, where it takes the form of a double-banked linear earthwork with a medial line of deep sub-rectangular pits separated by narrow strips of intact ground. The variety of form along the rest of the alignment is directly attributable to the effects of differential land-use. Rutter (1954) described this monument as being 'a shallow ditch between two low banks, with the ditch containing a small number of pits', and Smith (NMR No. SE 98 NW 10) records the flanking banks as being virtually non-existent and the pits as being outstanding. Spratt (1989), describes EPA1 as being 'in good condition with rectangular pits about 3m wide and from 2.3 to 3.0m long, with about 1m between them'. The morphology is much more complex than this (see below). The alignment follows a smoothly curved reversed 'S' route crossing the watershed and plateau of Ebberston Low Moor in a general north-north-east - south-south-west direction. Prior to this survey, the most up-to-date mapping (Ordnance Survey 1973) showed it as being *c* 340m in length and terminating abruptly at the northern edge of Field 1, but it is now clear that its line continued further northwards, ultimately to be joined and overlain by a later embanked pit-alignment (EPA2). A total of 63 pits have been identified along EPA1; it is estimated that there may have originally been *c* 168 pits (based on a 3.5m separation between centres).

EPA1 Section A (Figure 9)

The southernmost *c* 60m of this alignment lies within Field 4, and is visible mostly as a slight 'ditch-like' depression, averaging 6.0m in width and maximum 0.2m deep; there are intermittent remains of low banks 4.0m-5.0m wide and 0.2m high on either side (A1-A2). This section has been reduced through ploughing and land improvement for pasture, although enough survives to suggest that the banks were probably were originally continuous in a similar way to the alignment further north (Section D). No pits survive as surface features in this section but are visible on recent air photography (NMR 1999). This field has been enclosed since at least 1848 (Ordnance Survey 1854), with the result that the improvement ploughing and infill has destroyed the individual pits as surface features and produced the smoothed 'ditch-like' appearance seen now.

There is no evidence to indicate whether the present southern terminal at A1 is genuine or not. The 'ditch-like' depression simply fades out at the south where it is crossed by a metalled trackway and infilling for the gateway between Fields 4 and 7. Perambulation in the surrounding area produced no evidence that the alignment continues elsewhere. However, the alignment coincides with, and stops only 1.5m short of the line of an embanked hedgerow to the south, which defines the eastern edge of Field 5. Although this hedgerow has a shallow, 3.0m wide ditch along its east side, its present form is entirely consistent with it being a simple drainage ditch. Field 5 has within it ridge-and-furrow ploughing and headlands which respect the hedgerow boundaries; consequently this ploughing is likely to be closely contemporary with, or later than the boundaries, which themselves were laid out

before 1848 (Ordnance Survey 1854). It is possible that EPA1 may have turned south-west down onto the eastern slopes of the Long Grain valley and has been destroyed by this ploughing but there is no direct evidence for this. The present terminal is on a crest of ground which slopes down to the south and west forming the wider valley-head of the Long Grain. The original southern terminal of EPA1 thus remains inconclusive, although the strong relationship between the alignments on Ebberston Low Moor and valley-heads (see below) may suggest that the present terminal is genuine.

There is no ground evidence to support the suggestion that the alignment passed further to the west through Field 4 (see above – **Section 3**), as shown on the map of 1848 (Ordnance Survey 1854). As the later map of 1890 (Ordnance Survey 1892) shows the ditch in the same position as the current survey it is reasonable to assume

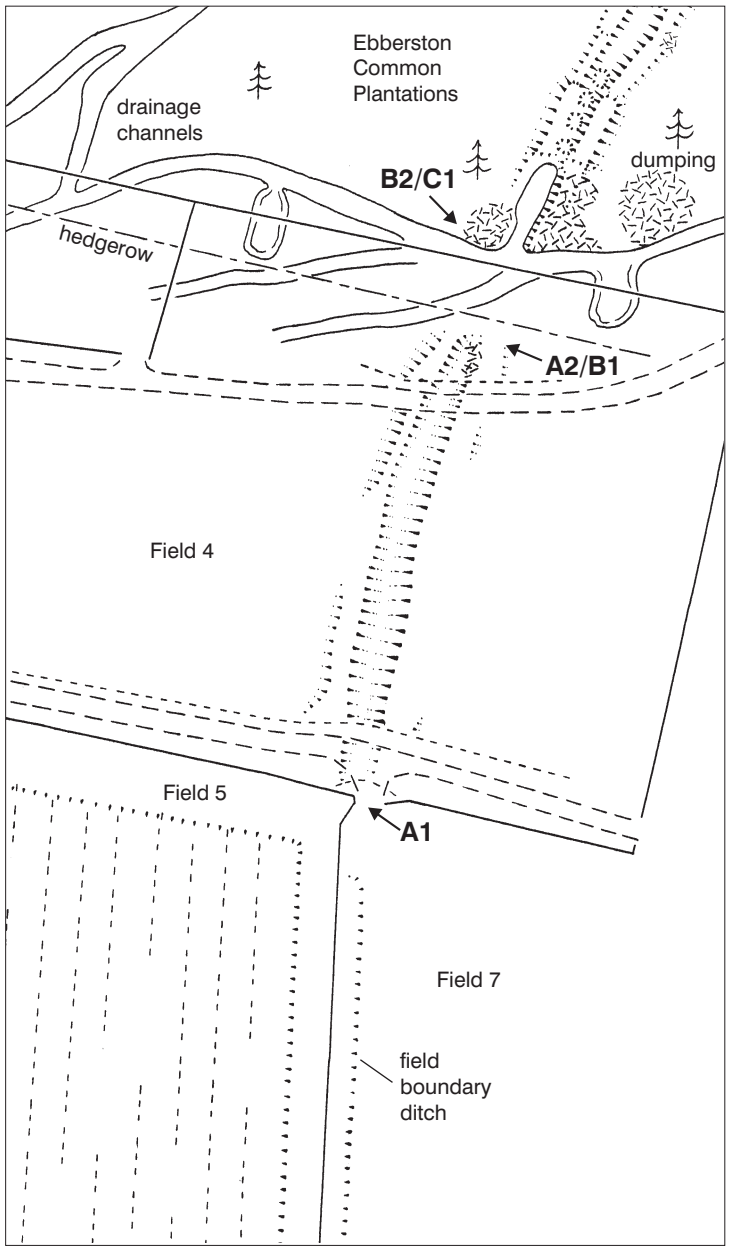

Figure 9. Embanked pit-alignment 1, Sections A and B: extract from 1:1000 scale survey

that the earlier cartography is erroneous in this section. The form of the northern end of the 'ditch-like' depression and banks (A2) is messy, simply fading away.

EPA1 Section B (Figure 9)

In this section (B1-B2), a combination of infilling associated with a trackway on the line of one shown on the 1848 map (Ordnance Survey 1854), the erection of a modern post and wire fence, the digging and laying of a hedgerow, which is probably the boundary set between 1848 and 1890 (Ordnance Survey 1854; 1892), and the cutting of a number of ditched drains, have all effectively destroyed the surface traces of the monument for the next *c* 12m. As the drains are overlain by hedgerow they must have been cut prior to 1848.

EPA1 Section C (Figure 10)

For a distance of *c* 140m through Ebberston Common Plantations, where the ground is very boggy, and slightly beyond to the north (C1-C3), the monument has been heavily disturbed by a combination of drain cutting, uprooting of trees, dumping, and cutting of trackways, thus creating variable survival of components along this section. The overall form, although better preserved, is similar to EPA1 Section A, with the dominant feature being a 'ditch-like' depression, 3.0m-4.0m in width and in places up to 0.4m deep. This can be attributed to re-cutting along the line of pits to drain the ground through Ebberston Common Plantations. As this feeds into the drainage network noted above and is mostly confined to the strip occupied by the woodland, this was probably an attempt at drainage utilising the already existing pit-alignment, prior to the establishment of the plantation sometime between 1848 and 1890 (Ordnance Survey 1854; 1892).

Along the eastern side is a rounded earthen bank, 3.5m-4.0m in width, and up to a maximum of 0.4m high; this bank is continuous except where cut by later hollow ways (HW1, HW2) and drainage channels. The western bank is lower and less substantial than the eastern bank, being in most cases no more than 0.2m high and averaging 3.0m in width; here also, any gaps can be attributed to later activities. This difference in the size of the east and west banks is consistent with the best preserved length to the north (EPA1 Section D). The eastern bank is not shown through Ebberston Common Plantations on Ordnance Survey mapping (1892; 1973) although it must have existed at the time.

At the south, a *c* 15m length of this monument reveals its original form. Here, the remains of four pits are evident in the bottom of the 'ditch'. They are equally spaced at 3.5m between centres, crudely rectilinear with curving corners, and have side lengths of 2.0m-2.5m. Here also the banks on either side are better preserved than elsewhere in the remainder of this section. At the north (C2-C3), the curving outlines of five or possibly six pits, similar to those in Section D (see below), could be identified just above the water-level in this flooded section which feeds into the drain network to the south.

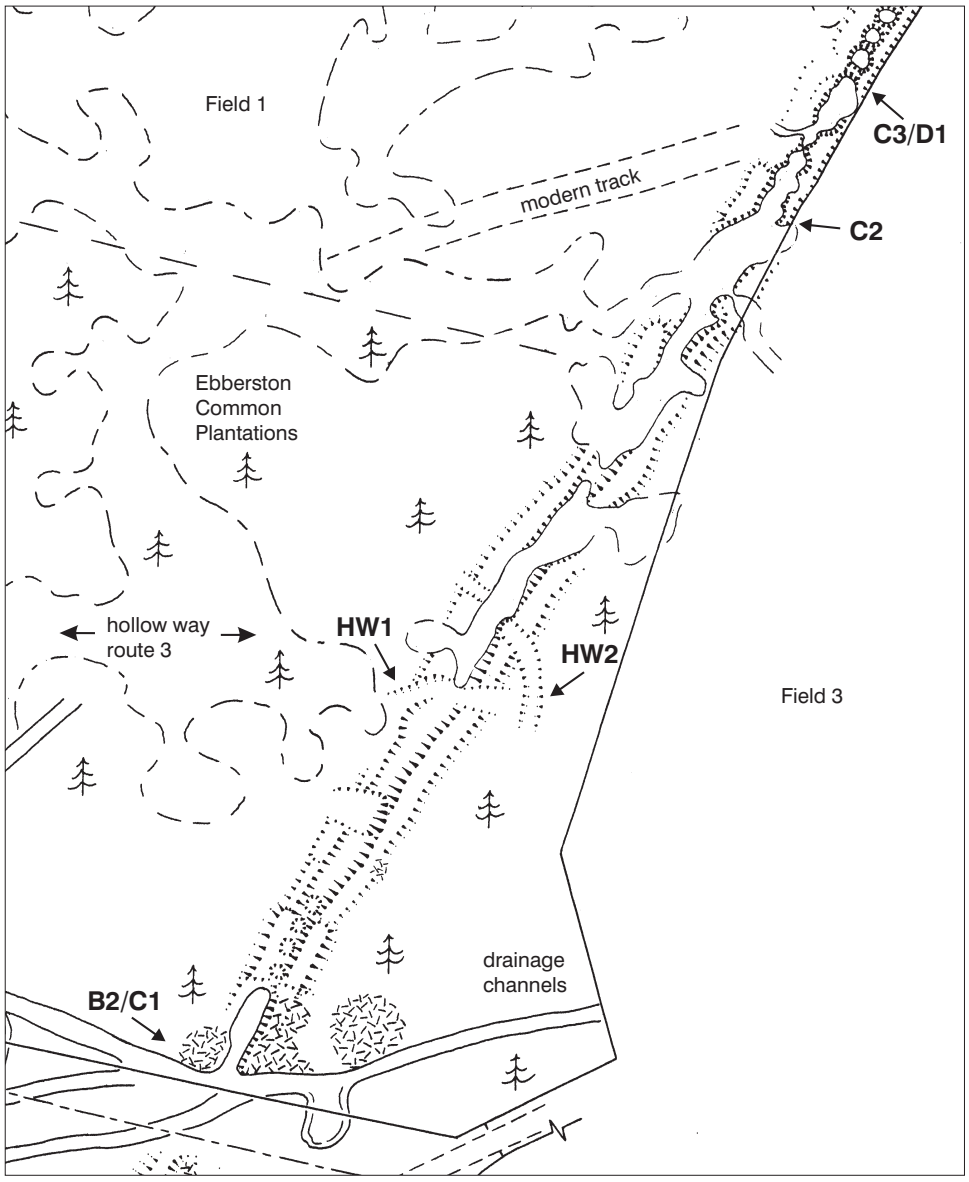

Figure 10. Embanked pit-alignment 1, Section C: extract from 1:1000 scale survey

EPA1 Section D (Figures 11 and 28)

This section (D1-D8) of *c* 190m in length, is outstanding in the level of preservation of the earthworks. It consists of a double bank separated by a medial line of deep pits. The pits, fifty-three have been identified in this section, are square/sub-rectangular in shape, generally with the sides being slightly curved in plan, although in many cases this curving is attributable to scarp retreat. The pits mostly average in length from 2.5m-2.8m and are generally 1.4m-1.6m wide. The pits are equally spaced at 3.5m between pit centres, and have an average depth of 0.5m-0.9m, with strips of intact ground, on average 0.5m wide, separating each from its neighbour. Some of these strips reveal bedrock in them, clearly demonstrating that the pits were conceived and dug as individual units. In most cases, the strips of intact ground are at right-angles to the overall alignment of the pits and banks but occasionally deviate from this norm at a shallow angle. The

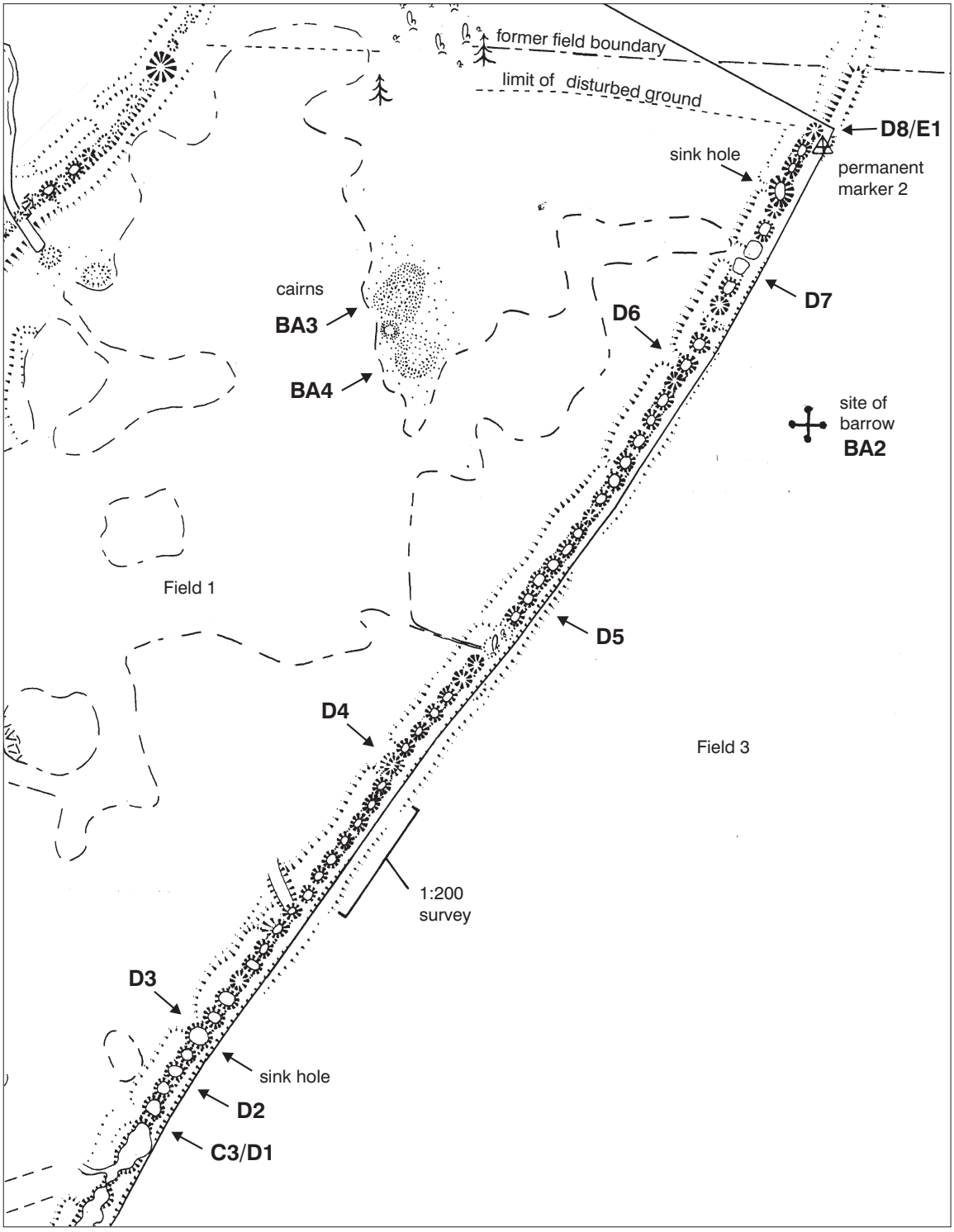

Figure 11. Embanked pit-alignment 1, Section D: extract from 1:1000 scale survey

Figure 12. Ground photograph of embanked pit-alignment 1, Section D, looking south

existence of bedrock close to the surface is indicated by a slight knoll at D4. At this point there is a slight, but distinct offset of the alignment of the pits around this knoll (a number with bedrock visible in the sides), probably a pragmatic response to the difficulty of digging. Also in this section there is a higher degree of stone waste visible in the bank makeup and lying loose in the pits; most of this in the pits appears to have been cast down when the east bank was ploughed (see below). It is also noticeable that the line of pits at this point appear as a series of 'steps' as the ground rises to the knoll, presumably reflecting the depth at which underlying bedrock was encountered during digging. A high proportion of the pits were filled with water at the time of survey, although the few that were dry revealed that the sides tapered almost to a flat bottom *c* 0.8m-1.0m in diameter. Two larger and deeper depressions are interpreted as sink-holes into the limestone below. Although Ordnance Survey maps (1892; 1973) do not show pits in the northernmost 100m of this section they still clearly exist.

