Barnsdale Bar Quarry

Norton

South Yorkshire

Archaeological Investigations

Contents

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List of Figures

List of Tables

List of Appendices

SECTION A: INVESTIGATIONS AT BARNSDALE BAR SOUTH

1. Introduction

1.1 Archaeological Services WYAS was commissioned to carry out a series of archaeological investigations at Barnsdale Bar Quarry, Norton, on behalf of SITA Ltd (~~now Darrington Quarries Ltd~~). The site is located immediately west of Long Lane, which lies *c.* 0.25km east of the A639/A1 junction (Fig. 1). The investigation was requested by the South Yorkshire Archaeology Service (SYAS) as a condition of planning consent relating to the proposed southern extension of the existing mineral extraction quarry (planning application number 99/65/4103/P/MINA).

1.2 The archaeological work was carried out in three stages. The first stage comprised a geophysical survey and was reported separately (Webb 2000). The subsequent evaluation was undertaken between the 23rd March and 28th April 2000, and finally an excavation was undertaken between the 24th July and 4th October 2000. The latter two stages of work are reported here.

1.3 The application area covers approximately 3.6ha of arable land and is centred at SE 511 141. It consists of a sub-rectangular area bounded by Long Lane to the east and by the existing quarry to the north. The northern boundary also corresponds with the administrative division between South Yorkshire and North Yorkshire. To the south and west the extent of the application area does not correspond with any existing topographic features or boundaries (Fig. 2). The site inclines gently from *c.* 56.5m above ordnance datum (OD) in the north to *c.* 62.0m in the south.

1.4 The underlying geology of the site is Lower Magnesian Limestone (British Geological Survey 1978). The soils are mapped as shallow, well-drained calcareous fine loamy soils of the Aberford association (511a; Soil Survey of England and Wales 1983). At the time of the evaluation the site was under crop. During excavation the southern part of the site remained under crop whilst the northern part had been recently ploughed.

2. Archaeological Background

2.1 The site is located in an area of extensive crop marks which appear to represent the remains of later prehistoric/Romano-British occupation. Due to the continuing expansion of quarry workings this landscape has undergone considerable archaeological investigation over the past decade. The areas to the north and north-west of the present site lie within the counties of North Yorkshire and West Yorkshire; the current proposed expansion of the Barnsdale Bar quarry is the first to affect land within South Yorkshire.

2.2 In 1996 an archaeological assessment identified 30 archaeological sites in the vicinity (Boucher 1996) and previous fieldwork has included geophysical survey, fieldwalking and trial trenching. The most recent phase of work reported the results of trial trenching and geophysical survey to the east of Long Lane, and confirmed the presence of enclosure and field ditches of probable later prehistoric/Romano-British date (O'Neill and Whittingham 1999). Earlier work in the area north-west of Long Lane, and immediately north of the present site, identified a similar system of ditched land division

and a surface scatter of 141 flint artefacts (Boucher 1993; Webb 1993; Webb 1995; Brown and Morris 1997; Speed 1997). The numerous previous investigations are summarised in Section B of this report and illustrated on Figure 17.

2.3 The first stage of the current investigations comprised a gradiometer survey which revealed several linear magnetic anomalies indicative of infilled ditches plus some isolated anomalies of which the majority were thought to have natural origins (Fig. 2; Webb 2000). These results suggest that the complex archaeological landscape to the north of Long Lane continues into the current application area.

3. Method

3.1 A staged programme of works comprising test pitting and trial trenching followed by open-area excavation was devised by SYAS and Archaeological Services WYAS. The investigations were carried out in accordance with the requirements of the *Written Scheme of Investigation* and the advice of SYAS (Appendices VI-VIII).

3.2 The aims of these investigations were, where possible:

- to establish by test pitting whether the previously identified concentration of flint artefacts continued into the application area and to determine whether the distribution of flints could suggest where the original deposition of these artefacts occurred;
- to investigate by test pitting whether any features relating to the period of flint deposition survive;
- to gather sufficient information by trial trenching to establish the presence/absence, character, extent, state of preservation and date of any archaeological deposits within the areas of proposed development;
- to gather sufficient information by open-area excavation to establish the presence/absence, character, extent, state of preservation and date of any archaeological deposits within the areas of proposed development and to further enhance the results of the trial trenching;
- to use all of the excavated evidence to determine the chronology of the site, the inter-relationships and function of the components of the site;
- to undertake the mapping and rectification of archaeological features visible on the available aerial photographs covering a 9km^2 area centred on the development area;
- to integrate the results of the all of the above investigations, plus any other known archaeological works or finds within the 9km^2 study area, and to produce a 1:5000 mapped overview of the archaeology within that area;
- to place the current archaeological investigations into a regional, chronological and geographical framework which will enhance the understanding of the archaeological resource in this area.

3.3 The locations of the test pits, trial trenches and excavation areas were set out using a 600 series Geodimeter total station theodolite with reference to control points established during the geophysical survey.

3.4 Thirteen test pits were located near the northern boundary of the site (numbered 1-3, 7-9, 16-18 and 22-25). Each test pit measured 1m^2 and was hand excavated. The deposits were sieved through a 10mm mesh to enhance artefact recovery and, in the absence of archaeological remains, excavation ceased when undisturbed natural deposits were reached (see Appendix IX).

3.5 The ten trial trenches (labelled A-J) and the excavation area were machine excavated, using an 360° mechanical excavator fitted with a toothless ditching bucket, under direct archaeological supervision, in level spits to the top of the first archaeological horizon or undisturbed natural. The resulting surfaces were cleaned manually and inspected for archaeological remains. All archaeological features were hand excavated in accordance with the strategy set out in the *Written Scheme of Investigation* (Appendices VI-VIII). The written, drawn and photographic record followed the Archaeological Services WYAS standard method (Boucher 1995). The trench limits and site grid were established with the Geodimeter total station theodolite.

3.6 Following the machine stripping of the site for the open-area excavation, and prior to the commencement of excavation, the Archaeological Services WYAS Environmental Officer devised a soil sampling strategy appropriate to the soil conditions and features found at the site. A soil sampling programme was undertaken for the recovery of carbonised plant remains, vertebrate remains, molluscs and small artefacts. It was hoped that this would aid artefact recovery, provide evidence for the reconstruction of the economy and environment, and retrieve carbonised material should radiometric dating be required. Soil samples of between ten and thirty litres were taken from the primary fills of all features and from other fills where appropriate.

3.7 The test pitting, trial trenching and open-area excavation results have been integrated into this single report. Four of the trial trenches (E, H, I and J) did not contain any archaeological remains. The features, artefacts and environmental samples from the other six trial trenches can be identified by their 3-digit context numbers compared to the 4-digit numbers of the excavation.

3.8 The paper archive and artefacts resulting from the works are currently stored by Archaeological Services WYAS and will be deposited with Doncaster Museum within a time scale agreed between Archaeological Services WYAS and the recipient museum. The museum accession number is DONMG:2001.38.

3.9 The text of the section entitled *Air Photograph Mapping and Interpretation* by Alison Deegan has been edited for inclusion in this report and the mapping is presented in Figures 17 and 18. A copy of the complete Archive Report with 1:5000 plot of the crop marks will be submitted to the South Yorkshire Archaeology Service Sites and Monuments Record.

4. Results

4.1 The Stratigraphic Sequence

4.1.1 The gradiometer survey revealed a series of anomalies that were interpreted as the remains of a large rectangular enclosure plus some additional, less clear, linear and discrete anomalies (Fig. 2). The results of this work determined the location of the evaluation trenches which were positioned to target ditch intersections and other areas of potential interest, and also to test some apparently blank areas. The test pits were located at the northern boundary of the site near to the area where flints had previously been collected. The evaluation test pits and trenches revealed no earlier prehistoric features and few flints but did confirm the presence of the enclosure ditches. Four of the trial trenches (E, H, I and J) did not contain any archaeological remains. The area selected for open-area excavation encompassed most of the ditched enclosure and its interior.

4.1.2 The open-area excavation involved the stripping of an area of *c.* 1.4ha. This exposed the remains of the four sides of a large rectangular enclosure and three of the corners; the fourth, the south-west, had been investigated in Trench G of the evaluation (Fig. 3).

4.1.3 It was apparent that this area had been subject to a great deal of truncation, probably caused by modern arable agriculture. Subsoil was present in the lowest parts of the excavation areas but elsewhere topsoil tended to lie directly above undisturbed limestone and sandy-clay natural deposits. Combined topsoil and subsoil cover was greatest, at *c.* 0.6m, in the northern part of the site, which occupied the lowest ground, compared to *c.* 0.45m on the higher ground in the south of the site. Despite this contrast there was only slight variation in the degree of truncation of archaeological features across the site, with the deepest features actually tending to be located on the higher ground.

4.1.4 Archaeological features could not be identified in the topsoil or subsoil and were only visible at the level of the undisturbed natural. Fill descriptions are only provided in the text when significant variations from the typical reddish-brown sandy-silt deposits were noted or when distinctive inclusions were present. The surface of the undisturbed natural deposits was encountered at around 56.0m OD in the northern part of the excavation area and 61.5m OD in the south.

4.2 Natural Features

4.2.1 The underlying geology of the area is Lower Magnesian Limestone and frequently incorporates glacial and peri-glacial features which can be difficult to distinguish from archaeological features. This problem has been noted by Archaeological Services WYAS at each of the previous Barnsdale Bar investigations and also nearby at South Elmsall, West Yorkshire (SE 480 120). At each of these sites numerous 'features' were visible in plan which were, upon excavation, found to be natural.

4.2.2 The majority of these geological features share a common form, consisting of a well-compacted reddish-brown clay/silt fill with no inclusions within an irregular 'cut'. These features also tend to have a red clay deposit at the

interface of the fill and the natural limestone, which appears very similar to a primary fill or lining. In section the features display very typical geological erosion/accumulation patterns. In natural features the clay/silt deposit fills a very smooth 'cut' into the limestone. In contrast the archaeological features have sharp cut edges with little erosion of the limestone, and the fills always contain limestone inclusions. The naturally accumulated fills are completely free of inclusions.

4.2.3 These geological features are solution hollows and channels which are formed by the accumulation of water in shallow natural faults. The soft limestone dissolves creating smooth, eroded edges. The red clay 'lining' represents the insoluble element of the limestone/water solution which is redeposited first. The silts are lighter and are redeposited later.

4.2.4 At Barnsdale Bar South all features which fitted the above criteria were interpreted as natural and were therefore not recorded. Archaeological deposits were identified by the presence of soft reddish brown sandy-silt fills with a low clay content and a higher concentration of limestone inclusions than the natural features. Any features which did not conform to this clear natural/archaeological distinction were investigated by excavation.

4.3 Phase 1: Gully 6000 (Fig. 3)

4.3.1 Gully 6000 was located in the north-eastern part of the site and was investigated in evaluation Trench B. It was located at the intersection of three later ditches (5000, 5001 and 5009) and had been severely truncated. The gully was irregular in plan - probably the result of truncation rather than the original construction. The feature comprised one or possibly a series of gullies in a 'ring' arrangement with a diameter of 4m. The gully was 0.7m wide and survived to a depth of 0.15m, with a U-shaped profile and irregular base (Fig. 4, S.9, S.19). Gully 6000 contained a single fill and yielded one copper alloy artefact of uncertain date.

4.4 Phase 2: Enclosure A (Fig. 3)

4.4.1 The earliest ditch (5000) was located on the north-eastern side of the site. The greater part of this ditch was orientated north-west to south-east but at each end the ditch turned through 90° to lie north-east to south-west. The course of the ditch was fairly straight and followed the downward-sloping topography of the site. At its north-western corner ditch 5000 cut Phase 1 gully 6000 (Fig. 4, S.12). Ditch 5000 appears to form the western boundary of a probable enclosure (Enclosure A) which lies outside of the current area of investigation.

4.4.2 Ditch 5000 had a total length of about 120m and ranged from 0.88m to 2.45m in width and from 0.72m to 0.20m in depth (Fig. 4, S.5, S.10, S.12, S.22; Fig. 5). Its construction was fairly uniform throughout its length and it maintained a wide U-shaped profile even in areas where the greatest truncation had occurred, notably at the corners where the ditch was shallowest. For the most part the ditch contained a single fill but at two places along its length two fills were noted (e.g. Fig. 4, S.5). The fill(s) contained a high proportion of large limestone fragments, with some pieces measuring up to 0.3m, mainly in the lower sections of the fill.

4.4.3 Ditch 5000 was also notable for containing all of the six non-residual sherds of Romano-British pottery that were recovered from this site. These sherds were distributed evenly along the north-west to south-east section of ditch 5000 and indicated deposition in the 2nd century AD. Segment 1128 (Fig. 5, S.788) yielded a residual worked flint lump and also a charred wheat grain (*Triticum* sp.) which was submitted for AMS dating. The date was returned as cal AD 1479-1946 (at the 95% level of confidence; AA-41786), indicating that the material was intrusive (see Section 7 below).

4.5 Phase 3: Enclosures B and C (Fig. 3)

4.5.1 Enclosure B corresponds to the rectangular enclosure identified during the gradiometer survey and which became the focus of subsequent investigations. Enclosure B was appended to the western side of Enclosure A by the construction of ditches 5001, 5002 and 5003, creating a rectangular enclosure measuring 130m by 85m. The western and eastern sides of the enclosure (5000 and 5002) were each formed by well-defined, regular, straight ditches. In contrast, the northern and southern sides (5001 and 5003) were irregular and sinuous. These latter boundaries were found to be more truncated than the former, especially on the southern side, where the ditch was segmented.

4.5.2 The southern side of Enclosure B was formed by a north-east to south-west aligned ditch (5003). It had been appended to the south-eastern corner of Enclosure A, cutting through the partially infilled ditch 5000 (Fig. 6, S.749/750). Ditch 5003 was 130m in length, of which 66m was identified within the open area and in evaluation Trench G. The remainder has been extrapolated from the results of the gradiometer survey. The construction of ditch 5003 was far less uniform than that of ditch 5000. Ditch 5003 varied between 0.6m and 1.3m in width and between 0.08m to 0.52m in depth (Fig. 6). The profile was irregular, changing from U-shaped at the eastern end to V-shaped at the western end. It contained a single fill and produced no finds.

4.5.3 Ditch 5003 incorporated at least three gaps along its length; at 10m, 23m and 52m from the south-east corner of Enclosure B. These breaks suggest that the ditch was constructed as a series of segments, the majority of which would have conjoined to form a continuous linear feature of varying depth. Recent truncation had almost certainly contributed to the presence of distinct segments and gaps of 1-3m width were evident. However, the widest of these gaps may possibly have been deliberate and could have formed an entranceway. Between the ditch terminals on either side of the putative entrance was an elongated pit (1073), positioned across the gap. The pit was 2.26m long, 0.8m wide and 0.26m deep (Fig. 6, S.746). The width and depth were comparable with ditch 5003 at this point, suggesting that the pit had been deliberately inserted as an extension to ditch 5003, to bridge the gap and to narrow or block the entrance.

4.5.4 At the south-west corner of Enclosure B ditch 5003 turned through 90° to form the western boundary of the enclosure (ditch 5002). Ditch 5002 was 77m long and was very similar in construction to the eastern ditch (5000), i.e. fairly straight, uniform and wide with a U-shaped profile (Fig. 7). Around 40m of the north-west to south-east orientated ditch was exposed and the remainder was extrapolated from the gradiometer survey. Ditch 5002 was the

best-preserved feature at the site, surviving to a width of 1.7-2.4m and a depth of 0.6-0.8m. The ditch contained a single fill which yielded no artefacts. Segment 1085 did, however, contain sufficient hazel charcoal (*Corylus avellana*) for AMS dating (Fig. 7, S.755). The date was returned as cal AD 262-539 (at the 95% level of confidence; AA-41785), suggesting that ditch fill was accumulating no earlier than the late 3rd century AD (see Section 7).

4.5.5 At the north-west corner of Enclosure B ditch 5002 shallowed slightly and turned through 90° to lie north-east to south-west, forming the northern boundary of the enclosure (ditch 5001). Ditch 5001 was highly truncated and followed a sinuous course, similar to the southern enclosure boundary, only really gaining any substantial depth at the corners of the enclosure. The curving course of the ditch may have been influenced by variation in the underlying geological deposits. In addition to the solid limestone bedrock some softer sandy deposits filled natural hollows and channels in this area, particularly at the western end of the ditch where the natural features were visible in section (Fig. 8, S.506, Fig. 9, 768).

4.5.6 Ditch 5001 was 135m in length and varied between 1.0-2.5m in width and 0.1-0.5m in depth, with the shallowest and narrowest sections being located in the middle part of the ditch. Like ditch 5003 (the southern boundary) the profile of ditch 5001 varied between U-shaped and V-shaped along its length (Figs 8 and 9). The majority of sections through this ditch revealed a single fill although at the eastern end, where the ditch widened, a secondary fill was visible (Fig. 8, S.1). It is possible that some degree of re-cutting may have been present in this area, or perhaps additional fills had been completely removed elsewhere. Two pieces of residual flint were recovered from the eastern end of the ditch.

4.5.7 Approximately 35m from the north-eastern corner of the enclosure, ditch 5001 truncated and partially re-cut unphased gully 5010 (Fig. 8, S.200, S.206). At the eastern end ditch 5001 intersected with Phase 1 gully 5000 but no relationship could be determined in section (Fig. 8, S.25). Further east, the ditch's eastern terminal stopped short of ditch 6000 (Enclosure A). At the terminal ditch 5001 appeared to consist of two separate cuts (Fig. 8, S.17).

4.6 Ditches 5006, 5007, 5008 and 5009 (Fig. 3)

4.6.1 The subsequent episode(s) of expansion may relate to either Phase 3 or Phase 4. The addition of ditches 5006 and 5007 to the north-west corner of Enclosure B and ditches 5008 and 5009 to the north-eastern corner certainly followed the construction of the enclosure as they each respect the position of ditch 5001.

4.6.2 The subdivision formed by Enclosure C was defined by ditches 5008 and 5009 which had each been appended to the northern side of Enclosure B. The complete outline of this smaller enclosure could not be determined with any certainty but it seems, from the available evidence, that it would have been a square enclosure of dimensions 30m by 35m.

4.6.3 Ditch 5009 was orientated north-west to south-east, perpendicular to ditch 5001 and on the same alignment as ditch 5000 (Enclosure A). Ditch 5009 was only revealed for 11m in length but this substantial feature is perhaps

likely to have been a major boundary, possibly relating to further enclosures. It was between 2.7-3.0m in width and 0.3-0.6m in depth and contained a single fill (Fig. 10, S.4; Fig. 11, S.2). At the southern end it intersected Phase 1 gully 6000 but stopped short of joining either ditch 5001 or 5000. At the terminal the section with gully 6000 was very shallow but it was suggested that ditch 5009 could be seen to cut the gully (Fig. 10, S.14). The end of ditch 5009 was very irregular and, like ditch 5001, appeared to comprise two cuts.

4.6.4 Ditch 5008 was 35m long (including an 11m section extrapolated from the gradiometer survey) and was orientated north-west to south-east, parallel with ditch 5009. Ditch 5008 was 1.4-2.7m wide but survived to only 0.08-0.20m in depth, with a single fill (Fig. 10, S.100, S.102, S.774). The northern terminal was identified in evaluation Trench A. At the southern end the ditch did not intersect with ditch 5001, although it may have done prior to truncation (Fig. 10, S.776).

4.6.5 Ditches 5006 and 5007 were identified in evaluation Trench F and a continuation of ditch 5006 was observed when the stripped area was expanded for excavation. Notably ditch 5007 appeared to end at the edge of Trench F and, despite careful cleaning, no extension could be identified during the excavation phase of work. Despite their apparent relationship with ditch 5001 it cannot be assumed that ditches 5006 and 5007 were contemporary with each other. In fact the difference in their alignments may suggest the opposite is true.

4.6.6 Ditch 5006 was orientated east to west – an alignment not observed anywhere else at the site. It was 13.2m long, 0.7-1.0m wide and 0.24-0.44m deep with a single fill (Fig. 11, S.502, S.514). The ditch terminated in a butt-end 6m away from the northern boundary of Enclosure B.

4.6.7 Ditch 5007 was 8m long, 1.25m wide and 0.4-0.6m deep with a single fill (Fig. 11, S.504, S.512). This ditch was orientated north-west to south-east and terminated only 0.8m from Enclosure B.

4.7 Phase 4: Enclosure D (Fig. 3)

4.7.1 The development of the enclosure system continued during Phase 4 with the construction of another enclosure extending from Enclosure B towards the south-west. Ditches 5004 and 5005 were appended to the existing south-western and north-western corners of Enclosure B respectively. Both of these later ditches lay on a south-west to north-east alignment and appear to represent the construction of a further enclosure (Enclosure D) which utilised the south-western side of Enclosure B as its north-eastern side. Only a short length of ditches 5004 and 5005 could be identified within the excavation area, although the results of the gradiometer survey confirm that ditch 5004 extended for a further 19m, and may possibly have incorporated a short entranceway. As with Enclosure A, it is impossible to determine the form or dimensions of Enclosure D, or even whether it was a complete enclosure.

4.7.2 A 4m length of ditch 5004 was recorded within evaluation Trench G. It was 1.6m wide and 0.6m deep with a single fill (Fig. 11, S.600). The ditch terminated in a butt end at the intersection with Enclosure B (ditches 5002/5003) which had filled to a depth of at least 0.5m (Fig. 11, S.608).

Ditch 5005 was exposed for only 3.5m within Trench F where it was 1.4m wide and 0.2m deep, again with a single fill (Fig. 11, S.510). It terminated in a butt end at the intersection with Enclosure B (ditches 5001/5002) where truncation had reduced the ditches to a depth of only 0.14m (Fig. 11, S.508). No finds were recovered from either ditch 5004 or 5005.

4.8 Phase 5: Post-medieval Features (Fig. 3)

4.8.1 Gullies 5011 and 5012 crossed the southern boundary of Enclosure B. These two features were around 20m long and were orientated north-west to south-east. Each gully was only 0.15m deep with an irregular U-shaped profile and a single fill (Fig. 12, S.735, S.737). The fills were identical to each other but contrasted with the other fills at the site, being a lighter colour and containing fewer inclusions. For this reason the features are believed to be contemporary. Gully 5011 was shown to cut ditch 5003 (Fig. 12, S.743/744) and contained a single sherd of Romano-British pottery which is believed to be residual. These features were parallel and about 10m apart, and have therefore been interpreted as the remnants of medieval/post-medieval ridge and furrow agriculture.

4.8.2 Deposit 1092 was located in the north-western part of the excavation area, east of ditch 5006. This layer did not lie within a cut but contained 77 fragments of rabbit bone. The deposit is not thought to be archaeological.

4.8.3 Pit 1048 was located in the centre of Enclosure B. It was 0.7m long, 0.5m wide and at least 0.15m deep. The dark brown fill contrasted with the lighter archaeological fills elsewhere on the site and this feature appeared to be modern. It contained the partial skeleton of a sheep/goat.

4.9 Unphased Features (Fig. 3)

4.9.1 *Gully 5010*

Gully 5010 was a T-shaped feature cut by the northern boundary ditch (5001) of Enclosure B. Unfortunately the original form and function of the gully was difficult to determine due to the truncation caused by the construction of ditch 5001. To the south of ditch 5001 the gully extended for 10.5m in a north-west to south-east direction. This section of gully 5010 was 0.9m wide and only 0.18m deep with a single fill (Fig. 12, S.204). At its north-western end the gully appeared to widen and turn, forming a north-east to south-west orientated gully. The relationship between this section of gully 5010 and ditch 5001 was demonstrated in two places (Fig. 8, S.200, S.206) which clearly showed that gully 5010 was the earlier feature. The north-east to south-west section of gully 5010 was at least 1.2m wide and 0.35m deep and around 9m in length. Additional sections through ditch 5001 did not reveal any further evidence of gully 5010 (Fig. 9, S.772, S.778). Although gully 5010 pre-dated Phase 3 Enclosure B, it has not been possible to determine whether it was contemporary with either Gully 6000 in Phase 1, or Enclosure A in Phase 2.

4.9.2 *Discrete features*

The few discrete archaeological features to be identified were generally situated near the eastern edge of Enclosure B (Groups 6001 and 6002) and within Enclosure C (Group 6003). The features in these groups were not

arranged in structural arrays, although the extent of truncation across the site is likely to account for this. No datable evidence was recovered from any of these features and aside from a few fragments of cattle tooth from pit 1041 (Group 6002) none of the features yielded any artefacts or environmental material. It is unclear whether these groups of pits and post-holes should be considered to be contemporary, and it is impossible to determine which phase of site activity is appropriate. However, as the groups lie within Enclosures B and C it might be suggested that the majority of these features are associated with Phase 3 activity.

4.9.3 *Group 6001*

Group 6001 comprised six small pits and post-holes. Four of these (1004, 1014, 1018, 1042) were extremely irregular in outline and measured 0.5-1.1m in length, 0.3-0.6m in width, and 0.1-0.18m in depth (Fig. 13, S.710, S.713, S.726). Two 0.3-0.4m diameter post-holes (1010, 1012) lay immediately south of feature 1014 and survived to a depth of less than 0.15m (Fig. 13, S.708).

4.9.4 *Group 6002*

Group 6002 consisted of six pits (1001, 1002, 1007, 1016, 1041, 1045) which were roughly grouped along the western side of ditch 5000. Five of these pits were irregularly sub-ovoid or sub-rectangular in plan and measured between 2.0m and 1.0m in length and 0.3m to 0.1m in depth (Fig. 13, S.703, S.705; Fig. 14, S.711, S.725, S.728). The northernmost feature in this group (pit 1001) was more regular with a circular plan of 0.6m diameter and a depth of 0.1m (Fig. 13, S.700). None of these features produced any evidence of either date or function.

4.9.5 *Group 6003*

Group 6003 comprised ten post-holes clustered in the centre of Enclosure C (1020, 1022, 1025, 1027, 1029, 1031, 1033, 1035, 1037, 1039). The post-holes were roughly circular in plan and ranged from 0.4m to 0.15m in depth and 0.4m to 0.2m in diameter (Fig. 14, S.717, S.721, S.723). No clear structural arrangements were visible and it remains possible that some or all of the features should be interpreted as natural features.

4.9.6 *Other features*

Two other pits, similar in form to those in Group 6001, were located near to the southern boundary of Enclosure B (ditch 5003). The larger of these was pit 1053 (Fig. 14, S.732) which lay to the north of ditch 5003. This sub-ovoid pit was 1.55m in length, 0.46m in depth and 0.50m wide. A post-hole or small pit (1051) had been cut into the south-eastern end of the infilled pit. It measured 0.45m in length, 0.3m in depth and 0.3m in width. In contrast to the majority of features at this site the fill of 1051 consisted of a dark reddish-grey silty sand with charcoal inclusions. A second pit (1047) was located to the south of ditch 5003. It was sub-oval in plan, 0.83m long, 0.3m wide and 0.13 to 0.24m deep (Fig. 14, S.730).

5. Artefact Record

5.1 The Pottery

by Jeremy Evans with a contribution by M. Ward

5.1.1 A combined total of eight sherds of Romano-British pottery was recovered from the evaluation and excavation, plus two sherds of a post-medieval vessel (not catalogued). Unfortunately this assemblage is too small to provide any information other than the probable date of its deposition.

5.1.2 The samian sherd can be dated to AD 150/55-180 (Fig. 15). The bodysherds from context 305 cannot be closely dated. However, grog-tempered greywares also occurred at the Romano-British site of High Street, Shafton, and seem to be a tradition in this area. There they would seem to be of 1st-2nd century date, as these may well also be. The sherds of South Yorkshire greyware have a 2nd-4th century date range (Buckland *et al.* 1980). There is no clear evidence of pottery deposition here later than the 2nd century, whilst most of the pottery cannot be earlier than the 2nd century. Thus evidence of occupation is limited to the 2nd century, but no safe conclusions can be drawn from the absence of other evidence in a collection of this size.

Catalogue

Context 019 A rather soft and abraded, decorated wall-sherd from a moulded bowl of form Dr 37. A product of Central Gaul, it displays ovolo Rogers type B223 above a fragment of panelling with indistinct astragaloid borders (Rogers 1974, A9). The extant panel contains the blurred figure of Perseus holding the head of Medusa (Oswald 1936, 234, cf. Dechelette 1904, 146). This figure-type appeared in greater detail on bowls produced during the early association of Cinnamus with Cerialis ii (*c.* AD 140-60). The type also occurred on a bowl in this early style, but in a non-samian fabric, which was found during excavations within the Chester fortress (see Bulmer 1980, fig. 10). Although the decoration of the Barnsdale fragment has suffered from abrasion, the figure-type is obviously degraded. The sherd represents a bowl decorated in the standard style of the prolific potter Cinnamus, *c.* AD 150/55-180. For a close parallel from London see Stanfield and Simpson (1958, 35, pl. 160). Wt 12g; Ditch 5000; Fig. 15

Context 305 Three bodysherds from a single vessel in a reduced fabric with a black core, margins and brown-black surfaces, with slightly 'soapy' texture with very common brown-black sub-angular grog inclusions *c.* 0.5-1.5mm. Wt 26g; Ditch 5000

Context 1055 A fragment of the bead from the rim perhaps of a jar or wide-mouthed jar in South Yorkshire greyware. 2nd-4th century. Wt 6g; SF104; Furrow 5011

Context 1123 A South Yorkshire greyware bodysherd. 2nd-4th century. Wt 9g; SF108; Ditch 5000

Context 1133 A South Yorkshire greyware base sherd with string marks on the base, vessel type unclear. 2nd-4th century. Diam. 170mm, base equivalent 15%; wt 65g; SF110; Ditch 5000

Unstratified A South Yorkshire greyware bodysherd. Wt 2g; SF109

5.2 The Metalwork

by Holly Duncan

5.2.1 The evaluation and excavation produced only two items of metalwork, neither closely datable. A fragment of a copper-alloy ring was recovered from the fill (031) of Phase 1 gully 6000 (Fig. 15). The incomplete survival of this object precludes certainty as to its original function, although the diameter of the ring is suggestive of an ornamental function. It is possible this may be the remains of an earring, either of Allason-Jones type 1, a plain penannular ring which tapers at one or both ends, or a type 12 consisting of a length of wire looped at one end with the opposing end either hooked on to it or threaded through to form a hook (Allason-Jones 1989, 2-3, 10). Both types have a long history, examples known from the Bronze Age and continuing in the Roman period. Other possibilities include a portion of a coil from a bow brooch or a link in an ornamental chain, such as have been found connecting pairs of La Tene brooches (e.g. Hull and Hawkes 1987, pl. S6; Montague 1997, 97).

