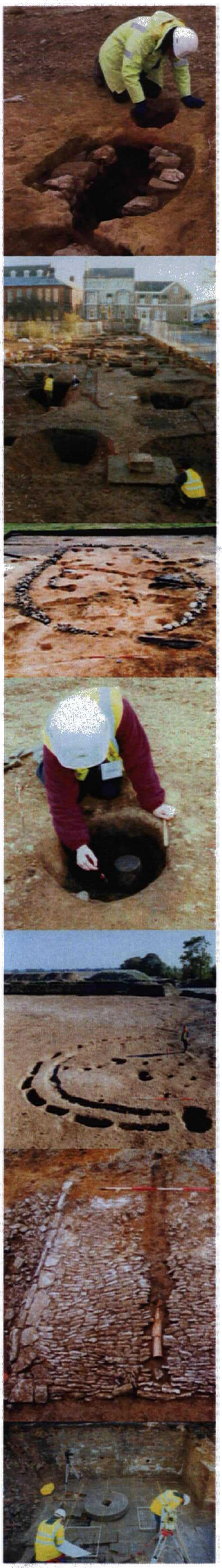

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NOSTERFIELD QUARRY

NOSTERFIELD

NORTH YORKSHIRE

INTERIM REPORT

REPORT

MARCH 2005

FAS

WATCHING BRIEF
NOSTERFIELD QUARRY
NORTH YORKSHIRE

SITE CODE: NOS
NGR: SE 280 808

INTERIM REPORT
March 2005

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Summary

This interim report presents the provisional results of an on-going watching brief at Nosterfield Quarry, North Yorkshire. Archaeological fieldwork has been undertaken at Nosterfield Quarry since 1991, by a range of contractors. Pre-determination assessment and evaluation was undertaken by Mike Griffiths and Associates and AOC (Scotland) in 1991-2 and 1995 in support of a planning application for the current quarry operation. Subsequently, a series of watching briefs has been undertaken across the site prior to gravel extraction, in accordance with an archaeological planning condition. Since 1998, this fieldwork has been carried out by Field Archaeology Specialists Ltd, on behalf of Mike Griffiths and Associates, for Tarmac Northern Ltd. This report initially summarises the results of fieldwork carried out in the area prior to 1995, and the state of knowledge at that time. Since that date, surveys, watching briefs and further evaluation have revealed the range and character of archaeology within the site, and provided evidence for the changing use of the landscape from the Mesolithic to the modern day. The long duration of this project has also allowed for the development of methodologies best suited to the nature of the site, and the archaeological remains in this area.

The successive phases of investigation have revealed a diverse range of features, dispersed throughout the quarry site. Small pits have been identified predominantly in the eastern part of the site. A significant concentration of archaeological features has been identified to the west of the quarry, where linear features (ditches and pit alignments), ring-ditches and square-ditch enclosures have been identified, as well as a number of cremation and inhumation burials.

The earliest evidence from the site consists of a series of Mesolithic lithic artefacts, from secondary contexts, but providing an indication that the landscape was occupied at this time. Into the Neolithic, evidence for domestic activity becomes more secure. A period of land clearance in the later Neolithic and early Bronze Age has been identified from a programme of sediment analysis, which would seem to correspond with the dates ascribed to assemblages of pottery and lithics produced from pits. This may indicate domestic occupation in the area, possibly restricted to specific zones within the landscape, and contemporaneous with the construction of the monument complex of Thornborough to the south. During the Bronze Age, the area seems to have become a focal point for burial, rather than occupation, with the construction of ring-ditches (round barrows), which are suggested to have formed the centre of cremation cemeteries, and later for inhumation. During the Iron Age, there appears to have been a demarcation of the landscape with boundaries, through the construction of pit alignments and ditches. Inhumation burials, and a horse burial, suggest that the area formed a funerary location until the end of the Iron Age. Romanised occupation followed with evidence for a corn-drying kiln, and an assemblage of high status pottery. This occupation appears to have disused many of the preceding features. This change in use remained until the modern day, and the landscape became dominated by the agricultural features and divisions of land that characterised the medieval and post-medieval landscapes.