Ploughing associated with the improvement of the fields to the east, presumably undertaken during the improvement from open moorland to pasture during the period 1953-1971 (RAF 1953; Ordnance Survey 1971), has considerably damaged the east bank, having sliced into the fabric half way across the width of the bank to a depth of 0.3m along the entire length of this section. At D2, D5, D7, scarps between the wooden post and wire fence and the line of pits evidence this destructive process started prior to the erection of the fence, which appears relatively recent. The remains of the bank on the east side of the fence are fragmentary having been reduced even further, and where visible, are no more than 0.2m high. Despite these destructive episodes, an original bank width of 3.0m-4.0m is indicated. The western bank is less substantial than the eastern, generally flatter, 3.0m-4.0m in width and 0.2m high. As in the other sections to the south, most breaks can be attributed to drainage, either artificial or natural, but at D3, D4, and D6 there are gaps in the bank, 2.5m, 4.0m and 2.0m in width respectively, which cannot be so assigned. That at D6 may simply be a low area between two slight ground rises which are evident here, and D4 is at the apex of the kink in the alignment caused by the underlying rock (see above), and the lack of bank here might simply reflect changing soil conditions; there is no obvious explanation for the gap at D3 although the collapse of the pit opposite as a sink-hole may have caused slippage of the bank. In all three cases there is no break in the line of pits or strips of intact ground between, and no gaps are immediately obvious in the eastern bank although the high level of disturbance precludes observation of fine detail. There is nothing therefore to indicate that any of the gaps identified might be interpreted as crossings. Although the surfaces of both banks appear to undulate as though some sections of bank are higher than others, this is simply the result of the bank material reflecting the rises and hollows caused by the erosion into the underlying limestone geology.

EPA1 Section E (Figure 13)

This section (E1-E6), *c* 160m in length, runs diagonally through Field 3, and has never been previously identified. It consists of a continuous low bank, 0.2m high and 3.0m-4.5m in width, continuing the line of the eastern bank in EPA1 Section D. At E1, a *c* 12m length north of the wooden post and wire fence is the highest (0.3m); its abrupt northern end is clearly truncated by a sharply-cut scarp running east-west. This scarp marks the remains of a field boundary depicted on 1972 mapping (Ordnance Survey 1973) since removed, and possibly also the edge of a narrow east-west corridor of disturbance visible on 1971 air photography (Ordnance Survey 1971), possibly the route of a pipeline or track associated with forestry development; the present fence overlies this scarp indicating a date of erection for the fence sometime after 1971. The southern limit of this corridor of disturbance is marked by another scarp.

In three places (E2, E3, E5), remains of a shallow 'ditch-like' depression averaging 3.0m in width, immediately on the west side of the bank are evident. At E5, in the bottom of this 'ditch', there are the slight remains of a pit. The overall form of the earthwork here is similar to EPA1 Section A, and again this is almost certainly due to plough damage, the 'ditch' resulting from the coalescing of pits during ploughing and infill. A narrow gap in the bank at E4 is very distinct, but given the variety of breaks evident in other sections, the remains are too reduced to make any

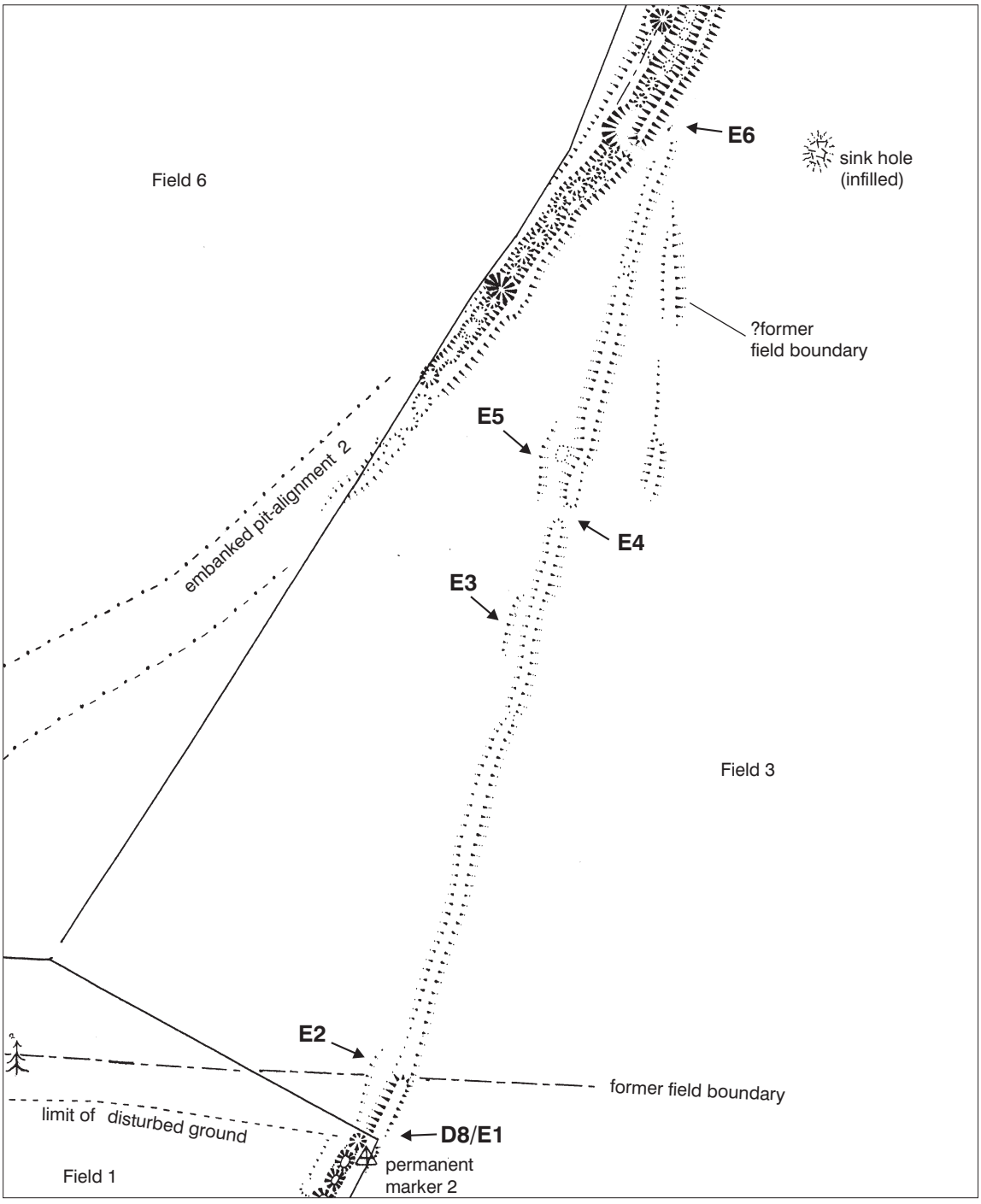

Figure 13. Embanked pit-alignment 1, Section E: extract from 1:1000 scale survey

interpretation as to its origin, although it does correspond approximately to the line of a track shown on 19th - century mapping (Ordnance Survey 1892).

At the north, the bank is overlain by the eastern bank of EPA2; this relationship demonstrates that EPA1 is earlier than EPA2. The earthwork evidence in EPA2 Section F (see below) also indicates that EPA2 re-used and remodelled the line of EPA1 which continued further north at least as far as EPA2 Section F, but how far is unclear.

It seems obvious to suggest that the poor definition of Section E is directly attributable to its location within the improved area; clearly this has contributed to its reduced form (as with EPA1 Section A). However, this section has remained undetected until this survey, not being recorded on mapping even before improvement was commenced and therefore it can be assumed that this section was reduced prior to the earliest date of mapping in 1848 (Ordnance Survey 1854). This may be supported by the identification of two curving, low earthen banks, roughly oriented north-south. One, *c* 10m to the east of EPA1 replicates the curve of that alignment, and the other, *c* 100m further east, clearly overlies EPA3 and both do not respect the later layout of east-west boundaries which appear between 1848 and 1890 (Ordnance Survey 1854; 1892). These banks may well relate to a phase of field division prior to 1848, probably using EPA2 as its western boundary, as this alignment has remained intact until relatively recently (see below).

Embanked Pit-Alignment (EPA)2 : NMR No. SE 98 NW 11

NGR SE 90207 89330 - SE 90850 89920

This embanked pit-alignment survives as a surface earthwork for the majority of its length of *c* 725m. A *c* 100m length toward the north (Section D) has been largely destroyed in recent years. Rutter (1954) described EPA2 as a shallow ditch between two low banks, with a considerable number of small pits distributed along the ditch. The pits were described as being of two sizes, some about 3 feet (0.9m) deep, and others about 8 feet (2.4m) deep, the former partly filled with water, and the latter dry. Spratt's later description (1989), suggests the monument had subsequently been slighted with most of the pits being in a very poor condition. Spratt also suggests it was connected to a dyke (EPA3). The new English Heritage survey indicates that the original form of the alignment is much more complicated than previously reported: it appears to have differing original characteristics along its length. Although roughly parallel to EPA1, its course is more erratic and its morphology is different. At the north, it overlies and re-uses the course of EPA1. A previously unrecorded *c* 70m length of the earthwork has been identified at the south. A total of 90 pits have been identified along EPA2; it is estimated that there may have originally been *c* 240 pits (based on an average 3.0m separation between centres).

EPA2 Section A (Figure 14)

This section (A1-A2), which crosses Field 4 and terminates in Field 5, is *c* 70m in length, and has not been previously identified. It takes the form of a shallow, discontinuous ditch, varying between 2.5m and 4.0m in width with a maximum depth of 0.3m, continuing the line of the ditch in the section to the north (Section B). Throughout the majority of this section it has been reduced, and in part destroyed as an earthwork by the same land-use and improvement processes affecting EPA1 Section A to the east. The banks, which are evident in Section B to the north, have not survived.

At the southern terminal, the ditch simply fades out in Field 5 on the slope down to the head of the Long Grain valley. Unlike the southern terminal of EPA1, this terminal (A1) is not confused by the proximity of later features. Although this field

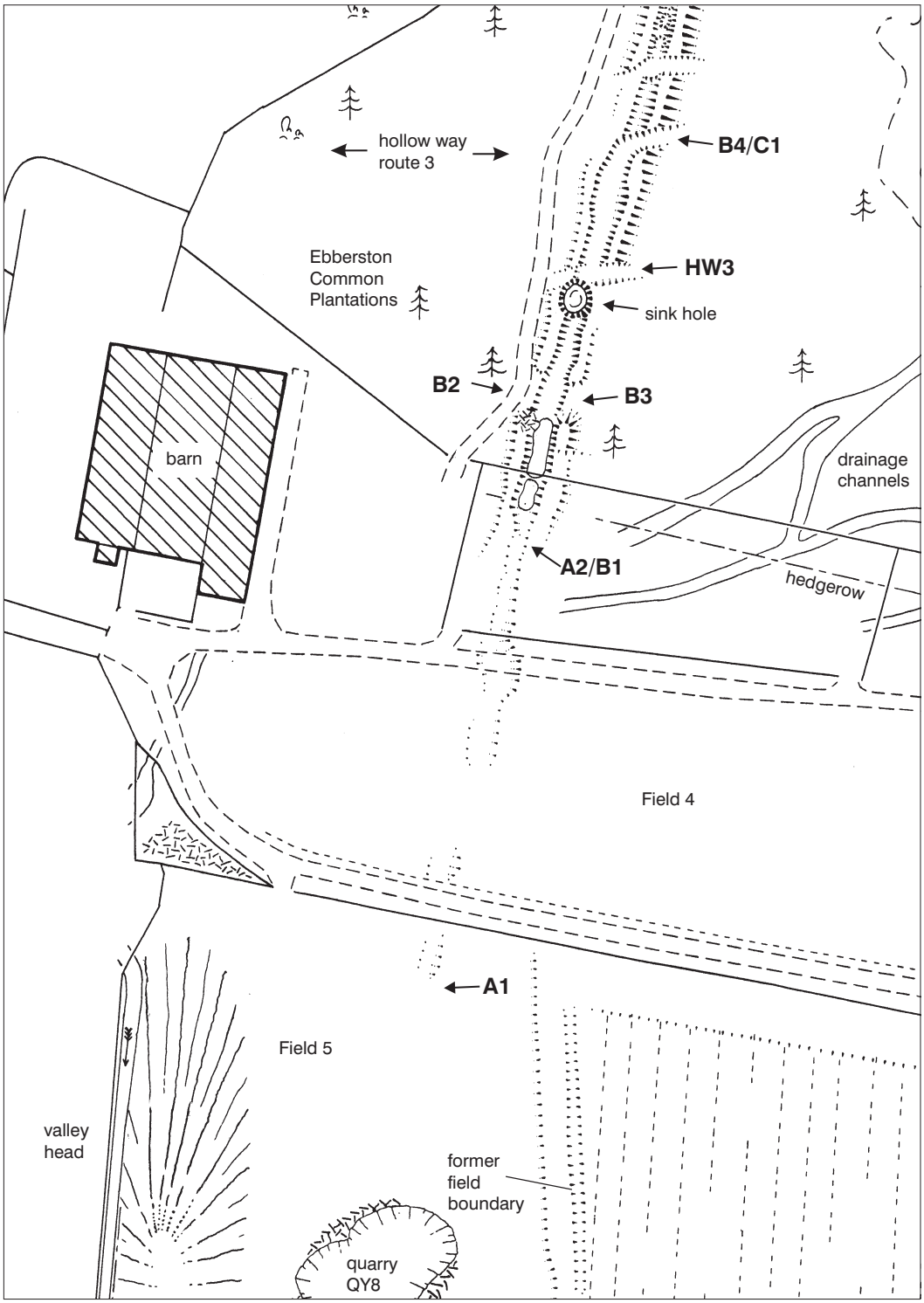

Figure 14. Embanked pit-alignment 2, Sections A and B: extract from 1:1000 scale survey

has been enclosed since at least 1848 (Ordnance Survey 1854) and has clearly been improved for pasture, the valley slopes are outside the area of ridge and furrow ploughing which occupies the east of this field, and thus failure to identify its course further south cannot be attributed to destruction from this ploughing. It is suggested, therefore, that the present end of the ditch may be the original, or very close to the original terminal of the embanked pit-alignment.