5.2.2 The absence of associated finds does not assist in refining the function or date range for this ring fragment, although a *terminus ante quem* of the 2nd century AD is provided by pottery recovered from ditch 5000, which cut the gully and its fill. It is not uncommon to encounter later finds, spanning the Iron Age to Roman periods, from the fills of ring gullies. This phenomena would appear to indicate the longevity of this form of monument in the landscape. At Barnsdale Bar this is perhaps illustrated by the fact that later ditches either terminate or change alignment at the point of intersection with gully 6000.

5.2.3 The only other feature to yield metalwork, the remains of a nail, was a probable furrow (5011). The form of this nail, with its flat rectangular head and tapering rectangular shank, indicate a general purpose use. The length of the shank, although incomplete, suggests it was used for fixing items, such as cladding, as opposed to structural pinning. This form of nail is not closely dated, finds of similar items spanning the Iron Age to the medieval period and beyond. The associated sherd of pottery suggests that the nail may be of Roman date. This small assemblage may have originally been deposited within the fills of enclosure ditch 5003, subsequent ploughing activity accounting for its secondary deposition within the furrow.

Catalogue

Context 031 Copper alloy. Circular sectioned ring (diameter 1.5mm), currently oval or C-shaped in plan, breadth 11.5mm. One end broken, the opposing end, although damaged, may be beginning to taper. Pitted surface. SF003; Gully 6000; Fig. 15

Context 1055 Iron. Nail. Incomplete nail with flat, rectangular head (9.5mm by 10.6mm), one edge damaged. Rectangular-sectioned shank (6mm by 3.5mm), tapering to a wedge-shaped point, tip missing. L. 34.8mm; SF103; Furrow 5011

5.3 The Flint Artefacts

by Ian Brooks PhD

5.3.1 Eleven flint artefacts were recovered from the test pitting, all from topsoil contexts. A further five flint artefacts were recovered during the open-area excavation. All of the latter were found in Roman-period features and are therefore assumed to be residual. Because of the low numbers and lack of secure contexts each artefact will be described separately.

5.3.2 The description of the tools follows that of Inizan *et al.* (1992), the cores follow Clark *et al.* (1960) and the flint colours are defined by the Geological Society of America's Rock-Color Chart (Goddard *et al.* 1948). The flakes were divided into three groups: primary flakes with completely cortical dorsal surfaces, secondary with partly cortical dorsal surfaces and tertiary with uncorticated dorsal surfaces.

5.3.3 There are no flint resources within the immediate area of the site, however, within the larger region a number of potential resources exist. The nearest primary flint source, those directly from chalk, is the Lincolnshire and Yorkshire Wolds. This contains considerable flint reserves in two main forms. Of particular interest are the Welton and Burnham Formations (Wood and Smith 1978). The lower, Welton formation, is characterised by the presence of bands of thalassiniodean burrow nodular flint, whereas the Burnham Formation contains tabular and semi-tabular flint bands some of which are markedly carious. The general quality of both flint groups is not good. Wold flint is often opaque, grey in colour and of poor knapping quality, although the nodular Welton Formation flints are sometimes of better quality.

5.3.4 More importantly for prehistoric exploitation there are a number of derived sources also available. The Devensian Tills of Lincolnshire and Yorkshire contain considerable flint resources (Kent *et al.* 1980). These vary in quality, but they include a number of translucent, high quality flint nodules of good knapping quality. Lincolnshire also contains a number of pre-Ipswichian tills (Perrin *et al.* 1979; Straw 1958) which also could serve as a potential flint resource. The flint within these till sheets is derived from both the local grey flints and flint from further afield including chalk resources no longer available. The river and beach gravels of Lincolnshire and Yorkshire are also potential flint sources as they contain flints derived from both the chalk and till sources within the area. Whilst the patinated nature of much of the assemblage makes a determination of source difficult, the unpatinated fragments and cortex survival on some artefacts suggest a derived source was being exploited. The location of the site would allow for both the resources of Lincolnshire and East Yorkshire to be exploited.

5.3.5 The date range of the test pitting and excavation assemblage is difficult to determine because of the low numbers of artefacts and the lack of typologically distinct artefacts. The two scrapers are of a form common in contexts with Beaker associations (Edmonds 1995, 141), however the small size of all the artefacts may suggest the forms are defined at least in part by the raw materials being exploited and also reflect the distance to potential flint sources. The previous work near the site (Webb 1995) recovered 141 artefacts suggesting a broadly Neolithic date. This would agree with the

polished flake (SF012), although the reworking of SF013 and SF016 would suggest some time depth to the assemblage.

5.3.6 The general impression of the assemblage is of a somewhat biased collection. The lack of primary and secondary flakes and the relatively high number of retouched pieces would suggest that large-scale flint knapping was not being carried out. The limited presence of core debris and worked lumps would suggest that some flintworking was being carried out, however, the very small size of the artefacts would suggest this was not a major part of the knapping strategy. This contrasts with the larger fieldwalking collection (Webb 1995) where the manufacture of tools on the site is suggested. This discrepancy probably reflects the small size of the excavated assemblage and the probable concentration of the majority of the lithic assemblage within the ploughsoil.

5.3.7 The generally decreasing numbers of flint artefacts recovered from the successive stages of this project is instructive: 141 artefacts were recovered from fieldwalking an adjacent field (Webb 1995), eleven from the test pitting, none from the evaluation trenches and only five from the excavation. This would suggest that the lithic assemblage largely resides within the topsoil of the site. The less formal disposal strategies adopted in later periods (post Early Neolithic) has been noted by Healy (1983), giving rise to the imbalance between secure contexts and the number of lithic artefacts recovered.

Catalogue

Topsoil A thumbnail scraper patinated to a very light grey colour (N7). The working edge was produced by a mixture of direct, semi-abrupt, sub-parallel and scaled invasive removals. Although worked along both sides and the distal end, most of the work concentrated along the right and distal right sectors of the tool. The tool had a flat butt. L. 19mm; w. 21mm; th. 6mm; SF007

Topsoil A worked lump patinated to a very pale orange colour (10 YR 8/2). The artefact has a patch of worn cortex surviving, suggesting a derived source for this artefact. The bulbar surface is battered. L. 30mm; w. 31mm; th. 15mm; wt 14g; SF008

Topsoil A thumbnail scraper on a semi-translucent dusky brown flint (5 YR 2/2). The tool was produced by a series of invasive, semi-abrupt, sub-parallel removals along the left and distal sides. The butt is flat and patinated to dense very pale orange (10 YR 8/2). A small patch of cortex survives on the right side, which is worn. Both the patinated butt and cortex would suggest a derived source for the flint source. L. 23mm; w. 20mm; th. 8mm; SF009

Topsoil An unmodified bladelet patinated to a very pale yellowish brown colour (10 YR 7/2). The distal end is broken and the bulbar end has been trimmed to a point. Bladelets of this form are a common by-product of knapping and do not necessarily suggest a specific date for the artefact. L. 14mm; w. 4.5mm; th. 2mm; SF010

Topsoil A worked lump of a semi-translucent, dusky yellowish brown flint (10 YR 2/2). Worn, stained cortex survives in patches on the artefact

	suggesting a derived flint source was exploited. L. 18mm; w. 14mm; th. 14mm; wt 2g; SF011
Topsoil	A tertiary flake patinated to a very light grey colour (N7). In places dorsal surface appears to have been polished suggesting it may have been derived by the damage, use, or reworking of a polished tool, such as an axe. The flake has a pointed butt. L. 19mm; w. 20mm; th. 3mm; SF012
Topsoil	A distal blade fragment patinated to a pinkish grey colour (5 YR 8/1). The artefact was reworked on proximal end showing the original flint was an opaque very light grey (N7). The distal end is broken and patinated, whilst the proximal end is reworked with three long, semi-abrupt, flakes removed. It is possible that this is post-depositional damage, however the regular nature of the removals makes this unlikely. L. 38mm; w. 16mm; th. 8mm; SF013
Topsoil	A double end scraper partly patinated to a very light grey colour (N7). The original raw material is a translucent pale brown flint (5 YR 5/2). The proximal end is defined by series of scaled abrupt removals forming a convex proximal end. The distal end is also convex with a series of invasive scaled, abrupt removals. The left side has a series of short, scaled removals along its entire length whilst the right side has worn stained cortex. The flint types and cortex would suggest a derived source was being exploited. L. 34mm; w. 16mm; th. 10mm; SF014
Topsoil	A class 'C' core, almost a disc core in form, with both blade and flake removals. The artefact is patinated to a very pale orange colour (10 YR 8/2). L. 29.5mm; w. 25mm; th. 11mm; wt 8g; SF015
Topsoil	A tertiary flake patinated to a medium light grey colour (N6), later reworking along distal right edge shows the original raw material to be a light olive grey (5 Y 6/1) semi-translucent flint. The reworking was in the form of a series of abrupt, short, scaled removals. The butt of the artefact is cortical. The flint type and surviving cortex suggests a derived raw material source was being exploited. L. 24mm; w. 28mm; th. 3mm; SF016
Topsoil	A core face rejuvenation flake from a blade core. It is patinated to a very pale orange (10 YR 8/2). The butt is battered and the distal end has been broken. The flake was designed to remove a stepped fracture from the blade core. L. 30mm; w. 14mm; th. 7mm; SF017
Context 1113	The proximal end of a tertiary flake of an opaque, dusky yellowish brown flint (10 YR 2/2) with many paler (10YR 6/2) inclusions. The slightly crystalline appearance of the distal broken end would suggest that this artefact has been heated. The dorsal surface has a number of removals suggesting that this flake was from an irregularly worked lump. L. 22mm; w. 18mm; th. 7mm; wt 3.1g; SF105; Ditch 5001
Context 1115	A secondary with a flat butt. The edge damage along the right hand edge would suggest extensive use of this artefact, however no further modification of the flake was carried out. The flake is patinated to a dense white. The surviving cortex is smoothed and worn suggesting a derived flint source for the raw material of the artefact. L. 25mm; w. 11mm; th. 3mm; SF106; Ditch 5001

Context 1115 An irregular worked lump. The artefact is patinated to a dense white colour sufficient that it is not possible to determine the original flint type. The surviving cortex, however, is worn suggesting a derived source. The cortex is also slightly discoloured to a pale red. This may be the result of the slight heating of this artefact. L. 22mm; w. 21mm; th. 12mm; wt 3.7g; SF106; Ditch 5001

Context 1127 An irregular worked lump with eroded cortex forming the ventral surface of the artefact. The appearance of the cortex and the iron staining on the artefact would suggest a gravel (probably river gravel) source for the raw material. The worked lump is patinated to a degree such that it is not possible to describe the flint type. L. 33mm; w. 18mm; th. 8mm; wt 5.0g; SF107; Ditch 5000

Unstratified The proximal end of a secondary flake of semi-translucent pale yellowish brown (10YR 6/2) flint. The knapping platform is partly cortical and the dorsal, left hand side of the artefact is heavily patinated. This demonstrates that this flake was struck on a previously worked piece. The right hand edge is heavily damaged suggesting extensive use of this tool. The flint type used for this tool is typical of the flint resources of the Devensian tills in Yorkshire and Lincolnshire. SF111

6. Environmental Record

6.1 Environmental Sampling Strategy

6.1.1 A total of 80 samples was taken during the evaluation and excavation of the site (Appendix IV). Deposits were sampled for general biological analysis (GBA). Samples were taken from primary fills, undisturbed archaeological deposits, and deposits within which concentrations of botanical material (such as wood charcoal) were clearly visible. Where possible a minimum sample size of ten litres was taken.

6.1.2 Upon completion of fieldwork the objectives of the project were reviewed and the potential for providing sufficient information to meet these objectives was assessed. The GBA samples from the evaluation phase of work had already been processed and assessed. The results indicated that the potential for the preservation of environmental data was very low, with only six of the samples containing any non-modern organic remains. As the site was composed mainly of ditches, and had few discrete features, deposits were targeted for their potential to provide environmental information and datable material for the ditches of Enclosure B.

6.1.3 In addition to the eighteen evaluation samples a further twelve samples from the excavation were selected for processing. All samples relating to the primary fills of ditch 5000 were processed plus the samples from deposits in ditches 5001, 5002 and 5003 which had been identified as relatively charcoal-rich during the excavation.

6.2 Sample Processing

6.2.1 A subsample of between five and ten litres of soil was processed from each of the 30 samples. They were subjected to a system of flotation in an Ankara-style flotation tank fitted with a 300 micron sieve and a 1mm mesh. The fine sieved material (the flot) was sorted, identified and quantified and Table 1 lists these results by context. The heavy fraction (the retent) was scanned by eye, but apart from an animal bone fragment from sample 016 no further environmental remains were found. It should be noted that samples which did not yield a flot or which only contained modern root material have not been included in Table 1.

6.3 Botanical Analysis

by Ruth Young PhD

6.3.1 All samples containing botanical material were contaminated with modern plant remains, particularly root material and the seeds of *Chenopodium* sp. (fat hen or goose foot). There were also charred seeds of *Silene* sp. (campion), an unidentified weed seed and a single (under-ripe) wheat grain. Many samples also contained the remains of land molluscs one of which was identified to the family Etonidae. This species is characteristic of moist, shaded habitats which may be found within ditch contexts (Kerney and Cameron 1979).

6.3.2 Wood charcoal was recovered from twelve samples, although the material in six of these was too small for reliable identification. The wood charcoal that could be identified indicated a wide range of tree types present at the site. The following were identified: *Prunus* cf. *spinosa* (blackthorn), *Alnus glutinosa* (alder), *Salix* spp. (willow), *Crataegus* sp. (hawthorn), *Corylus avellana* (hazel) and *Quercus* spp. (oak). In addition, three samples contained the charred remains of hazelnut shells.

6.3.3 The range of wood types identified suggests an area of small trees or scrub, with the exception of the oak. As the site today is not situated on a stream or boggy ground, the presence of willow in the charcoal assemblage suggests that it was brought to the site from another area, which may or may not have been relatively close by. An alternative possibility is that conditions at the site have changed since occupation. It is interesting that the samples from the earliest ditch (ditch 5000, samples 155-161) contained only wood charcoal from *Corylus avellana*, but unfortunately the recovery of charcoal was generally poor and too much emphasis should not be placed on this observation.

Table 1. The environmental material recovered from sample flots

Context number	Group number	Sample number	Vol. processed	Cereal grain	Charred seeds	Cereal chaff	Charred nut shells	Charcoal fragments	Uncharred plant	Comment
020		002	10 l		+				++	*Silene* sp., *Chenopodium* sp. (modern), unident. weed seed. At least two types of land snail
022		003	10 l					+	++	*Chenopodium* sp. (modern), unident. wood charcoal fragments. Two types of land snail
102		006	10					+++	++	*Prunus* cf. *spinosa* wood charcoal, modern weed seeds
504		016	1 l					++++	+	*Salix* spp. (incl. one twig), *Prunus* cf. *spinosa*, *Crataegus* sp., *Quercus* spp., *Alnus glutinosa* wood charcoal, modern weed seeds
601		007	8 l					++	++	*Chenopodium* sp. (modern), unident. wood charcoal fragments
605		013	10 l					++	++	*Salix* spp, *Alnus glutinosa* wood charcoal, amorphous (heated?) material
1061		129	5 l						+++	*Chenopodium* sp. (modern)
1079		137	5 l						++	*Chenopodium* sp. (modern), land snails
1084		114	5 l					+*	+	*Prunus* cf. *spinosa*, *Corylus avellana*? wood charcoal
1091		115	5 l					+	+++	*Corylus avellana* (one twig), *Alnus spp.* wood charcoal
1122		154	5 l				+++		++	*Corylus avellana* (hazelnut) shell fragments, land snails
1123		155	5 l					+	+++	unident. wood charcoal fragments
1125		156	5 l				+		+++	cf. *Corylus avellana* (hazelnut) shell fragment, land snails
1127		157	5 l	+*				+	++	1 grain (under-ripe) *Triticum* sp. (wheat), unident. wood charcoal
1130		158	5 l				+		+	*Corylus avellana* (hazelnut) shell fragments, land snails
1131		159	5 l					+	+++	*Corylus avellana* wood charcoal, land snails
1133		161	5 l					+	++++	*Chenopodium* sp. (modern), unident. wood charcoal fragments. At least three types of land snail
1136		160	5 l					+	+++	*Chenopodium* sp. (modern), unident. wood charcoal fragments. Coleoptera remains, land snails

Key : + = rare (0-5), ++ = occasional (6-10), +++ = common (11-50), ++++ = abundant (>50); * = charred material for AMS date

6.4 The Faunal Remains

by Jane Richardson PhD

6.4.1 A total of 243 animal bone fragments was retrieved from the evaluation and excavations at Barnsdale Bar (Table 2). With the exception of four ?cattle tooth fragments, and seven long bone fragments from ?pig and ?cattle, however, the bones are believed to be intrusive and are of no archaeological significance. A partial sheep/goat skeleton was excavated from the centre of Enclosure B and was not associated with any archaeological feature. In addition, the large size of this subadult animal is indicative of a post-medieval or modern animal. At least three partial rabbit skeletons were also recovered but again no association with an archaeological feature was identified.

Table 2. The faunal remains

Context	Group	Species	Description
041		pig (?)	tibia shaft (3 fragments)
043		large-sized mammal	long bone fragment (2 fragments)
504		large-sized mammal	long bone fragment
505		medium/large-sized mammal	long bone fragment
1040	6002	cattle (?)	4 tooth fragments
1049		sheep/goat	155 bone fragments from a partial skeleton – modern?
1092		rabbit	77 bone fragments from a number of partial skeletons – modern?

6.4.2 The remaining eleven archaeological bone fragments were in a very poor state of preservation with highly eroded bone surfaces and their friable condition was responsible for a number of fresh breaks. The underlying limestone geology may have caused the chemical deterioration of these bones.

6.4.3 Given this poor state of preservation, it is not possible to make any meaningful comment. Only domestic animals are represented (most probably cattle and pig) and while they may typify food waste, this cannot be stated with any certainty.

6.5 Environmental Overview

by Jane Richardson PhD

6.5.1 Very little environmental material was recovered during the evaluation and excavation of Barnsdale Bar. This may have been the result of adverse taphomonic conditions and certainly both the charred plant material and the faunal remains were poorly preserved. Alternatively the enclosures may not have been used for processes that would have facilitated the inclusion of

environmental material into the archaeological record. If farming activities or food preparation (e.g. the slaughter of livestock or the processing of cereal crops) were not occurring in the vicinity, then environmental/economic indicators would not be expected. Unfortunately, given the poor state of environmental preservation, it is not possible to differentiate an absence of certain activities from taphonomic bias. The potential for the recovery of further environmental information from the unprocessed samples is considered to be extremely low.

7. Radiocarbon Dating

7.1 Two samples were selected and submitted for radiocarbon dating (Table 3). None of the samples contained sufficient organic material for a conventional 'High precision' radiometric count and therefore the small quantities of carbonised material (hazel wood charcoal and a charred wheat grain) were submitted for an AMS determination. The samples were measured at the University of Arizona AMS Facility and the results calibrated at the Scottish Universities Research and Reactor Centre (SURRC).

Table 3. Radiocarbon dating results

Laboratory sample code	Context (Group)	Material	1σ date range	2σ date range	Radiocarbon age BP
AA-41785	1084 (5002)	*Corylus avellana* charcoal	cal AD 391-526	cal AD 262-539	1630±45
AA-41786	1127 (5000)	*Triticum* sp. charred grain	cal AD 1552-1659	cal AD 1479-1946	280±50

Note: The calibrated age ranges are determined from the University of Washington, Quaternary Isotope Laboratory, Radiocarbon Dating Program, Rev. 4.0 1998

7.2 The sample from ditch 5000 (AA-41786) yielded a post-medieval to modern radiocarbon determination which is not consistent with the ceramic dating evidence from the same ditch. In the context of the other evidence from this site the date is archaeologically unacceptable and the wheat grain must therefore represent intrusive material.

7.3 The sample from ditch 5002 (AA-41785) returned a date of cal AD 262-539 (at the 95% level of confidence) which is broadly comparable with the ceramic dating evidence from Enclosure A/B. As would be expected from an AMS determination for this period, the resulting date range is imprecise and does little to clarify the dating of the enclosure. It does, however, provide some support for the tentative pottery dating and confirms that the very small quantity of ceramics recovered from the enclosure complex is unlikely to be residual.

8. Discussion

8.1 Stratigraphy and Dating

8.1.1 Despite the investigation of a large area, very low levels of stratified datable artefacts were recovered. The flint assemblage indicates that the site may have been occupied as early as the Neolithic period but no features of earlier prehistoric date were identified. Evidence for later prehistoric activity was absent and seven stratified sherds of Romano-British pottery provided the only artefactual dating evidence, albeit tentatively because of the small sample size. Truncation and disturbance accounts for the removal of the upper levels of the ditches, pits and post-holes and this has almost certainly removed artefacts as well.

8.1.2 Only one of the two radiocarbon determinations is considered to be archaeologically valid. The post-medieval/modern charred wheat grain is intrusive and it is interesting to note that its context also contained a lump of worked flint which is presumed to be residual. Together the grain and the flint attest to considerable disturbance in this area and would tend to imply that the other finds from this ditch should not be relied upon without supporting evidence.

8.1.3 The archaeological evidence reveals a system of enclosures constructed in sequence from east to west. The repeated utilisation of an existing boundary as an integral part of a new enclosure implies the expansion of the enclosure system rather than the replacement of derelict enclosures. Thus the impression is of a multi-phase site, but one with little chronological depth. If the date indicated by the small pottery assemblage is reliable then it appears that ditch 5000 (Enclosure A/B) was open during the 2nd century AD or later. The single valid radiocarbon date indicates that the Enclosure B ditches infilled sometime between the late 3rd to early 6th centuries AD, and supports the ceramic dating. Given that the stratigraphic evidence suggests that the enclosure system developed westwards, and that the construction of Enclosure B followed closely upon Enclosure A, the earlier part of the radiocarbon date range would seem most appropriate.

8.2 Landscape Development (Fig. 16)

8.2.1 *Pre-enclosure features*

The flint assemblage from the northern part of the site probably represents a continuation of the activity represented by the Neolithic flint scatter in the adjoining field. However, the small number of flints found in the current investigation area suggests that this site lies at the periphery of any early prehistoric activity. Both the current investigation area and the field to the north sloped downwards from south to north. Given the absence of flint finds in the central and southern part of the recent excavation area, it is considered unlikely that the flints originated on the highest ground. It has been suggested that the flint evidence from the current site conforms to later Neolithic flint disposal patterns which were less formal than earlier periods (paragraph 5.3.7); certainly no sub-surface features of probable early prehistoric date were identified during the recent investigations. The available evidence suggests that the focus of Neolithic activity lay to the north of the current application site.

8.2.2 The earliest phase of activity (represented by features) probably comprised two gullies (5010 and 6000), both located in the north-eastern part of the site. Unfortunately, truncation by later features made both of these gullies extremely difficult to interpret. Gully 5010 may originally have extended towards gully 6000 but was subsequently removed by the establishment of boundary ditch 5001. It is uncertain whether gully 5010 was contemporary with gully 6000 in Phase 1 as it could feasibly have related to Enclosure A during Phase 2.

8.2.3 The ephemeral nature of gully 6000 makes interpretation difficult as, like many features in this area, the gully was too shallow to reveal convincing stratigraphic relationships. In plan gully 6000 appears to form a ring ditch located at the position where the later enclosure ditches converge. A single stratigraphic relationship indicated that the gully was cut by the enclosure ditches but no dating evidence was recovered from the gully.

8.2.4 Gully 6000 may represent a small barrow (4m in diameter), which was of sufficient prominence and significance to be incorporated into the boundary of the later enclosure. However no evidence of burials, other internal features or a mound were identified. Alternatively gully 6000 may represent the remains of a small roundhouse but again, no structural remains, post-holes or internal features were identified.

8.2.5 In the absence of conclusive stratigraphic evidence, or additional features, there is little to support either of these interpretations. It is notable that the terminals of other ditches in this area (5009 and 5001) had been sufficiently truncated to make them appear gully-like in plan, and it may be the case that all of the ephemeral features in this area, including gully 6000, simply relate to erosion at the point of convergence of the enclosure ditches.

8.2.6 *The enclosure system*

The enclosure system appears to have developed from east to west in a uniform manner, and possibly comprised at least three, large rectangular enclosures. The available evidence suggests that each of the enclosures was constructed by adding to an existing north-eastern boundary. Appended to this were the other three sides of the enclosure which were constructed from a single, possibly segmented, ditch. Subsequent enclosures were added in the same way, each time with ditch terminals appended to the corners of the earlier enclosure. This method of construction clearly indicates that although three phases of enclosure have been proposed, the preceding phases remained extant, and probably in use, throughout.

8.2.7 It was not possible to determine the position of the banks which would have accompanied the enclosure ditches. The position of the adjoining ditches at the north-western corner of Enclosure B suggests that the upcast material may have been located outside of the enclosure. At the north-eastern corner, however, the ditches of Sub-enclosure C conjoin with Enclosure B, suggesting that no bank was present in this area. Similarly, the proximity of Group 6002 to the eastern boundary of Enclosure B would seem to indicate that the bank could not be on the western side. It therefore seems likely that the position of the bank altered according to variation in the architecture of the surrounding enclosures.

8.2.8 The location of entranceways into Enclosure B were also difficult to determine. One excavated example was located at the eastern end of ditch 5003 and showed evidence of having been blocked during the enclosure's use. Other possible gaps in the ditches were suggested by the gradiometer data but many of these were disproved during excavation.

8.2.9 The site plan shows that the down-slope boundaries, ditches 5000 and 5002, were straight whilst the cross-slope boundaries, ditches 5001 and 5003, were sinuous and interrupted. Given that the underlying geology of the site is free-draining limestone it is unlikely that these ditches would have served a drainage function. The route of the ditches may have exploited existing geological fissures and/or could have altered course in order to include or exclude existing topographic or landscape features. Certainly at the bottom of the slope (ditch 5001) the ditch appeared to have followed (or been modified by) natural water channels in the bedrock. Whilst going some way to explaining the variation in form of the ditches, this reasoning does not account for the straightness of the parallel downslope ditches. Perhaps greater emphasis was placed upon the construction of these sections as they represent the common links between the enclosure, its predecessor and its successor.

8.2.10 This gradually expanding system may have been pre-designed or may have been an unplanned response to changing requirements. It is clear that the development was continuous with each enclosure representing a separate unit which could be fully utilised whilst the adjoining enclosure was constructed.

8.2.11 As is so often the case, the function of the enclosures remains unclear. Few artefacts were recovered and, in addition, the scarcity of discrete features and absence of clearly domestic features means that interpretation is difficult. A paucity of evidence for occupation may imply that an agricultural function is more likely, although the creation of separate enclosures and subdivisions, such as Enclosure C, may represent specialisation within a larger complex. The enclosures are discussed in greater detail and in the context of the wider Barnsdale Bar landscape in Section C of this report.

SECTION B: THE BARNSDALE BAR STUDY AREA

9. The Study Area

9.1.1 The 9km^2 survey area was centred close to the mutual borders of South, North and West Yorkshire at SE 510 142 and includes the area between SE 495 125 and SE 525 155 (Fig. 1). The survey area lies between the River Went and The Skell, both tributaries of the River Don. This is a landscape of gentle hills and dry valleys with the highest ground, at no more than 70-80m OD, near the centre of the survey area, falling to *c.* 35m OD near The Skell in the south-west.

9.1.2 The information discussed in Section B is presented on a composite plan of a 2.5km^2 area immediately around the Barnsdale Bar quarries (Fig. 17) and the air photo mapping of the entire 9km^2 study area is presented on Figure 18.

10. Previous Archaeological Investigations

10.1 Over the last twelve years numerous archaeological investigations have been carried out at Barnsdale Bar resulting in the production of around eighteen separate reports. This situation is complicated by the geographical position of the site at the mutual boundaries of North, West and South Yorkshire and thus the involvement of three separate County Sites and Monuments Records. The majority of the archaeological investigations were carried out by Archaeological Services WYAS.

10.2 The following is a summary of all known archaeological investigations to date. References to the appropriate individual reports are listed in Table 4 and can be cross-referenced to the Bibiography for the full titles. In the course of these investigations a total area of 37.5ha has been the subject of geophysical survey and 2.8ha has been examined in detail through trial trenching and excavation (Table 5).

10.3 Area A

10.3.1 The first archaeological investigations were carried out to the east of Windhill Plantation at SE 512 148 (Fig. 17). The initial magnetometer survey covered an area of 1.08ha (the southern half of Area A) and revealed a sinuous east/west anomaly, two north/south anomalies and a group of ring-shaped anomalies. The subsequent excavation of three trial trenches confirmed the presence of the east/west ditch and also identified some gullies and a crouched human burial orientated north/south. No dating evidence was recovered.