Acknowledgements

Field Archaeology Specialists Ltd are grateful for the assistance and cooperation of Alan Coe and the staff of Tarmac Northern Ltd, and Neil Campling of the North Yorkshire County Council Heritage Unit, throughout the course of the project.

1.0 INTRODUCTION

This interim report provides a preliminary account of the results of an ongoing watching brief being undertaken at Nosterfield Quarry, North Yorkshire, on behalf of Mike Griffiths and Associates for Tarmac (Northern) Ltd. The archaeological investigation in advance of mineral extraction at Nosterfield Quarry will not be completed for several years, and as such this report is based on the preliminary assessment and review of field records, and selected specialist assessments and analyses, which have been prioritised in order to inform the strategy for the ongoing watching brief. This interim report has been prepared at the request of Tarmac (Northern) Ltd. in support of a planning application to extend Nosterfield Quarry. In accordance with the archaeological planning condition for the current quarry, a full and final report including all necessary assessments and analyses, will be produced on completion of the watching brief and the results published.

The watching brief at Nosterfield Quarry commenced in 1995, and has been carried out since 1998 by Field Archaeology Specialists (FAS) Ltd on behalf of Mike Griffiths and Associates for Tarmac Northern Ltd. The area covered by the fieldwork lies to the north of Nosterfield village, North Yorkshire.

1.1 LOCATION AND LAND USE

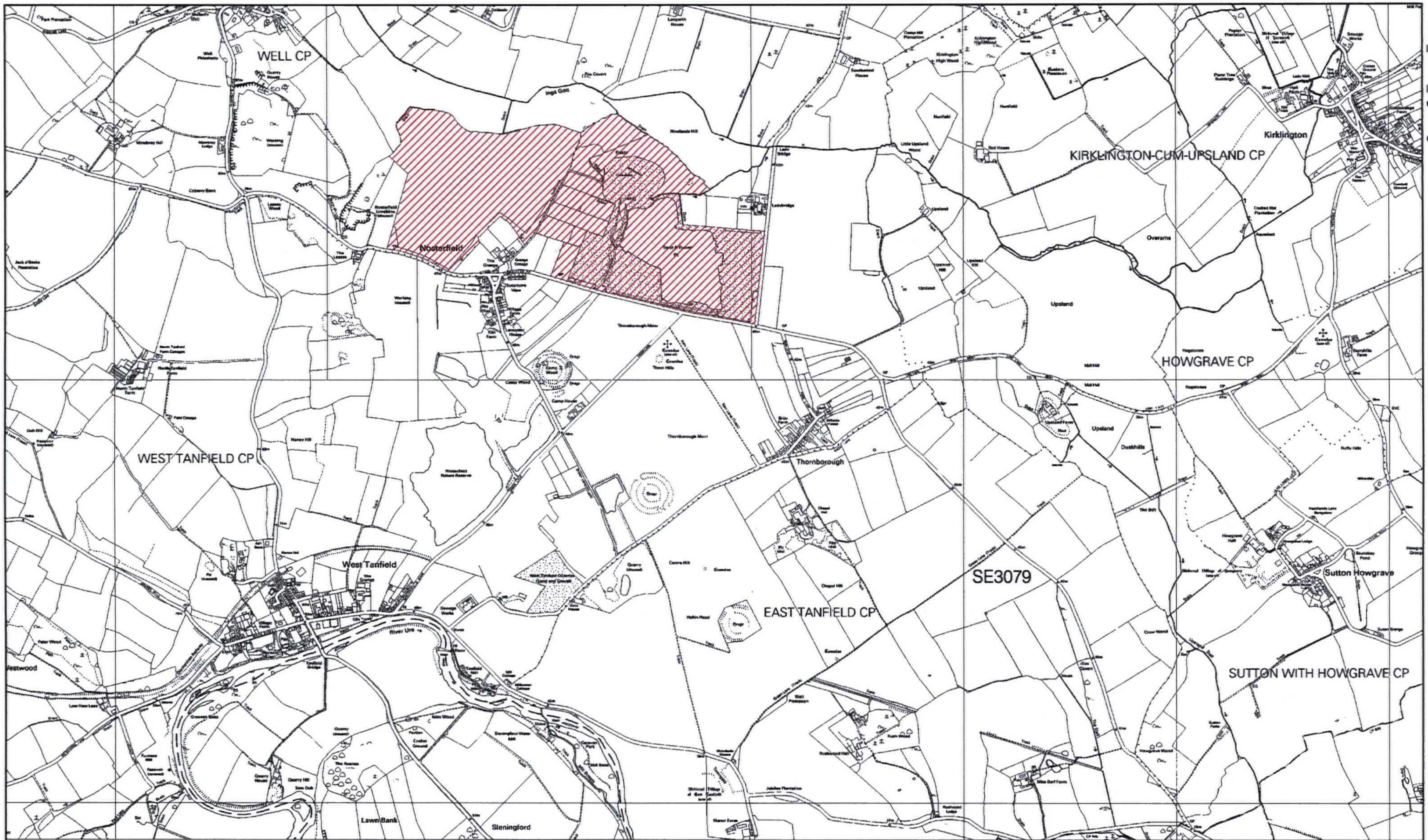
Nosterfield Quarry (SE 280 808) is situated to the west of Nosterfield village, North Yorkshire, on fluvio-glacial gravels that lie to the north of the River Ure. The quarry occupies land on the northern side of the B6267, as it leads away from the A1 (Figure 1), bounded to the east by a road, and extending westwards for 1800m. The quarry extends north-south for 660m, covering a total of 106 hectares. At the onset of this project, existing quarry workings dominated the eastern part of this area, lying between the road to the south, and extending north and west for a total of 13.4 hectares.