EPA2 Section B (Figure 14)

This section (B1-B4), *c* 65m in length, consists of a double-banked earthwork with a medial ditch. The ditch, which is sharp-sided and averages 4.0m in width and 0.3m-0.4m in depth, can be seen to turn and cut through the eastern bank at B4. This is clearly due to re-cutting of the original ditch, probably part of the same draining episode noted above (see EPA1 Section B). One large sink-hole occurs in this section. The ground the earthwork crosses is very boggy and covered by a mixture of standing and fallen trees.

The widening of the ditch to form a drain has cut into the western bank, particularly at the north where the bank width is reduced to 2.0m, but overall the average width of the bank is 3.0m and generally no more than 0.2m high with a flattish profile; in some places slight increases in height are attributable to spoil cast up from the drain cutting. At B2 there is a 5.0m wide gap in the western bank; this appears to be original (see below, EPA2 Section C). The bank flanking the east of the ditch, which is up to 4.0m in width and 0.3m in height, is much more substantial in size than the western bank and has a rounded profile. Breaks in this can attributed to the drain cut at B4, and a hollow way (HW3). A 4.0m wide gap in the eastern bank at B3 (directly opposite that in the western bank at B2) appears to be original.

EPA2 Section C (Figures 15 and 28)

This section (C1-C15), *c* 310m in length, crosses boggy ground for all of its length; the southern *c* 50m of it is within Ebberston Common Plantations and is covered by a mixture of standing and fallen trees, whist the remainder crosses open boggy ground and is mostly grass covered. Along the length of Section C it is generally well-preserved. Apart from variations in form which result from later land-use, its overall form is consistent, being a double-banked linear earthwork with a medial ditch, at the base of which are shallow pits. The ditch averages 3.0m in width and is generally 0.3m-0.4m deep. At C2, and between C7-C9, C10-C11, and C13-C15, shallow pits are evident. In general, they are irregularly spaced, ranging from 2.0m-3.5m between centres. They are irregular in plan, being a mixture of rectilinear and circular, and are usually no more than 0.3m deep. In a number of areas, the ditch was flooded at the time of survey. In places, some of this flooding results from natural processes, but in others the boggy ground has been deliberately drained into the ditch and is most obvious at C3, C5, and C12. At C6, C8 and at points between C3 and C6, the scalloped outline of standing water evidences the existence of further pits.

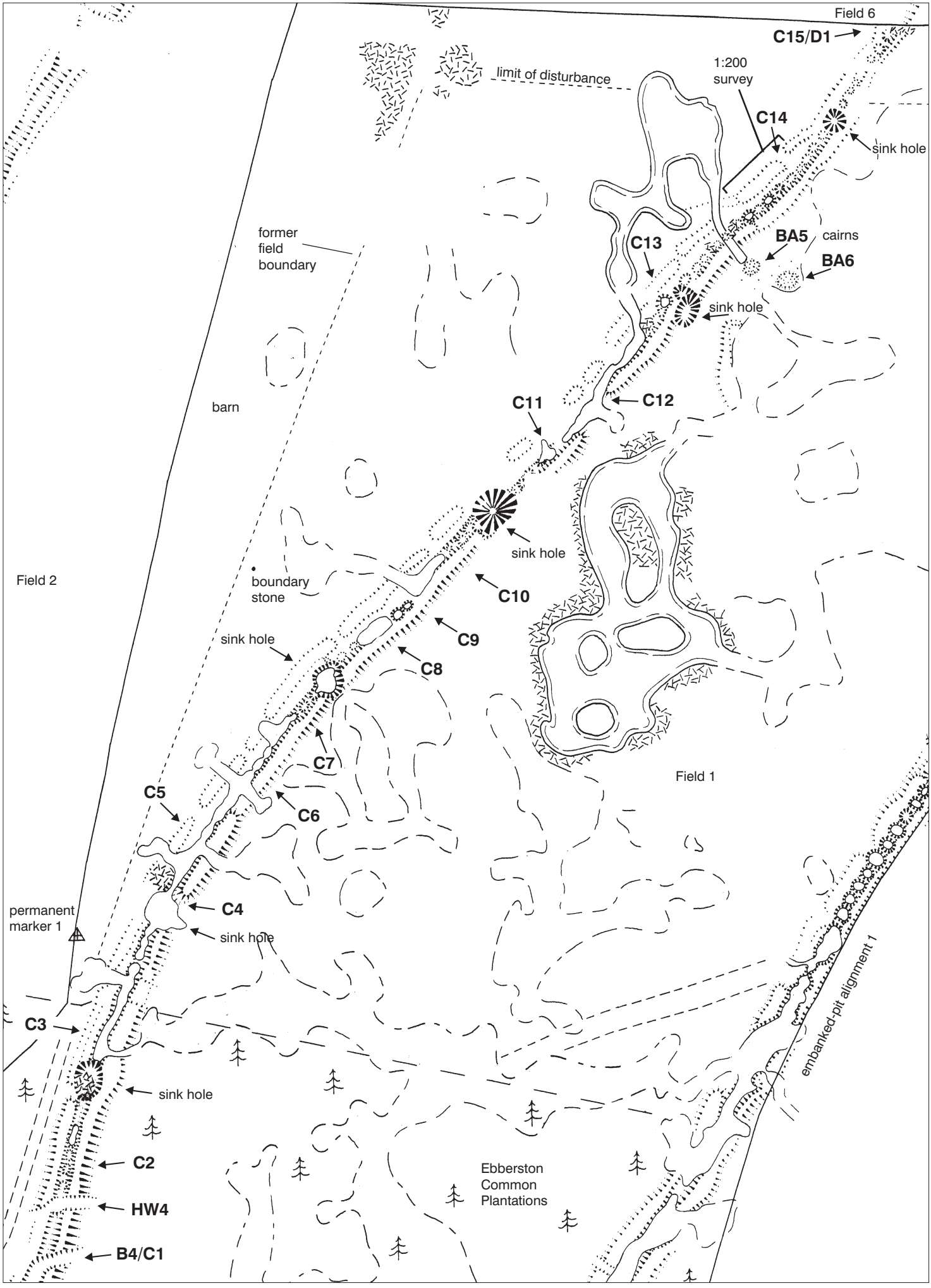

Figure 15: Embanked pit-alignment 2, Section C: extract from 1:1000 scale survey

Figure 16. Ground photograph of embanked pit-alignment 2, Section C, looking south

Along the line of the ditch there are five large sink-holes, 1.0m-1.5m deep. It is probable that these have resulted from the collection and draining of water into the ditch, the resulting larger volume of flowing water causing subsequent collapse where prehistoric pits in the line were close to weaknesses in the underlying limestone. This would account for the occurrence of only two sink-holes along EPA1, as here the pits are not inter-linked and water volume and flow is therefore restricted. Three of the sink-holes show a level of artificial enlarging suggesting they may also have functioned as sumps to help drain the boggy area; one has been used also as a farm refuse dump. There is no evidence to suggest that any of the sink-holes were in existence when the embanked pit-alignment was constructed.

The eastern bank, which ranges in width from 3.5m-5.0m and a maximum height of 0.3m, has a rounded profile. It is continuous throughout this section, apart from where breaks caused by drains, and collapses into sink-holes etc occur; it is also crossed by a later single hollow way (HW4). Two possible original gaps were identified at C4 and C12. At C12 the bank appears to have genuinely rounded terminals on both sides of a gap 8.0m wide, suggesting this gap is original; at C4 there is a single rounded terminal in the bank, but as there is also a definite cut for drainage close-by, interpretation of this as an original gap is somewhat speculative.

The western bank is markedly different to its partner to the east and to any other banking associated with the pit-alignments on Ebberston Low Moor. It is segmented rather than continuous, the bank segments being very low, no more than 0.1m high with flattish tops. The segments vary in size, the longest being 22.0m, the shortest 6.0m, with widths ranging between 2.5m and 3.5m. The gaps between the segments also vary considerably in size, ranging from 2.0m to 13.0m. There is no discernible

pattern to these segments or gaps in between. Also, the segments are separated from the ditch-line by a flat berm which averages 2.0m in width. One bank segment (C14) is unique in that it is angled away from the ditch. At the northern end of this section there is a *c* 20m length where there is only minimal trace of both banks due to a combination of ploughing, improvement and damage associated with the possible pipeline or track noted earlier (see EPA1 Section E). The evidence suggests that at some point between C14 and the fence-line between Fields 1 and 6, there was a change in the nature of the western bank from the segmented section to the south, to the continuous bank further north in Section D (see below) mapped in 1972 and also visible on air photography in 1998 (NMR 1998). Unfortunately this junction occurs within the corridor of disturbance and therefore it is impossible to come to any firm conclusions. However, the peculiar angle of bank noted at C14 may mark the point of change; unfortunately any stratigraphic relationship is not now retrievable from the surface evidence.

EPA2 Section D (Figure 17)

Through Field 6, a *c* 120m section (D1-D2) has been largely destroyed by deep ploughing during the recent past; this section is shown as being intact on 1971 air photography (Ordnance Survey 1971) and 1972 mapping (Ordnance Survey 1973), but had largely disappeared when photographed from the air in 1995 (NMR 1995). The mapping depicts double banks with a medial ditch and pits. Now, only the southernmost *c* 20m of this feature is visible on the ground as a 5.0m wide, 0.2m deep depression. Recent air photography (NMR 1998 - Figure 8) reveals parallel soil marks coinciding with the mapped position and which clearly indicate the lines of the peripheral banks. At the north, a short section of the eastern bank still survives in Field 6 close to the boundary fence to the east. What is clear though, is that the mapped form of Section D is closely analogous to the earthwork form of Section E further north (see below).

EPA2 Section E (Figure 17)

For a distance of *c* 55m on the east side of the fence separating Field 6 from Field 3, the alignment is double-banked, with a medial ditch averaging 3.0m in width and 0.4m deep, with pits along its line (E1-E2). This section is well-preserved and is probably the continuation of form of Section D. One sink-hole is evident along this line. Although the western bank is disturbed by the fence-line it would appear to be continuous; the eastern bank averages 3.0m in width, and 0.3m in height. The pits are of similar size and spacing to those in Section C although generally better preserved. A break in the eastern bank at E1 corresponds with the position of an east-west track shown on 19th - century mapping (Ordnance Survey 1892). There is a significant shift in alignment at E2: this is discussed below (see Section F).

EPA2 Section F (Figures 17 and 28)

The next *c* 100m of the alignment (F1-F7) superficially appears similar in form to Section E, although detailed survey has demonstrated that it is in fact very different both in the form of the banks and the pits. At F1, a marked shift in alignment in the ditch and the eastern bank is evident. This shift also corresponds with the start of an

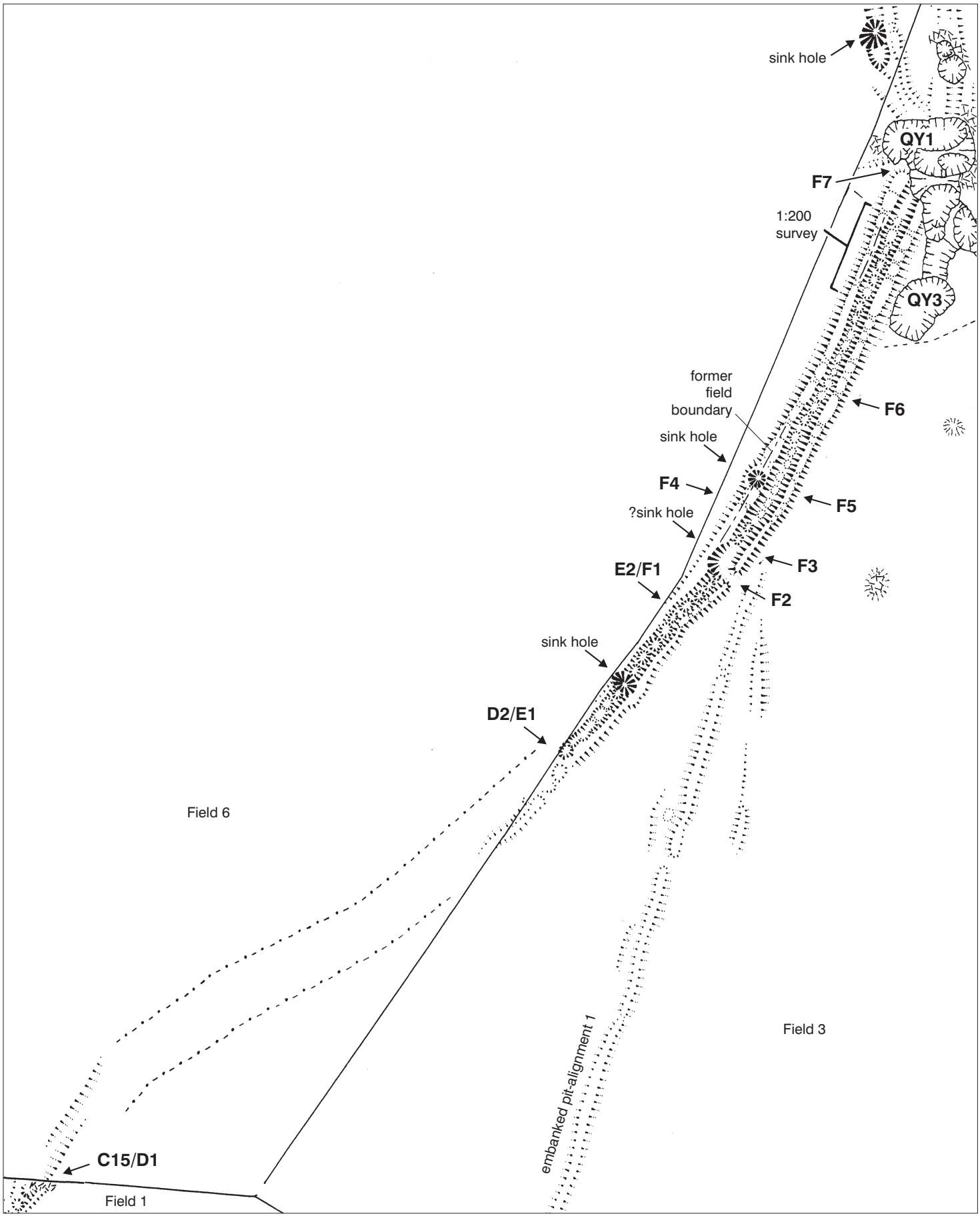

Figure 17. Embanked pit-alignment 2,Sections D, E and F: exract from 1:1000 scale survey

Figure 18. Ground photograph of embanked pit-alignment 2, Section E, looking north

Figure 19. Ground photograph of embanked pit-alignment 2, Section F, looking south

Figure 20. Ground photograph of embanked pit-alignment 2, Section F, looking north

undulating appearance along the line of the eastern bank, which can be seen continuing to the north to the point where it is truncated by quarrying (QY1). A similar undulating form to the opposite bank can also be detected from F4 northwards. This undulating appearance is caused by small, very low mounds of earth (usually no more than 0.2m high and ranging between 2.0m and 9.0m in length), which have been placed on top of already existing, continuous banks. These underlying banks average 4.0m-5.0m in width and 0.3m high. Throughout this section the ditch is also generally deeper than elsewhere along EPA2 (up to 0.5m in places) and the banks generally more substantial and better preserved. The pits are now much shallower and indistinct and are best described as 'footprints' of pits, although of similar shape and spacing to those in EPA1 Sections C and E.