10.3.2 A magnetometer survey of a further 1.62ha revealed additional north/south linear anomalies, a possible enclosure and a possible kiln/oven or industrial area. A scheme of detailed excavation was proposed (Abramson 1990b) but ultimately a watching brief was carried out across the whole area and only one area was examined in detail. This work established that the field system had been constructed over more than one phase, located three gateways between the fields and identified an isolated hearth. Secondary ditch fills yielded six sherds of 2nd/3rd-century Romano-British pottery.

Table 4. Summary of archaeological investigations at Barnsdale Bar

Area	Type of investigation	Date	Reference	Contractor
A	Magnetometer survey	March 1989	Abramson 1989a	WYAS
A	Trial trenches	October 1989	Abramson 1989b	WYAS
A	Magnetometer survey	December 1989	Abramson 1990a	WYAS
A	Watching brief and trial trenching	May – June 1990	Simpson 1990; 1991	ERARC
B	Gradiometer survey	July 1993	Boucher 1993	WYAS
B	Trial trenches	September 1993	Webb 1993	WYAS
B	Watching brief	September 1996	Brown and Morris 1997	WYAS
C	Geophysical survey	May 1994	Stratascan 1994	Stratascan
C	Fieldwalking and gradiometer survey	September - October 1995	Webb 1995	WYAS
C	Trial trenches	October 1996	Speed 1997	WYAS
D	Gradiometer survey	October 1996	Webb 1996	WYAS
E	Gradiometer & magnetic susceptibility survey	February 1996	Cottrell 1996	WYAS
E	Trial trenching	October 1998	O'Neill and Whittingham 1999	WYAS
F	Gradiometer survey	April 1997	Webb 1997	WYAS
F	Trial trenching	June 1997	O'Neill 1997a	WYAS
G	Gradiometer survey	November 1998	O'Neill and Whittingham 1999	WYAS
H	Gradiometer survey	September 1999 – February 2000	Webb 2000	WYAS
H	Test pitting & trial trenching	March – April 2000	Section A, this report	WYAS
H	Open area excavation	July – October 2000	Section A, this report	WYAS
I	Geophysical survey	May 1994	Stratascan 1994	Stratascan
	Preliminary assessment	December 1995 – January 1996	Boucher 1996	WYAS
	Archaeological study	1992	RPS Clouston 1992	RPS Clouston

Table 5. Total areas investigated by geophysical survey and excavation

Area	Area (m^2) covered by geophysical survey	Area (m^2) covered by trial trenching and excavation
A	28269.90	90.50
B	38581.17	*10205.09
C	98884.83	1525.18
D	9343.59	-
E	49976.99	1813.57
F	23089.79	867.48
G	46055.08	-
H	41542.66	**13950.13
I	40000.00	-
Total	**375,744.01m^2**	**28,451.95m^2**

Notes: * includes area subject to watching brief, ** not including test pits

10.4 Area B

10.4.1 The next area of quarry expansion was located to the south-west of Windhill Plantation at SE 510 144 (Fig. 17). Magnetometer survey over a 4.5ha area revealed anomalies indicative of at least two phases of ditched features in the southern part of the site. In addition twenty pieces of struck flint (including blades, a core and other tools) and two sherds of Romano-British pottery were recovered from the surface of the field.

10.4.2 The excavation of nine trial trenches confirmed the presence of multi-phased ditches, including four parallel linears, and also identified an ?extended human burial orientated north-east/south-west. Two sherds of Romano-British pottery were recovered and three iron nails were found in the grave fill.

10.4.3 Six of the ditches were investigated by a watching brief during the machine stripping of the southern half of the site. The presence of Romano-British ditches was confirmed and several pits were also identified, including one containing 26 sherds of Iron Age or Iron Age tradition pottery. In addition to the Iron Age pottery, two sherds of Romano-British pottery, 26 fragments of cattle bone and a piece of worked flint were recovered. Radiocarbon dating indicated that two of the four parallel ditches should be considered to be post-medieval in date (cal AD 1480-1955, GU-4534 and cal AD 1450-1953, GU-4535 at the 95% confidence level).

10.5 Area C

10.5.1 Area C incorporated a large area bounded by Area B to the east and the A1 to the west (SE 509 144, Fig. 17). Area C was first investigated by Stratascan as part of the A1(M) Redhouse to Ferrybridge improvement scheme. A 4ha geophysical survey area (Site 26) identified a number of linear and isolated anomalies.

10.5.2 Fieldwalking and magnetometer surveys were subsequently carried out over an area of 10.5ha, which partly overlapped with the Stratscan survey. The geophysical survey revealed anomalies indicating a coherent system of interconnecting ditches, many of which were thought to be of recent date, plus a small ditched enclosure, a possibly natural curvilinear feature and several discrete features. Systematic fieldwalking recovered 110 pieces of flint in addition to 11 pieces found during the geophysical survey. The majority of the flints (84%) came from the southernmost 165m of the surveyed area. The assemblage was indicative of Neolithic activity at the site.

10.5.3 In the northern part of Area C trial trenching revealed continuations of the post-medieval boundaries investigated in Area B. In the southern part of the area the southern and eastern sides of a small enclosure were identified. Two pieces of worked flint were recovered, one from the enclosure ditch and one from an internal feature.

10.6 Area D

10.6.1 Area D was located directly east of the A1 and south of Crab Tree Lane at SE 506 147 (Fig. 17). The 0.9ha gradiometer survey identified four linear anomalies and several isolated discrete anomalies. Comparison with the data from Area C revealed that some of the linears may have been of recent date.

10.7 Area E

10.7.1 Area E was located to the east of Long Lane and south of Wooddle Hole Lane at SE 515 144 (Fig. 17). A gradiometer survey of a 6.6ha area revealed anomalies indicative of recent field boundaries plus an archaeological system of field boundaries and enclosures and a double-ditched trackway. Isolated anomalies within the enclosures were thought to represent pits or hearths. A magnetic susceptibility survey over the same area suggested that activity may have concentrated in the low-lying enclosures at the site. Three flint artefacts and one sherd of Romano-British pottery were recovered from the surface of the field.

10.7.2 The geophysical anomalies were investigated by trial trenching which revealed at least two phases of boundary delineation, a dry stone wall blocking a ditch and several discrete features. The stratified finds assemblage comprised two flints, two pieces of slag and an iron nail. A further nine flints and three sherds of Romano-British and medieval pottery were recovered as surface finds.

10.8 Area F

10.8.1 Area F was also known as 'Long Lane Quarry' and was located to the north-east of Wooddle Hole plantation and west of Old Whin Fox at SE 518 147 (Fig. 17). A 2.5ha gradiometer survey revealed several linear anomalies indication of field ditches and enclosures but the anomalies were discontinuous and did not form an overall coherent pattern.

10.8.2 The anomalies were subsequently investigated in eleven trial trenches. Archaeological features survived to fairly substantial depths in this area and the results of the geophysical were confirmed plus several additional discrete features were identified. Three sherds of prehistoric pottery were recovered from two ditches, of which two sherds were identified as Iron Age. Two

sherds of Romano-British pottery were also recovered from two ditches, one of which had been re-used as a gaming counter. The partially articulated remains of a pony and three residual flints were also recovered.

10.9 Area G

10.9.1 Area G lay immediately west of Area E and south of Wooddle Hole Plantation at SE 517 146 and was known as 'Barnsdale Bar East' (Fig. 17). A gradiometer survey was carried out over 3ha of land and essentially this work comprised the unsurveyed parts of Area E. The survey revealed several linear anomalies but most were attributable to recent agriculture, field boundaries or to geological variation. Some linears were also thought to be of archaeological potential but these did not appear to be as coherent as the enclosures in the adjacent areas to the south and west in Area E. As of October 2000 this area had not yet been quarried.

10.10 Area H

10.10.1 Area H lay immediately west of Long Lane and east of the A1 at SE 511 141 and was known as 'Barnsdale Bar South' (Fig. 17). Gradiometer survey of the 4ha site revealed intersecting linear anomalies indicative of a rectangular field or enclosure with further linear anomalies radiating from all four corners. Possible discrete features were also tentatively identified.

10.10.2 This area was subsequently investigated by test pitting, trial trenching and open area excavation as reported in Section A of this report.

10.11 Area I

10.11.1 A further 2ha geophysical survey was carried out to the A1/A639 junction at SE 512 136 (Fig. 17). The work was undertaken by Stratascan as part of the A1(M) Redhouse to Ferrybridge improvement scheme (Site 22). The results show a number of linear features which were interpreted as possible boundary or drainage ditches.

10.12 Desk-based and Other Assessments

10.12.1 The Barnsdale Bar area was included in an archaeological study carried out in 1992, in advance of improvements to the A1 (Redhouse to Ferrybridge). The study noted a number of crop marks at Barnsdale Bar and also included observations of geotechnical trial pits along the road. No archaeological deposits or features were noted in the trial pits at Barnsdale Bar (Trial pits 108, 111, 164-168; RPS Clouston 1992).

10.12.2 In 1996 a preliminary archaeological assessment was carried out in advance of quarrying at Barnsdale Bar East (the area corresponding to Areas E, F and G). The assessment study area covered the 9km^2 between SE 500 130 and SE 530 150 (inclusive) and therefore covered much of the same area as the current study. Thirty archaeological sites were identified and catalogued. The majority of these (28 in total) were either sketched crop mark sites or previous archaeological investigations (Boucher 1996).

10.12.3 The crop mark elements of these assessments has been superseded by the comprehensive air photo rectification undertaken as part of the current programme of work (Section 12 below).

11. Other Relevant Sites

11.1 Roman Ridge Road

11.1.1 The Roman road known as 'Roman Ridge' passes within 200m of the recent Barnsdale Bar investigations and follows the same route as parts of the present A1 and A639 (Figs 17 and 18). Roman Ridge road (Margary 1973, road 28b) formed the main route between Doncaster (*Danum*) and Tadcaster (*Calcaria*) and took in Castleford (*Lagentium*) and Burghwallis Roman fort along its route. The most visible remains of this 29½ mile stretch of Roman road are located at Barnsdale Bar - just to the south-west of the junction between the A1 and the A639.

> 'Just before the fork, however, the Roman road is seen in great strength on the west of the present road as a huge *agger*, 36 feet wide and 5-6 or more feet high...', (Margary 1973, 415).

11.1.2 The road forms part of a military communications network connecting the Flavian forts and, given the establishment of Castleford and York in the early AD 70s, a date of AD 71-83 is thought to be appropriate for the surveying and construction of the road (Hartley and Fitts 1988; O'Neill forthcoming a).

11.1.3 Roman road 28b has been investigated in several places along its route (for a discussion of the results see O'Neill forthcoming a): at Tadcaster, North Yorkshire (Ramm 1976), Headley Bar, North Yorkshire (NY SMR 9163.01), Nut Hill, West Yorkshire (Thackray 1967; Babtie 1999), Hook Moor, West Yorkshire (Babtie 1999), Roman Ridge near Aberford, West Yorkshire (O'Neill forthcoming b), Castleford, West Yorkshire (Abramson *et al.* 1999), Micklefield, West Yorkshire (Abramson 1987), Thorpe Audlin, South Yorkshire (Houlder 1983) and most recently by Northamptonshire Archaeology at Adwick Le Street, South Yorkshire.

11.2 Investigations at South Elmsall, West Yorkshire

11.2.1 Numerous detailed archaeological investigations have been carried out by Archaeological Services WYAS at South Elmsall, West Yorkshire, which lies *c.* 5km south-west of Barnsdale Bar (SE 480 120). The results illustrate the presence of a complex landscape incorporating elements of enclosure, occupation, agriculture, domestic, funerary and industrial activity dating from the Bronze Age through to the Roman period (Burgess 1998; Burgess forthcoming; Howell 1998; McNaught 1998; McNaught in prep.; O'Neill 1997b; O'Neill 1998).

11.2.2 The preliminary results of the South Elmsall investigations reveal that much of the activity may be of prehistoric date but importantly there is some evidence to suggest the continued use of Iron Age enclosures, trackways, fields and boundaries into the Roman period. The air photographs of this landscape have been examined and mapped (Deegan 2000) and the air photo study area conjoins the Barnsdale Bar air photo study area (Section 12 below); providing a potentially important link between these two areas of extensive archaeological investigations.

11.3 Find Spots and Related Sites

11.3.1 The County Sites and Monuments Records for South Yorkshire, West Yorkshire and North Yorkshire were interrogated for records relating to the present study area. Records of crop marks or post-Roman sites have not been included here.

11.3.2 The South Yorkshire SMR records the find of a Roman coin dated to AD 81-96 from the 1km grid square SE 51 13 (SY SMR PIN 2859). The Roman fort at Burghwallis is located east of Robin Hoods Well at SE 525 118 and is a Scheduled Ancient Monument (SY SAM no. 1222).

11.3.3 The West Yorkshire SMR records two sites within the study area, one of which is the Roman Ridge road (WY SMR PRN 3075) and the other is a crop mark enclosure site at Sleep Hill Lane, North Elmsall township (SE 496 130) from which 91 flints of Mesolithic/Neolithic character were recovered during fieldwalking in 1991 (WY SMR PRN 879).

11.3.4 Also relevant, but just outside of the study area, at Walton Wood, Upton township (SE 4873 1401) is the site of a hoard of at least 300 Roman coins (now lost) which were discovered in 1927 (WY SMR PRN 1934). The excavation of a crop-marked site at Upton, *c.* 3km west of Barnsdale Bar, revealed possible prehistoric features, a single phase Romano-British D-shaped enclosure and a Late Roman cremation. The Upton enclosure yielded a very small quantity of ceramics and was interpreted as a small defensible enclosure for corralling livestock (Roberts 1995). The West Yorkshire SMR also records four Roman coin finds from within the Upton area (WY SMR PRNs 1748, 1749, 1932, 6847).

11.3.5 To the south of the study area, at Hazel Lane, Hampole (SE 5006 1122), the excavation of a crop mark site identified a 50m by 50m enclosure which lay within a larger field system. A small pottery assemblage indicated a 1st to 2nd-century date. The enclosure was subdivided into four areas but no evidence of habitation was found and a stock management function has been proposed (Brown 1997; O'Neill and Cumberpatch 1999).

11.3.6 No additional spot finds within the study area are recorded on the North Yorkshire SMR. However a 1994 archaeological assessment evaluated an area of 1.16ha at Kirk Smeaton Quarry, North Yorkshire at *c.* SE 510 170 (incorrect NGR of SE 383 500 cited; GeoQuest Associates 1994). The study was carried out post-topsoil clearance and targeted the area of a crop mark. An archaeological feature, corresponding to the crop mark, was identified in plan but was not investigated. The existing spoil heaps did not yield any artefacts and it was also concluded that geophysical survey was 'unlikely... [to] recover any data of archaeological value' (GeoQuest Associates 1994).

12. Air Photograph Mapping and Interpretation

by Alison Deegan

12.1 Introduction

12.1.1 Differences in soils and geology can influence the appearance of crop marks. The crop marks delineating buried and levelled archaeology are the effect of differential growth between that on archaeological deposits and that on surrounding undisturbed ground. These marks are clearest when there is a considerable difference in matrix, water and nutrient availability between the archaeological and natural deposits. These responses can be seen most clearly in large areas of homogenous, fast-growing plants such as cereal crops, but grass and root crops can be similarly effected.

12.1.2 The study area is surrounded by villages and small towns such as Upton, North Elmsall and South Elmsall in West Yorkshire, Skelbrooke, Skellow, Campsall and Norton in South Yorkshire and Kirk Smeaton in North Yorkshire. However modern settlement within the survey area is sparse and dispersed at Hollins Farm, Warren House Farm and Woodfield Farm. The area is traversed north-west to south-east by the A1 trunk road and a disused railway line, a relic of the coal industry at North and South Elmsall, curves across the study area from north-east to south-west. There has been quarrying activity at Kirk Smeaton and Barnsdale Bar since 1945, but in the last decade there has been a considerable expansion of these operations.

12.1.3 There are still small areas of woodland such as Barnsdale Wood and other small plantations. Much of the remainder of the land is given to arable farming; generally cereal crops but also root crops and brassicas. Thus the conditions across much of the survey area are or have been conducive to the identification of levelled archaeological sites from the air.

12.2 Data Sources

12.2.1 Oblique and vertical air photographs held in the following collections were consulted for this investigation (Table 6). All air photographs consulted for this survey are listed in Appendix V. Together the air photographs consulted for this investigation provided complete coverage of the survey area.

12.3 Mapping

12.3.1 The results of the air photo mapping are presented on Figure 18. All levelled and upstanding archaeological features visible on the available air photographs were mapped to 1:2500 scale accuracy and detail. A brief summary of the results of this investigation is provided in this text and a gazetteer with detailed descriptions can be found in Appendix V along with a full methodology.

12.3.2 In all cases attempts were made to achieve accuracy of shape and form and positioning to within ± 3m. Features in AP complexes 24 and 32 were sketch plotted as there was insufficient information on the photographs of these features to relate them with any confidence to the map data. The errors in the positioning and mapping of these features is unquantifiable and may be large. The positioning of features in AP complexes 23 and 25 may exceed ± 3m as the photographs of these features do not show adequate map reference points.

Features in AP complex 29 were positioned with reference to the corresponding anomalies in the geophysical data as the photographs of these features did not show adequate map reference points for accurate plotting.

Table 6. Air photograph mapping: summary of sources

Collections consulted	No. of air photographs consulted
CUCAP	70 oblique photographs
NMRC	228 oblique and 144 vertical air photographs
NY SMR	6 oblique photographs
SY SMR	90 oblique photographs
WMDC	15 vertical air photographs
WY SMR	22 oblique photographs
Total	**575 air photographs †**

† includes prints duplicated between collections

CUCAP - Cambridge University Committee for Aerial Photography, The Mond Building, Free School Lane, Cambridge; NMRC - National Monuments Record Centre, Kemble Drive, Swindon; NY SMR - North Yorkshire Sites and Monuments Record, County Hall, Northallerton; SY SMR - South Yorkshire Sites and Monuments Record, Town Hall, Sheffield; WMDC - Map Office, Regeneration Department, Wakefield Metropolitan District Council, Newton Bar, Wakefield; WY SMR - West Yorkshire Sites and Monuments Record, Registry of Deeds, Newstead Road, Wakefield

12.4 Site Visibility and Preservation

12.4.1 No features corresponding to the ditches identified by the recent investigations at Barnsdale Bar South were identified on the air photographs. Furthermore, of the numerous features identified by geophysical surveys, archaeological evaluations and excavations to the north only those in Area E (SE 514 145) were visible on the air photographs examined. This apparent blank area extends west of the A1 but is in considerable contrast to the rest of the air photo survey (see below).

12.4.2 Although a greater part of the aerial reconnaissance pre-dates much of the quarrying at Barnsdale Bar there were only a limited number of oblique air photographs of this area and none of the Barnsdale Bar southern extension. However there was vertical coverage from several decades available for the whole of the study area and some of these photographs recorded crop mark features elsewhere in the survey area.

12.4.3 Several factors may contribute to the absence of evidence on the air photographs for the archaeological features known to exist at Barnsdale Bar. Glacial and peri-glacial features were observed during most of the excavations and the difficulties experienced in distinguishing them from anthropogenic features noted (e.g. Webb 1993; Brown and Morris 1997). These features, in the form of naturally infilled cracks and solution holes can also produce crop marks which may contrive to camouflage and mask archaeological features from the archaeological aerial photographer. Some of the later features identified on the geophysical survey and examined during

excavation were observed to be cut entirely within the subsoil and to be extremely difficult to distinguish visually (Speed 1997). In such cases the differences between the subsoils and feature fills may be insufficient to produce visible differences in crop growth or maturation. These areas may also have been planted with a less responsive non-cereal crop on the occasions of archaeological aerial reconnaissance.

12.4.4 The preliminary archaeological assessment of the Barnsdale Bar area undertaken in 1996 recorded a barrow cemetery visible on air photographs centred at SE 5081 1458 (Boucher 1996). The source of this information is a North Yorkshire Sites and Monuments Record (PIN 9170), which identifies the relevant photographs as DNR0035/36 and DNR0036/13-14 dated to the 1st July 1972. These photographs are not held by the North Yorkshire SMR and could be not be identified with prints in any other of the collections consulted. This site was not visible on any of the photographs consulted for this survey and thus the validity of the interpretation remains unknown. Part of the area in which the cemetery is recorded has been subject to geophysical survey but the no barrows were not identified in the interpretation of the results (Webb 1995).

12.4.5 All of the archaeological features identified by this survey were levelled. The excavations around Barnsdale Bar indicates that some of these features may be severely truncated. The trackway in AP complex 31 which is thought to continue through Barnsdale Wood to AP complex 32, may survive better in the woodland.

12.5 Dating

12.5.1 The crop marks reveal a predominantly agricultural landscape of enclosures, trackways and fields, reflecting the results of the previous archaeological investigations. This landscape is characterised by field boundaries, trackways, enclosures and small discrete features. Although there has been a relative paucity of datable material the accumulated evidence suggests this to be a multi-phase landscape developing from the Late Iron Age through the Roman period. With the current knowledge base it seems reasonable to extrapolate these findings to most of the features identified by this air photo survey.

12.5.2 Post-medieval field boundaries and hedge lines were also interpreted from the geophysical surveys and confirmed by excavation (Webb 1995, Brown and Morris 1997). If these later features have been removed before the time of Ordnance Survey First Edition 1 inch to 1 mile mapping it is difficult to distinguish them from earlier field boundaries on the evidence of the air photographs alone and some examples may have been grouped in the gazetteer with significantly earlier remains.

12.5.3 The features in AP complex 14 were not recorded as crop marks but rather by clearly defined tonal differences in the bare soils where ploughing had cut the archaeological deposits. It is possible that these features are the remains of later, medieval or post-medieval activity.

12.6 Enclosure Sites

12.6.1 More than 38 enclosures were identified on the air photographs in the survey area, mostly relatively evenly dispersed. There were no large clusters or groups, and no particular area had a significant under representation with the exception of the 'blank' area noted in paragraph 12.4.1. Most of the enclosures were rectilinear or polygonal in plan with three notable exceptions, including the possible barrow in AP complex 33.

12.6.2 The enclosures in AP complex 7 and 31 are of similar oval plan but the latter, covering 0.17ha is considerable larger than the former which is only 0.05ha. Nevertheless they occur in similar contexts, close to sinuous trackways and have outer ditches that may be part of those trackways. AP complex 31 contains a small circular feature that may be the remains of a hut circle and in turn indicate a possible domestic function for this type of enclosure plan.

12.6.3 The rectilinear enclosure in AP complex 15 was truncated along the western side by a pipeline in 1984. Despite this intrusion a detailed plan of the surviving features could be identified in the crop marks. The enclosure is defined by a ditch 3-4m wide with an east-facing entrance, inside there are numerous rectilinear compartments defined by ditches or gullies and pits. The arrangement of the internal features does not leave space for an internal bank suggesting it was either positioned external to the enclosure or that the ditch material was re-deposited elsewhere. The entrance opens into another enclosed area. The plan of these features as seen from the air undoubtedly belies a complex sequence of development.

12.6.4 A similarly detailed plan was observed for the enclosure in AP complex 10. The broad-ditched rectilinear enclosure of 0.28ha has a east-facing entrance and is bisected by a ditch or gully. There is a possible hut circle in the southern half and clusters of pits in both areas. However contemporaneity between these features and the enclosing ditch should not perhaps be presumed as it would appear that the enclosure overlies a smaller slighter enclosure in its north-east quadrant.

12.6.5 The enclosure in AP complex 1 is of similar outline plan to the AP complex 10 enclosure. This rectilinear enclosure is larger at 0.52ha but is of similar proportions and is again subdivided. This enclosure has only been photographed on one occasion and the crop marks did not reveal the level of detail seen in the examples above.

12.6.6 Enclosures in AP complexes 8 and 19 and the possible incomplete enclosure in AP complex 28 have internal divisions separating small corners from the rest of the enclosure.

12.6.7 In many cases internal divisions and structural features could not be identified within or around the enclosures. In examples such as AP complexes 3, 19 and 29 this is undoubtedly a factor of visibility. These features were ill-defined by crop marks and it is not surprising that any slighter features in their vicinity have not produced a visible crop response.

12.6.8 The two broad ditched enclosures and slighter features in AP complex 27, being the most substantial features visible in the vicinity, may be settlement remains associated with the multi-phased field systems identified by excavation in Areas B, C and H.

12.6.9 The enclosures in AP complex 24 (0.08ha) and 26 (0.04ha) are relatively small and both appear in association with linear features. These may be simple stock pens in the corner of fields and may not have been associated with any other structures.

12.7 Trackways

12.7.1 A large proportion of the enclosures observed within the study area are found in direct association with double-ditched features thought to be trackways or lanes. Enclosures in AP complexes 31, 18, 30, 35, 22, 25 and 35 all abut one of the ditches of these trackways. The function of each of these enclosures is unlikely to be consistent, the polygonal example in AP complex 22 may be the remains of human occupation whilst the large, irregular examples in AP complex 31 are more likely to be paddocks or fields.

12.7.2 Although the visible sections of trackway are not contiguous, with the integration of evidence from the geophysical surveys and excavations several routes can be projected across the study area. In the north, an east to west aligned trackway can be traced over 2km through AP complexes 17, 18, 30, 24 and 35. At AP complex 17 the trackway appears to intersect with a north-west to south-east aligned trackway and at its eastern extent in AP complex 35 it joins a north to south aligned branch extending beyond the study area.

12.7.3 AP complex 31 contains sections of branching trackway which extend beyond the study area, unseen into Barnsdale Wood and westward in AP complex 28. A curving section of double-ditched feature to the north of Barnsdale Wood in AP complex 32 may be part of the same network. Other meandering sections of trackway are seen in AP complexes 8 and 9. Trackways of similar sinuosity were observed in the South Elmsall Area (Deegan 2000). Parts of trackway in AP complexes 8 and 9 follow the line of the *c.* 60m contour but other trackways cross slopes and were presumably routed with respect to other natural and anthropogenic features in the landscape that have not been identified here. There is no clear relationship between Roman Ridge Roman road and these trackways.

12.7.4 Several sections of trackway are abutted linear features at or close to right angles. These are probably field boundaries. In AP complexes 20 and 22 four rows of rectangular fields can be between the two trackways. These fields are defined by irregular often apparently discontinuous ditches as is the linear feature in AP complex 11. Similar features excavated at South Elmsall and further north on the Magnesian Limestone at Roman Ridge in West Yorkshire have been found to be defined by elongated pits of irregular length and shape (Howell 1998; O'Neill 1998; O'Neill forthcoming b).

12.7.5 Elsewhere the layout of the fields is less clear. Away from the trackways and enclosure there is less crop mark evidence for the field boundaries, though the evidence from geophysical survey and excavations and they are known to exist in expansive and coherent patterns. It is likely that these slighter features defined by a single, often discontinuous ditch simply cannot promote the same effect on overlying crop as the ditches of trackways and enclosures. However, it may also be the case that essential differences between the processes of infilling the trackway and enclosure ditches and those demarcating the fields results in differential visibility.

12.8 Funerary Sites

12.8.1 Skeletal remains have been previously been identified through excavation in Areas A and C. The remains were both located within simple grave cuts but are not thought to be contemporary (Brown and Morris 1997). These or any similar graves in the area were not identified on the air photographs.

12.8.2 An enclosure in AP complex 33 is tentatively identified as a Neolithic or Bronze Age funereal monument. The sub-circular enclosure, possibly the ring-ditch of a truncated barrow is surrounded by a more irregular outer enclosure. The crop marks of these features were rather weak in comparison with those in the same field in AP complex 32 which may suggest narrower or shallower ditches and/or an earlier date. Fieldwalking in Area C recovered Neolithic flint material from an area concentrated around SE 5093 1419, however the evidence available is insufficient to associate the possible barrow with this material. As noted above the barrow cemetery previously observed on air photographs (Boucher 1996) was not identified by this survey.

12.9 Beyond the Study Area

12.9.1 The features in AP complexes 17, 18, 30, 34, and 35 form an extensive trackway flanked by various stock enclosures, pens or domestic enclosures but with admittedly meagre evidence for fields. A brief examination of the air photographs to the immediate north of this study area suggests that a similar landscape of features extends northward to edge of the Went valley.

12.9.2 The trackways, discontinuous field boundaries and enclosures in AP complexes 20 and 22 constitute a suite of features very similar to those excavated at South Elmsall. There the discontinuous boundaries and enclosures were identified as part of a sequence of development originating in the Bronze Age and developing through the Late Iron Age and Roman periods (Howell 1998; McNaught 1998, in prep.; O'Neill 1998). The earliest phases at South Elmsall were represented by ephemeral features which were not identified on the air photographs examined for the South Elmsall survey (Deegan 2000).

12.9.3 Although the remains identified by this survey may correspond predominantly with agricultural activity, the presence of evidence for metalworking at South Elmsall in similar landscape contexts suggests that such interpretations should not be made to the exclusion of the possibility of other industries (Howell 1998; O'Neill 1998).

12.10 Conclusion

12.10.1 This air photo survey has demonstrated that extensive agricultural landscapes of probable Late Iron Age to Roman date exist around Barnsdale Bar. The coherent character of some aspects these landscapes can indicate the likely presence of archaeological features not visible on the air photographs. This predictive quality may be of value in the planning process in the absence of any other direct archaeological evidence.

12.10.2 Geophysical surveys and excavation at Barnsdale Bar have demonstrated the high archaeological potential where the air photographs could not. The excavation evidence has indicated that the apparently simple layout of the enclosures, trackways and fields suggested by the crop mark evidence is deceptive and rather that the development of this predominantly agricultural landscape is gradual and to some extent cumulative.