The area of investigation generally lies between 40m and 43m AOD, rising gently from north to south, and much of the surrounding area is given over to arable land and pasture. The northern part of the site is occupied by a relict lake, in which peat deposits have formed and which retains a marshy character, now known as the Flasks.

To the east of the quarry, the land rises towards Upsland Hill, and in the west, slopes towards the more distant Whitwell Hill. Generally, the landscape surrounding the quarry site is dominated by arable cultivation, although areas such as the Flasks have always been poorly drained. The disused marl pits, areas of peat, limestone and sandstone quarries located within the surrounding areas provide evidence for extraction over several centuries.

1.2 PLANNING BACKGROUND

Planning permission for the current quarrying operation at Nosterfield Quarry was granted by North Yorkshire County Council in January 1995. This planning permission included an archaeological condition requiring a watching brief to be maintained during topsoil stripping at the quarry, and the submission of a full report within 6 months of the completion of the final phase of fieldwork. Since 1995 a watching brief has been maintained on successive phases of mineral extraction undertaken in line with the phases of operation submitted with the planning application (Figure 2).



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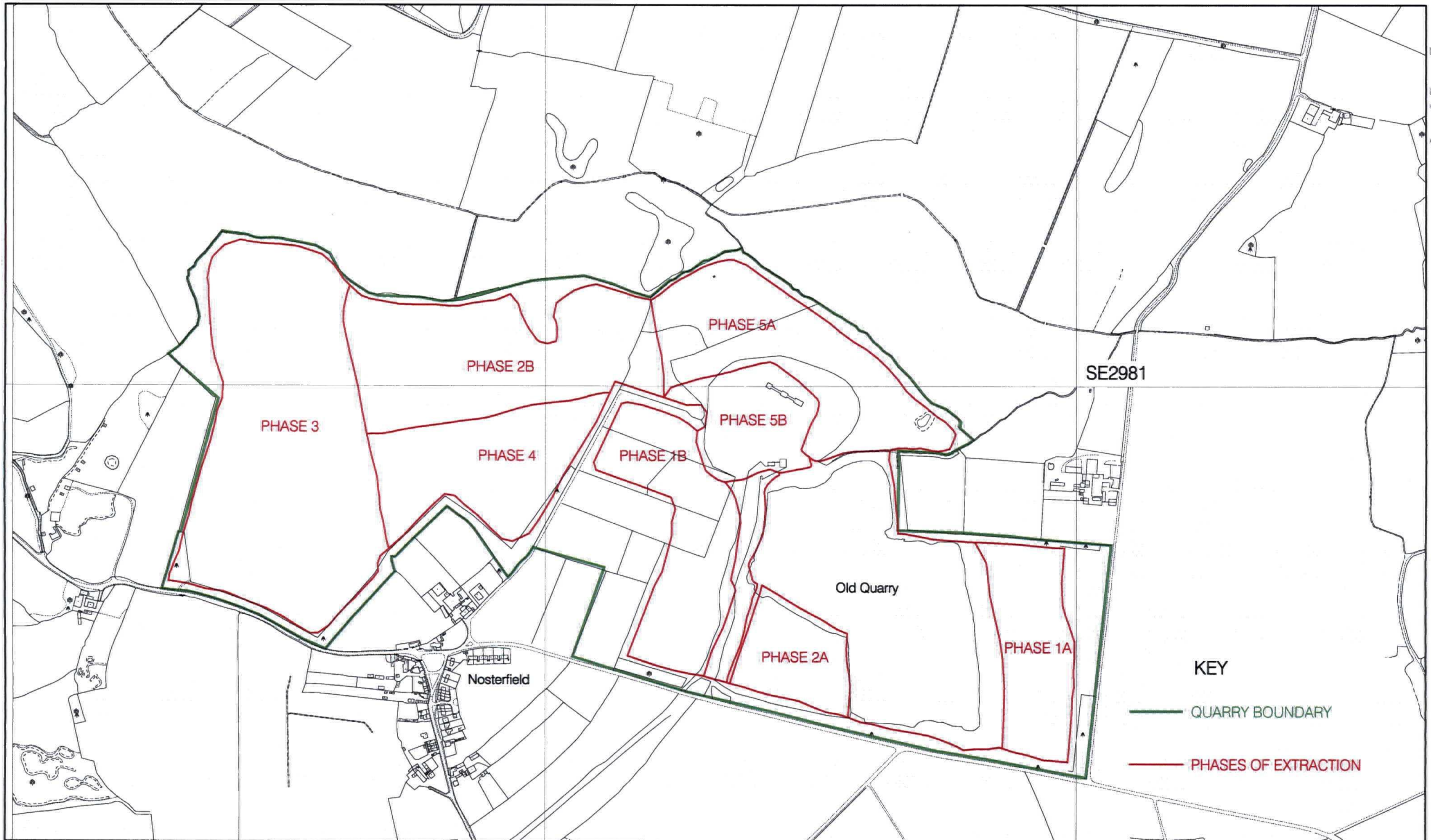
Location map | Scale 1:25000 | Figure 1



Phases of mineral extraction

Scale 1:10000

Figure 2

1.3 AIMS AND OBJECTIVES

The primary aim of the watching brief was to identify, investigate and record any archaeological remains within the quarry area prior to mineral extraction, and where possible to determine their date, character and function. A further objective of the archaeological investigation was to develop the most effective methodological approach, given the nature of the archaeological remains encountered, the anticipated variation in the natural strata, and the necessary health and safety constraints of working on an active quarry. In many instances, a variety of investigative techniques were tested in order to enhance data recovery. Geophysical survey, topographic survey, fieldwalking (before and after topsoil stripping), test pitting, and auger survey were employed to provide a fuller record than would have been produced by the watching brief alone.