At F3, the eastern bank of EPA2 overlies the eastern bank of EPA1. A break in the bank at F2 and a corresponding hollowing of the slope on the opposite bank occurs at the junction point. There is no obvious explanation of this break. The break might be a drain cut through the bank into a sink-hole which has subsequently collapsed but this is far from certain; it has clearly been exaggerated by livestock erosion and some slumping. Also, no feature appears on mapping or air photography to account for its origin. All the evidence indicates that EPA2 post-dates EPA1 along this section and that the placing of small mounds on the bank indicates where the former undug strips between pits along EPA1 were removed, the resultant material then being mounded carefully along the banks on either side. In some cases, on the eastern bank particularly, the gap between the mounds corresponds to the gap between the 'footprints' of the pits, although in other cases the mounding appears as longer segments. The mounding on the western bank has been disturbed, having been encroached on by ploughing prior to the fence at the west being erected, and cut into

by a narrow gulley which evidences the removal of a former boundary. A small sink-hole has opened up along this bank. Despite the fact that the banks are still well-preserved, they were not shown along the northernmost *c* 140m of this alignment on Ordnance Survey mapping (1892;1973).

Another pronounced shift in alignment occurs between F5 and F6. Here, a *c* 20m length of the alignment creates an angular change in direction. The alignment of this section is more in sympathy with the alignment of the last section of EPA1 and may be an indication of the course of the earlier alignment. At the north end, EPA2 is clearly truncated by quarrying (QY1). The morphology of Section F is directly comparable to EPA3 Section B (see below); suggesting that these two alignments are contemporary. It has been suggested that EPA2 and EPA3 joined (Ordnance Survey 1854; Spratt 1989), but the quarrying has removed any surface evidence (but see **Section 5**).

Embanked Pit-Alignment (EPA)3 : NMR No. SE 98 NW 5

NGR SE 90585 89920 - SE 90852 - 89948

This embanked pit-alignment exists as an earthwork for *c* 230m, running downhill in a west-east direction into the steep-sided offshoot valley off Deep Dale. It is relatively straight for most of its length, with only one major change in direction toward its western end. Rutter (1954) described it as being a ditch between two banks but with no pits evident. The possibility that this earthwork may once have connected with the 'West Dike' (EPA2) was raised although it is suggested that the quarrying may have removed the point of junction. In later years, Smith describes its form as being a ditch 0.9m deep between two banks each 0.5m high and that apart from one short stretch these are very fragmentary (NMR No. SE 98 NW 5). It is clear that the majority of its course has been disturbed and reduced by later ploughing, which presumably led to the assessment that this was simply a ditch or dyke and that it had mostly been destroyed in recent years (Spratt 1989). However, it is now clear that the eastern section through the woodland on the slope into the valley represents its original form (EPA3 Section B). It is probably a monument of two phases, an earlier embanked pit-alignment (a continuation of EPA1), later redefined along the same alignment. It is overlain by a large barrow of probable Bronze Age date (BA1). A total of 39 pits have been identified along EPA3; it is estimated that there may have originally been *c* 65-70 pits (based on an average 3.0m-3.5m separation between centres).

EPA3 Section A (Figure 21)

This section (A1-A7), totalling *c* 180m in length, has been heavily over-ploughed and therefore much reduced in substance. It consists of a double bank with a medial ditch and a few remaining 'footprints' of pits, similar in size and spacing to those in EPA2 Section F, although here they are harder to see because of the disturbance. The banks are *c* 3.0m-4.0m in width and the ditch generally 2.5m-3.0m wide and 0.3m deep. As well as the destruction caused by ploughing, sections have been removed at A1, A2 and A3 by localised surface quarrying (probably for clay or sand

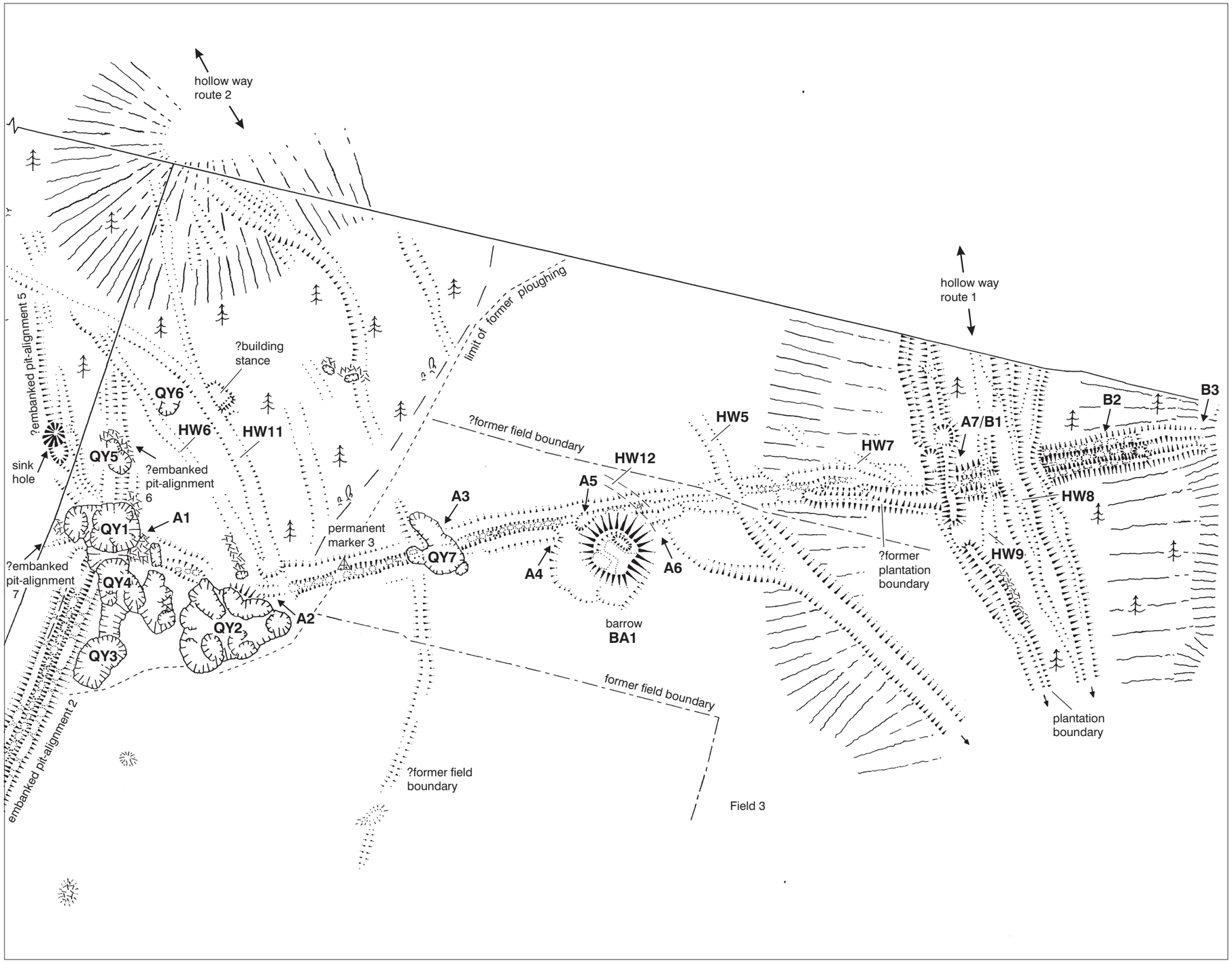

Figure 21: Embanked pit-alignment 3, Sections A and B; and embanked pit-alignments 5, 6 and 7: extract from 1:1000 scale survey

Figure 22. Ground photograph of embanked pit-alignment 3, Section A, and barrow BA1

- see below **Quarries**), and at three points where hollow ways cut through (HW 5, HW6, HW7); these activities clearly post-date the alignment.

The alignment is overlain by a large round barrow (BA1). There are three points at which this relationship is clear. At the north-west of the barrow, the arc of a platform cut into the hillslope for the barrow to stand on cuts away the southern bank of the alignment (A4); at the north, where a concentric ditch at the base of the barrow cuts away the southern bank and part of the medial ditch (A5), and at the north-east where the barrow clearly overlies the southern bank of the alignment (A6). Two slight scarps on the north barrow slope could witness sinking of the barrow material into underlying pits, but they could also be hollows caused by the removal of trees.

At A2, the ditch, which is very slight at this point, is overlain by a remnant of a mound which has itself been cut by quarrying. Although little remains of this mound, its curve is suggestive of the edge of another barrow, the remainder of which has been quarried away but it is much more likely to be quarry spoil.

The northern bank of the alignment is overlain at right-angles by an earthen boundary bank of pre-1848 date (see above EPA1 Section E), and the southern by another bank which runs almost parallel to the alignment. This bank has a ditch to the north which has cut away most of the alignment through here, and seems to be associated with the boundary systems around the woodland to the east established between 1848 and 1890 (see **Section 3**). The return of this ditch to the north alongside the woodland boundary bank has destroyed the last *c* 7m of the alignment outside the woodland, and the bank clearly overlies the next section of the alignment (EPA3 Section B). Air photographic evidence indicates that this boundary bank and ditch originates at some date between 1953 and 1971 (RAF 1953; Ordnance Survey 1971); it is the feature shown as the woodland edge on mapping in 1973 (Ordnance Survey 1973).

Figure 23. Ground photograph of embanked pit-alignment 3, Section B,west end looking east

Figure 24. Ground photograph of embanked pit-alignment 3, Section B, east end looking east

EPA3 Section B (Figure 21)

This section (B1-B3), of *c* 60m in length is very well-preserved and of exactly the same morphology and scale as EPA2 Section F, ie double-banked with small mounds surmounting the banks, and with a medial ditch with 'footprints' of pits in the bottom. Here, the mounds appear to have a significantly higher stone content than on EPA2, but this is simply because the ditch is cutting through stonier ground. Toward the west a series of hollow ways (HW8) have cut through and destroyed a *c* 12m long section, and immediately to the west a further hollow way (HW9) overlies, but has not seriously damaged the alignment. At B2, where the slope into the valley to the east steepens sharply, the pits are evident now as a series of well-formed 'steps' cut into the slope; these end *c* 12m west of the present terminal where the slope is extremely steep. Although difficult to see because of fallen deadwood, their substance and regular shape is reminiscent of pits along EPA1 Section D. Some valley-side erosion is visible here and it is possible the alignment may have continued further eastward, but not more than a few metres.

Embanked Pit-Alignment (EPA4) : NMR No. SE 98 NW 112

NGR SE 90100 89460 - SE 90253 - 89725

This embanked pit-alignment survives as a surface earthwork for *c* 310m. It takes a sinuous course, roughly north-north-east - south-south-west, roughly parallel to EPA1 and EPA2, and its existence had not been detected until this survey. The form of this alignment is best preserved in Section B, being double-banked, with a medial ditch and shallow pits in the bottom. Due to the poor survival of this alignment and uncertainties about its extent, it is not possible to estimate the number of pits that may have been dug.

EPA4 Section A (Figure 25)

The southern *c*170m section of this alignment (A1-A2) has been heavily disturbed by drains, farm activity and improvement ploughing. Consequently, its morphology is less easy to determine than further north, where the alignment is better preserved. The current southern terminal fades out close to the farm track immediately north of Ebberston Common Farm. It is likely that the alignment continued further south toward the head of the Long Grain valley, although any surface evidence of this has been destroyed by the farm complex, which has been in existence since at least 1848 (Ordnance Survey 1854); the present farmhouse and outbuildings are 20th Century in date. No trace of any alignment could be found south of the farm complex.

For *c* 70m north of the southern terminal the alignment is mostly evidenced by the eastern bank which ranges from 3.0m-5.0m in width and 0.3m high, although at the south a *c* 15m length of ditch to the west of the bank, 3.5m wide and 0.3m deep is visible. North of this, the alignment runs through Ebberston Common Plantations and has been disturbed by tree roots and the cutting of a drain; some dumping has also occurred across its line. Close to the gate at the north of the woodland, a ditch-like feature east of the bank appears to be a hollow way (HW10), probably an earlier route of the present track immediately to the east. A track in a similar position

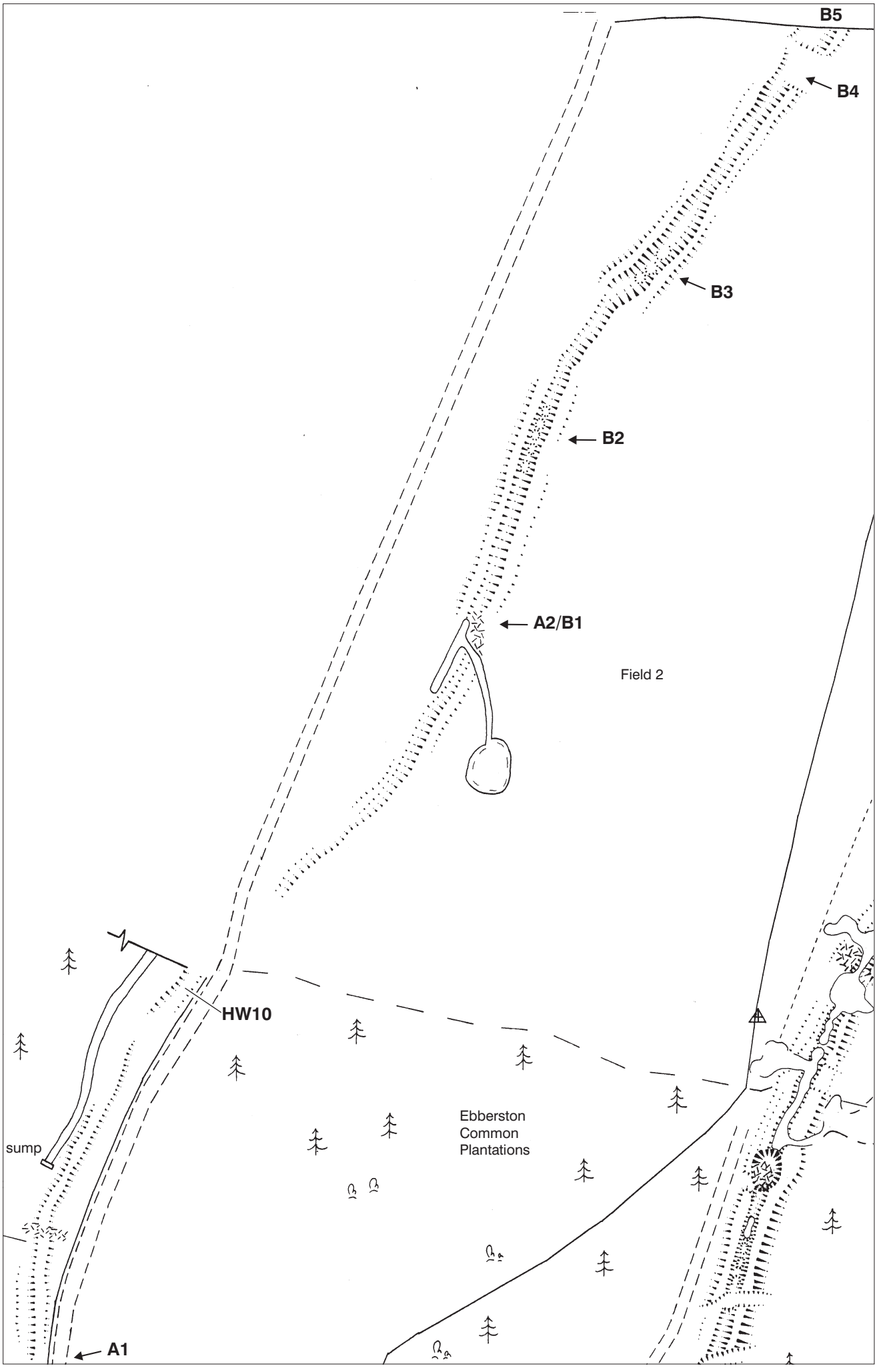

Figure 25: Embanked pit-alignment 4, Sections A & B: extract from 1:1000 scale survey

to this is shown on the 1848 map (Ordnance Survey 1854), and air photography indicates that prior to improvement there were a number of braided tracks along this route (RAF 1953); this probably accounts for the absence of the alignment for the strip either side of the modern track. Beyond this, the alignment is visible mostly as a low, grass covered ditch *c* 2.5m wide and 0.2m deep, with slight traces of banks on either side. Air photography indicates that this field was improved from moorland sometime between 1953 and 1971 (RAF 1953; Ordnance Survey 1971) and which would account for its degraded state. At A2 a drain has been cut through, and spoil dumped across the alignment.