SECTION C: OVERVIEW

13. Discussion

13.1 Early Prehistoric Activity

13.1.1 The evidence for early prehistoric activity at Barnsdale Bar is restricted to five assemblages of flint and chert artefacts. The distribution of these artefacts is, however, quite widespread with 20 pieces being recovered from Area B, 121 pieces from Area C, 4 pieces from Area E, 3 pieces from Area F and 16 pieces from Area H. No features of early prehistoric date were identified, although numerous undated discrete features were recorded at many of the sites. It should also be noted that no ceramics of early prehistoric date have been recovered from any of the investigations.

13.1.2 The absence of features associated with the Barnsdale flint assemblages is not unusual. Brooks (see Section 5.3) has highlighted the tendency for lithics of later Neolithic date to occur in unstratified contexts rather than having been deposited within feature fills and this observation certainly appears to apply to the Barnsdale Bar assemblages. A paucity of stratified lithics would considerably reduce the chances of recognising any early prehistoric features through excavation; although fieldwalking may perhaps be more successful at identifying areas of activity.

13.1.3 The presence of the barrow cemetery previously identified as crop marks in Areas C/D (Boucher 1996) has not been confirmed by subsequent geophysical survey or air photo analysis (see paragraph 12.4.4) and therefore cannot be relied upon as evidence of early prehistoric activity. The recent excavation of Area H did, however, tentatively identify an undated ring ditch (gully 6000) which appeared to pre-date the enclosures but no funerary remains were recovered. In addition the air photo study identified a putative Neolithic/Bronze Age barrow (AP complex 33) which lies 1km east of Barnsdale Bar (Fig. 18). The concentration of 91 lithics recovered from fieldwalking at Sleep Hill Lane, North Elmsall, *c.* 2km west of Barnsdale Bar (paragraph 11.3.3), also attests to the presence of significant early prehistoric activity in the vicinity.

13.2 Later Prehistoric Activity

13.2.1 Later prehistoric activity was not identified at the recent investigation but previous work at Barnsdale Bar has illustrated that Iron Age artefacts can be expected to be preserved within the archaeological record. A pit in Area B contained 26 sherds of Iron Age pottery and a further two sherds were recovered from ditch fills in Area F.

13.2.2 The extent of later prehistoric activity in this area is very much an unknown quantity at present. The South Elmsall landscape, *c.* 5km away at SE 480 120, is known to include a significant Iron Age component which has been dated by artefactual and radiometric dating methods. Some of the Iron Age features at South Elmsall appear to have continued in use into the Roman period whereas other enclosures and areas of activity were completely abandoned (Burgess 1998; Burgess forthcoming; Howell 1998; McNaught 1998; McNaught in prep.; O'Neill 1997b; O'Neill 1998). Similarly, at

Pickburn Leys, South Yorkshire (SE 534 067) the ceramic assemblage had sufficient chronological depth to confirm occupation of the site from the early 1st century BC until at least the 3rd century AD (Sydes 1993). Dating evidence for all periods is relatively scarce at Barnsdale Bar. Whilst it is certainly possible that some of the ditched enclosures may have originated in the Iron Age, no stratigraphic or artefactual evidence for pre-Roman period activity was recovered from the recent excavation of Area H.

13.3 Romano-British Activity

13.3.1 *Roman Ridge road*

The Roman road represents an early and direct effect of the Roman conquest on any communities occupying the Barnsdale Bar area. The construction of Roman Ridge road is known to have impacted upon existing enclosures and settlements along its route; at Rossington, South Yorkshire, crop marks reveal that the road cut through earlier fields and enclosures (Riley 1980) and near Aberford, West Yorkshire, the road was superimposed over a recently abandoned enclosure (O'Neill forthcoming b). The paucity of Iron Age evidence from Barnsdale Bar makes it impossible to determine any patterns of landscape development from later prehistory into the Roman period and to assess the impact of Roman Ridge road. It is possible, given this lack of Iron Age evidence, that Romano-British settlement at Barnsdale Bar developed in response to the presence of the road.

13.3.2 *Settlement at Barnsdale Bar*

In common with other excavated crop-mark enclosures in this area, such as the D-shaped enclosure at Upton (Roberts 1995) and the subdivided enclosure at Hampole (Brown 1997), the function(s) of the Romano-British enclosures at Barnsdale Bar are unknown. Apart from a hearth in Area A and some isolated geophysical anomalies within the enclosures in Area E no evidence of habitation or structures has been found at Barnsdale Bar. Deegan (paragraph 12.6.8) has suggested that the crop marks in AP complex 27 (200m south-east of Area H) may represent the settlement remains that the excavations have so far failed to identify.

13.3.3 The presence of two inhumations in Areas A and B indicates that some areas of the Barnsdale Bar complex were not used exclusively for agricultural purposes. Areas A and B lie close to a group of crop mark enclosures which have been interpreted by Deegan as a late prehistoric to Roman enclosure with possible paddocks, trackway and field boundaries (AP complex 19). If contemporaneity between these excavated and crop mark features is assumed then this may also be an area of habitation.

13.3.4 It is notable that very small quantities of Romano-British ceramics seem to occur across the sites: six sherds were recovered from Area A, six sherds from Area B, four sherds from Area E, two sherds from Area F and eight sherds from Area H. This total of 24 sherds is the result of the excavation of a total area of around 2.8ha, and this low level of pottery deposition would seem to confirm that the enclosures lie at the periphery of the associated settlement. Unfortunately, comparison between areas is problematic because the low levels of dating evidence tend to preclude inter-site phasing.

13.3.5 *Enclosure and specialisation within the landscape*

The general paucity of features and artefacts within the excavated enclosures at Barnsdale Bar may suggest that the enclosures represent agricultural activity on the periphery of settlement, although no environmental evidence is present which can support this interpretation. It is also feasible that truncation caused by ploughing has removed not only above-ground remains but also any shallow sub-surface archaeological features.

13.3.6 Area H contained the only enclosure within the Barnsdale Bar complex to be investigated in its entirety, yet its function remains ambiguous. The staged construction of this enclosure system represents the gradual subdivision of the landscape, presumably for agricultural purposes. Apart from the unstratified lithic assemblage no evidence for earlier activity was recovered from this area. Therefore the construction of these enclosures (probably in the 2nd century AD) could represent the use of previously unenclosed land. Whilst the larger enclosures (such as Enclosure B) appear to be agricultural fields, possibly for the containment of stock, the presence of a smaller sub-enclosure (C) suggests specialisation within the complex. However, no evidence for the nature of the activity within the sub-enclosure was found.

13.3.7 There are numerous similar examples of specialisation and sub-enclosures within larger enclosures at other Romano-British sites, yet the morphological similarities are superficial and conceal a variety of uses. At Warning Tongue Lane, South Yorkshire (SE 631 001) a small enclosure within the 'brickwork' fields was thought to be the site of both occupation and small-scale craft production (Atkinson and Merrony 1994). In Shafton, South Yorkshire (SE 391 107) a D-shaped enclosure within a large field appeared to have been the location of habitation, although some specialisation within the small enclosure itself was also suggested (Burgess 2001). Elsewhere, Romano-British agricultural specialisation is suggested at Hampole, South Yorkshire (SE 5006 1122) where the small enclosure may have been used for herd management (Brown 1997; O'Neill and Cumberpatch 1999) and at Swillington Common, West Yorkshire (SE 377 330) where a sub-enclosure within a large rectangular field contained evidence of crop processing (Howell forthcoming).

13.3.8 The crop marks reveal an archaeological landscape of enclosures, fields and trackways which, in all probability relate to later Iron Age and/or Romano-British activity. In the vicinity of Barnsdale Bar there are several enclosures whose complexity may well belie settlement or industrial remains e.g. AP complexes 14, 15, 19, 27, 30, 32 and 35.

13.3.9 Barnsdale Bar quarry is a blank in terms of crop marks yet the trial trenches and excavations have revealed numerous ditches and enclosures. Far from being uniform these field systems and enclosures vary greatly in complexity and nature. It would be therefore be inappropriate to assume that the lack of artefactual evidence is itself an indication of an agricultural function in all cases. Features such as the staged construction of the enclosures in Area H and a stone revetment wall in an enclosure ditch in Area E are particularly revealing as they demonstrate clear variations in enclosure architecture, presumably reflecting different requirements and uses.

13.4 Site and Feature Visibility

13.4.1 Numerous archaeological prospection and identification techniques have been employed at Barnsdale Bar including air photograph analysis, gradiometer survey, magnetic susceptibility survey, fieldwalking, desk-based assessment, watching brief, test pitting, trial trenching and open-area excavation.

13.4.2 The air photographs revealed that the sites lay within a wider landscape of fairly complex enclosures and trackways but the Barnsdale Bar quarry itself included several 'blank' areas. Geophysical survey over the sites has also been extensive (with a total area of *c.* 37.5ha) and has provided detail of archaeological and potentially archaeological features, often within the crop mark blanks. It has become clear, however, that the excavation of the sites reveals discrete features and a complexity of ditched features which could not be predicted by either of the prospection methods.

13.4.3 Arable agriculture, carried out from the medieval period into the present, has adversely affected the preservation of the underlying archaeological deposits. Truncation has been noted across many of the sites and in some places even ditched features survive as only shallow gullies. A further problem, which has been noted in almost all of the previous reports, is the presence of natural features which are typical of the underlying geology of the area but which can be confused with archaeological remains. Another feature of the underlying limestone geology is the poor preservation of organic remains and artefacts in general.

13.5 Future Research

13.5.1 The composite plan of crop marks, geophysical anomalies and excavated sub-surface features at Barnsdale Bar indicates that many of the known sites are likely to be inter-related (Fig. 17). However, the small quantities of dating evidence recovered thus far are not adequate to create an inter-site chronology for any of the previous investigations. Should future work reveal larger flint or ceramic assemblages there may even be the potential for refining the dating of the existing collections.

13.5.2 Some rationalisation of the results of the previous investigations may be possible through map regression analysis which should attempt to identify features/anomalies corresponding to known medieval and post-medieval boundaries and trackways. This is particularly relevant for Areas B and C where radiocarbon dating indicated a post-medieval date for some linears. This would also be profitable for the sites where large areas were subject to geophysical survey but where trenching or open-area excavation were not carried out.

13.5.3 It is recommended that future project designs for investigations in this area should recognise the need to incorporate their results with those of earlier projects and hence to contribute to an integrated and coherent study of the Barnsdale Bar landscape.

14. Conclusions

14.1 Barnsdale Bar South (Area H)

14.1.1 The enclosure system in Area H is characterised by a clear pattern of ditch construction over several phases, although the absolute chronology of the site's evolution was difficult to determine. It seems, however, that despite the continuous modification and expansion of the ditches, the intention was the enlargement rather than the replacement of the enclosure system. Thus it is feasible that all of the enclosures in the sequence should really be considered to be contemporary. The dating evidence tentatively suggests that pottery deposition occurred between the 2nd and 4th centuries AD.

14.1.2 The function of the enclosures remains ambiguous but the available archaeological evidence does not suggest settlement, domestic or industrial activity at the site. Structural remains and artefacts are scant and therefore an agricultural use would perhaps seem most appropriate. The presence of a small sub-enclosure may, however, imply a degree of specialisation within the landscape which cannot be confirmed by either the artefactual or stratigraphic evidence.

14.2 The Barnsdale Bar Landscape

14.2.1 The remains in Area H are a component of an extensive landscape of late prehistoric/Romano-British enclosures and field systems which has been revealed by air photographs, evaluations, watching briefs and geophysical surveys. The number, and scale, of investigations within this area provides a rare opportunity to study a Romano-British landscape in detail. However, although the area has been the subject of numerous archaeological investigations, the recent programme of work in South Yorkshire included the only detailed open-area excavation. The results of this work provide significant information about enclosure layout and construction techniques which it has not previously been possible to obtain. Future archaeological investigation of the Barnsdale Bar landscape may be able to further elucidate the nature and date of these enclosures and field systems.

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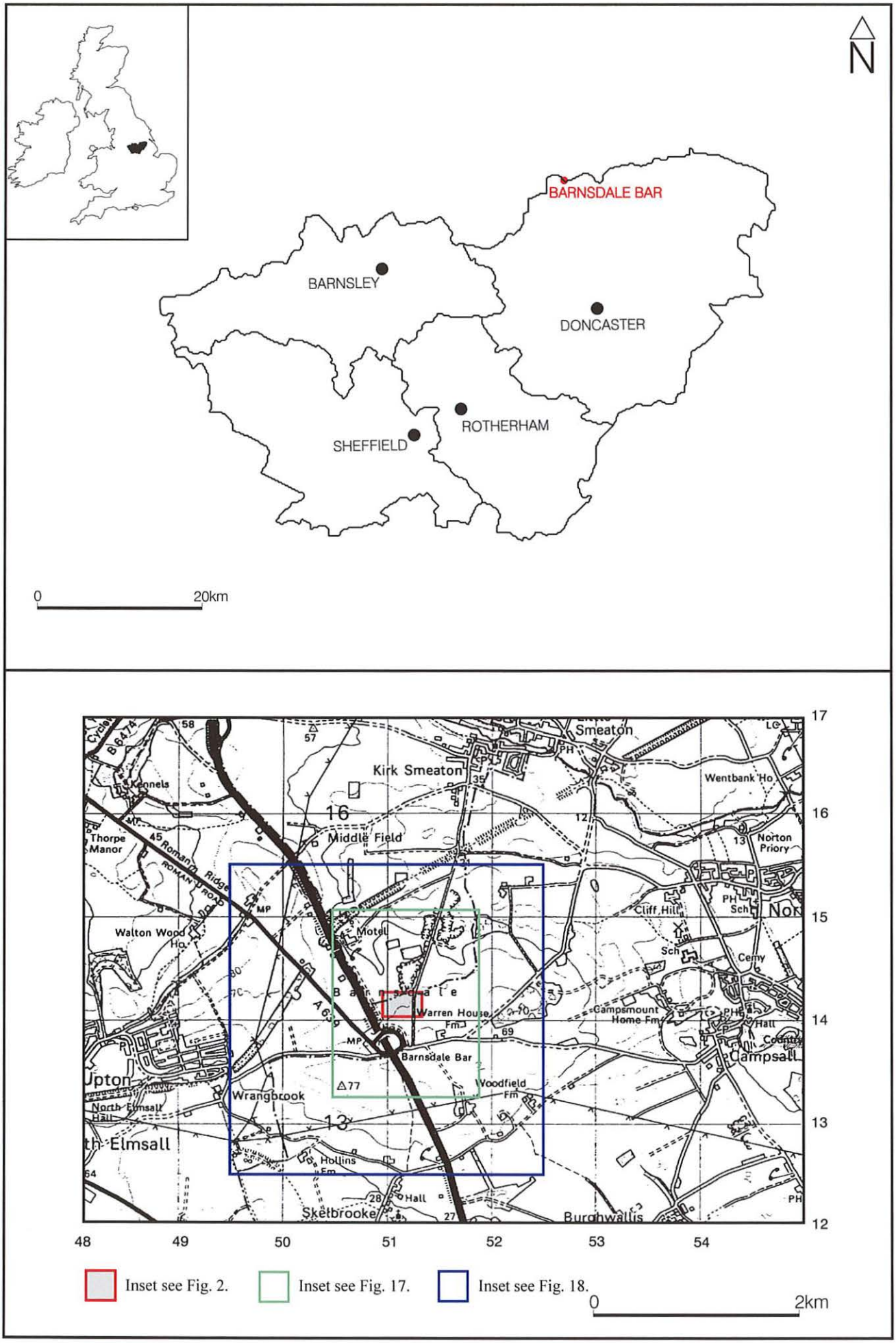
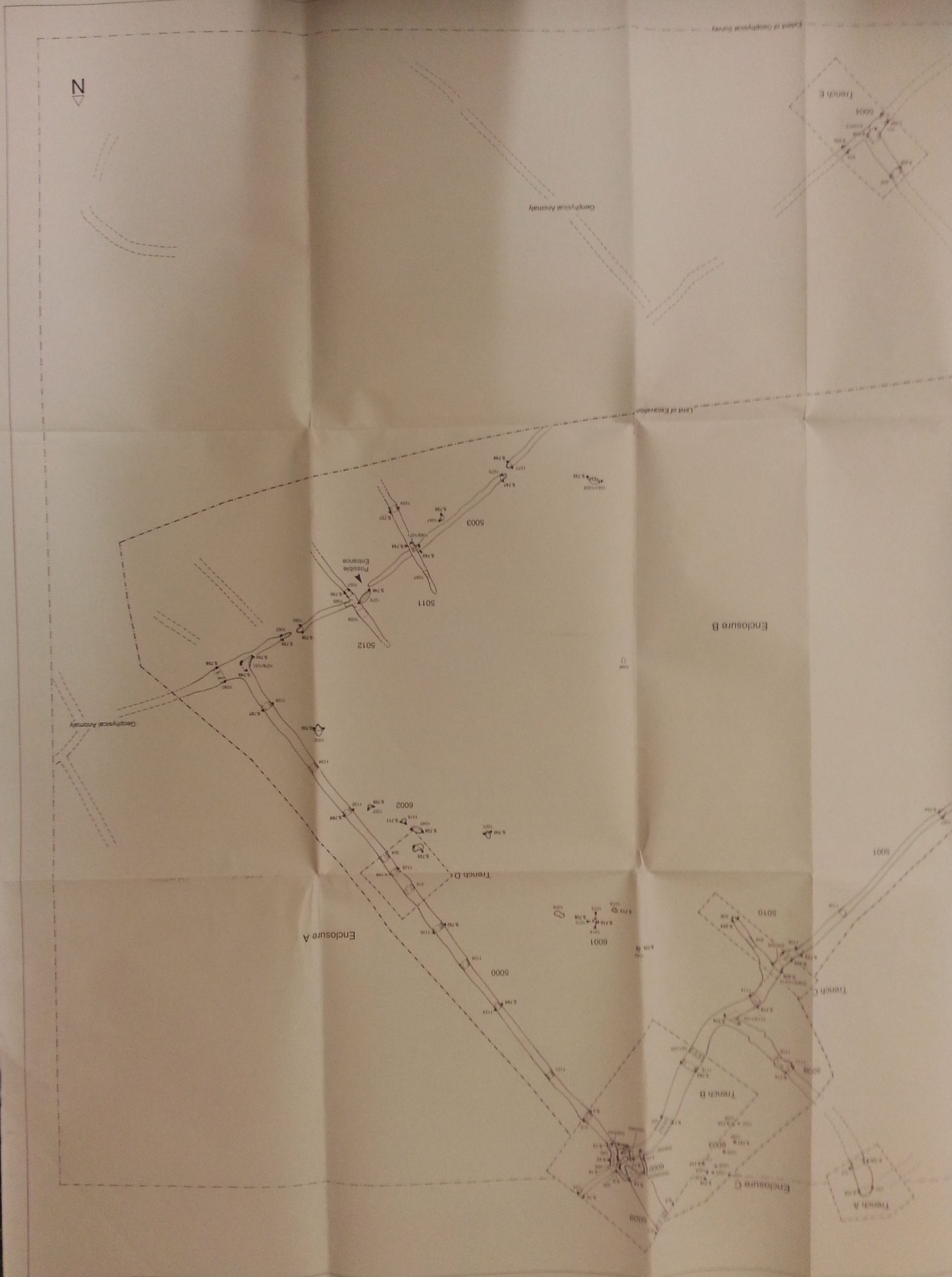


Fig. 1. Site location

Fig. 2. Test pit, trial trench and open-area excavation locations showing greyscale gradiometer data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Trench B
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6006
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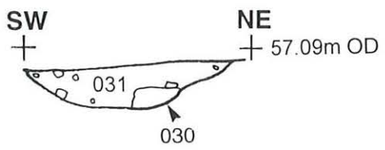
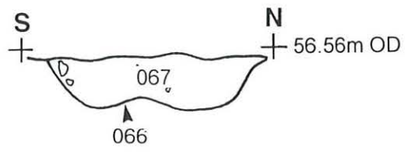
Section 9

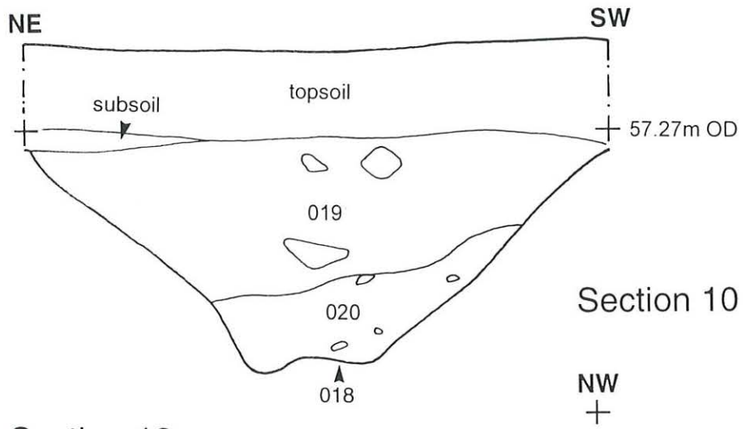


Section 19



Ditch 5000

Section 5



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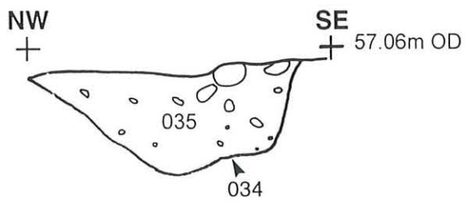

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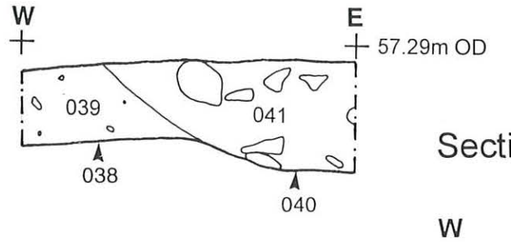

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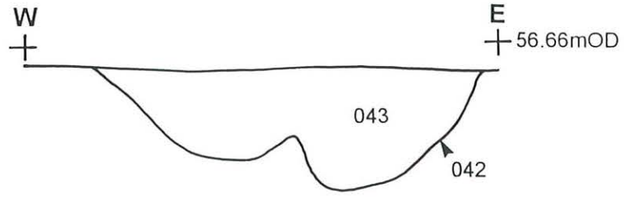


Fig. 4. Barnsdale Bar South: sections

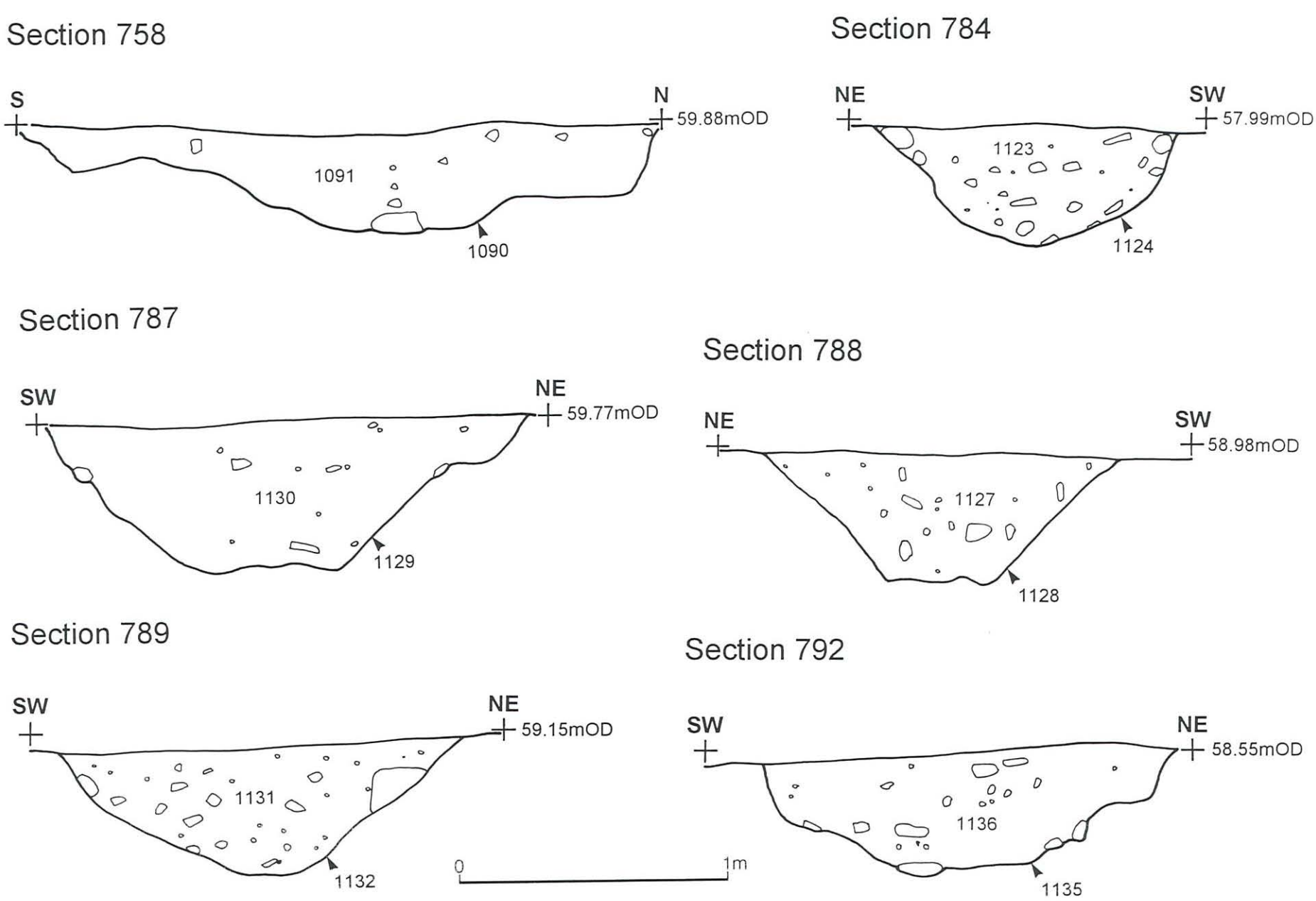


Fig. 5. Barnsdale Bar South: sections

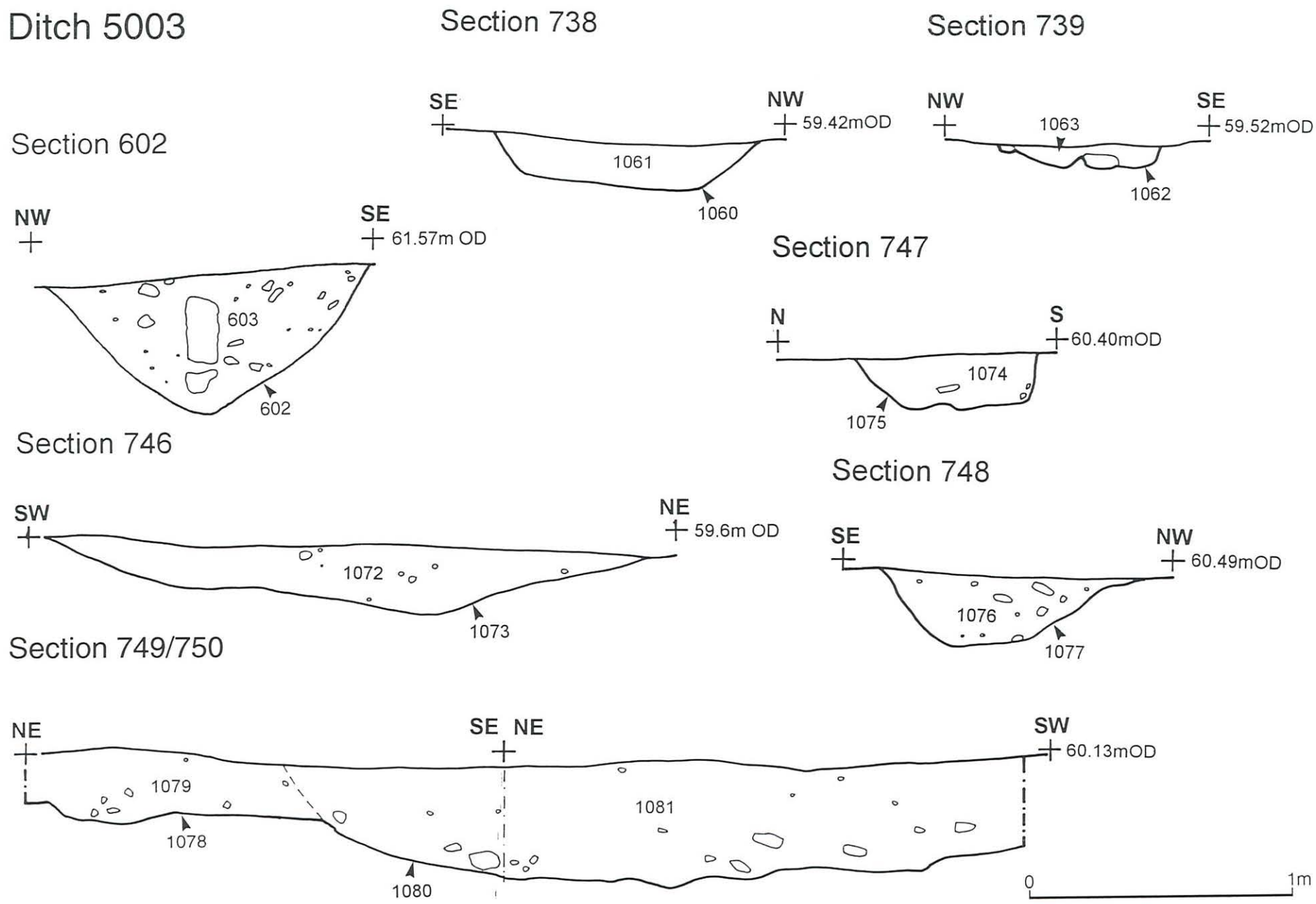
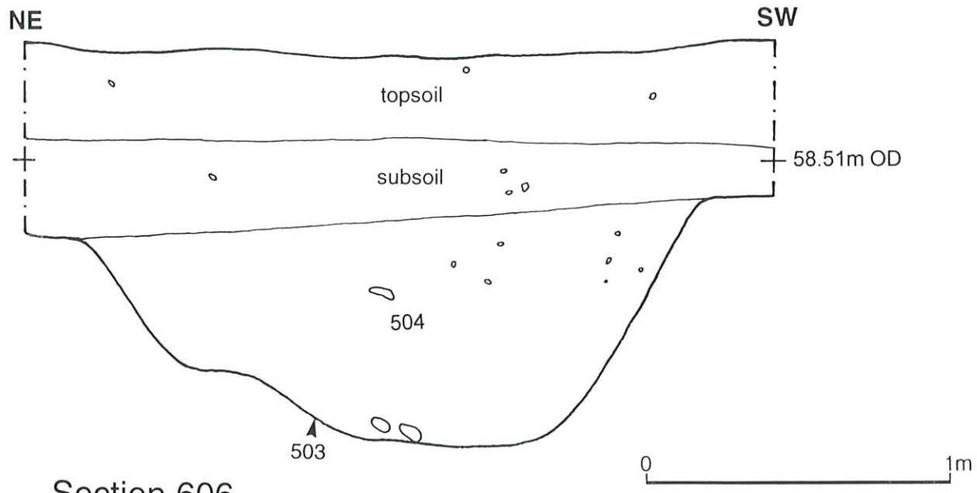


Fig. 6. Barnsdale Bar South: sections

Ditch 5002

Section 500



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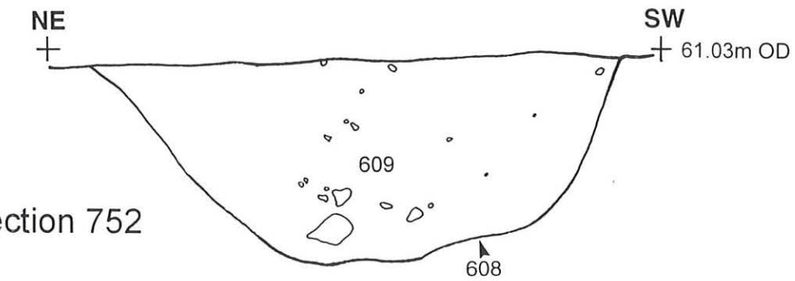

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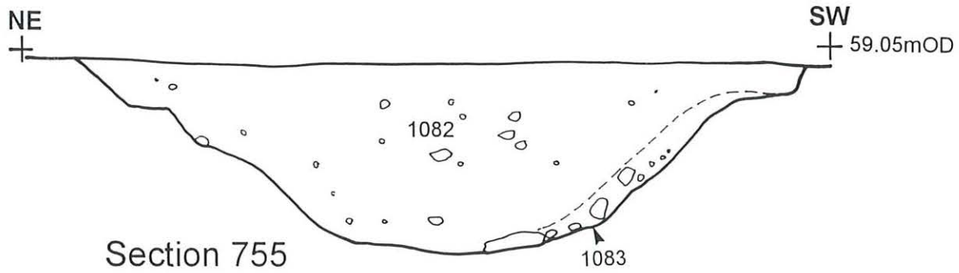

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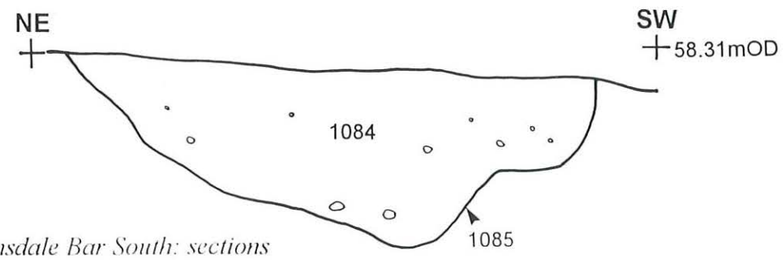


Fig. 7. Barnsdale Bar South: sections

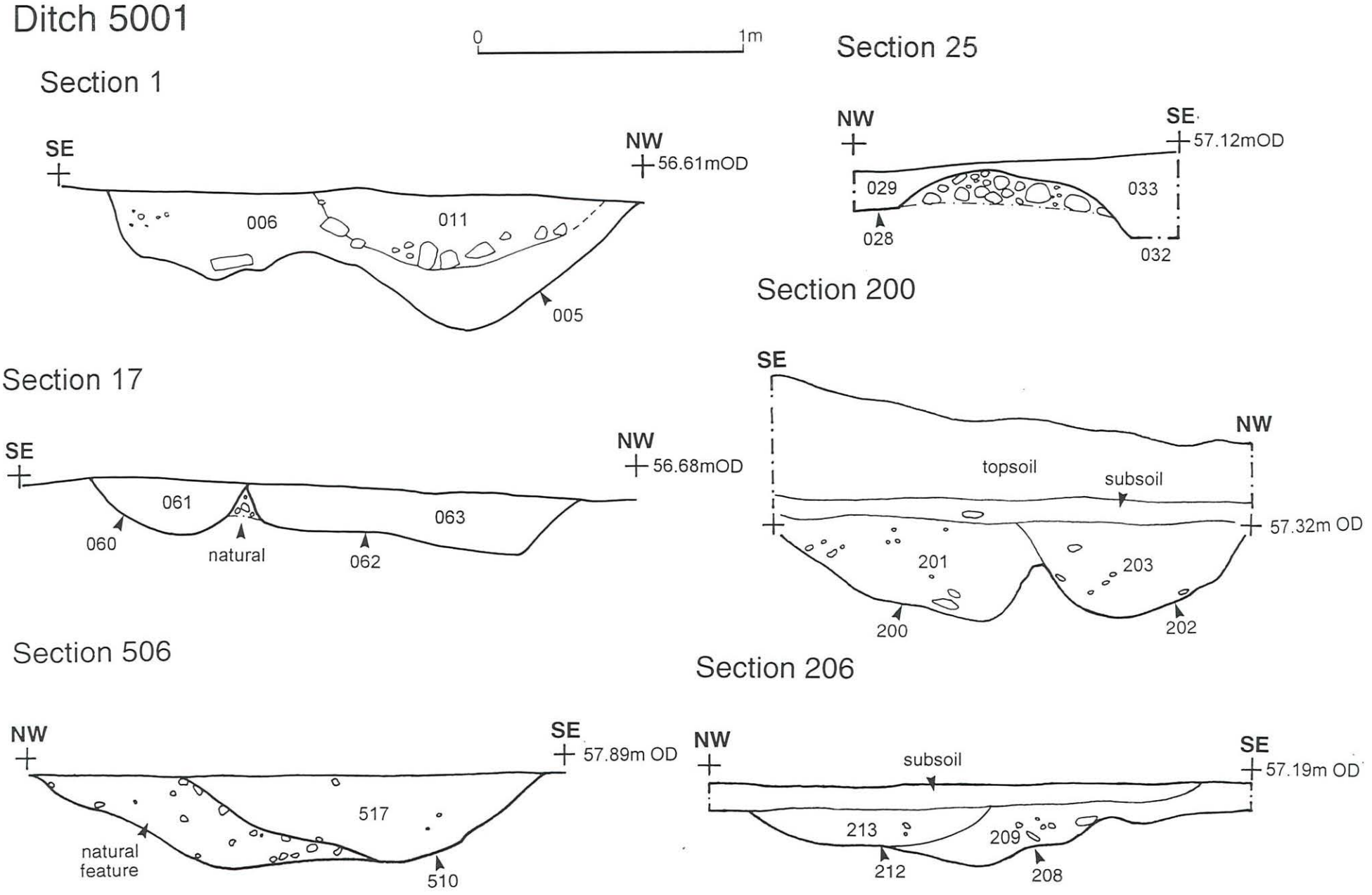
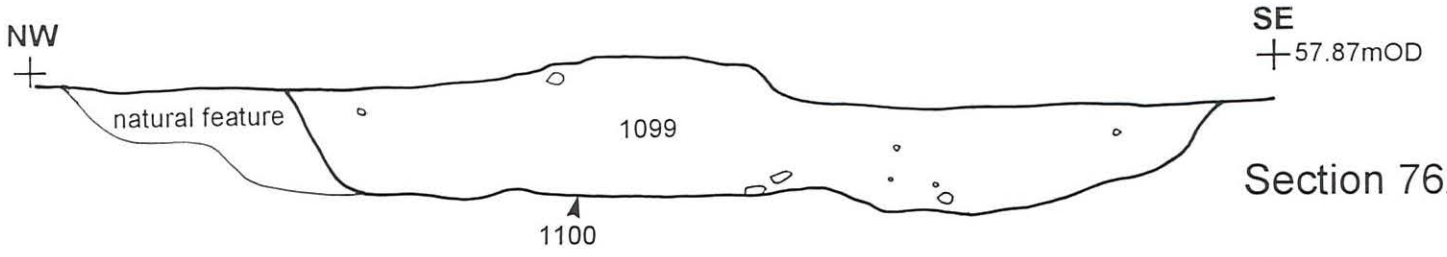


Fig. 8. Barnsdale Bar South: sections

Section 768



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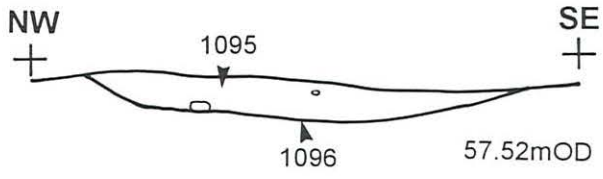

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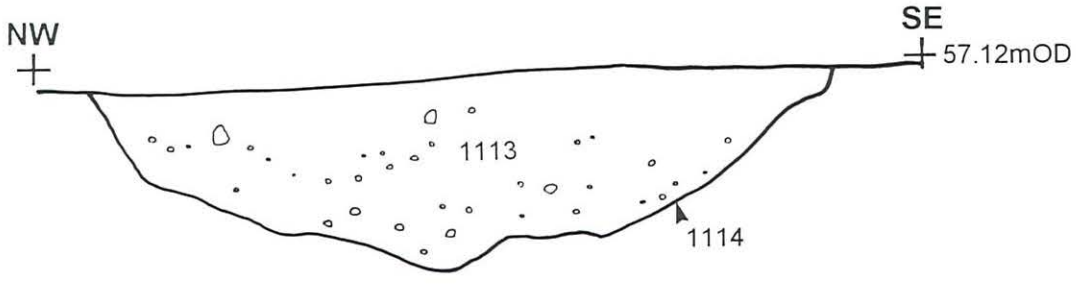

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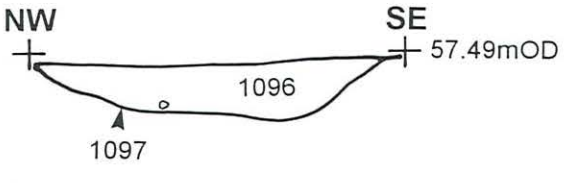

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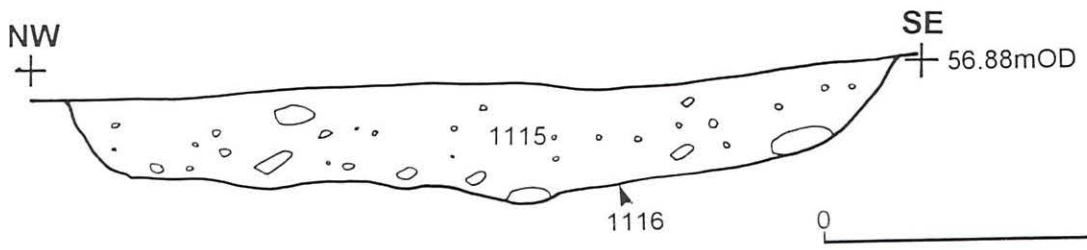

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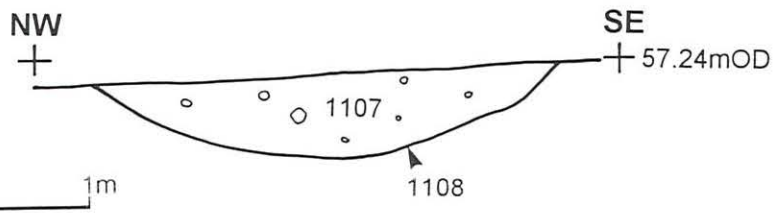
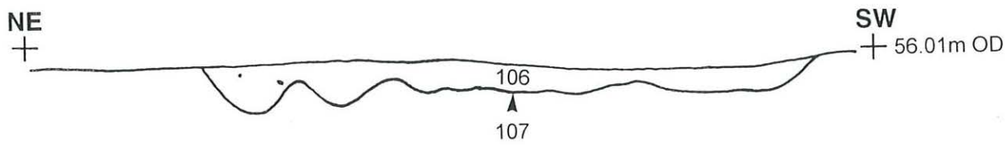


Fig. 9. Barnsdale Bar South: sections

Ditches 5008 & 5009

Section 102



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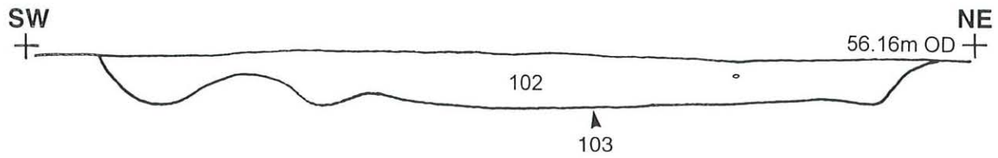

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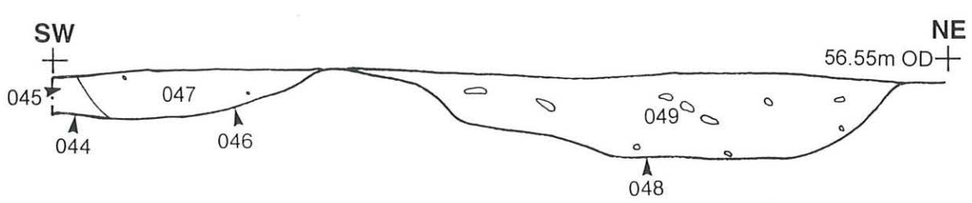

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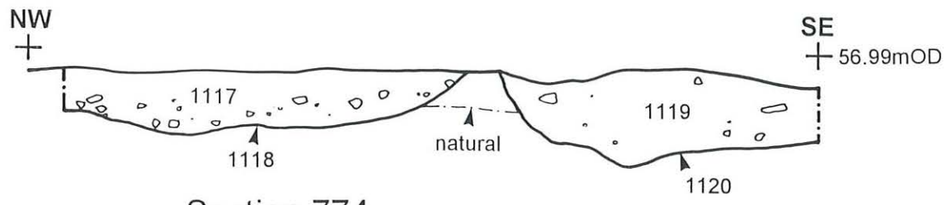

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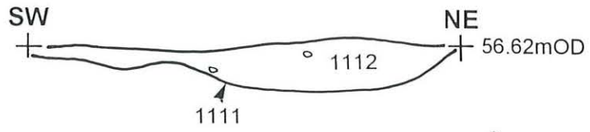
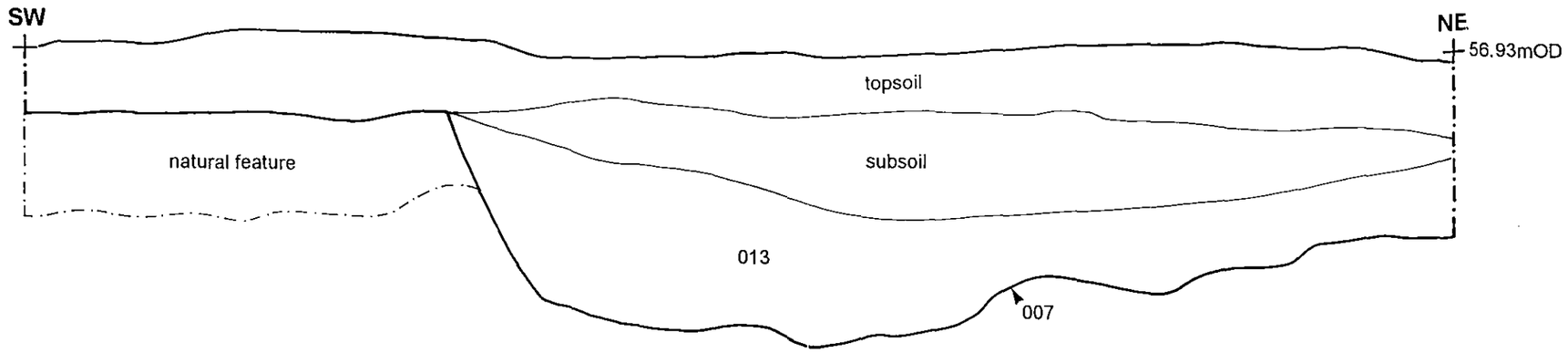


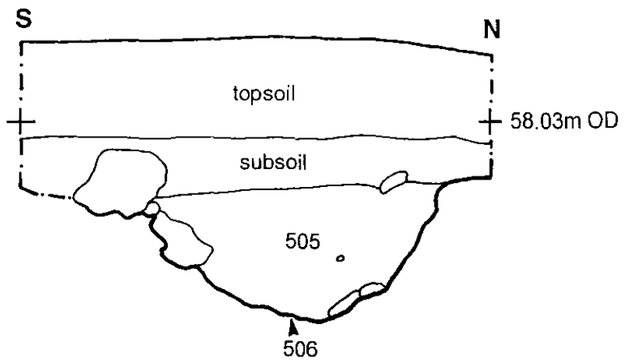
Fig. 10. Barnsdale Bar South: sections

Section 2

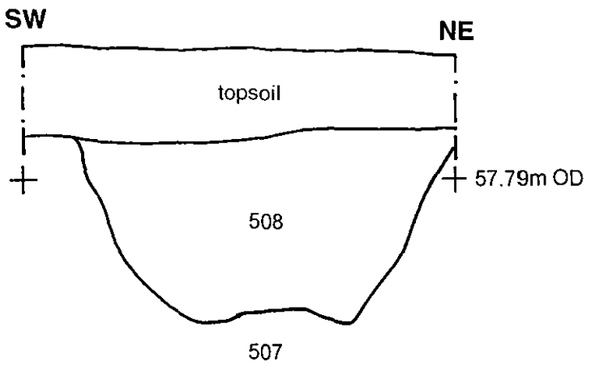


Ditches 5006 & 5007

Section 502



Section 504



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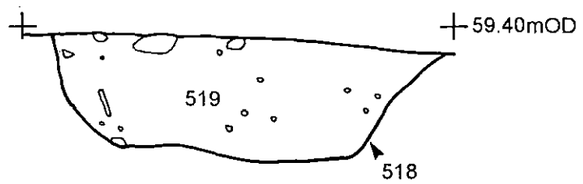
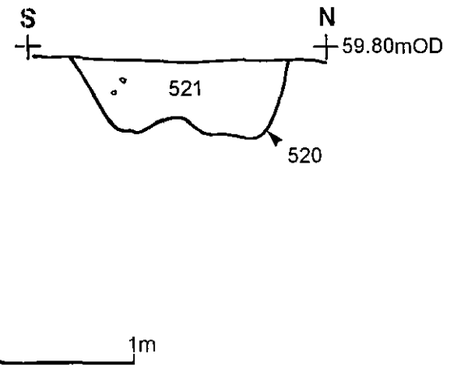
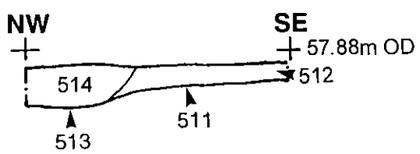


Section 514



Ditches 5004 & 5005

Section 508



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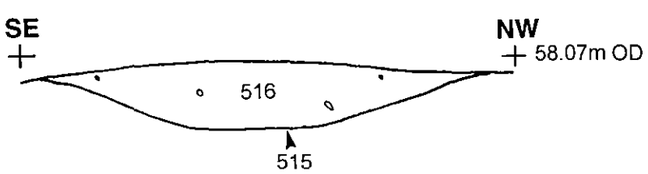

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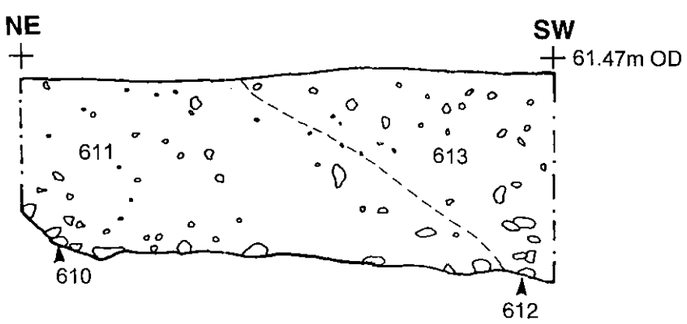

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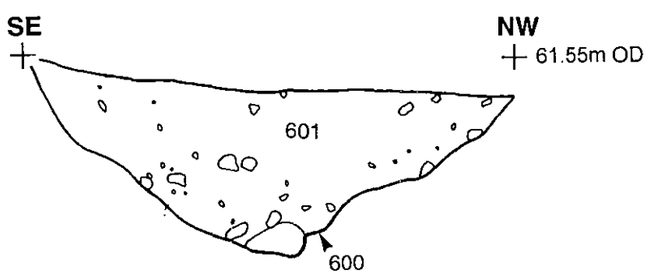
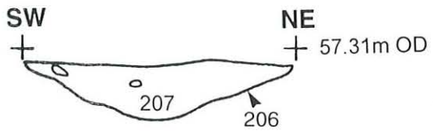


Fig. 11. Barnsdale Bar South: sections

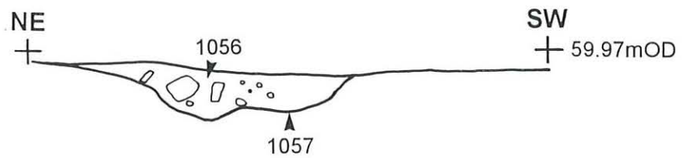
Ditch 5010

Section 204



Gullies 5011 & 5012

Section 735



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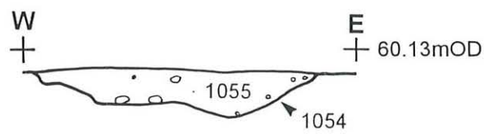


Section 743/744

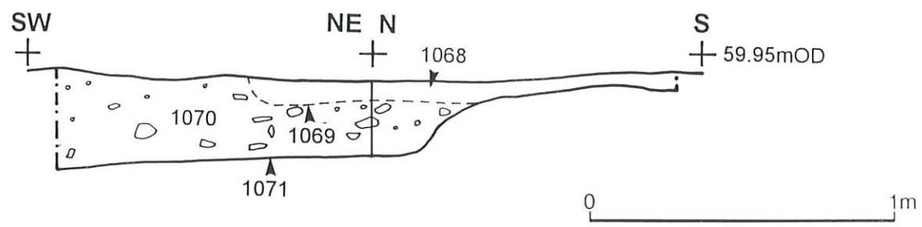
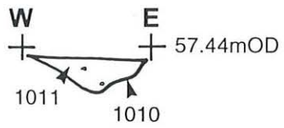


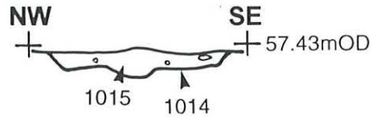
Fig. 12. Barnsdale Bar South: sections

Group 6001

Section 708



Section 710



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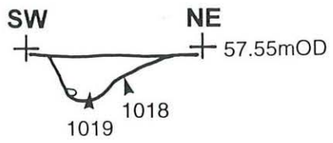
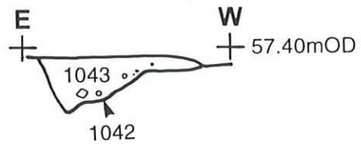
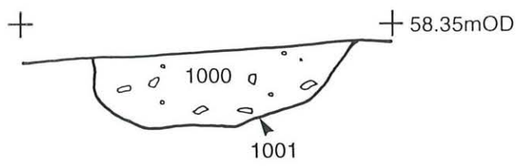


Section 726

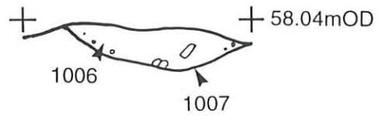


Group 6002

Section 700



Section 705



Section 703

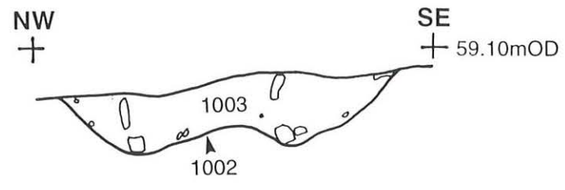
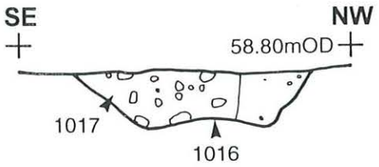
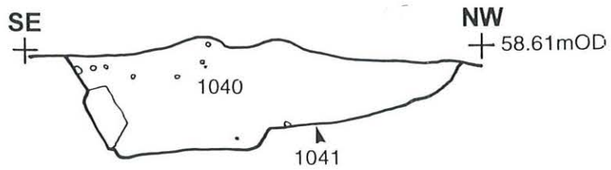


Fig. 13. Barnsdale Bar South: sections

Section 711



Section 725



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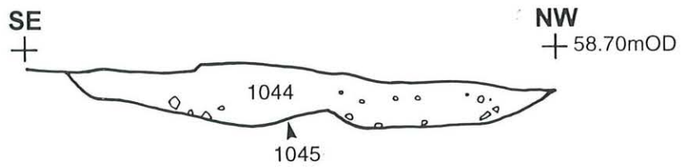
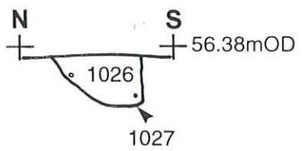


Group 6003

Section 717



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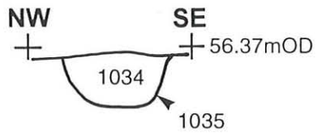

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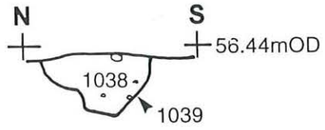
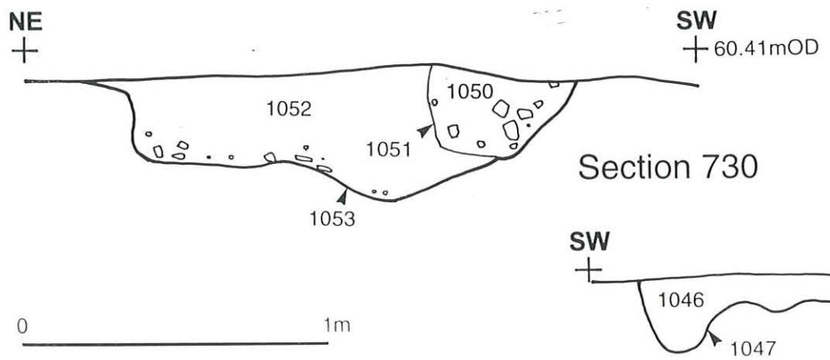


Isolated Features

Section 732



Section 730

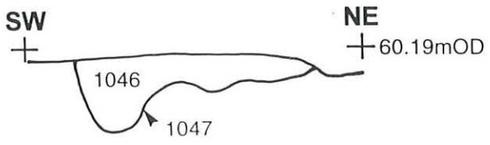
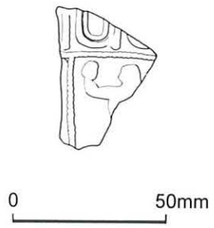


Fig. 14. Barnsdale Bar South: sections



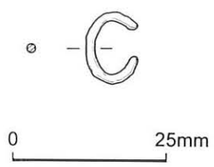


Fig. 15. Barnsdale Bar South: samian sherd (context 019, ditch 5000) and copper alloy ring (context 031, ring gully 6000)

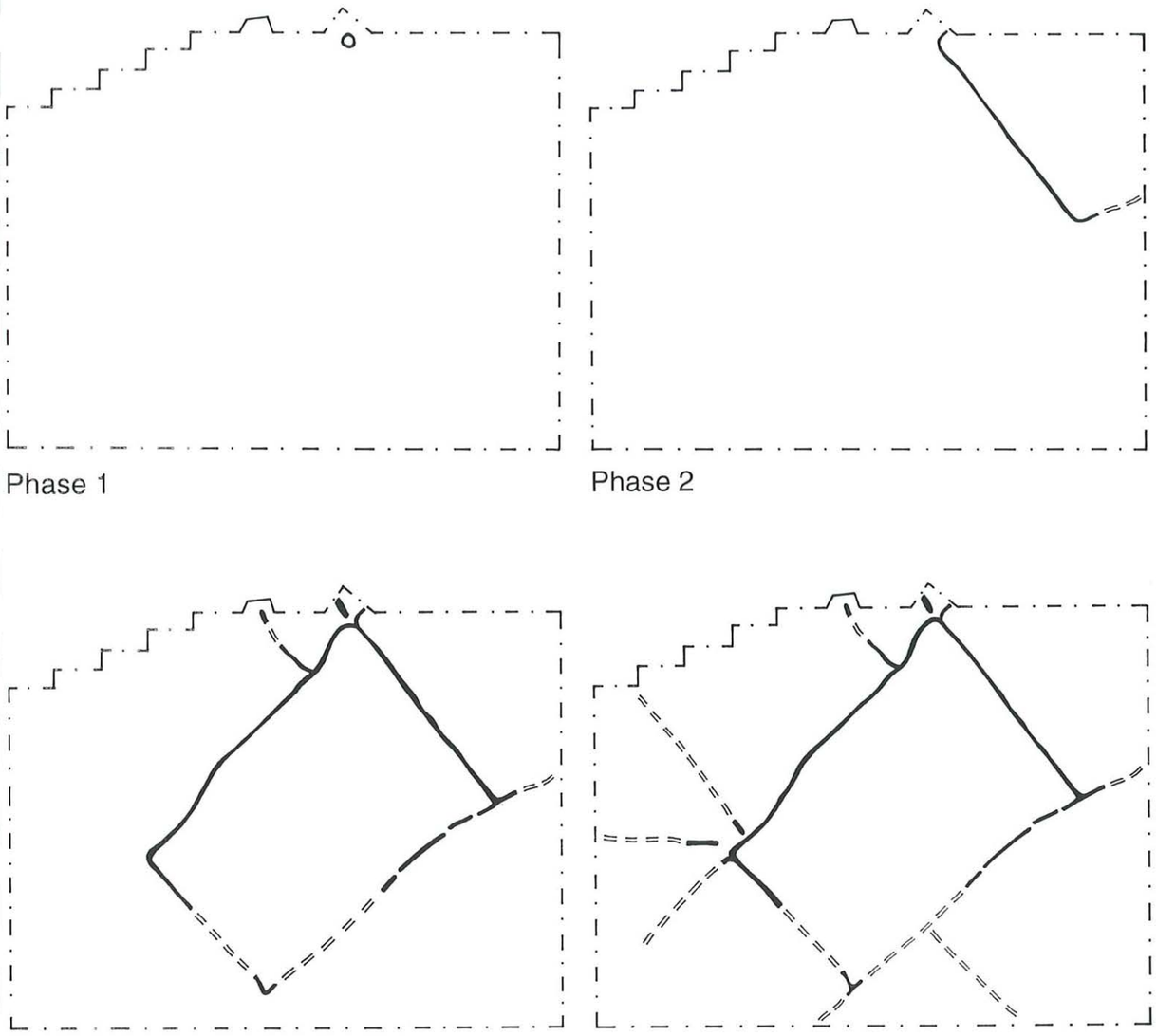


Fig. 16. Barnsdale Bar South: phase plans

Fig. 17. Archaeological investigations at Areas A-I:
composite plan of crop marks, geophysical anomalies and excavated features

Appendix I

Inventory of primary archive

File no.	Description	Quantity
Evaluation Records		
1	Context register	12
1	Context cards	143
1	Group sheets	16
1	Trench sheets	10
2	Test pit records	12
2	Levels data	12
2	Environmental sample register	2
2	Sample record sheets	18
2	Sample process sheets	16
2	Monochrome contact sheets	5
2	Colour transparency films	5
2	Photograph registers	10
3	Drawing register	10
3	Drawings	31
Loose	Large drawing sheet	1
Excavation Records		
1	Context register	8
1	Context cards	134
2	Environmental samples register	4
2	Environmental sample forms	58
2	Small finds register	1
2	Finds registers	4
3	Drawing register	10
3	Drawings	39
4	Film catalogue	1
4	Monochrome negatives, contact sheets, film registers (film nos 5901, 5908-5911)	4
4	Colour transparencies, film registers (film nos 5906, 5907, 5912)	3
Loose	Large drawing sheets	19

Appendix II

Inventory of contexts

Note: Contexts allocated during the evaluation phase of work are composed of 3-digit numbers whilst those recorded during the excavation can be identified by their 4-digit numbers.