EPA4 Section B (Figures 25 and 26)

North of the drain at A2, the alignment is better preserved, and can be traced as a grass-covered earthwork to the northern boundary of Field 2 (B1-B4). It is double-banked with a medial ditch, and at two places shallow pits in the bottom of this can be seen. Both banks are *c* 3.0m wide, and 0.2m - 0.3m high, and although they only appear intermittently, enough survives to indicate that they were both probably originally continuous. The ditch varies in width between 3.0m and 4.0m, and on average is 0.3m deep; at two places (B2 and B3) a total of eight pit impressions survive. They are oval in shape, generally 2.5m by 1.8m and 3.0m between centres. At B4, the alignment is heavily disturbed; this corresponds to the corridor of disturbance noted above (EPA1 Section E). The junction of the alignment with the wooden post and wire fence marks the terminal of the surviving earthwork.

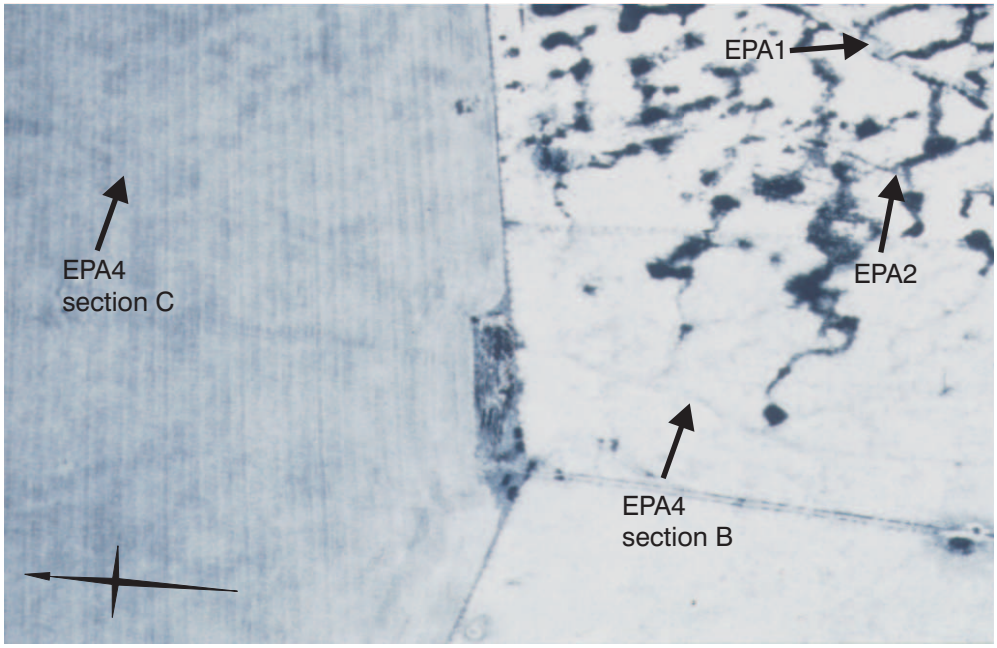

Figure 26. Air photograph of Ebberston Low Moor from the west (NMR SE9089/9)

EPA4 Section C (Figures 26 and 27)

A transcription of soil marks visible on air photographs (NMR 1998) reveals that the alignment (C1-C2) continued into Field 6 for *c* 70m where it appears to change direction to the east, echoing the line of EPA2. It cannot be traced beyond NGR SE 9037 8985. This soil mark is similar to, but less pronounced than the soil mark through EPA2 Section D in the same field. If this change in direction is real, then this alignment may have extended to the junction of EPA2 and EPA3 in the area of the quarries.

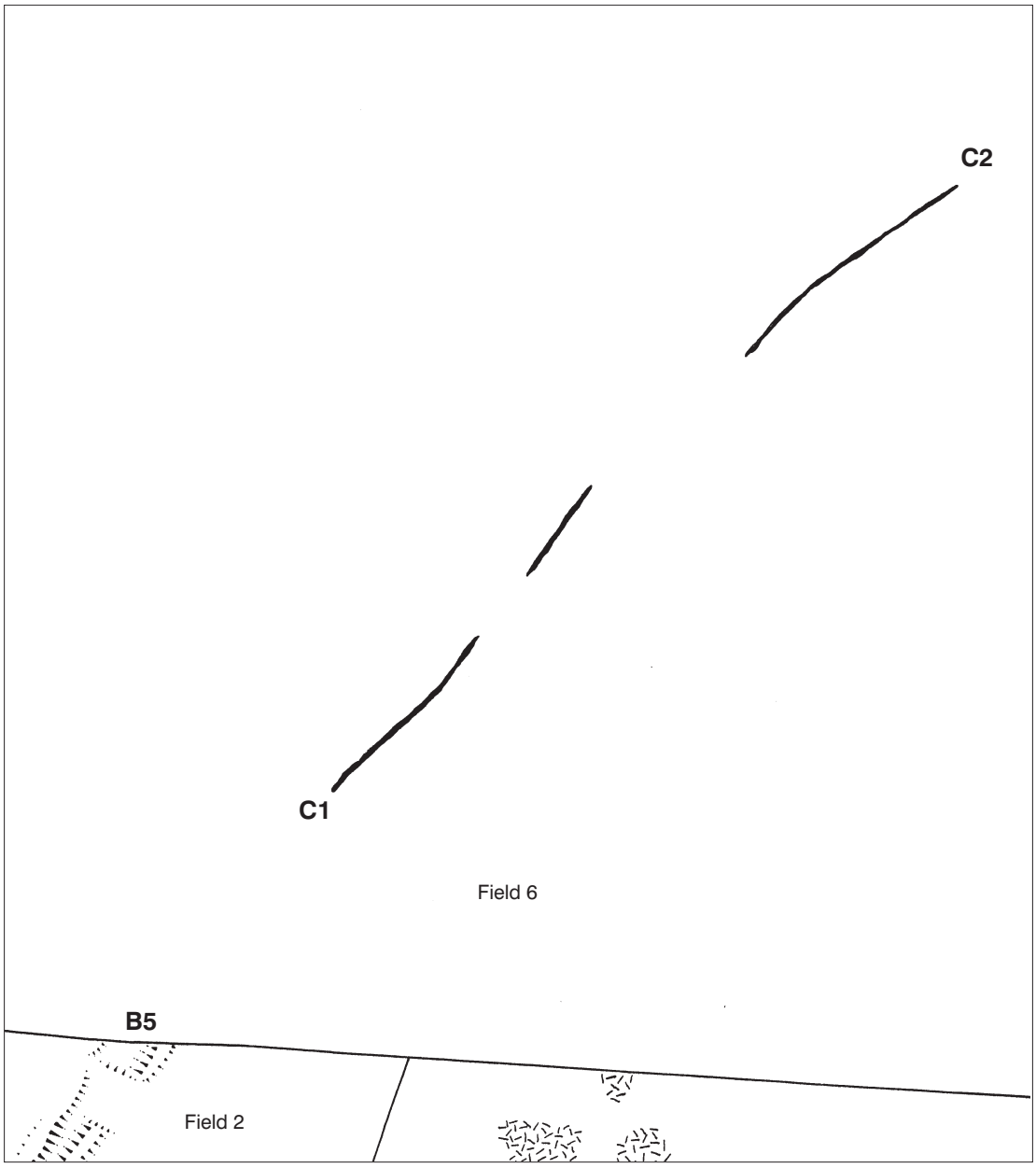

Figure 27. Embanked pit-alignment 4, Section C: extract from 1:1000 scale survey

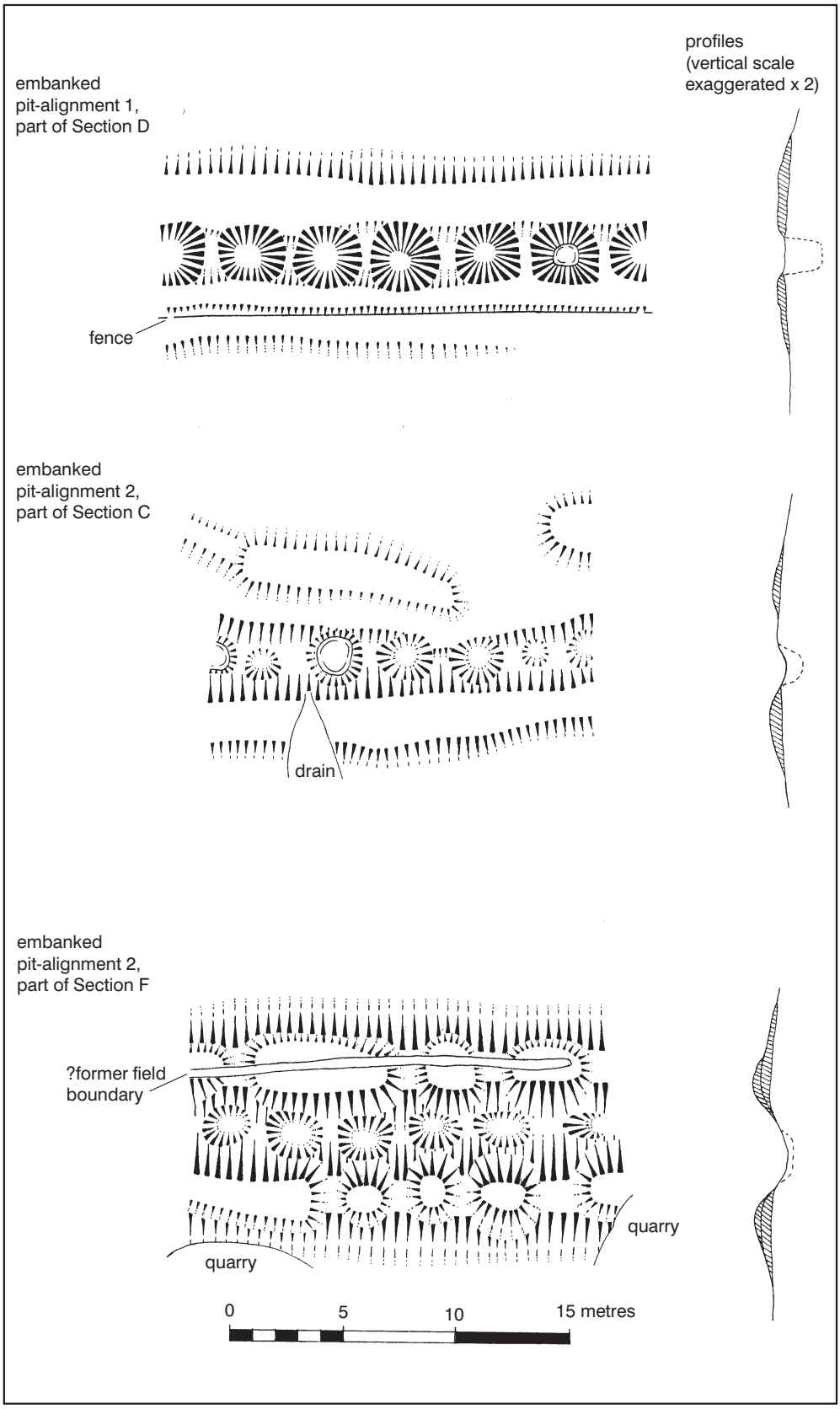

Figure 28. Surveys of parts of EPA1 and EPA2, reduced from 1:200 scale

Possible Embanked Pit-Alignments : NMR No. SE 98 NW 5

North of the quarry (QY1) at the angle formed by EPA2 and EPA3 are three short linear earthworks formed by banks and ditches (EPA5, 6 and 7); although none display any evidence of pits it is possible that they are part of the network of embanked pit-alignments and associated linear monuments.

EPA5 (Figure 21)

NGR SE90577 89995 – SE 90590 89930

This bank and ditch can be traced for *c* 70m north from the quarry (QY1) which truncates it at the south. The ditch, which has been cut into the slight east-facing slope, varies in width between 1.5m and 4.0m; there is one sink-hole along its line. A bank averaging 3.0m wide and 0.3m high is only intermittently evident on the east side. At the south, both the bank and ditch start to curve to the east and line up directly with the dramatic change in direction of EPA3. The eastern bank of EPA5 appears to be overlain by the western bank of another linear monument (EPA6 - see below), but the cutting for the quarry also occurs at this point making interpretation difficult. Toward the north, the line of the ditch and bank is overlain by a hollow way (HW6). The northern terminal ends abruptly at the head of a western valley offshoot off Deep Dale. There is no evidence for pits along this line.

EPA6 (Figure 21)

SE 90595 89930 – SE 90592 89964

This low, double bank and medial ditch can be traced for *c* 30m north of the quarry. The southern end is truncated by the quarry (QY1) and the northern end is lost under the confluence of hollow ways (HW6) immediately above the head of the same valley offshoot as EPA5. The western bank varies between 2.5m and 4.0m in width and 0.2m-0.3m in height, with the eastern one averages 3.0m in width and 0.3m in height; the ditch is consistently 3.0m wide and 0.3m deep. The line is disturbed by further quarrying (QY5) and associated dumping of spoil. There is no evidence for pits.

EPA7 (Figure 21)

SE 90577 89920 – SE 90583 89922

A 7.0m length of ditch, 1.5m wide, runs in a rough east-west line between the quarry (QY1) and the ploughed field (Field 6). The eastern end is truncated by the quarry and there is no trace beyond the fence to the west. Although only a short alignment is visible, it lines up with the predicted junction of EPA3 and EPA2 at the east and also heads in the direction of the change in alignment of EPA4 visible as a soil-mark on air-photography in the field to the west (*ibid*). Although this might simply be the remnant of an old field boundary, it is also possible that it may be a surviving

fragment of EPA4. Because so little survives of this feature, interpretation is necessarily speculative.

Snainton Dykes : NMR No. SE 98 NW 9

SE 9059 8871 – SE 9089 8991

Although the area to the east was outside the survey area, a rapid inspection was undertaken to establish if there was any physical or topographic link between EPA3 and the northern terminus of the Snainton Dykes, a multiple ditch and bank linear earthwork along a slight escarpment which links Deep Dale at the north and Rosekirk Dale at the south. Although undated, the Snainton Dykes are presumed to be of prehistoric origin and part of a wider network of territorial land boundaries (Spratt 1989). On the valley side immediately opposite the terminus of EPA3, a narrow embanked ditch cut into the slope continues the alignment before curving south to line up with the western of the ditches of the Snainton Dykes. Unfortunately, a track which curves around the edge of the Dykes obscures the physical relationship, but it is possible that this curving embanked ditch is a forerunner of the western ditch of the Snainton Dykes. The physical form of this embanked ditch is similar to EPA5.

Barrows and Cairns

BA1 : NMR No. SE 98 NW 17 (Figure 21)

This barrow has been depicted on mapping from 1848 onwards (Ordnance Survey 1854; 1892; 1973). It is scheduled as a round cairn (NY/970), although its makeup appears to be predominantly earthen. It is centred at NGR SE 90712 89920 on a slight artificial platform cut into a gentle east-facing slope and has a diameter of 20.0m and a maximum height of 1.3m. It has a flattish top which shows evidence of disturbance (see Figure 29). Most of the disturbance can be attributed to rabbit burrowing and sheep-scraping, particularly on the east side, although a rectilinear hollow, measuring *c* 7.0m by 3.0m and 0.3m deep, on the north-east top, has all the appearances of an old excavation. A slight rim around the north-west arc into which this hollow cuts may well represent the limit of earlier disturbance or antiquarian delving; this is probably the 'central pit' referred to by Rutter (NMR No. SE 98 NW 17 – Authority 2). A number of tree-removal hollows are visible. Apart from these largely superficial disturbances, the monument is essentially in good condition.