Context	Description	Group
001	Tr. B topsoil	
002	Tr. B subsoil	
003	Tr. B cut of ditch (=005)	5001
004	Tr. B fill of 003 (=006)	5001
005	Tr. B cut of ditch	5001
006	Tr. B fill of 005	5001
007	Tr. B cut of ditch	5009
008	Tr. B fill of 007 (=013)	5009
009	Tr. B natural	
011	Tr. B fill of 005	5001
012	Tr. B fill of 007 (=013)	5009
013	Tr. B fill of 007	5009
015	Tr. B natural feature	
016	Tr. B natural feature	
017	Tr. B natural feature	
018	Tr. B cut of ditch	5000
019	Tr. B fill of 018	5000
020	Tr. B fill of 018	5000
021	Tr. B cut of ditch	5001
022	Tr. B fill of 021	5001
023	Tr. B cut of ditch (=021?)	5001
024	Tr. B fill of 023 (=022?)	5001
025	Tr. B cut of ditch (=021?)	5001
026	Tr. B fill of 025 (=022?)	5001
027	Tr. B natural	
028	Tr. B cut of gully	6000
029	Tr. B fill of 028	6000
030	Tr. B cut of gully	6000
031	Tr. B fill of 030	6000
032	Tr. B cut of ditch	5001
033	Tr. B fill of 032	5001
034	Tr. B cut of ditch	5000
035	Tr. B fill of 034	5000
036	Tr. B cut of ditch (=042)	5000
037	Tr. B fill of 036 (=043)	5000
038	Tr. B cut of gully	6000
039	Tr. B fill of 038	6000
040	Tr. B cut of ditch	5000
041	Tr. B fill of 040	5000
042	Tr. B cut of ditch	5000

Context	Description	Group
043	Tr. B fill of 042	5000
044	Tr. B cut of gully	6000
045	Tr. B fill of 044	6000
046	Tr. B cut of ditch	5009
047	Tr. B fill of 046	5009
048	Tr. B cut of ditch	5009
049	Tr. B fill of 048	5009
050	Tr. B cut of ditch	5009
051	Tr. B fill of 050	5009
052	Tr. B cut of ditch (=050)	5009
053	Tr. B fill of 052 (=051)	5009
054	Tr. B cut of gully	6000
055	Tr. B fill of 054	6000
060	Tr. B cut of ditch	5001
061	Tr. B fill of 060	5001
062	Tr. B cut of ditch	5001
063	Tr. B fill of 062	5001
064	Tr. B cut of ditch (=062)	5001
065	Tr. B fill of 064 (=063)	5001
066	Tr. B cut of ditch	6000?
067	Tr. B fill of 066	6000?
068	Tr. B cut of ditch (=066)	6000?
069	Tr. B fill of 068	6000?
070	Tr. B cut of gully (=038)	6000
071	Tr. B fill of 070	6000
072	Tr. B same as 012	5009
100	Tr. A topsoil	
101	Tr. A subsoil	
102	Tr. A fill of 103	5008
103	Tr. A cut of ditch	5008
106	Tr. A fill of 107	5008
107	Tr. A cut of ditch	5008
110	Tr. A natural	
111	Tr. A natural	
200	Tr. C cut of gully	5010
201	Tr. C fill of 200	5010
202	Tr. C cut of ditch	5001
203	Tr. C fill of 202	5001
204	Tr. C cut of gully	5010
205	Tr. C fill of 204	5010
206	Tr. C cut of gully	5010
207	Tr. C fill of 206	5010
208	Tr. C cut of gully	5010
209	Tr. C fill of 208	5010
210	Tr. C cut of ditch (=208)	5010

Context	Description	Group
211	Tr. C fill of 210 (=209)	5010
212	Tr. C cut of ditch	5001
213	Tr. C fill of 212	5001
214	Tr. C subsoil	
215	Tr. C natural	
301	Tr. D topsoil	
302	Tr. D subsoil	
303	Tr. D natural	
304	Tr. D cut of ditch	5000
305	Tr. D fill of 304	5000
306	Tr. D natural feature	
307	Tr. D natural feature	
308	Tr. D fill of 310	5000
309	Tr. D fill of 310	5000
310	Tr. D cut of ditch	5000
500	Tr. F natural	
501	Tr. F topsoil	
502	Tr. F subsoil	
503	Tr. F cut of ditch	5002
504	Tr. F fill of 503	5002
505	Tr. F fill of 506	5006
506	Tr. F cut of ditch	5006
507	Tr. F cut of ditch	5007
508	Tr. F fill of 507	5007
509	Tr. F natural feature	
510	Tr. F cut of ditch	5001
511	Tr. F cut of ditch	5002
512	Tr. F fill of 511	5002
513	Tr. F cut of ditch	5005
514	Tr. F fill of 513	5005
515	Tr. F cut of ditch	5005
516	Tr. F fill of 515	5005
517	Tr. F fill of 510	5001
518	Tr. F cut of ditch	5007
519	Tr. F fill of 518	5007
520	Tr. F cut of ditch	5006
521	Tr. F fill of 520	5006
522	Tr. F fill of 523	5001
523	Tr. F cut of ditch	5001
600	Tr. G cut of ditch-	5004
601	Tr. G fill of 600	5004
602	Tr. G cut of ditch	5003
603	Tr. G fill of 602	5003

Context	Description	Group
604	Tr. G cut of ditch (=602)	5003
605	Tr. G fill of 604	5003
606	Tr. G natural feature	
607	Tr. G natural feature	
608	Tr. G cut of ditch	5002
609	Tr. G fill of 608	5002
610	Tr. G cut of ditch	5002
611	Tr. G fill of 610	5002
612	Tr. G cut of ditch	5004
613	Tr. G fill of 612	5004
1000	Fill of 1001	6002
1001	Cut of pit	6002
1002	Cut of pit	6002
1003	Fill of 1002	6002
1004	Cut of possible pit	6001
1005	Fill of 1004	6001
1006	Fill of 1007	6002
1007	Cut of pit	6002
1010	Cut of possible post-hole	6001
1011	Fill of 1010	6001
1012	Cut of possible post-hole	6001
1013	Fill of 1012	6001
1014	Cut of possible pit	6001
1015	Fill of 1014	6001
1016	Cut of pit	6002
1017	Fill of 1016	6002
1018	Cut of possible natural feature	6001
1019	Fill of 1018	6001
1020	Fill of 1021	6003
1021	Cut of possible post-hole	6003
1022	Fill of 1023	6003
1023	Cut of possible post-hole	6003
1024	Fill of 1025	6003
1025	Cut of possible post-hole	6003
1026	Fill of 1027	6003
1027	Cut of possible post-hole	6003
1028	Fill of 1029	6003
1029	Cut of possible post-hole	6003
1030	Fill of 1031	6003
1031	Cut of possible post-hole	6003
1032	Fill of 1033	6003
1033	Cut of possible post-hole	6003
1034	Fill of 1035	6003

Context	Description	Group
1035	Cut of possible post-hole	6003
1036	Fill of 1037	6003
1037	Cut of possible post-hole	6003
1038	Fill of 1039	6003
1039	Cut of possible post-hole	6003
1040	Fill of 1041	6002
1041	Cut of pit	6002
1042	Cut of pit	6001
1043	Fill of 1042	6001
1044	Fill of 1045	6002
1045	Cut of pit	6002
1046	Fill of 1047	
1047	Cut of possible pit	
1048	Cut of animal burial pit	
1049	Fill of 1048	
1050	Fill of 1051	
1051	Cut of post-hole (in pit 1053)	
1052	Fill of 1053	
1053	Cut of pit	
1054	Cut of gully	5011
1055	Fill of 1054	5011
1056	Fill of 1057	5012
1057	Cut of gully	5012
1058	Fill of 1059	5012
1059	Cut of gully	5012
1060	Cut of ditch	5003
1061	Fill of 1060	5003
1062	Cut of ditch	5003
1063	Fill of 1062	5003
1064	Fill of 1065	5003
1065	Cut of ditch	5003
1066	Fill of 1067	5011
1067	Cut of gully	5011
1068	Fill of 1069	5011
1069	Cut of gully	5011
1070	Fill of 1071	5003
1071	Cut of ditch	5003
1072	Fill of 1073	5003
1073	Cut of ditch	5003
1074	Fill of 1075	5003
1075	Cut of ditch	5003
1076	Fill of 1077	5003
1077	Cut of ditch	5003

Context	Description	Group
1078	Cut of ditch	5000
1079	Fill of 1078	5000
1080	Cut of ditch	5003
1081	Fill of 1080	5003
1082	Fill of 1083	5002
1083	Cut of ditch	5002
1084	Fill of 1085	5002
1085	Cut of ditch	5002
1086	Fill of 1087	5006
1087	Cut of ditch	5006
1088	Fill of 1089	5007
1089	Cut of ditch	5007
1090	Cut of ditch	5000
1091	Fill of 1090	5000
1092	Deposit nr ditch 5006	
1093	Fill of 1094	5001
1094	Cut of ditch	5001
1095	Fill of 1096	5001
1096	Cut of ditch	5001
1097	Cut of ditch	5001
1098	Fill of 1097	5001
1099	Fill of 1100	5001
1100	Cut of ditch	5001
1101	Natural	
1102	Natural	
1103	Natural	
1104	Natural	
1105	Fill of 1106	5001
1106	Cut of ditch	5001
1107	Fill of 1108	5001
1108	Cut of ditch	5001
1109	Cut of ditch	5008
1110	Fill of 1109	5008
1111	Cut of ditch	5008
1112	Fill of 1111	5008
1113	Fill of 1114	5001
1114	Cut of ditch	5001
1115	Fill of 1116	5001
1116	Cut of ditch	5001
1117	Fill of 1118	5008
1118	Cut of ditch	5008
1119	Fill of 1120	5001
1120	Cut of ditch	5001

Context	Description	Group
1121	Cut of ditch	5000
1122	Fill of 1121	5000
1123	Fill of 1124	5000
1124	Cut of ditch	5000
1125	Fill of 1126	5000
1126	Cut of ditch	5000
1127	Fill of 1128	5000
1128	Cut of ditch	5000
1129	Cut of ditch	5000
1130	Fill of 1129	5000
1131	Fill of 1132	5000
1132	Cut of ditch	5000
1133	Fill of 1134	5000
1134	Cut of ditch	5000
1135	Cut of ditch	5000
1136	Fill of 1135	5000

Appendix III

Inventory of artefacts

Material	Context	SF no.	Quantity	Details	Stage of work
Pottery	015		1	samian	Trial trenching
	305		3	Romano-British	Trial trenching
	1055	104	1	Romano-British	Excavation
	1123	108	1	Romano-British	Excavation
	1133	110	1	Romano-British	Excavation
	unstrat	100	2	post-medieval	Excavation
	unstrat	109	1	Romano-British	Excavation
Total			10		
Animal bone	041	005	3		Trial trenching
	043	004	2		Trial trenching
	504	016	1		Trial trenching
	505	006	1		Trial trenching
	1040		4		Excavation
	1049		155		Excavation
	1092		77		Excavation
Total			243		
Metalwork	030	003	1	Cu alloy ring	Trial trenching
	1055	103	1	Fe nail	Excavation
Total			2		
Flint	surface	007	1	scraper	Test pit
	surface	008	1	worked lump	Test pit
	surface	009	1	scraper	Test pit
	surface	010	1	bladelet	Test pit
	topsoil	011	1	worked lump	Test pit 16
	surface	012	1	flake	Test pit
	surface	013	1	blade	Test-pit
	surface	014	1	scraper	Test-pit
	surface	015	1	core	Test-pit
	surface	016	1	flake	Test-pit
	surface	017	1	flake	Test-pit
	1113	105	1	flake	Excavation
	1115	106	2	flake, worked lump	Excavation
	1127	107	1	worked lump	Excavation
	unstrat	111	1	flake	Excavation
Total			16		

Appendix IV

Inventory of samples

Sample	Context	Processed	Description
001	019	*	fill of ditch 5000
002	020	*	fill of ditch 5000
003	022	*	fill of ditch 5001
004	305	*	fill of ditch 5000
005	309	*	fill of ditch 5000
006	102	*	fill of ditch 5008
007	601	*	fill of ditch 5004
008	201	*	fill of ditch 5001
009	205	*	fill of ditch 5010
010	207	*	fill of ditch 5010
011	609	*	fill of ditch 5002
012	603	*	fill of ditch 5003
013	605	*	fill of ditch 5003
015	041	*	fill of ditch 5000
016	504	*	fill of ditch 5002
018	505	*	fill of ditch 5006
019	509	*	fill of ditch 5001
020	508	*	fill of ditch 5007
100	1000		fill of pit 1001
101	1003		fill of pit 1002
102	1005		fill of pit 1004
103	1006		fill of possible pit 1007
105	1011		fill of possible post-hole 1010
106	1013		fill of possible post-hole 1012
107	1015		fill of possible pit 1014
108	1017		fill of pit 1016
109	1019		fill of possible natural feature 1018
110	1020		fill of possible post-hole 1021
111	1022		fill of possible post-hole 1023
112	1024		fill of possible post-hole 1025
113	1030		fill of possible post-hole 1031
114	1084	*	fill of ditch 5002
115	1091	*	fill of ditch 5003/5000
116	1086		fill of ditch 5006
117	1088		fill of ditch 5007
118	1095		fill of ditch 5001
119	1076		fill of ditch 5003
120	1043		fill of pit 1042
121	1044		fill of pit 1045
122	1040		fill of pit 1041
123	1046		fill of possible post-hole 1047
124	1050		fill of post-hole 1051

Sample	Context	Processed	Description
125	1052		fill of pit 1053
126	1049		fill of pit 1048
127	1056		fill of ditch 5012
128	1058		fill of ditch 5012
129	1061	*	fill of ditch 5003
130	1063		fill of ditch 5003
131	1055		fill of ditch 5011
132	1064		fill of ditch 5003
133	1066		fill of ditch 5011
134	1068		fill of ditch 5011
135	1070		fill of ditch 5003
136	1072		fill of ditch ?5003
137	1079	*	fill of ditch 5000
138	1081		fill of ditch 5003
139	1083		fill of ditch 5002
140	1093		fill of ditch 5001
141	1098		fill of ditch 5001
142	1099		fill of ditch 5001
143	1101		natural
144	1103		natural
145	1105		fill of ditch 5001
146	1107		fill of ditch 5001
147	1110		fill of ditch 5008
148	1112		fill of ditch 5008
149	1117		fill of ditch 5008
150	1119		fill of ditch 5001
151	1115		fill of ditch 5001
152	1115		fill of ditch 5001
153	1113		fill of ditch 5001
154	1122	*	fill of ditch 5000
155	1123	*	fill of ditch 5000
156	1125	*	fill of ditch 5000
157	1127	*	fill of ditch 5000
158	1130	*	fill of ditch 5000
159	1131	*	fill of ditch 5000
160	1136	*	fill of ditch 5000
161	1133	*	fill of ditch 5000

Appendix V

Air Photograph Mapping: Methodology, Gazetteer and Catalogue

by Alison Deegan

Methodology

This assessment was undertaken according to guidelines set out in the Institute of Field Archaeologists Technical Paper 'Uses of aerial photography in archaeological evaluations' (Palmer and Cox 1993).

All the available air photographs were examined under x2 magnification where necessary and profitable and the vertical photographs were examined stereoscopically where possible and profitable. Details of the relevant archaeological, natural and modern features and control points were transferred to acetate sheets overlain to appropriate air photographs.

This information was rectified to control points derived from the map data supplied by the client. Rectification was undertaken using the Bradford Aerial Photographic Rectification Programme, AERIAL5.14. Visible, levelled archaeological features were mapped to 1:2500 scale accuracy and detail. The Ordnance Survey published tolerances at 1:2500 scale are 1.88m (99% degree of confidence). AERIAL5.14 gives error readings for each control point, where 5 or more control points are used. In all cases attempts were made to attain error readings of less than 3 metres for any one control point.

The rectified plots were collated in MAPINFO Professional 5.5 and converted from raster images to vector plots. The vector plots were then exported to AutoCAD LT® 2000 for assimilation and editing with reference to the photocopies of the original prints.

The data is presented in the AutoCAD LT® 2000 (AutoCAD® release 14 and AutoCADMAP® compatible) *barnsdale.dwg* file and *barnsdale* MAPINFO table to be viewed up to 1:2500 scale. This data is also presented in fig. 2. of the Archive Report and at 1:5000 scale in fig. 5 of the Archive Report.

Summary information regarding groups of the archaeological features recorded is given in the gazetteer below (and in Appendix I of the Archive Report). A key to the gazetteer information is presented in the file *barnsdale.dwg* and in the *barnsdale* MAPINFO table.

Gazetteer

AP complex no. 1
Central NGR SE 49604 13008
Condition levelled
Form of features cut
Description sub-divided rectilinear enclosure and parallel linear features
Interpretation late prehistoric to Roman enclosure and field boundaries
Comments cut by pipeline in 1984.
Photo SE4913/5 NMRC

AP complex no. 2
Central NGR SE 49594 14795
Condition levelled
Form of features cut
Description dubious perpendicular linear features
Interpretation possible late prehistoric to Roman enclosures
Comments
Photo MAL67054 39 WMDC

AP complex no. 3
Central NGR SE 50686 12906
Condition levelled
Form of features cut
Description rectilinear enclosures and dubious linear features
Interpretation possible late prehistoric to Roman enclosures and field boundaries
Comments
Photo MAL71041 175 NMRC, DNR554/22A SY SMR, DNR738/20 WY SMR, DNR738/22 WY SMR

AP complex no. 4
Central NGR SE 50936 12786
Condition levelled
Form of features cut
Description small rectilinear enclosure with internal pits and annexe and linear feature
Interpretation late prehistoric to Roman farmstead and field boundary
Comments
Photo SE5012/12 NMRC, DNR738/22 WY SMR, WY241/10 WY SMR, WY241/10 WY SMR

AP complex no. 5
Central NGR SE 50906 12661
Condition levelled
Form of features cut
Description broad linear feature
Interpretation medieval or post-medieval field boundary
Comments
Photo MAL71041 175 NMRC, SE5012/12 NMRC, DNR738/22 WY SMR, WY241/10 WY SMR

AP complex no. 6
Central NGR SE 50128 13130
Condition levelled
Form of features cut
Description dubious perpendicular linear features
Interpretation possible late prehistoric to Roman ditches
Comments possibly associated with AP complex 9
Photo 82/1266 28 NMRC

AP complex no. 7
Central NGR SE 49934 13533
Condition levelled
Form of features cut
Description curvilinear enclosure with outer ditch and linear features
Interpretation prehistoric to Roman enclosure and unknown ditches
Comments possibly associated with AP complex 8
Photo SE4913/8 NMRC

AP complex no. 8
Central NGR SE 50159 13412
Condition levelled
Form of features cut
Description sinuous double-ditched linear feature, one rectilinear enclosure with internal pit and corner enclosure, one incomplete sub-divided enclosure with pits and linear feature
Interpretation late prehistoric to Roman trackway, settlement and field boundary
Comments probably associated with AP complex 9, and possibly associated with AP complex 7
Photo MAL71025 99 NMRC, SE5013/19 NMRC

AP complex no. 9
Central NGR SE 50644 13115
Condition levelled
Form of features cut
Description sinuous double-ditched linear feature with perpendicular linear features and pit cluster
Interpretation late prehistoric to Roman trackway and field boundaries and cluster of possible storage pits
Comments probably associated with AP complex 8
Photo BTX67 CUCAP, DNR554/22A SY SMR, DNR738/17 WY SMR, WY230/17A WY SMR, WY241/6 WY SMR

AP complex no. 10
Central NGR SE 50639 13316
Condition levelled
Form of features cut
Description small rectilinear enclosure, overlain by large broad-ditched, sub-divide rectilinear enclosure also pits, circular enclosure and linear features
Interpretation multi-phase late prehistoric to Roman settlement with pits, possible hut circle and external ditches
Comments
Photo DNR738/17 WY SMR, WY230/17A WY SMR, WY241/6 WY SMR

AP complex no. 11
Central NGR SE 50469 13410
Condition levelled
Form of features cut
Description linear arrangement of elongated pits and parallel linear feature
Interpretation late prehistoric to Roman segmented boundary and field boundary
Comments
Photo MAL71025 99 NMRC, SE5013/18 NMRC

AP complex no. 12
Central NGR SE 50904 13530
Condition levelled
Form of features cut
Description sinuous linear feature
Interpretation late prehistoric to medieval ditch
Comments
Photo MAL71041 175 NMRC

AP complex no. 13
Central NGR SE 50774 13331
Condition levelled
Form of features cut
Description amorphous feature
Interpretation late prehistoric to medieval quarry
Comments
Photo DNR738/17 WY SMR

AP complex no. 14
Central NGR SE 50593 14256
Condition levelled
Form of features cut
Description system of rectilinear enclosures
Interpretation possible medieval or post-medieval paddocks or fields
Comments
Photo SE5015/12 NMRC

AP complex no. 15
Central NGR SE 50116 14641
Condition levelled
Form of features cut
Description broad-ditched, sub-divided enclosure with internal pits and linear features
Interpretation late prehistoric to Roman settlement and paddocks
Comments cut by pipeline in 1984
Photo CQI22 CUCAP, SE5014/24 NMRC, WY241/2 WY SMR

AP complex no. 16
Central NGR SE 50204 14895
Condition levelled
Form of features cut
Description dubious linear feature
Interpretation possible late prehistoric to Roman enclosure and field boundaries
Comments
Photo CQI22 CUCAP, SE5014/24 NMRC

AP complex no. 17
Central NGR SE 50438 15285
Condition levelled
Form of features cut
Description perpendicular, double-ditched linear features
Interpretation late prehistoric to Roman trackways
Comments east to west aligned branch possibly associated with AP complex 18
Photo MAL81038 121 NMRC

AP complex no. 18
Central NGR SE 50937 15418
Condition levelled
Form of features cut
Description rectilinear enclosure and double-ditched linear feature
Interpretation late prehistoric to Roman enclosure and trackway
Comments probably associated with AP complexes 17 and 30
Photo CCX64 CUCAP, 2422/26 SY SMR

AP complex no. 19
Central NGR SE 50958 14990
Condition levelled
Form of features cut
Description rectilinear enclosure with corner enclosure, two irregular-shaped enclosures, hexagonal enclosure and linear features
Interpretation late prehistoric to Roman enclosure, possible paddocks and trackway and field boundaries
Comments
Photo 70H-Y 32 CUCAP, CQI3 CUCAP, CQI3 CUCAP, SE5215/2 NMRC, AJC70/38 NY SMR, 2422/24 SY SMR, MAL67054 39 WMDC

AP complex no. 20
Central NGR SE 51591 12767
Condition levelled
Form of features cut
Description amorphous feature and linear feature
Interpretation post- medieval quarry and boundary
Comments
Photo CQI19 CUCAP, SE5112/35 NMRC, 2431/24 SY SMR

AP complex no. 21
Central NGR SE 51461 13027
Condition levelled
Form of features cut
Description curving linear feature
Interpretation post-medieval woodland boundary
Comments woodland extant on 1951 vertical photographs
Photo SE5112/35 NMRC, 2422/18 SY SMR

AP complex no. 22
Central NGR SE 51715 12861
Condition levelled
Form of features cut
Description two double-ditched linear features, sinuous, perpendicular linear features, two adjoining rectilinear enclosures with pits, one pentagonal enclosure with pits and a broad linear feature
Interpretation extensive system of late prehistoric to Roman trackways, field system and enclosures and post-medieval ditch
Comments probably associated with AP complex 25 and possibly associated with AP complex 24
Photo CQI19 CUCAP, CPE/UK/1880 NMRC, SE5112/35 NMRC, SE5113/29 NMRC, 1270/12 SY SMR, 2422/18 SY SMR, 2431/24 SY SMR

AP complex no. 23
Central NGR SE 51420 13718
Condition levelled
Form of features cut
Description two adjoining enclosures and linear features
Interpretation late prehistoric to Roman enclosures
Comments
Photo BJN4 CUCAP, BTE9 CUCAP

AP complex no. 24
Central NGR SE 51382 13477
Condition levelled
Form of features cut
Description rectilinear enclosure and perpendicular linear features
Interpretation late prehistoric to Roman enclosure and field boundaries and possibly later field boundaries
Comments possibly associated with AP complex 22; sketched plotted due to inadequate photo control
Photo BJN4 CUCAP, BTE9 CUCAP, DNR48/21 SY SMR

AP complex no. 25
Central NGR SE 51927 13464
Condition levelled
Form of features cut
Description rectilinear enclosure, sinuous double-ditched linear feature and perpendicular and parallel linear features
Interpretation late prehistoric to Roman enclosure, trackway and field system
Comments probably associated with AP complex 22
Photo 1270/10 SY SMR, 1270/12 SY SMR, 1270/12 SY SMR

AP complex no. 26
Central NGR SE 51092 13793
Condition levelled
Form of features cut
Description perpendicular linear features and small rectilinear enclosure
Interpretation late prehistoric to Roman field boundaries and corner enclosure
Comments possibly associated with AP complex 27
Photo BTE9 CUCAP, 2371/26 SY SMR

AP complex no. 27
Central NGR SE 51424 13962
Condition levelled
Form of features cut
Description two, broad-ditched adjoining rectilinear enclosures, one irregular enclosure, one incomplete rectilinear enclosure and dubious linear features
Interpretation late prehistoric to Roman settlement and possible field boundaries
Comments possibly associated with AP complex 26
Photo CQI5 CUCAP, 2371/26 SY SMR

AP complex no. 28
Central NGR SE 51874 13969
Condition levelled
Form of features cut
Description sinuous double-ditched linear feature with perpendicular linear features and incomplete sub-divided curvilinear enclosure
Interpretation late prehistoric to Roman trackway, field boundaries and enclosure
Comments possibly associated with AP complex 31
Photo 2371/20 SY SMR

AP complex no. 29
Central NGR SE 51538 14494
Condition levelled
Form of features cut
Description three rectilinear enclosures and perpendicular linear features
Interpretation late prehistoric to Roman enclosures and field boundaries
Comments correspond to elements of a more complex suite of features identified by geophysical survey and evaluated in 1999 (Cottrell 1996, O'Neill & Whittingham 1999); the mapped features were positioned with reference to the geophysical survey plots as the photo control was inadequate
Photo BJN22 CUCAP, BJN24 CUCAP

AP complex no. 30
Central NGR SE 51418 15377
Condition levelled
Form of features cut
Description double-ditched linear feature, rectilinear enclosure and perpendicular linear features
Interpretation late prehistoric to Roman trackway, enclosure and field boundaries
Comments probably associated with AP complex 18 and 34
Photo BJN16 CUCAP, 2360/23 SY SMR

AP complex no. 31
Central NGR SE 52259 13857
Condition levelled
Form of features cut
Description sinuous double-ditched linear features, curvilinear enclosure with entrance and internal circular enclosure and outer ditch and two polygonal
Interpretation late prehistoric to Roman trackways, enclosure with possible hut circle and paddocks
Comments possibly associated with AP complex 28
Photo SE5213/22 NMRC, 2362/4 SY SMR, 2362/5 SY SMR

AP complex no. 32
Central NGR SE 52184 14304
Condition levelled
Form of features cut
Description perpendicular linear features, small rectilinear enclosure and pits, double-ditched curving linear features and incomplete sub-circular
Interpretation late prehistoric to Roman field boundaries, enclosure and pits, possible double-ditched enclosure or section of trackway and possible hut circle
Photo SE5214/17 NMRC, 2422/22 SY SMR

AP complex no. 33
Central NGR SE 52274 14549
Condition levelled
Form of features cut
Description sub-circular enclosure with irregular outer curvilinear enclosure and amorphous pit
Interpretation possible prehistoric barrow
Comments
Photo SE5214/17 NMRC

AP complex no. 34
Central NGR SE 51990 15398
Condition levelled
Form of features cut
Description double-ditched linear features
Interpretation late prehistoric to Roman trackway
Comments probably associated with AP complexes 30 and 35
Photo MAL71052 24 NMRC

AP complex no. 35
Central NGR SE 52418 15355
Condition levelled
Form of features cut
Description perpendicular double-ditched linear features, perpendicular linear features and three rectilinear enclosures
Interpretation late prehistoric to Roman trackways, field boundaries and stock or domestic enclosures
Comments probably associated with AP complex 34
Photo MAL71051 206 NMRC, SE5215/17 NMRC, 2365/10 SY SMR

Catalogue of photographs consulted

Cambridge University Committee on Aerial Photography

Oblique air photographs

A search of this collection was undertaken by a CUCAP librarian on the 18th August and the photographs were examined on the 5th October 2000.