As noted above, the barrow stands on an artificial platform, up to a maximum 7.0m wide. Uphill, following the arc of the western side of the barrow, the platform is cut into the natural slope, whilst downhill, a built-up scarp at the south-east can be seen to merge with the base of the barrow. The cutting of the platform and the substance of the barrow clearly post-date the line of EPA3 (see EPA3 Section A). In places, erosion has revealed part-sections through the top layers of the barrow surface. In some of these sections, a distinct layer of sand is exposed beneath the turf-line suggesting that it at some stage in the construction the barrow may have been deliberately covered or capped in sand.

Figure 29. Ground photograph of exposed section on barrow BA1

BA2 : NMR No. SE 98 NW 61 (Figure 11)

The 'Tumulus' at NGR SE 90508 89640, which was depicted on mapping from 1848 onwards (Ordnance Survey 1854; 1892; 1973 - see **Section 3**) is no longer visible on the ground. In 1972 it was visible as a slight stony swelling (NMR No. SE 98 NW 61 - Authority 2, D Smith).

BA3 and BA4 (NMR No. SE 98 NW 62) (Figure 11)

The two 'Tumuli' marked on mapping from 1848 onwards (Ordnance Survey 1854; 1892; 1973 – see **Section 3**) are still visible as two distinct 'plinth-like' concentrations of small stones centred at NGR SE 9044 8966. Both appear to have been heavily robbed, with loose material being scattered around the edges, but there is sufficient consolidation of the stones to indicate that these were distinctly separate, but closely positioned cairns rather than barrows. The northern of the pair (BA3) is now heart-shaped, measuring 10.0m north-south by 7.0m; the southern (BA4) is almost circular and 6.0m-7.0m in diameter and survives mostly as a consolidated stone ring, the interior having been mostly robbed away. Between the two, is a small, consolidated platform-like stone ring 2.5m in diameter and 0.3m-0.4m high. Its positioning and its consolidation suggest it may have been fashioned within original cairn material and may be a later construction such as a hearth or stand of some kind, although its exact purpose is unclear.

BA5 and BA6 : NMR No. SE 98 NW 106 (Figure 15)

BA5 and BA6 (centred at NGR SE 90383 89662 and SE 90392 89661 respectively), are two small, turf-covered stony concentrations of stones, possibly cairns, 3.5m in diameter and 0.2m high, and 4.5m by 3.5m and 0.3m high respectively. In many upland areas, small cairns such as these would be classified as prehistoric field clearance cairns although it is now generally accepted that correlation between morphology and function cannot necessarily be determined (Barnatt 1994, 358). Due to the slight nature of these monuments, this interpretation is necessarily speculative.

Hollow Ways : NMR No. SE 98 NW 107

Three concentrations of hollow ways have been identified within the area surveyed. They have not been investigated outside the survey area or in documentary research.

Route 1 (Figure 21)

Three/four main well-defined and braided hollow ways centred at NGR SE 9081 8992 running in a north-south direction immediately above the steep western slope of the offshoot valley off Deep Dale (HW8-9). They clearly cut, and have destroyed part of EPA3 (see above EPA3 Section B), and are overlain by the field wall at the north of Field 3 which cartographic evidence indicates was established between 1848 and 1890 (Ordnance Survey 1854; 1892). The hollow-ways do not appear on any mapping (first date 1848) and therefore may be presumed to have been both established and subsequently made redundant by that date.

Route 2 (Figure 21)

A *c* 150m wide swathe of hollow ways centred at NGR SE 9063 8993 heading in a south-east - north-west direction. A number can be seen directly cutting across and clearly post-dating EPA3 (eg HW11, HW12, HW5, HW7); HW12 curves to avoid barrow BA1. A number also clearly pre-date the drystone wall at the north of Field 3 which was established between 1848 and 1890 (*ibid*). It is possible that HW7, HW5 and HW12 connect into Route 1. One hollow way (HW11) seems to coincide with a track shown on the 1848 map (Ordnance Survey 1854) leading to Troutsdale Quarries some 350m to the south-east. As this route is not shown on the 1890 map it is probable that the enclosing of this stretch of moorland between 1848 and 1890 (Ordnance Survey 1854; 1892) rendered these routes redundant.

Route 3 (Figures 10, 14, 15)

A number of hollow ways (HW1, HW2, HW3, HW4) running approximately east-west and centred at NGR SE 9030 8941. All cross, and cut through EPA1 and EPA2. They are roughly parallel to a track along the southern edge of Ebberston Common Plantations which is shown on the 1848 map (Ordnance Survey 1854) running from Ebberston Common House toward Troutsdale Quarries to the east. They may be pre-cursors or braids to this track, a formally established route by 1848.

Quarrying

Seven main areas of sand or clay quarrying were identified within the survey boundaries (QY1-QY7). The oldest, which was dug before 1848, is QY1, and the most recent are QY5-7 which were probably opened between 1946 and 1953 (see below). An orange sandy clay is visible in some sections in the quarries. As noted above, a sand layer was observed within the nearby Bronze Age barrow (BA1): this suggests that sand has been deliberately dug in this vicinity from a very early date, but there is no direct evidence to associate the barrow with QY1.

QY1 : NMR No. SE 98 NW 108 (Figure 21)

A small, homogenous group of three/four quarry pits measuring *c* 18m east-west by 12m and centred at NGR SE 90585 89925. There is no obvious stone visible in the quarry sides and these may therefore be clay or sand pits. This, or part of this group, are indicated on the 1848 map (Ordnance Survey 1854 – see **Section 3**) As the embanked pit-alignments EPA2 and EPA3 are shown as connecting on this map of 1848, but are now truncated by the southern of the pits in this group, it is possible that the quarry expanded in this direction between this date and 1890, the date of the next mapping (Ordnance Survey 1892).

QY2 (Figure 21)

A group of numerous, coalesced pits covering some *c* 40m by 20m centred at SE 90620 89900. They do not appear on the 1848 map (Ordnance Survey 1854) but are shown as 'Old Quarries' the 1890 map (Ordnance Survey 1892); the nomenclature therefore suggests they were cut and abandoned within this timeframe. The western end of EPA3 is cut and partially obscured by this group, accounting for its non-depiction on the 1890 map. There is no obvious stone visible in the quarry sides and these may therefore be clay or sand pits

QY3-QY4 (Figure 21)

This group of quarry pits centred at NGR SE 90590 89900 in effect joins QY1 and QY2. They do not appear on any mapping. Evidence from air photography indicates that this group may have been opened as late as sometime between 1946 and 1953 (RAF 1946; 1953) as they do not appear at the earlier date but show up well, as if recently cut, at the later date. There is no obvious stone visible in the quarry sides and these may therefore be clay or sand pits

QY5 and QY6 (Figure 21)

Two small, deep quarry pits at NGR SE 90592 89940 and SE 90605 89955, measuring 10.0m by 6.0m and 6.0m by 4.0m respectively. Evidence from air photography indicates that this group may have been opened as late as sometime between 1946 and 1953 (RAF 1946; 1953) as they do not appear at the earlier date but show up well, as if recently cut, at the later date. There is no obvious stone visible in the quarry sides and these may therefore be clay or sand pits.

QY7 (Figure 21)

A shallow, 'L'- shaped area at NGR SE 90670 89920 measuring *c* 20m by 14m, which has removed part of EPA3 and also part of the later earthen field boundary noted in EPA3 Section A. There is no obvious date for the removal of this surface, and it may not strictly be a quarry. It does not appear on the 1953 air photography in the same way as QY3-QY6; it therefore probably occurred before that date and possibly at the same time as QY2, ie between 1848 and 1890.

QY8 (NMR No. SE 98 NW 109) (Figure 21)

This large, deep quarry centred at NGR SE 90200 89250 measuring some *c* 60m by 40m, has been shown on mapping since 1848 (Ordnance Survey 1854) when it is shown as a 'Limestone Quarry' with a 'Limekiln' at the south end. It is shown as 'Old Quarries' on the 1890 map, indicating that it had ceased working at sometime between 1848 and 1890. It has been used in recent times for the dumping of farm waste.

Miscellaneous Monuments

?Building stance: NMR No. SE 98 NW 110 (Figure 21)

Situated at NGR SE 90616 89956, adjacent to, and partially cut by, hollow way HW11, is a rectangular earthen platform measuring 8.0m north-west - south-east by 5.0m; there is a slight bank on the short, south-east side flanked by a shallow external ditch. As the hollow way is likely to have been in use in 1848 (see above - **Hollow Ways** Route 3) then this platform must have been constructed before that date. The remains are suggestive of a stance for a shed or building structure.

Lynchets

On the steep slopes on the west side of the Long Grain valley are two strip lynchets 4.0m-6.0m wide centred at NGR SE 90160 89200. The lower one also appears to have functioned as a trackway. These were only surveyed up to the boundary of the survey area.

Boundary Stone : NMR No. SE 98 NW 111 (Figure 15)

At SE 90319 89649 is a small upright stone inscribed 'WA' on its north side. It has not been mentioned by previous investigators and has not appeared on any mapping consulted (Ordnance Survey 1854; 1892; 1973). However, to the east, two 'Stones' are shown on the 1890 map (*ibid* 1892) at SE 90527 89598 and SE 90735 89543; the western of the two was still marked on mapping in 1972 (*ibid* 1973). The newly discovered stone continues the line of the two mapped stones. Further east (between SE 91134 89680 and SE 91476 89682), a line of five 'Stones' are marked on the 1890 along the south side of an east-west boundary, presumably a wall. On the 1848 survey (*ibid* 1854) only the western half of this boundary is shown. It seems likely therefore, that the stones shown are boundary markers related to the

extending/setting out of field boundaries and/or ownership rights during the period of enclosure between 1848 and 1890 (*ibid* 1854; 1892). As the line of stones across Ebberston Low Moor is roughly parallel to other boundaries to the north and south which appear between 1848 and 1890 to the north and south, these stones may have been set for a boundary which was never built.

5. DISCUSSION

It is outside the scope of this report to examine how the embanked pit-alignments fit into the wider landscape and other well-known prehistoric linear boundaries on the Tabular Hills (Spratt 1989). However, within the area of survey, the quality of the earthwork survival permits new perceptions about the siting, morphology, and chronology of the monuments on Ebberston Low Moor which may prompt a reconsideration of aspects of the class of monument as a whole.

Siting (Figure 30)

The embanked pit-alignment routes seem to have been carefully chosen to link natural valleys. This can be seen in all three of the north-north-east - south-south-west oriented alignments (EPA1, EPA2, EPA4) which can be seen to end at, or close to, the slopes at the head of the Long Grain valley at the south. At the north, EPA3, which the survey has demonstrated is likely to be a continuation of EPA1 and EPA2, can be seen to terminate on the west side of an off-shoot valley of Deep Dale. There is no obvious topographic reason why the alignments appear to focus at the point where EPA2 and EPA3 (and possibly EPA4) would join. Even allowing for the later disturbance caused by quarrying, there is nothing to distinguish this point on a gentle east-facing slope. However, it is due west of the northern end of the Snainton Dykes, where they meet the escarpment which forms the southern limit of Deep Dale, a major landscape feature. If as suggested, EPA3 is preceded by, and is on the same line as EPA1, then such an alignment running west from the corner of the escarpment, and possibly curving to the head of the northwest valley-head (via EPA5), would ensure that this valley-head would be within a northern 'estate', and the head of the north-south valley at the east would be within the 'estate' bounded by the alignments on Ebberston Low Moor. This would possibly imply some demarcation of water sources within topographically defined units (see below). The presence of banks either side of all the four main alignments (EPA1, EPA2, EPA3, EPA4) may imply common or shared boundaries between the 'estates' or areas that are being defined.

On the basis of the limited inspection undertaken during this English Heritage investigation, there is an implied connection between the Snainton Dykes and the alignments on Ebberston Low Moor, although this will only be verified by more detailed survey. Thus, an homogenous unit of landscape is completely bounded by the escarpment along which runs the Snainton Dykes at the east, the valleys of Rosekirk Dale and Long Grain at the south-east and south-west, and the Ebberston Low Moor embanked pit alignments at the north-west and north (see Figure 2). Why there are three, almost parallel alignments on Ebberston Low Moor is unclear, although migration and replacement of boundaries is a possibility (see below), but that all three head towards the valley-head of the Long Grain implies that this natural valley was a continuing landscape focus. Similarly, although changes in the alignments at the north have been identified, the valley-heads seem to remain as fixed foci.

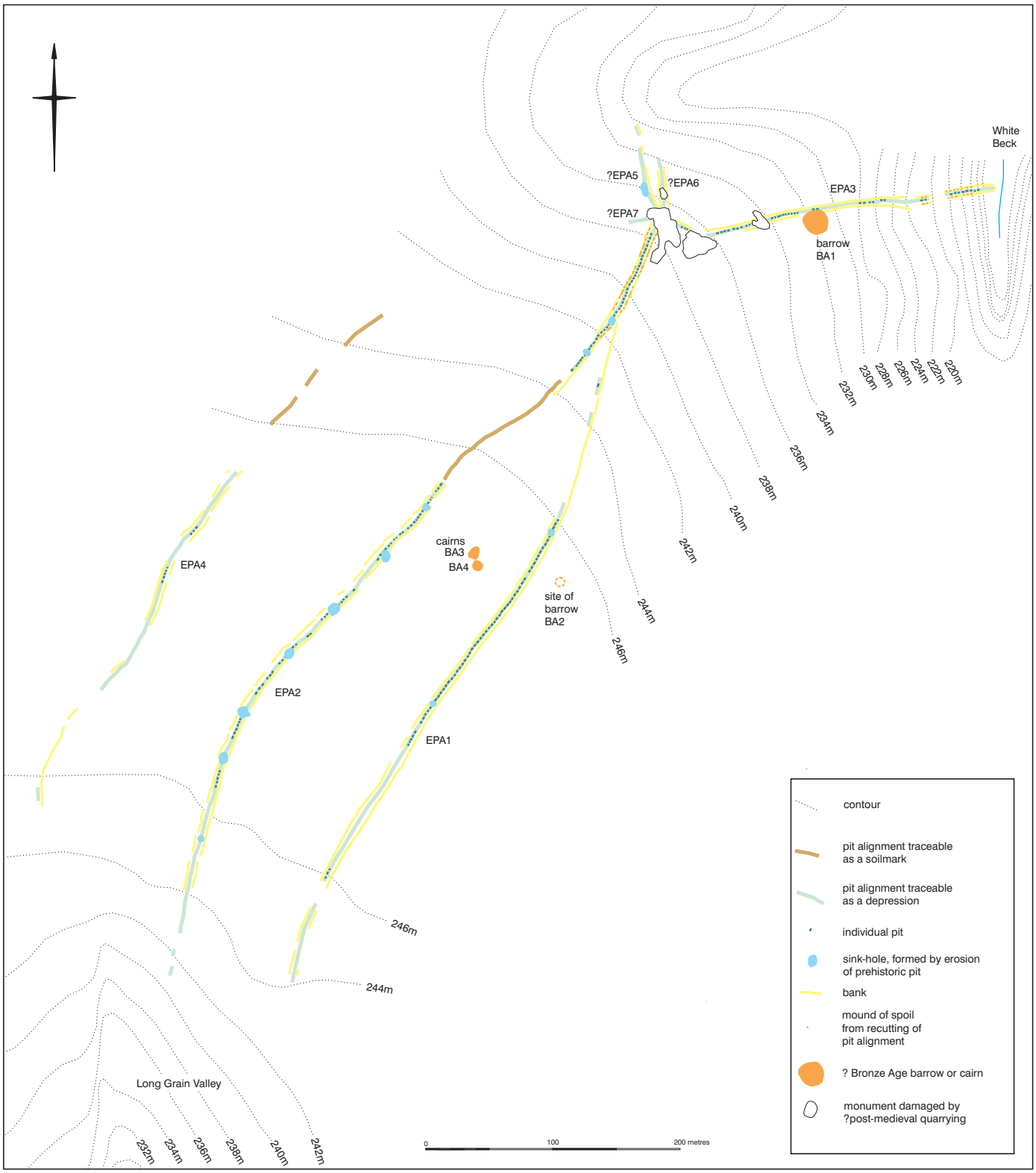

Figure 30: the siting of the embanked pit-alignments

Morphology

The generic term 'pit-alignment' has been traditionally applied to monuments comprising lines of pits, identified generally by aerial survey. This survey has shown that where earthworks survive, the presence and character of the banks is also a fundamental part of the architecture and the understanding of the monument as a whole. Other detailed field survey carried out by the RCHME on 'double pit-alignments' elsewhere on the North York Moors similarly recognised the importance and significance of bank architecture on this type of monument (Lofthouse 1993) and introduced the term Segmented Embanked Pit-Alignment (SEPA) to reflect the unique morphological characteristics exhibited there. To reflect the primary components of the alignments on Ebberston Low Moor the term *Embanked* Pit-Alignment (EPA) has been adopted and it could be concluded that the global term 'pit-alignment' may be something of a misnomer except when there is a clear absence of banks.

There are clear morphological differences between the various alignments recorded in this survey. In many cases this is directly attributable to identification of the localised impact of later land-use change, but despite this interference, original morphological differences between individual alignments can be deduced (see Figure 28).

Banks

One section of bank is unique on Ebberston Low Moor (EPA2 Section C). Here, along the west side of the alignment, segmentation is apparent, with a berm-like separation between the bank segments and the pits. Because of the general disturbance at the south of EPA2, the morphology of the western bank is hard to determine, but south of C4 it appears to be continuous down to C1/B4 where the whole line has been recut as a drain; north of C14 the portrayal on mapping suggests the alignment continued north as a substantial and continuous double bank. This leaves a *c* 200m length where segmented banks occur as surface earthworks. The chronological significance of this is discussed below (see **Chronology**).

Further coherence of bank architecture is apparent where redefinition of earlier alignments is obvious (EPA2 Section F and EPA3 Section B). The mounds which surmount the underlying continuous bank appear to be very carefully placed relative to the width of the bank; they are not casually thrown up. This tends to suggest again that the architecture of the banks is every bit as important as that of the pits, which by this time are barely visible in earthwork form, having been in effect replaced by the ditch. Apart from the segmented bank, and the sections where small mounds surmounting the banks evidence the redefinition of alignments, the banks, particularly along EPA1, generally appear to be broad in relation to their height. No evidence has been found that the banks were deliberately built significantly higher than they presently are, all being generally low and wide with rounded or flattish tops. This may suggest that especially along EPA1 the pits were meant to be conspicuous and not significantly obscured by the banks, although this hypothesis does not take account of the possible presence of hurdling or hedgelines along the

top. This contrasts with EPA2 and EPA3, where the banks (exaggerated by the presence of the ditch) are more conspicuous features; whilst the ditch retains pits and pit impressions, these are no longer the main visual element.

Gaps in the banks which may indicate crossings or termini (other than the segmented section of EPA2) and which cannot be directly attributed to later activity, have only identified in two alignments (EPA1, EPA2). Along EPA1, two gaps occur in the west bank but are not matched on the east, and although they may be original the confidence in these as such is low. However, the opposed gaps in both banks along EPA2 (Section B, B2/B3) suggest a break at this point, but as the western bank is segmented further north, this may also be further evidence of segmentation or a combination of both: a possible gap in the eastern bank at Section C, C4 may be original.

Pits

There are clear differences in the types of pit exhibited along the alignments, and these fall into three broad categories. The first category, in EPA1 Section D, are distinctly separate, deep pits, carefully aligned, regularly-shaped and spaced, and their overall uniformity is striking. This contrasts dramatically with pits in the other alignments. The second category, represented in EPA2 Section C, are generally smaller and more irregularly-shaped and spaced, and lie within a ditch; the third category in EPA2 Section F and EPA3 Section B, are barely impressions at the base of a more substantial ditch. In this third category it may be significant that even where the final form of the alignment is principally as a double bank and medial ditch, the pit impressions survive, possibly indicating a deliberate retention of the concept of visible pits from the earlier phases of the alignments. The fact that the northern end of EPA2, and the line of EPA3 appear to overlie and continue part of the line of EPA1, implies that the third category of pit is the final morphological phase in the evolution of pits and transition to ditches as the major boundary feature within the overall alignments on Ebberston Low Moor.

Alignment

EPA1 is characterised by its smoothness of line, deep, regularly spaced, individual rectilinear pits and double bank. The regularity of spacing and consistency of shape and size of pits implies a planned regime of construction. Also, the overall smoothness of the route and the fact that the marked changes in direction in the line of pits only seem to occur where there is a geological reason for this, implies that there is a uniformity of laying-out along this alignment. The banks are evenly sized and matched in form, with the east bank appearing slightly more substantial, and appear to have been constructed with the same organisation and uniformity as the line of pits. The smoothness of line is also apparent in EPA3 which clearly has the same re-defined morphology apparent where EPA2 overlies EPA1.

In contrast, EPA2 and EPA4 are erratic in course and have none of the uniformity of course displayed by EPA1. It is possible that this may result from the conjoining of separated segments as at Ugthorpe Moor and Danby Rigg (Lofthouse 1993), although the identification of a segmented bank along EPA2 alone is insufficient

evidence to make a direct analogy. The erratic routes of EPA2 and EPA4 may simply reflect a more haphazard and less controlled construction regime, possibly implying a lower status for these alignments.

Chronology

From the surface evidence, the relationship between the large round barrow BA1 and the embanked pit-alignment EPA3 seems relatively secure: the barrow post-dates the majority of the alignment. The size, form and siting of the barrow are entirely within the range of parameters identified for Bronze Age barrows in a regional study of this category of monument (Smith 1994), and consequently there is no reason to suspect that it should not be attributed to that broad period and possibly to the earlier part of that period. Thus, the identification that the final form of EPA3, itself a continuation of alignment and combination of the form of EPA2 and EPA1, implies a reasonably long and complex chronology on these alignments prior to the establishment of the barrow. Thus, a late Neolithic - Early Bronze Age date range is likely for the group. The barrow only physically overlies the southern bank, ditch and pits of EPA3; it does not impinge on the northern bank. This may imply that this boundary still held some relevance when the barrow and its platform were established.

The earthwork survey has demonstrated that at least part of the central alignment (EPA2 Section F) redefines EPA1 and probably EPA3 at the north, implying a re-routing of the boundary westwards and a reinforcement of the northern boundary, but there is no physical evidence to indicate the chronological relationship of the third parallel alignment (EPA4) at the west. However, the morphology of EPA4 at B2/B3 where there are continuous double banks, medial ditch and pit imprints is similar to EPA2 Section E. Also, EPA4, like EPA2 is very erratic in its course. This may indicate that these are contemporaneous monuments. If the slight return to the north-east of EPA4 indicated as a soil-mark on air photography is correct, this together with the alignment of the short length of ditch (EPA7), may indicate that EPA4 marks a further expansion westward. As EPA3 would continue this line it is possible that this was retained in the last phase of boundary development. However, given that the relative chronology of this cannot be established, this is purely speculative.

The identification of a segmented section of bank along EPA2 raises doubt as to whether this alignment developed as a single unit or whether it is multi-phased. It is tempting to suggest that EPA2 had successive phases of change, the first phase being segmented, subsequently being replaced by the double-banked alignment to the north and south, but that along this middle section only the eastern bank was subsequently constructed. Such an interpretation would fit in with the very obvious re-definition of earlier alignments as evidenced at the north along EPA2 Section F and EPA3 and would help explain why differing morphologies occur along EPA2. Conversely, it is possible that a detached segmented embanked pit-alignment (see below) was linked into a larger network. Neither scenario can be confidently proposed from the surface evidence alone here. Such an interpretation of an early segmented phase, whether as a discrete detached unit or a longer alignment, would further complicate the relative chronology identified within the monuments. An earlier segmented phase

subsequently replaced by a conjoining of bank/pits, thus producing continuous features, could also explain why EPA2 follows a very erratic course with frequent, short changes in direction, possibly evidencing linking of segments; this is in contrast to EPA1 which takes a smooth course. The pits in EPA2 are also more erratic in line, shape and size, being smaller, shallower and more rounded than those in EPA1. It is possible that the segmentation observed is similar in concept, but in a less obvious form, to that displayed in the banks of the segmented embanked pit-alignments (SEPAs) alongside the double line of pits surveyed on Middle Rigg, Danby Rigg and Ugthorpe Moor (Lofthouse 1993). Unlike the SEPAs recorded by Lofthouse, on Ebberston Low Moor there is no direct correlation between the siting of the pits and the bank segments. There is also no evidence to suggest that segmentation occurred along the east side of the alignment, where the bank there is well formed and continuous. It is possible that EPA6 is a remnant of this phase.

The apparent dramatic change in morphology between Section C and Section D of EPA2 may imply that only the northern end of EPA2 was redefined and thus further complicate the perceived chronological relationship between EPA1 and EPA2. As the majority of all four main alignments survive as surface earthworks, they clearly would presumably also have been extant as surface features during the prehistoric period. Thus, unless there was some mutuality of boundaries when all were in place, it is tempting to suggest that the status and currency of one would have had to be highlighted by upright posts or hedges or hurdling along the banks. (see Waddington 1997).

The existence of other possible embanked pit-alignments (EPA5 and EPA6) at the north may indicate a complex chronology seemingly focussed on the 'right-angled' junction of EPA2 and EPA3. The southern section of EPA5 lines up perfectly with the western section of EPA3, whilst EPA6 could easily continue the line of the northern end of EPA2. However, the incidence of the quarrying at the point of junction precludes an assessment as to whether there was an original link or relationship. Both EPA5 and EPA6 seem to end at the head of a natural valley, analogous to the alignments to the south, and the coincidence of alignments cannot be ignored easily; for these reasons alone they should be considered part of the complex of prehistoric boundaries until demonstrated otherwise. The absence of pits in these linear earthworks does not argue against their inclusion as part of this complex of linear boundaries, as is demonstrated by the morphology of EPA4, where only in two sections are remnant pits visible and EPA1 Section A where no pits are visible on the ground but show on air photography. If a pre-cursor to EPA3 did curve to the valley at the north-west then this would account for the apparent curious short offset of the alignment or right-angled join where it would meet EPA2. The earthwork similarity between EPA5 and the section of bank and ditch which was noted connecting the line of EPA3 to the Snainton Dykes suggests that they may be contemporaneous features. It is possible that EPA5 and EPA6 are remnants of earlier lines of EPA3 and EPA2 respectively but during the re-definition of these boundaries these lengths were not included and may have become redundant.

In summary, there are a number of critical ground points on which the chronology of the embanked pit-alignments can be confidently proposed. These are;

- Relationship of EPA1 and EPA2. EPA1 Section E is physically overlain by EPA2 Section F.

- EPA3 Section B has exact same form as EPA2 Section F indicating similar physical development and phasing.

- Southern bank and 'ditch' of EPA3 overlain by barrow of probable Bronze Age date.

As a result of the surface survey of the earthworks, the following simplified chronology of embanked pit-alignment evolution on Ebberston Low Moor is tentatively proposed (see Figure 31);

- Phase 1? - EPA5 (bank and ditch); pre-cursor to, and line re-used by later EPA3; connection to Snainton Dykes

- Phase 2 - EPA3; EPA1 (double banks, individual large pits)

- Phase 3? - EPA2; EPA6 Segmented or segmented on one side only (segmented bank separated from small irregular pits by berm; detached or part of longer alignment)

- Phase 4 - EPA2 (redefinition and conjoining of banks with ditch development; northern end of EPA1 and majority of EPA3 redefined at this stage; possible redefinition at south? Strips between pits removed, ditch widened, residue placed on banks in small heaps).

- Phase 5 - Bronze Age barrow placed partially over EPA3 at the north.

- Phase 6 – EPA4; EPA7 (?expansion westward)