SORTIES	FRAMES			DATE
70h-y	32	-	33	17/07/74
bjn	1	-	8	12/07/72
bjn	11	-	12	12/07/72
bjn	14	-	17	02/07/72
bjn	21	-	24	12/07/72
bnx	12	-	13	02/07/73
bte	8	-	10	25/06/75
btx	66	-	68	05/07/75
buu	43	-	46	21/07/75
byh	11	-	15	28/06/75
ccx	63	-	64	19/07/77
cei	69			02/08/77
cia	45	-	46	12/01/79
cjo	70			19/07/79
cmq	16	-	20	13/07/80
cpb	4	-	5	27/07/81
cqi	1	-	11	24/07/84
cqi	19	-	23	24/07/84

Vertical air photographs

A search of this collection was undertaken by a CUCAP librarian on the 18th August and no verticals photographs of the survey area were found.

National Monuments Record Centre

Oblique air photographs

NMRC Coversearch no. 1910700/01, consulted 11th October 2000.

NMRC REF NO				DATE
4913	1	-	2	30/07/72
4913	3	-	4	05/08/72
4913	5	-	6	30/07/72
4913	7	-	9	24/07/91
4915	1			24/07/91
5012	1			30/07/72
5012	2	-	3	14/06/75
5012	4	-	8	31/05/75
5012	9	-	17	26/07/91
5012	18	-	20	04/07/95
5013	1	-	3	05/08/72
5013	4	-	6	14/06/75
5013	7	-	11	31/05/75
5013	12	-	13	25/07/81
5013	14	-	15	03/07/89
5013	16	-	24	24/07/91
5013	25	-	29	30/06/94
5013	30	-	32	04/07/95
5014	1	-	5	14/07/73
5014	6	-	9	22/07/73
5014	10			09/07/74
5014	11			19/07/84
5014	12	-	14	24/03/82
5014	15	-	16	18/07/90
5014	17	-	20	24/07/91
5014	21	-	26	05/07/96
5014	27	-	30	04/07/95
5015	1			30/07/72
5015	2	-	6	16/07/77
5015	7	-	8	18/07/90
5015	9			25/07/91
5015	10			30/06/94
5015	10			30/06/94
5112	1			26/07/71
5112	2			08/08/71
5112	4			30/07/71
5112	16	-	17	26/07/78
5112	20	-	21	16/07/77
5112	33	-	39	26/07/91
5112	40			29/07/91
5112	41			02/08/91
5112	42	-	43	26/07/91
5113	1			15/07/72

NMRC REF NO				DATE
5113	2	-	5	30/07/72
5113	6	-	8	10/07/72
5113	9	-	10	30/07/72
5113	12	-	15	26/07/78
5113	16	-	22	18/07/90
5113	23	-	33	26/07/91
5113	34	-	38	30/07/84
5114	1			30/07/72
5114	2	-	5	10/07/72
5114	6	-	7	16/07/72
5114	8			30/07/72
5114	9	-	10	19/07/75
5114	11			26/07/76
5114	12			16/07/84
5114	13			19/07/84
5114	14			15/07/79
5114	15			30/07/84
5114	16			29/07/91
5115	3	-	4	30/07/72
5115	5			14/07/73
5115	6	-	9	22/07/73
5115	10	-	12	30/07/73
5115	13			11/07/84
5115	16	-	19	25/07/91
5213	5			30/07/72
5213	6	-	9	30/07/84
5213	12	-	16	16/07/84
5213	19	-	20	30/07/84
5213	21	-	22	06/07/95
5214	1	-	2	10/07/72
5214	3			16/07/72
5214	10			18/07/90
5214	11			02/08/79
5214	12	-	21	03/07/90
5215	1			26/07/71
5215	2			30/07/72
5215	8			16/07/84
5215	9			19/07/84
5215	12	-	17	18/07/90

Vertical air photographs

NMRC Coversearch no. 1910700/01 consulted 11 October 2000.

SORTIE & POSITION	FRAMES			DATE	SCALE 1:
CPE/UK/1879	4107	-	4112	06/12/46	10000
CPE/UK/1880	4079	-	4083	06/12/46	10000
541/21	4105	-	4107	15/05/48	10000
541/31	3325	-	3330	18/05/48	10000
541/31	3397	-	3402	18/05/48	10000
541/31	3463	-	3468	18/05/48	10000
540/561	3184	-	3186	26/07/51	10000

SORTIE & POSITION		FRAMES			DATE	SCALE 1:
543/9	F21	4	-	8	19/06/57	10500
543/9	F21	53	-	57	19/06/57	10500
543/9	F21	106	-	109	19/06/57	10500
543/9	F22	4	-	8	19/06/57	10500
543/1507	2F21	92	-	95	03/11/61	20000
543/1676	F21	105	-	107	02/03/62	11000
543/1676	F22	105	-	107	02/03/62	11000
543/2750	2F21	255	-	258	11/03/64	20000
543/2750	2F22	255	-	258	11/03/64	20000
58/1879	F21	1	-	2	08/12/55	9999
58/1879	F21	48	-	48	08/12/55	9999
82/1266	F21	25	-	29	08/08/55	10000
82/1266	F22	25	-	30	08/08/55	10000
MAL67056		37	-	39	13/06/67	10500
MAL67056		40	-	41	13/06/67	10500
MAL67056		64	-	67	13/06/67	10500
MAL71025		94	-	100	17/04/71	5000
MAL71041		175	-	181	02/05/71	5000
MAL71051		200	-	207	03/05/71	5000
MAL71052		24	-	30	03/05/71	5000
MAL80036		146	-	147	26/11/80	10000
MAL80036		206	-	210	26/11/80	10000
MAL80036		211	-	213	26/11/80	10000
MAL81038		11	-	121	11/05/81	3000
MAL81038		124	-	134	11/08/81	3000
OS84199		161	-	165	01/08/84	8200
OS86014		5	-	11	08/03/86	8050
OS69285		27	-	27	15/06/69	7000
OS69286		59	-	60	15/06/69	7000
OS69286		63	-	68	15/06/69	7000
OS69286		123	-	124	15/06/69	7000

North Yorkshire Sites and Monuments record

Oblique air photographs

Consulted 12th October 2000

PHOTOGRAPHER	SORTIE	FRAME	DATE
AJC	70	38	18/06/86
CUCAP	BJN	22	12/07/72
DNR	509	24	22/07/73
DNR	550	12	30/07/72
DNR	1615	5	24/03/92
DNR	1065	11	16/07/77

South Yorkshire Sites and Monuments record

Oblique air photographs

Consulted 4th October 2000

SORTIE	FRAMES			DATE
36	11			?
509	4	-	8	14/07/73
509	17	-	20	14/07/73
554	21a	-	22A	05/08/72
765	22			?
860	15			?
874	5			04/07/76
1270	5	-	6	26/07/78
1270	9	-	12	26/07/78
1542	20			?
1618	6			06/07/82
2360	23			?
2361	19			16/07/85
2362	3	-	8	16/07/84
2362	15			?
2365	10	-	11	19/07/84
2371	16	-	27	30/07/84
2372	23			30/07/86
2422	15	-	22	18/07/90
2422	24	-	29	18/07/90
2422	35	-	36	18/07/90
2431	23	-	24	29/07/91
2432	25			02/08/91
2428	24	-	25	02/08/91
DR42	31	-	34	15/07/79
DR48	9			30/07/72
DR48	21	-	24	30/07/72
DR738	16	-	18	31/05/75
DR738	20	-	24	31/05/75
2361	19			16/07/85

West Yorkshire Sites and Monuments record

Oblique air photographs

Consulted 14th September 2000

WYSMR NO.		FILM NO & FRAME		DATE
44 51	03 63	dnr738	16-17	31/05/75
44 51	03 63	wy230	16a-20a	30/06/94
44 51	03 63	wy241	6-8	04/07/95
44 51	04 49	wy1	10	03/04/75
44 51	04 16	wy241	2-5	04/07/94
44 51	02 98	wy241	9-11	04/07/94
44 51	02 98	dnr738	19-22	31/05/75

Wakefield Metropolitan District Council Regeneration department

Vertical air photographs

Consulted 20th September 2000

SORTIE	FRAMES	DATE	SCALE 1:
MAL80036	212 - 213	26/01/80	10000
MAL80036	207 - 208	26/01/80	10000
MAL80036	148 - 148	26/01/80	10000
JASAIR4790	125 - 129	?	?
JASAIR4790	60 - 63	?	?
MAL67054	39 - 39	13/06/67	10500

Appendix VI

Archaeological evaluation: written scheme of investigation

Prepared by Archaeological Services WYAS

Barnsdale Bar Quarry, Proposed Southern Extension, Kirk Smeaton, South Yorkshire

Written Scheme Of Investigation

1. Introduction

1.1 An archaeological evaluation has been requested for the above proposed development area (SK 511 141). This document forms the strategy for further evaluation (Stage 2) of the site via trial trenching, and has been prepared for SLR Consulting Limited by Archaeological Services WYAS and approved by the Sites and Monuments Record (SMR) of the South Yorkshire Archaeology Service.

1.2 There is reason to believe, following a geophysical survey on the site (Stage 1), that archaeological remains exist but little is known as to their extent and state of preservation. Archaeological Services WYAS, in consultation with the South Yorkshire SMR, has advised that the archaeological implications of the proposed development cannot be adequately assessed on the basis of the available information. It has been recommended therefore that an archaeological field evaluation should be carried out, in line with government guidance as set out in D.O.E. Planning Policy on Archaeology and Planning (PPG16 1990). The results of this evaluation will aim to enable the impact of the proposed development on any archaeological deposits to be assessed.

1.3 This document details the proposed methodology for the required field evaluation.

2. Archaeological Background

2.1 The archaeological interest of the site relates to its setting within an extensive later prehistoric/Romano-British landscape that has been defined originally by crop marks shown on aerial photographs. The expanding quarry site has been subject to numerous phases of archaeological work over the past decade including fieldwalking, several geophysical surveys, trial-trenching evaluations and a desk-based assessment. The latest phase of work reported the results of trial trenching and geophysical survey immediately east of Long Lane, which confirmed the presence of truncated ditched features of probable late prehistoric/Romano-British date. Earlier work north-west of Long Lane, immediately to the north of the site currently being investigated, identified a similar, multi-phased system of ditch-defined land division which is thought to continue into the current site.

2.2 The gradiometer survey that covered the current site revealed the presence of anomalies indicative of infilled ditches of likely archaeological origin.

The anomalies probably represent the continuation of the system of land division/field enclosure that has previously been evaluated in the area immediately to the north-west. On the basis of the results of the survey a second stage of archaeological evaluation via trial trenching of parts of the application area has been devised.

3. Aims and Objectives

3.1 In the area of the proposed development, any below–ground works are likely to impact upon any surviving archaeological deposits within and below topsoil cover. It has been recommended therefore that an archaeological evaluation should take place in order to obtain further information on the presence and preservation of any archaeological deposits.

3.2 The aims and objectives of an archaeological evaluation in the area of the proposed development will be:

- to gather sufficient information to establish the presence/absence of archaeological remains within the proposed development area;
- to determine the extent, condition, character, quality of survival, importance and date of any archaeological remains present;
- to provide information that will enable an assessment of the potential and significance of the archaeology of the site to be made and the impact which the development will have upon this;
- to provide information that will enable an informed decision to be taken regarding the future treatment of the remains and any mitigation measures appropriate either in advance of and/or during development.

4. Proposed Method

4.1 Experience that has been gained from evaluating this landscape and others of a similar nature and date in the region, suggests that it is more worthwhile opening larger areas to try and isolate possible areas of occupation than simply targeting the field boundary ditches. These are undoubtedly of prehistoric/Romano-British date but invariably contain little datable remains. Of more interest, is the potential of identifying discrete areas of occupation within, or on the periphery of, the field system. With this in mind it has been agreed that the evaluation will comprise the excavation of six large trial trenches.

4.2 The evaluation will involve the investigation of those areas indicated on the figure attached to this document (Figure 1). They are positioned to investigate the nature, depth and extent of any deposits encountered. All trench locations will be established and set out using the 600 series robotic Geodimeter system and locational information being derived from the geophysical survey stations.

Proposed trench areas

Trench	Dimensions	Area
A	10m by 10m	100m^2
B	30m by 20m	600m^2
C	10m by 4m	40m^2
D	10m by 10m	100m^2
E	10m by 10m	100m^2
F	20m by 20m	400m^2
G	20m by 10m	200m^2
H	20m by 10m	200m^2
	Total	**1740m^2**

4.3 The location of the proposed trenches will be read from the available map data. These co-ordinates will then be used to set out the trenches. This will maximise the accuracy of the trench locations. However, due to unforeseen nature of the below-ground modern make-up it is proposed that the trench locations may be subject to change at the discretion of the supervising archaeologist and in consultation with the South Yorkshire SMR.

4.4 All trenches to be machine excavated, using an appropriate mechanical excavator with a toothless ditching bucket, under direct archaeological supervision, in level spits to the top of the first archaeological horizon or undisturbed natural. The resulting surface to be inspected for archaeological remains. Where archaeological remains require clarification the relevant area will be cleaned by hand. Non–modern artefacts will be collected from the excavated topsoil.

4.5 Archaeological features will be hand excavated in an archaeologically controlled and stratigraphic manner in order to meet the aims and objectives outlined above. A sufficient sample of features will be investigated in order to understand the full stratigraphic sequence, down to the naturally occurring deposits. Where minor archaeological features such as agricultural boundary ditches are identified, they will be planned and minimally sampled (10% by length). Where more substantial or significant deposits are identified, they will be treated through the following sampling strategies :

- Excavation of any potential medieval or earlier features will involve a minimum of 10% up to a maximum of 100% hand and machine sampling (where appropriate) to achieve the objectives of determining the date and function of the site and its components.

Sampling and recording strategies will take account of, and reflect any potential for multi-phased occupation. However, in the specific case of encountering what is believed to be a kiln feature (and where single context recording of the whole feature would be the most appropriate strategy and where this is unlikely to be possible during this phase of evaluation, then the proposal is to simply to locate and define the limits of such a feature.

- Linear features: A minimum of 10% (or a minimum sample of 1m if the feature is less than 10m long) of the deposits within linear features, such as boundary or drainage ditches associated with domestic, agricultural, industrial, funerary or ritual enclosures, or fields, or trackways, will be excavated to their full depth. Where possible one section will be located and recorded adjacent to the trench edge.
- Intersections of linear features: The deposits at the junctions of or interruptions in linear features will be totally removed over a sufficient length to determine the nature of the relationship between the components. Excavation of an 'L'-shaped section will be undertaken in the first instance to demonstrate and record relationships and then expanded to the full widths, planned and recorded.
- Discrete features: Pits, post–holes and other isolated features will normally be half-sectioned to determine and record their form. The exceptions will be potential sunken-floored buildings, wall-settings, hearths, kilns, storage pits or other identifiable domestic, agricultural, industrial, funerary or ritual structures or buildings. Huts, barns, kilns, gateways, causeways, working hollows, floor levels, hearths will be subject to a 100% sample by volume, and excavated to a degree whereby their extent, nature, form, date, function and relationship to other features and deposits can be established.
- Built structures, such as walls, will be examined and sampled to a degree whereby their extent, nature, form, date, function and relationship to other features and deposits can be established.

4.6 A full written, drawn and photographic record will be made of all material revealed during the course of the evaluation. The trench limits will be surveyed using the Geodimeter Total Station with larger scale hand drawn plans of features at 1:20, as appropriate. Sections of linear and discrete features will be drawn at 1:10. All sections, plans and elevations will include spot–heights related to Ordnance Datum in metres as correct to two decimal places and survey tie-in information will be undertaken during the course of the evaluation and will be fixed in relation to nearby permanent structures and roads and to the National Grid (located on the 1:2500 map of the area).

4.7 All finds will be recorded, where practicable, three dimensionally using the robotic 600 series Geodimeter system. The resulting data will be downloaded and processed using Landscape 3.1 software. All artefacts

recovered will be retained and removed from the site for conservation and analysis (except in the case of 19th and 20th century artefacts that will be noted but not retained). Non–modern artefacts will be collected from the excavated topsoil to aid in an assessment of the spatial distribution of finds across the site. Finds material will be stored in controlled environments, where appropriate. All artefacts recovered will be retained, cleaned, labelled and stored as detailed in the guidelines laid out in the IFA Guidelines for Finds Work. Conservation, if required, will be undertaken by the University of Bradford or other approved conservators dependent on availability. UKIC guidelines will also apply.

4.8 Context recording will be by Archaeological Services WYAS standard method (Boucher 1995). All contexts, and any small finds and samples from them will be given unique numbers. Bulk finds will be collected by context. Colour transparency and monochrome negative photographs will be taken at a minimum format of 35mm.

4.9 A soil-sampling programme will be undertaken for the identification and recovery of carbonised and waterlogged remains, vertebrate remains, molluscs and small artefactual material. Where appropriate and practicable soil samples of between 10 and 30 litres will be taken from excavated contexts, and larger samples will be taken of any rich carbonised deposits. Particular attention will be paid to the sampling of primary ditch fills and any surviving buried soils beneath banks or other positive features (if any of the latter are found to survive) and for the recovery of material suitable for radiocarbon, thermoluminescence and/or dendrochronological determinations, as appropriate. If buried soils or other appropriate deposits are encountered; column samples will be taken for micromorphological and pollen analysis. Where appropriate environmental material will be stored in controlled environments. Appropriate environmental and soil specialists will be consulted during the course of the excavation with regard to the implementation of the sampling programme.

4.10 Where specialist environmental consultancy is required, including site visits, this will be undertaken by Dr Ben Gearey of the Centre for Wetland Archaeology.

4.11 In the event of human remains being discovered during the excavation these will be left *in situ*, covered and protected, in the first instance. The removal of human remains will only take place under appropriate Home Office and environmental health regulations, and in compliance with the Burial Act 1857. If human remains are identified the SMR and Coroner will be informed immediately. A Home Office licence will be obtained prior to the removal of the remains and contingency provision will be made for the specialist reports on the remains and either Helen Start MSc or Dr Charlotte Roberts will undertake this osteoarchaeological work.

4.12 Provision will be made for the recovery of samples suitable for scientific dating. Contingency sums will be made available for thermoluminescent

dating and radiometric/AMS dating, if deemed necessary, and will only be acted upon in consultation with the South Yorkshire Sites and Monuments Record. In the event that archaeomagnetic dates may be possible, these will have to take place on-site and will therefore be dependent upon specialist availability. If this is not possible then archaeomagnetic dating may have to be delayed or enacted upon during a further stage of work.

4.13 Further contingency provisions will be made available for specialist reports on animal bone, pottery, metalwork and other miscellaneous small finds. All contingencies are to have the prior agreement of the South Yorkshire SMR before they are invoked and this agreement will be recorded in writing, if necessary in retrospect.

4.14 All finds that fall within the purview of the Treasure Act 1996 will be reported to HM Coroner according to the procedures outlined in the Act, after discussion with the client and the SMR.

4.15 It is envisaged that the evaluation and recording of the six trenches will be completed within three weeks. The archaeological team will consist of a Project Manager, a Project Supervisor and three Site Assistants. Although the field team may be subject to change all Archaeological Services WYAS staff are professionals.

5. Archive preparation and deposition

5.1 The site archive will contain all the data collected during the exploratory work, including records, finds and environmental samples. It will be quantified, ordered, indexed and internally consistent. Adequate resources will be provided during fieldwork to ensure that all records are checked and internally consistent. Archive consolidation will be undertaken immediately following the conclusion of fieldwork:

- the site record will be checked, cross–referenced and indexed as necessary;
- all retained finds will be cleaned, conserved, marked and packaged in accordance with the requirements of the recipient museum;
- all retained finds will be assessed and recorded using pro forma recording sheets, by suitably qualified and experienced staff. Initial artefact dating will be integrated with the site matrix;
- all retained environmental samples will be processed by suitably experienced and qualified staff and recorded using pro forma recording sheets, to identify at this stage presence or absence of environmental remains.

5.2 The archive will be assembled in accordance with the specification set out in English Heritage's "*Management of Archaeological Projects 2*" (English Heritage, 1991; Appendix 3). In addition to the site records, artefacts, ecofacts and other sample residues, the archive shall contain:

- site matrices where appropriate;

- a summary report synthesising the context record;
- a summary of the artefact record;
- a summary of the environment record.

5.3 The integrity of the primary field record will be preserved. Security copies will be maintained where appropriate.

5.4 Provision will be made for the deposition of the archive, artefacts and environmental material, subject to the permission of the relevant landowner (and if no further archaeological work is to be initiated), in an appropriate recipient museum (Sheffield City Museum). The museum will be advised of the timetable of the proposed investigation prior to evaluation commencing. Further, Archaeological Services WYAS will adhere to any reasonable requirements the museum may have regarding conservation and storage of the excavated material and the resulting archive. The archive will be prepared in accordance with the guidelines published in "*Guidelines for the preparation of Excavation Archives for long–term storage*" (United Kingdom Institute for Conservation, 1990) and "*Standards in the Museum care of archaeological collections*" (Museums and Galleries Commission, 1994). Provision will be made for the stable storage of paper records and their long–term storage on a suitable medium, such as microfilm.

5.5 Should further archaeological evaluation be initiated and/or additional archaeological work undertaken, the evaluation archive will be prepared accordingly for incorporation into the final archive.

5.6 Archive deposition will be arranged in consultation with the recipient museum and the South Yorkshire SMR and will take into account all requirements of the recipient museum and of the relevant guidelines outlined above. The timetable for deposition will be agreed on completion of the site archive and narrative.

6. Report preparation, contents and distribution

6.1 Upon completion of the evaluation, the artefacts, ecofacts and stratigraphic information shall be assessed as to their potential and significance for further analysis.

6.2 A post–excavation assessment report will be prepared and include the following :

- a non–technical summary of the results of the work;
- a summary of the project's background;
- the site location;
- an account of the method;
- the results of the evaluation, including phasing and interpretation of the site sequence and spot–dating of ceramics;
- a post–excavation assessment of the stratigraphic and other written, drawn and photographic records;

- a catalogue and post–excavation assessment of each category of artefact recovered during excavation;
- a catalogue and post-excavation assessment of any faunal remains recovered during the excavation;
- a catalogue of soil samples collected and post–excavation assessment of the results of the soil sampling programme;
- catalogues and post–excavation assessments and/or summary reports of all scientific dating procedures or other analyses carried out;
- an appendix containing a list and summary descriptions of all contexts recorded;
- a summary of the contents of the project archive and its location;

6.3 The report will be supported by an overall plan of the site, accurately identifying the location of trenches; individual trench plans as excavated, indicating the location of archaeological features with supporting section drawings where appropriate; and photographs.

6.4 The report will also contain the specialist assessments of the artefacts and ecofacts recovered with a view to their potential for further study.

6.5 Finally, the post–excavation report will outline the archaeological significance of the deposits identified, and provide an interpretation of the results in relation to other sites in the region.

6.6 Copies of the report will be submitted to the Client, the Local Planning Authority, and the Sites and Monuments Record within an agreed timetable, notwithstanding any contractual requirements on confidentiality (see section 8 below).

7. Publication and Dissemination

7.1 The information contained within the assessment report will enable decisions to be taken regarding the future treatment of the archaeology at the site and any material recovered during the evaluation.

7.2 If the outcome of the evaluation results in a decision not to initiate any further works, it is to be appreciated that the assessment may produce results of sufficient significance to merit publication in their own right.

7.3 Where no further work is envisaged, allowance will be made for the preparation and publication of the work in the appropriate issue of *Archaeology in South Yorkshire*, and, if of regional or national significance, within an appropriate journal.

7.4 Should further archaeological excavation be undertaken, a synopsis of the results of the assessment will be prepared for publication with the final results of any further fieldwork.

8. Copyright, Confidentiality and Publicity

8.1 Unless the Client commissioning the project wishes to state otherwise, the copyright of any written, graphic or photographic record and reports rests with the originating body (Archaeological Services WYAS). Issues concerning copyright will be agreed between Archaeological Services WYAS and the Client at the outset of the project.

8.2 The circumstances under which other parties can use the report or records will be identified at the commencement of the project, as will the proposals for the distribution of the report. Archaeological Services WYAS will respect the Client's requirements over confidentiality, but will endeavour to emphasise the company's professional obligation to make the results of archaeological work known to the wider archaeological community within a reasonable time.

8.3 Archaeological Services WYAS will agree with the Client all aspects of publicity at the outset of the project.

9. Health and Safety

9.1 Archaeological Services WYAS has its own Health and Safety policy, which has been compiled using national guidelines such as SCAUM. These guidelines conform to all relevant Health and Safety legislation.

9.2 In addition each project undergoes a 'Risk Assessment' which sets project specific Health and Safety requirements to which all members of staff are made aware of prior to on–site work commencing.

9.3 Health and safety will take priority over archaeological matters. Necessary precautions will be taken over underground services and overhead lines at the outset of the project.

10. Insurance

10.1 Archaeological Services WYAS is covered by the insurance and indemnities of the City of Wakefield Metropolitan District Council.

10.2 Insurance has been effected with: Zurich Municipal, Sterling House, 2 The Bourse, LEEDS LS1 5EE.

10.3 The policy number is QLA 03R896 0013

10.4 Any further enquiries should be directed to :

Head of Financial Services, Central Services Department, City of Wakefield MDC, County Hall, Bond Street, Wakefield WF1 2QW.

11. Monitoring

11.1 The work will be monitored by the Sites and Monuments Record office of the South Yorkshire Archaeology Service who will be consulted before the commencement of any site works and afforded the opportunity to inspect the site and the records at any stage of the work.

12. Resources and Programming

12.1 Project personnel :

Project Manager:	Paul Wheelhouse BA (Hons)
Chief Surveyor:	Rob McNaught BSc (Hons)
Project Supervisor:	Adam Smith BSc (Hons)
Site Assistant	Marina Rose BSc (Hons)
Site Assistant	Stephen Toase BSc (Hons)
Site Assistant	TBA
Artefact co–ordinator:	Kath Keith BA (Hons)
Illustrator/CAD operator:	Andy Swann MAAIS
Photographer:	Paul Gwilliam BA (Hons)

12.2 Post–excavation specialists :

Prehistoric pottery specialists:	Blaise Vyner BA FSA
Roman pottery specialist:	Dr Jeremy Evans PhD
Medieval pottery specialist:	Dr Chris Cumberpatch PhD
Flint specialist:	Dr Ian P Brooks PhD
Soils and environmental:	Dr Ben Gearey PhD
	Dr Margaret Bastow PhD
Faunal analyst:	Dr Jane Richardson PhD
Human bone specialist:	Sue Boulter BSc (Hons)
Metalwork specialist:	Holly Duncan MIFA
Artefact conservationist:	Yannick Minvielle–Debat

12.3 All appropriate specialists have been approached and are willing to undertake the work within the time-scales and parameters set out in the specification. The list of Archaeological Services WYAS project personnel may be subject to change.

Appendix VII

Archaeological evaluation: amendments to the proposed method

Prepared by the South Yorkshire Archaeology Service

South Yorkshire Archaeology Service

Planning, Transport and Highways, Town Hall, Sheffield, S1 2HH
Telephone: (0114) 273 6428 / 6354 Fax: (0114) 273 5002

3rd April 2000

Our ref:
Your ref:

Paul Wheelhouse
Archaeological Services - WYAS
14 St John's North
Wakefield
WF1 3QA

Dear Paul,

Barnsdale Bar Quarry Southern Extension: Evaluation

Here is a note to follow on from our site meeting to discuss the evaluation strategy for this site:

As we discussed, I am happy with the proposals to evaluate the field system/enclosures identified by geophysical survey. However, this identified landscape is likely to be only one phase of previous human activity on the site. Other phases of activity may not be represented by large features that can be detected by geophysics. The evaluation strategy for this site must, therefore, include an element of looking for these geophysically invisible phases.

A clue that such phases do exist is the scatter of flints identified to the north; previous work by Archaeological Services - WYAS identified a concentration of flints for 165m from the northern boundary of this site. It is unlikely that this concentration would stop at the boundary; it is probable that the flints identified to the north derived from this site, but have moved downslope through soil creep. Evaluation of this site must establish whether flints are present on this site and, if so, whether this (?Neolithic) phase of activity is only represented by flints, or whether there are surviving features of this date. Even if this phase is only represented by flints in the soil, their distribution may provide information on where they originated from, enabling us to re-create the Neolithic landscape.

Similarly, it is possible that the Iron Age/Romano-British landscape identified by geophysics is a re-working of an earlier Iron Age (or even Bronze Age) landscape that survives more ephemerally.

Not considering these aspects of the site's past will make it difficult to develop an appropriate scheme of mitigation for this site, raising the possibility of unsuspected archaeology being discovered once development work has commenced. This could not only have an impact on the development timetable and the cost of the agreed mitigation scheme, but lead to archaeology being dealt with in a rush, which is not a satisfactory approach. It is much better to consider these aspects in advance, i.e. now, to ensure that the mitigation scheme can cover all likely aspects of the site's past.

I suggest that an appropriate evaluation strategy to identify the spread of Neolithic flints/ features is a series of test pits to answer some very broad questions, i.e. does the flint scatter extend into this site? Does the distribution of flints support the theory that they originated on higher ground to the south? If not, does the scatter indicate an alternative location? Do any sub-soil features relating to this flints survive? I suggest the following strategy - a series of hand dug test pits measuring 1m x 1m spaced 10 metres apart from each other, at a distance of approximately 5m from the northern boundary, with the westernmost trench being placed adjacent to the application boundary. I think this gives a spread of 11 or 12 trenches up to trial trench A. A second series of test pits should be placed 20m to the south of the first, same size, same spacing. In all, that will give a little over 20 test pits.

I suggest that an appropriate evaluation strategy to identify earlier phases of the Iron Age/ Romano-British landscape is one that targets the northern end of the site again - given that the slightly greater depth of soil may have protected features better here than elsewhere on the site. I suggest a trench 20m x 10m to the north east of trench B, another 10m x 10m north east of trench D and possibly re-locating trench E to the east (because, the test pits should have sampled the area of trench E's original location).

Attached is a plan showing these suggestions.

I'm in the office today, then out for the rest of the week. If you could get back to me today, that would be perfect. If not, try me on our mobile: 0411 154 002. If all else fails, Roy Sykes, will be in the office this Friday and will be able to help you in my absence.

Yours sincerely,

Dinah Saich

Dinah Saich
Head of Service

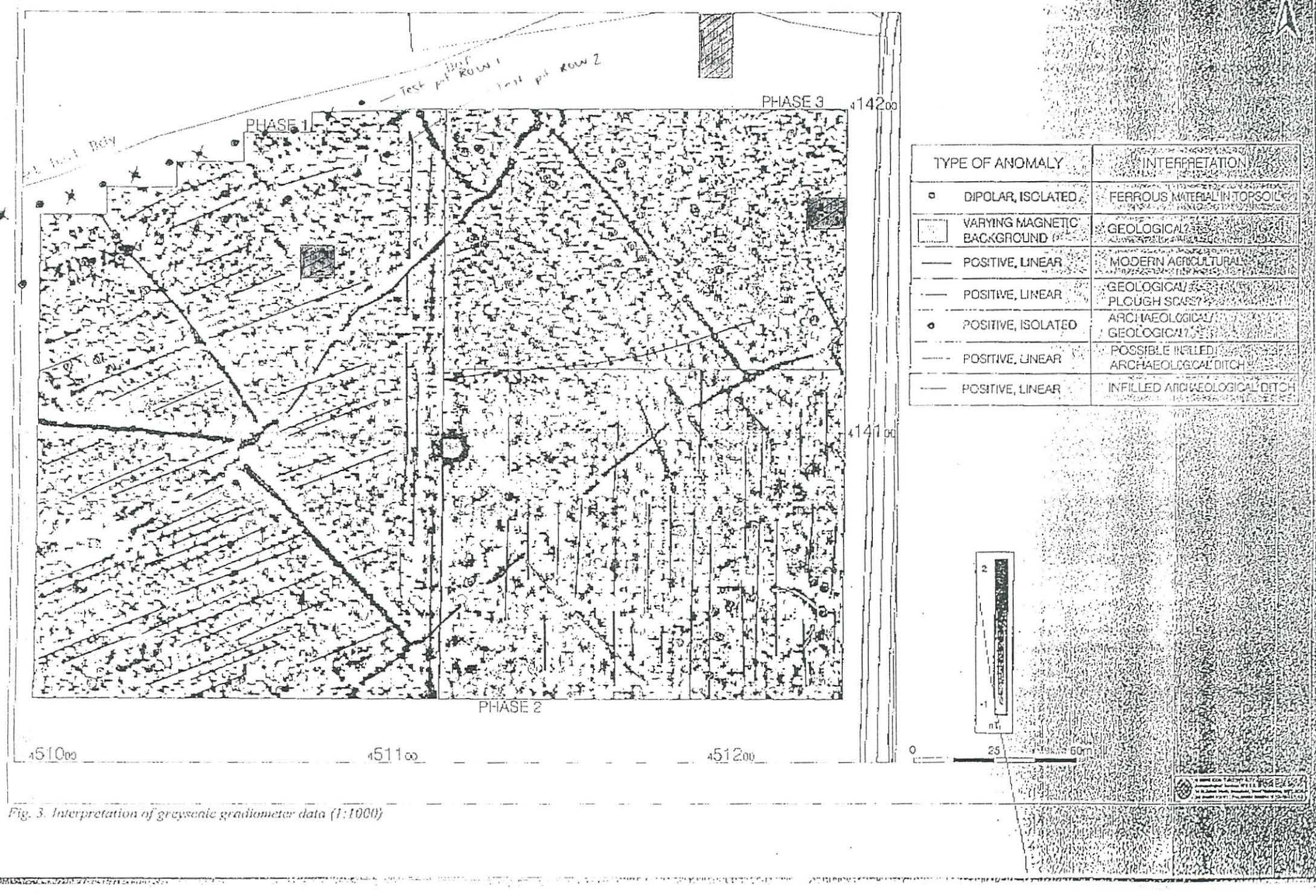


Fig. 3. Interpretation of greyscale gradiometer data (1:1000)

South Yorkshire Archaeology Service
Planning, Transport and Highways, Town Hall, Sheffield, S1 2HH

Facsimile Cover Sheet

To: Paul Wheelhouse, WYAS

Fax: 01924 306 814

From: Dinah Saich, Head of SYAS
Phone: 0114 273 6354

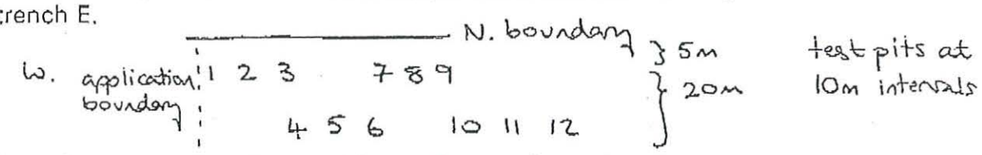
Fax: 0114 273 5002

Date: 3-4-2000
No. of pages (including this cover page):

If ticked, the original of this document will follow by post ☐

Barnsdale Bar Southern Extension - Evaluation

1) I do not believe that the conditions on site are conducive to fieldwalking being used as an effective evaluation technique. I cannot see an alternative to testing this part of the site's archaeology by test pitting (and sieving the excavated soils). I will reluctantly accept a compromise whereby a minimum of 50% of my suggested test pits are excavated as an initial phase, leading to the excavation of the remaining 50% if the results are positive, i.e. produce flint finds. I anticipate that this will mean a minimum of 12 and a maximum of 24 test pits. I suggest the following layout for the initial phase, which should sample the anomalies formerly to be tested by trial trench E.



2) I think we have agreed on the need for, and approximate locations of, the remaining trial trenches.

3) I can confirm that I believe this evaluation strategy will enable us to identify the archaeological potential of this site sufficiently well that an appropriate mitigation strategy will be readily developed from its results. I cannot comment on these probable mitigation measures until I have seen the results of the evaluation.

4) As I stated, I am out of the office until next week, but am happy for you to go ahead with this work in my absence. I look forward to a site visit next week to see progress. If you need advice in the meantime, my colleague Roy Sykes will be in the office from Friday.

Dinah Saich

Appendix VIII

Archaeological excavation: written scheme of investigation

Prepared by Archaeological Services WYAS

Land to the west of Long Lane, Barnsdale Bar Quarry, South Yorkshire

Written Scheme of Investigation for an Archaeological Excavation

1. Introduction

1.1 A planning application for the extension of an existing quarry for mineral extraction, followed by infilling with waste materials, has been submitted to Doncaster Metropolitan Borough Council (Planning application no. 99/65/4103/P/MINA) by S.I.T.A. Products and Services Ltd. This specification has been written at the request of the South Yorkshire Archaeology Service to conform with an archaeological condition that is attached to the permission. The site is centred at SE 511 141 and consists of an area of land, roughly rectangular in shape and measuring approximately 3.6 hectares. The eastern limits of the proposed development area is bounded by Long Lane. The northern limit abutts the existing quarry and actually forms the administrative boundary between North Yorkshire and South Yorkshire. To the south and the west there are no defined field boundaries to which the development abutts. Areas to the north and north-west of the present site have been the subject of extensive archaeological investigations, some of which are still ongoing, but which fall within North Yorkshire (principally by Archaeological Services WYAS). This is the first extension of quarrying activities into South Yorkshire in recent times. The site was partly under crop (to the south) or recently ploughed. The field gently rises from north to south. The drift geology is Lower Magnesian Limestone (Geological Survey Sheet 87).

1.2 Dinah Saich of the South Yorkshire Archaeology Service, holders of the Sites and Monuments Record and advisors to the Local Planning Authority, has indicated that a further stage of archaeological investigation, in the form of open area excavation, is required in a selected part of the site.

1.3 This document details the methodology with which we (Archaeological Services WYAS) propose to undertake the specified further archaeological investigations in order to satisfy the archaeological condition.

2. Archaeological Background

2.1 The archaeological interest of the site relates to its setting within an extensive later prehistoric/Romano-British landscape that has been defined originally by crop marks shown on aerial photographs. The expanding quarry site has been subject to numerous phases of archaeological work over the past decade including fieldwalking, several geophysical surveys, trial-trenching evaluations and a desk-based assessment. The latest phase of work reported the results of trial trenching and geophysical survey

immediately east of Long Lane, which confirmed the presence of truncated ditched features of probable late prehistoric/Romano-British date. Earlier work north-west of Long Lane, immediately to the north of the site currently being investigated, identified a similar, multi-phased system of ditch-defined land division which is thought to continue into the current site.

2.2 The gradiometer survey that covered the current site revealed the presence of anomalies indicative of infilled ditches of likely archaeological origin. The anomalies probably represent the continuation of the system of land division/field enclosure that has previously been evaluated in the area immediately to the north-west. On the basis of the results of the survey a second stage of archaeological evaluation via trial trenching of parts of the application area was devised.

2.3 An agreed programme of sample excavation, via trial trenching, was devised between Archaeological Services WYAS (acting on behalf of their client, S.I.T.A. Ltd) and the South Yorkshire Archaeology Service. This involved the sample excavation of 10 trenches (labelled as Trenches A through to K) located across the whole of the development area aimed at targetting anomalies from the geophysical survey thought to be archaeological in origin as well as sampling blank areas. Further, a total of 13 test pits were excavated to the north-west part of the site to elucidate upon further the possibility of the continuation of a flint scatter identified during a previous investigation to the north.

2.4 As a result of these sample excavations the South Yorkshire Archaeology Service advised that further archaeological investigations would be required within the development limits. The investigations identified the presence of an enclosure, redefined and expanded upon, that would form the focus of a further stage of work. Although no indication of the presence of structural remains were found during the geophysical survey or the trial trenching, there was certainly the possibility that important archaeological remains may be present within or close to the enclosure.

2.5 It was agreed that the further stage of work would involve, in the first instance, the supervised machine stripping of topsoil and modern overburden from the eastern half of the enclosure area. This was expanded following discussions with Dinah Saich of the South Yorkshire Archaeology Service, to encompass the whole of the enclosure area available for investigation.

2.6 This work was completed, using machines provided by the developer, on Monday 7th August 2000.

2.7 Subsequently, at the request of the South Yorkshire Archaeology Service, this document has been prepared in order to outline the methodology for both on-site and post-excavation work.

3. Aims, Objectives and Research Potential

3.1 Information derived from the previous sample excavation of the site has indicated the need for further investigation on the site. Consultation between Archaeological Services (WYAS) and the South Yorkshire Archaeology Service determined the scope of the required works. In the area of the proposed excavation, any below–ground works are to impact upon any surviving archaeological deposits. As stated above (see section 2), the development will impact upon significant archaeological deposits relating to the Roman and perhaps earlier settlement and land-use of this area of South Yorkshire (this being based upon tentative initial dating of a small assemblage of sherds recovered during the sample excavation).

3.2 The general aims and objectives of the archaeological excavation in the stripped area will be:

- to establish the presence/absence of all archaeological remains within the excavated area;
- to determine the extent, condition, function, relationships, character, quality of survival, importance and date of all archaeological remains present;
- to provide information that will allow an full understanding of the significance of the archaeological record retrieved from the site to be made;

3.3 The specific aims and objectives will be to:

- to identify and record in plan all archaeological features within the excavated area;
- to recover an adequate sample of the deposits and related artefactual and ecofactual materials to allow the determination of:

  the chronology of the site, its components and detailed phases;

  the inter-relationships between the various components of the site;

  the function of the various components of the site and

  the potential co-existence or succession of sites in the immediate vicinity.

3.4 The archaeological investigations have the potential to assist in the resolution of the chronology of the prehistoric and Roman landscape of the Barnsdale Bar area. A primary aim of these investigations will be to attempt

to place the archaeological remains within a regional chronological and geographical framework.

3.5 Little is known about how a later prehistoric and Roman landscape, such as this, was utilised, whether rural 'settlements' and 'fields' were temporary or long-term establishments and what effect human activity in this area may have had upon the local environment. Therefore, of particular importance will be information derived from the archaeological investigations that may shed light upon the economic use of the landscape. Additionally, it is hoped that the recovery of securely stratified pottery sherds will contribute significantly to regional pottery studies and a fuller understanding of the stratigraphic sequence.

3.6 The integration of the results of archaeological investigations (geophysical surveys, evaluations, excavations, SMR records, etc.) within the immediate area will be plotted on to a base plan along with the results of this work. This will assist in the greater understanding of the archaeological resource and allow a framework for further research development in the Barnsdale Bar area. At the specific request of the South Yorkshire Archaeology Service, an air photographic mapping and rectification programme will be undertaken to place the site more fully within the wider landscape. This work will commence immediately and will be undertaken by a specialist air photographic interpreter, Alison Deegan. The scope of the study area will be agreed between South Yorkshire Archaeology Service, Archaeological Services WYAS and Alison Deegan.

4. Proposed Method

4.1 The excavation initially involved the topsoil stripping of the enclosure area using a 360° mechanical excavator. The machine used did not exceed 25 tonne and the toothless ditching bucket was no more than 2m wide. The machine was assisted in the removal of topsoil by two 25 tonne dump trucks.

4.2 Mechanical excavation was used judiciously and carried out under direct archaeological control in level spits to the top of the first archaeological horizon or undisturbed natural. The resulting surface was inspected for archaeological remains and where archaeological remains require clarification the relevant area was marked with spray paint and tagged. The resultant spoil heaps were scanned for non-modern artefacts.

4.3 All identified archaeological features will be accurately recorded in plan, initially by using a robotic 600 series Geodimeter system, then by hand drawing. This initial survey plan will be used to draw up a excavation sampling strategy and will allow a quick reference guide to the site, indicating what has been excavated, those areas still to be investigated and from which areas finds have been recovered. This will be updated on a daily basis.

4.4 The site will be divided into 20m grid squares. As a result of the high number of natural features that occur on the site, and the difficulty in determining natural from potential archaeological remains, an archaeologist will be designated to each 20m square area and will be afforded time to determine whether archaeological features are present or not. Sample slots will be excavated through potential features and where these are believed to be archaeological in origin, excavation of these will proceed in an archaeologicallly controlled and stratigraphic manner in order to meet the aims and objectives outlined above. The sample of features investigated will be sufficient enough to fully understand the stratigraphic sequence, down to the naturally occurring deposits. This shall be achieved through the following sampling strategies:

- Linear features (including the enclosure ditch(es): An appropriate sample of each feature will be excavated, to its full depth. No section will be less than 1m in length. Where possible one section will be located and excavated adjacent to a trench edge and particular attention will be paid to butt-ends, corners and intersections. In general, a minimum sample of 10% of each linear feature will be excavated, and this will be increased in order to attempt to recover datable material.

- Intersections of linear features: Excavation of an 'L'-shaped section to demonstrate and record relationships, expanded to the full widths if appropriate.

- Discrete features: Pits and post-holes to be subject to 100% sample by volume as appropriate.

4.5 A full written, drawn and photographic record will be made of all material revealed during the course of the excavation. A site grid will be set out in the areas of excavation and this will be used to plan features at a scale of 1:50 with larger scale plans of features at 1:20, as appropriate. Sections of linear and discrete features will be drawn at 1:10. All sections, plans and elevations will include spot–heights related to Ordnance Datum in metres as correct to two decimal places.

4.6 All finds will be recorded, where practicable, three dimensionally using the robotic 600 series Geodimeter system. The resulting data will be downloaded and processed using Landscape 3.1 software. All artefacts recovered will be retained and removed from the site for conservation and analysis. Where appropriate finds material will be stored in controlled environments. All artefacts recovered will be retained, cleaned, labelled and stored as detailed in the guidelines laid out in the IFA Guidelines for Finds Work. Conservation, if required, will be undertaken by the University of Bradford or other approved conservators dependent on availability. UKIC guidelines will also apply.

4.7 Context recording will be by Archaeological Services WYAS standard method. All contexts, and any small finds and samples from them will be given unique numbers. Bulk finds will be collected by context. Colour transparency and monochrome negative photographs will be taken at a minimum format of 35mm.

4.8 A soil sampling programme will be undertaken in accordance with recommendations made by our Environmental Officer, Dr Jane Richardson, for the identification and recovery of carbonised and waterlogged remains, vertebrate remains, molluscs and small artefactual material. Where appropriate and practicable soil samples of 10 litres will be taken from excavated contexts, and larger samples will be taken of any rich carbonised deposits. Particular attention will be paid to the sampling of primary ditch fills, large discrete features (e.g. refuse pits), structural and occupational evidence, skeletal remains and any surviving buried soils. Further, the recovery of material suitable for radiocarbon, archaeomagnetic, thermoluminescence and/or dendrochronological determinations will be sought, as appropriate. If buried soils or other appropriate deposits are encountered, column samples may be taken for micromorphological and pollen analysis. Magnetic susceptibility samples will also be collected. Where appropriate environmental material will be stored in controlled environments. Appropriate environmental and soil specialists will be consulted during the course of the evaluation with regard to the implementation of the sampling programme.

4.9 All human remains will be recorded on-site prior to removal and analysis by the project's assigned osteoarchaeologist. Disturbance of human remains will only take place under appropriate Home Office and environmental health regulations, and in compliance with the Burial Act 1857 and the Disused Burial Grounds Act 1981. If human remains are identified the SMR and Coroner will be informed immediately. A Home Office licence will be obtained prior to the commencement of the project and Andrea Burgess will undertake any osteoarchaeological work.

4.10 All finds of gold and silver shall be reported to HM Coroner according to the procedures relating to the Treasure Act 1996, after discussion with the Client and the SMR.

4.11 It is envisaged that the excavation and recording could be completed in four weeks by a team consisting of a Project Supervisor and three Site Assistants. Although the field team may be subject to change all Archaeological Services WYAS staff are professionals.

5. Archive preparation and deposition

5.1 The site archive will contain all the data collected during the excavation, including records, finds and environmental samples. It will be quantified, ordered, indexed and internally consistent. Adequate resources will be provided during fieldwork to ensure that all records are checked and

internally consistent. Archive consolidation will be undertaken immediately following the conclusion of fieldwork:

- the site record will be checked, cross–referenced and indexed as necessary;
- all retained finds will be cleaned, conserved, marked and packaged in accordance with the requirements of the recipient museum;
- all retained finds will be assessed and recorded using pro forma recording sheets, by suitably qualified and experienced staff. Initial artefact dating will be integrated within the site matrix;
- all retained environmental samples will be processed by suitably experienced and qualified staff and recorded using pro forma recording sheets.

5.2 The archive will be assembled in accordance with the specification set out in English Heritage's "*Management of Archaeological Projects 2*" (English Heritage, 1991; Appendix 3). In addition to the site records, artefacts, ecofacts and other sample residues, the archive shall contain:

- site matrices where appropriate;
- a summary report synthesising the context record;
- a summary of the artefact record;
- a summary of the environment record.

5.3 The integrity of the primary field record will be preserved. Security copies will be maintained where appropriate.

5.4 Provision will be made for the deposition of the archive, artefacts and environmental material, subject to the permission of the relevant landowner (and if no further archaeological work is to be initiated), in the appropriate recipient museum, in this instance Doncaster Museum. The museum will be advised of the timetable of the proposed investigation prior to excavation commencing. Further, Archaeological Services WYAS will adhere to any reasonable requirements the museum may have regarding conservation and storage of the excavated material and the resulting archive. The archive will be prepared in accordance with the guidelines published in "*Guidelines for the preparation of Excavation Archives for long–term storage*" (United Kingdom Institute for Conservation, 1990) and "*Standards in the Museum care of archaeological collections*" (Museums and Galleries Commission, 1994). Provision will be made for the stable storage of paper records and their long–term storage on a suitable medium, such as microfilm.

5.5 Should further archaeological excavation be initiated and/or additional archaeological work undertaken, this archive will be prepared accordingly for incorporation into the final archive.

5.6 The monitoring archaeologist will be afforded the opportunity to inspect the contents of the archive prior to its final deposition. Archive deposition will be arranged in consultation with the recipient local institution/museum and

will take into account all requirements of the recipient museum and of the relevant guidelines outlined in paragraph 5.4 above. The timetable for deposition will be agreed on completion of the site archive and narrative. Artefacts discovered during the course of the excavations are the property of S.I.T.A. Ltd (subject to the provisions of the Treasure Act 1996). Artefacts will be given to an approved museum or institution or loaned for such periods as are necessary for research and study.

6. Report preparation, contents and distribution

6.1 Upon completion of the investigations, the artefacts, ecofacts and stratigraphic information shall be assessed as to their potential and significance for further analysis.

6.2 An interim report will be prepared within three weeks of completion of on-site archaeological investigations and include the following :

- a non–technical summary of the results of the work;
- a summary of the project's background;
- the site location;
- an account of the method;
- the results of the excavation, including phasing and interpretation of the site sequence and spot–dating of artefacts, if recovered;
- an assessment of the stratigraphic and other written, drawn and photographic records;
- a catalogue of the archaeological material recovered during the excavation
- a summary of the contents of the project archive and its location
- assessments of potential for further analysis of each finds group, environmental samples, industrial samples, etc. recovered from the site with discussions held with SYAS concerning recommendations and agreed post-excavation analyses – the final report to include the results of these agreed analyses.

6.3 The report will be supported by an overall plan of the site, accurately identifying the location of the open area excavations, indicating the location of archaeological features.

6.4 Finally, the report will outline the archaeological significance of the deposits identified, and provide an interpretation of the results in relation to other sites in the region and any recommendations for post-excavation work.

6.5 Copies of the report will be supplied to S.I.T.A. Ltd for distribution to the South Yorkshire Sites and Monuments Record. These reports will be produced within an agreed timetable, notwithstanding any contractual requirements on confidentiality (see section 7 below).

6.6 A final report, including all finds analysis and scientific dating results that have been previously agreed with SYAS, shall be produced in accordance with English Heritage's "*Management of Archaeological Projects 2*" (English Heritage, 1991). The distribution of reports will be as for the interim report.

6.7 The results of this work will contribute significantly to the on-going post-excavation research programme concerned with the Barnsdale Bar landscape. The final report will also include a detailed discussion of the context of the site, with reference to the results of other archaeological work in the vicinity and the aerial photographic rectification and interpretation. It is envisaged that the report may form a component part of a proposed publication on the landscape. Further details of the likely journal to which the article will be submitted will be passed to the South Yorkshire Archaeology Service.

7. Copyright, Confidentiality and Publicity

7.1 Unless the Client commissioning the project wishes to state otherwise, the copyright of any written, graphic or photographic record and reports rests with the originating body (Archaeological Services WYAS). Issues concerning copyright will be agreed between Archaeological Services WYAS and the Client at the outset of the project.

7.2 The circumstances under which the report or records can be used by other parties will be identified at the commencement of the project, as will the proposals for the distribution of the report. Archaeological Services WYAS will respect the Client's requirements over confidentiality, but will endeavour to emphasise the company's professional obligation to make the results of archaeological work known to the wider archaeological community within a reasonable time.

7.3 Archaeological Services WYAS will agree with the Client all aspects of publicity at the outset of the project.

7.4 A summarised report will be produced for inclusion in the annual review publication *Archaeology in South Yorkshire*. Time and financial constraints permitting, members of staff may be available to talk about the site to local societies and at the annual archaeology day.

8. Health and Safety

8.1 Archaeological Services WYAS has its own Health and Safety policy which has been compiled using national guidelines such as SCAUM. These guidelines conform to all relevant Health and Safety legislation.

8.2 In addition each project undergoes a 'Risk Assessment' which sets project specific Health and Safety requirements to which all members of staff are made aware of prior to on–site work commencing.

8.3 Health and safety will take priority over archaeological matters. Necessary precautions will be taken over underground services and overhead lines at the outset of the project.

9. Insurance

9.1 Archaeological Services WYAS is covered by the insurance and indemnities of the City of Wakefield Metropolitan District Council.

9.2 Insurance has been effected with: Zurich Municipal, Sterling House, 2 The Bourse, LEEDS LS1 5EE.

9.3 The policy number is QLA 03R896 0013

9.4 Any further enquiries should be directed to :

Head of Financial Services, Central Services Department, City of Wakefield MDC, County Hall, Bond Street, Wakefield WF1 2QW.

10. Monitoring

10.1 The South Yorkshire Archaeology Service will be responsible for monitoring the project, acting on behalf of the local planning authority, and their officers will be afforded the opportunity to inspect the site and the records at any stage of the work.

11. Resources and Programming

11.1 Project personnel :

Project Management:	Paul Wheelhouse BA
Project Supervisor:	Marina Rose BA
Site Assistant	Bernard McCluskey BSc
	Laura Davison BSc
	Alun Roger BSc
Illustrator/CAD operator:	Andy Swann MAAIS
Photographer:	Paul Gwilliam BA

11.2 Post–excavation specialists :

Air photographic specialist:	Alison Deegan BSc
Prehistoric pottery specialists:	Blaise Vyner

Roman pottery specialist:	Dr Jeremy Evans
Anglian/Medieval pottery specialist:	Peter Didsbury
	Dr Chris Cumberpatch
Flint specialist:	Dr Ian P Brooks
Soils, environmental, faunal:	Dr Jane Richardson
Human bone specialist:	Andrea Burgess BSc
Metalwork specialist:	Holly Duncan MIFA
Artefact conservationist:	Karen Barker

11.3 All appropriate specialists have been approached and are willing to undertake the work within the time-scales and parameters set out in the specification. The list of Archaeological Services WYAS project personnel may be subject to change.

11.4 The start date for the work will be Monday 21st August 2000, with hopeful completion on-site by no later than Friday 3rd October 2000.

Appendix 1 Recording and reporting guidelines

The general and more specific standards of both recording and reporting that will be adhered to during the project are listed below. This list will be updated, as necessary, during the project.

- English Heritage 1991 "*Management of Archaeological Projects*", Second Edition (MAP2)
- Institute of Field Archaeologists "*Code of Approved Practice for the Regulation of Contractural Arrangements in Field Archaeology*"
- Institute of Field Archaeologists 1994 "*Draft Standard and Guidance for Archaeological Excavations*"
- Institute of Field Archaeologists "*IFA Guidelines for Finds Work*"
- Association of Environmental Archaeology 1995 "*Environmental Archaeology and Archaeological Evaluations*"
- Museums and Galleries Commission 1994 "Standards in the museum care of archaeological collections"
- United Kingdom Institute for Conservation 1990 "*Guidelines for the preparation of Excavation Archives for long-term storage*"
- Institute for Field Archaeologists Code of Conduct
- McKinley, J.I. and Roberts, C. 1993 "*Excavation and post-excavation treatment of cremated and inhumed human remains*" IFA Technical Paper No. 13
- Philo, C and Swann, A. 1997 "*Preparation of Artwork for Publication*" IFA Technical Paper No. 10

Appendix IX

Test pit results

See Figure 2 for test pit locations

Test pit no.	Topsoil depth	Subsoil depth	Total depth
1	0.29m	-	0.29m
2	0.22m	-	0.22m
3	0.23m	-	0.23m
7	0.23m	0.11m	0.34m
8	0.27m	0.10m	0.37m
9	0.25m	0.11m	0.36m
16	0.31m	-	0.31m
17	0.30m	-	0.30m
18	0.28m	0.08m	0.36m
22	0.33m	0.12m	0.45m
23	0.30m	-	0.30m
24	0.27m	-	0.27m
25	0.35m	-	0.35m