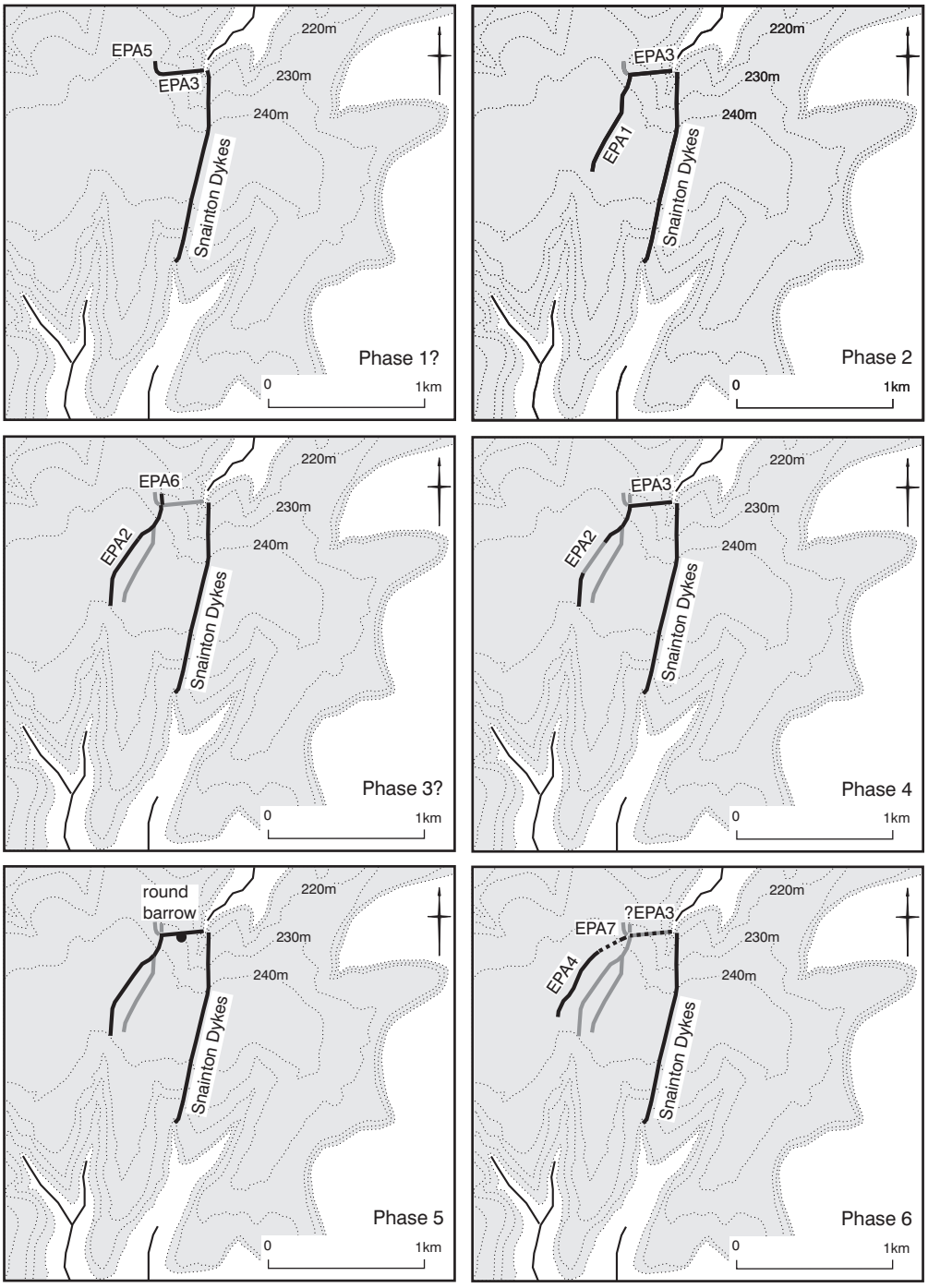

Figure 31. Phasing of embanked pit-alignments

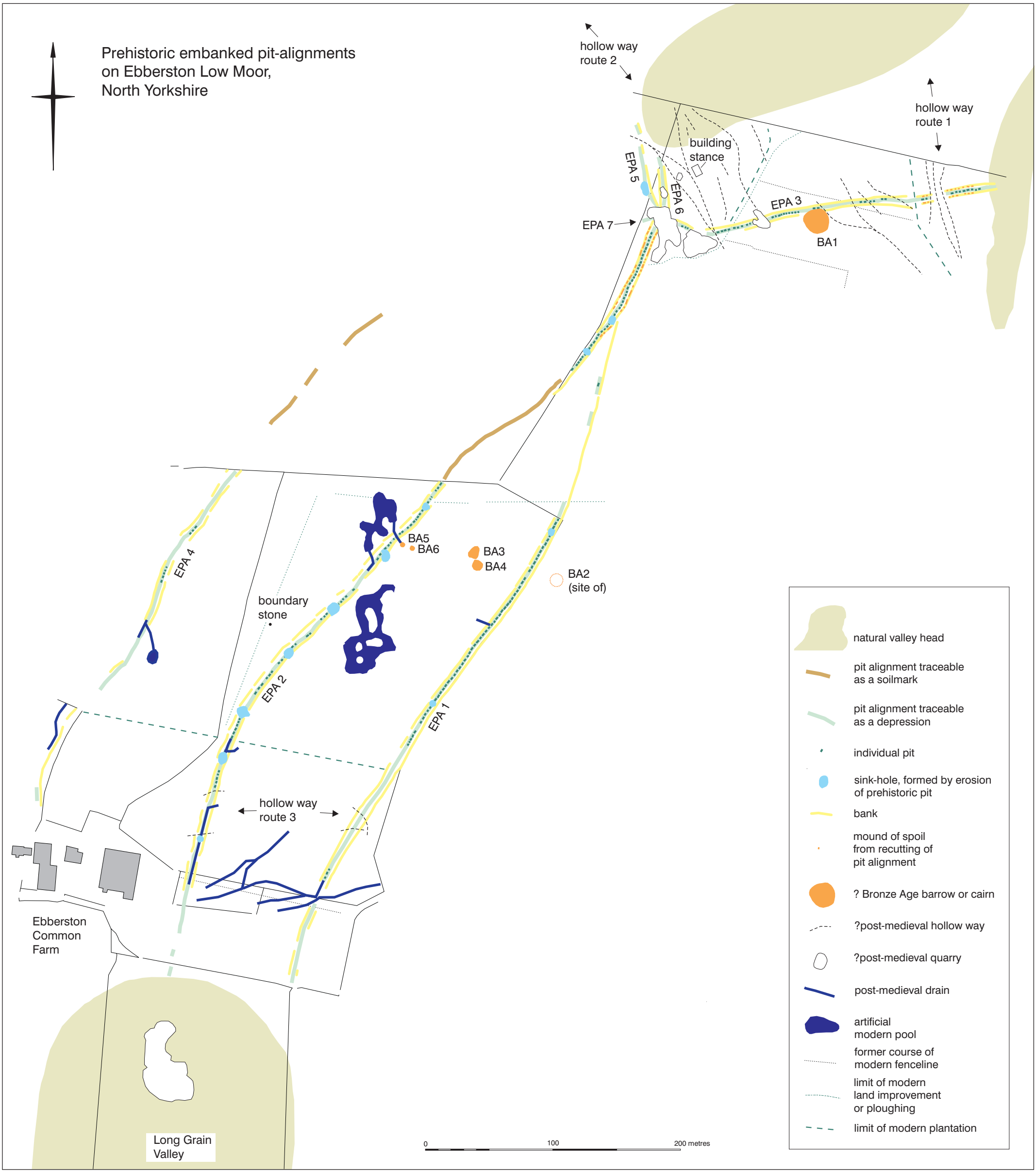

Figure 32: Summary interpretation diagram

6. METHODOLOGY

The survey was related directly to the Ordnance Survey National Grid coordinate system (OSGB 1936). This was done using Leica single frequency Global Positioning System (GPS) equipment to record relative positions between survey stations on site and an Ordnance Survey triangulation pillar SE97/11, situated approximately one kilometre to the south-west (NGR SE 889 890). The data was transformed using SKI software. A total of eight stations were established on Ebberston Low Moor of which three were permanently marked by ground anchors; all have coordinated values to the nearest centimetre within the National Grid. For location of permanent stations see Figure 7, and for witness measurements and values see Appendix 4.

These stations were then used as the basis for the measured survey, which was carried out using a Leica TC1610 electronic theodolite with integral Electromagnetic Distance Measurement (Total Station). Seven of the stations were occupied as single-station computations, using other GPS coordinated stations for orientation. Observations from these stations were taken to set out a network of temporary control points marked by plastic pegs and degradeable paint marks across the site. Total station data was processed and plotted using Mathshop software. Fibron tapes were then used to measure between these control points allowing archaeological detail to be plotted directly by hand at 1:1000 scale onto the emerging plan on site using standard graphical techniques of tapeline and offset. Samples of two pit-alignments were also surveyed at 1:200 scale.

The hand-drawn archive plans were prepared by Alastair Oswald as were the CAD-based interpretative drawings. The latter were produced using CorelDraw 8 software. The core investigation and survey was undertaken by Stewart Ainsworth and Alastair Oswald, with assistance from Trevor Pearson and Philip Sinton. The report was researched and written by Stewart Ainsworth and edited by Alastair Oswald. Aerial photography was carried out by Peter Horne, and the soil-marks were transcribed by Jane Stone. Ground photographs were taken by Bob Skingle.

The full site archive has been deposited in English Heritage's National Monuments Record, Great Western Village, Kemble Drive, Swindon SN2 2GZ, to where applications for copyright should be made.

7. ACKNOWLEDGEMENTS

The survey was prompted by a request from Graham Lee, the North York Moors National Park archaeologist, who along with John Ette from English Heritage, organised contribution of funding toward the costs. Thanks are extended to the farmer of the land, Mr Hammond, who kindly allowed access and provided information on the land-use aspects of the site. Valuable comment was received on site from Graham Lee and Blaise Vyner.

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APPENDIX 1: The photographic record

Black and white medium-format record photographs taken during the field investigation

AA99/03595 Ebberston Low Moor: embanked pit-alignment (EPA)2, Section C, looking north

AA99/03596 Ebberston Low Moor: embanked pit-alignment (EPA)2, Section C, looking south

AA99/03598 Ebberston Low Moor: embanked pit-alignment (EPA)1, Section D, looking south

AA99/03599 Ebberston Low Moor: embanked pit-alignment (EPA)1, Section D, looking south

AA99/03600 Ebberston Low Moor: embanked pit-alignment (EPA)2, Section E, looking north

AA99/03601 Ebberston Low Moor: embanked pit-alignment (EPA)2, Section F, looking north

AA99/03602 Ebberston Low Moor: embanked pit-alignment (EPA)3, Section A and barrow (BA1), looking east

AA99/03603 Ebberston Low Moor: barrow (BA1) from the west

AA99/03604 Ebberston Low Moor: embanked pit-alignment (EPA)3, Section B, looking east

AA99/03605 Ebberston Low Moor: embanked pit-alignment (EPA)3, Section B, looking west

AA99/03606 Ebberston Low Moor: embanked pit-alignment (EPA)3, Section B, looking east

AA99/03607 Ebberston Low Moor: embanked pit-alignment (EPA)3, Section B, looking west

Additionally, a number of 35mm black and white record photographs, plus some digital colour photographs are also held in the site archive.

APPENDIX 2: Table of NMR numbers linked to this site

Embanked pit-alignment 1	SE 90300 89318 - SE 90557 89845	SE 98 NW 10
Embanked pit-alignment 2	SE 90207 89330 - SE 90850 89920	SE 98 NW 11
Embanked pit-alignments 3, 5, 6, 7	SE 90585 89920 - SE 90852 - 89948	SE 98 NW 5
Embanked pit-alignment 4	SE 90100 89460 - SE 90253 – 89725	SE 98 NW 112
Barrow (BA1)	SE 90712 89920	SE 98 NW 17
Tumulus (BA2)	SE 90508 89640	SE 98 NW 61
Cairns (BA3, BA4)	SE 9044 8966	SE 98 NW 62
Cairns (BA5, BA6)	SE 90383 89662	SE 98 NW 106
Hollow ways	SE 9081 8992, SE 9063 8993, SE 9030 8941	SE 98 NW 107
Quarrying (QY1-7)	SE 90585 89925	SE 98 NW 108
Quarrying (QY8)	SE 90200 89250	SE 98 NW 109
?Building stance	SE 90616 89956	SE 98 NW 110
Boundary stone	SE 90319 89649	SE 98 NW 111

APPENDIX 3: Concordance of monument identifiers

English Heritage report identifier	NMR number	Rutter number (1954)	Spratt number (1989)	Name
EPA1	SE 98 NW 10	-	C22	Ebberston Common East Dike
EPA2	SE 98 NW 11	L17	C21	Ebberston Common West Dike
EPA3	SE 98 NW 5	L17a	C23	-

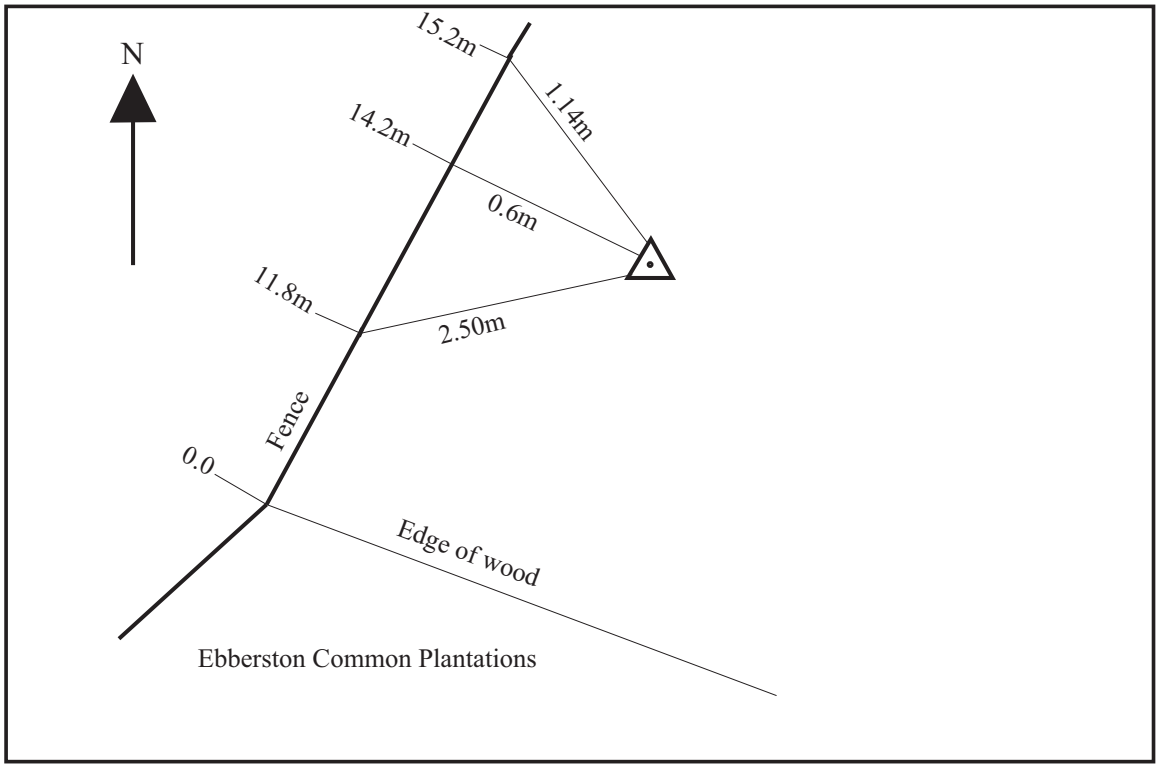
APPENDIX 4: Locations of permanent survey stations

SURVEY STATION INFORMATION

ENGLISH HERITAGE

SITE NAME	Ebberston Low Moor		
Station number	1	**Status**	Permanent
Type of Mark	Ground Anchor	**NMR number**	-
Date of Survey	3/12/1998	**Sam number**	-
Office of origin	EH York	**RSM number**	-
Surveyor(s)	SA; TP; PS; AO	**Neg number**	-

Co-ordinate Scheme	**Eastings**	**Northings**	**Height**
OS National Grid	490243.882	489528.041	246.545m
Divorced Site Grid	N/A		

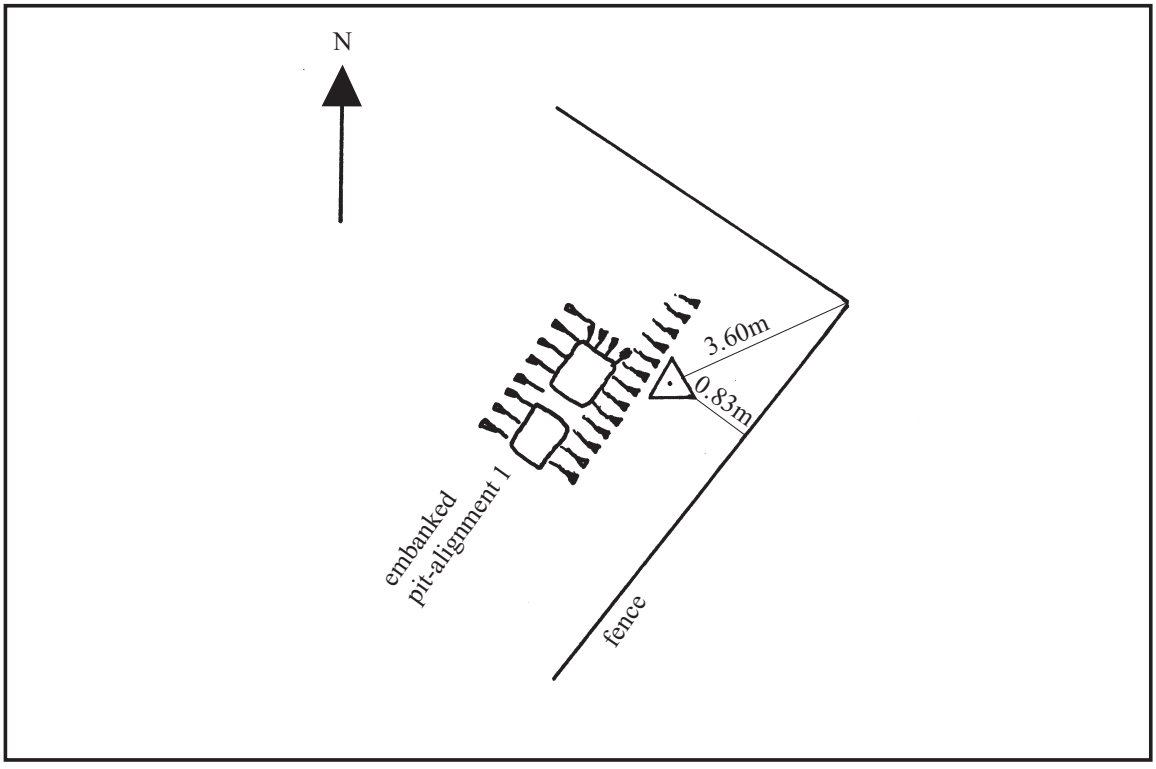


SURVEY STATION INFORMATION

ENGLISH HERITAGE

SITE NAME	Ebberston Low Moor		
Station number	2	**Status**	Permanent
Type of Mark	Ground Anchor	**NMR number**	-
Date of Survey	3/12/1998	**Sam number**	-
Office of origin	EH York	**RSM number**	-
Surveyor(s)	SA; TP; AO; PS	**Neg number**	-

Co-ordinate Scheme	**Eastings**	**Northings**	**Height**
OS National Grid	490509.995	489682.458	246.130m
Divorced Site Grid	N/A		



SURVEY STATION INFORMATION

ENGLISH HERITAGE

SITE NAME	Ebberston Low Moor		
Station number	3	**Status**	Permanent
Type of Mark	Ground Anchor	**NMR number**	-
Date of Survey	3/12/1998	**Sam number**	-
Office of origin	EH York	**RSM number**	-
Surveyor(s)	SA; TP; AO; PS	**Neg number**	-

Co-ordinate Scheme	**Eastings**	**Northings**	**Height**
OS National Grid	490646.293	489916.367	235.265m
Divorced Site Grid	N/A