1.4 CHRONOLOGY OF INVESTIGATION

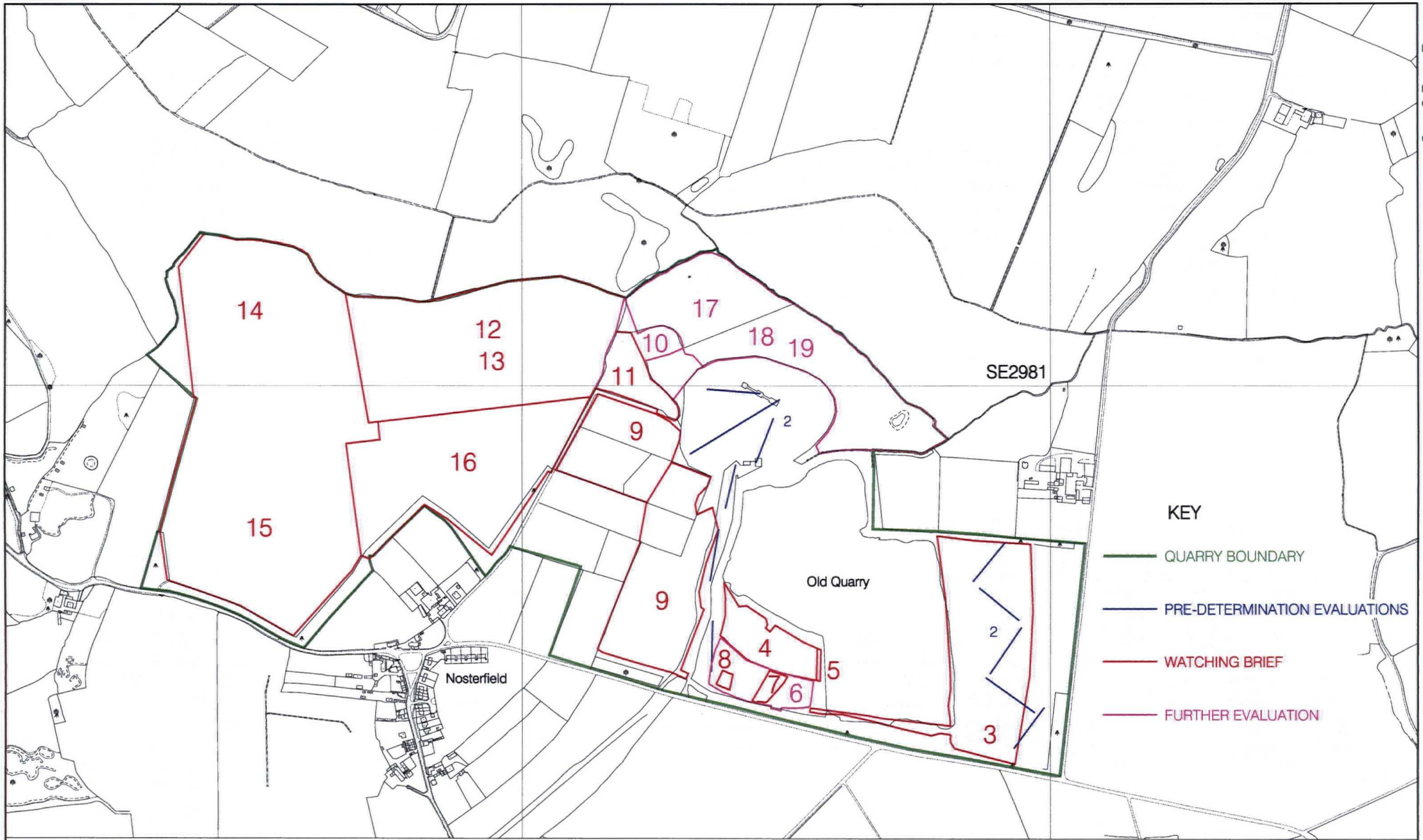
Pre-determination assessment and evaluation of the Nosterfield Quarry site was undertaken in a number of stages from 1991 to 1995, with the watching brief commencing in 1995 (Table 1; Figure 3). Fieldwork was initially undertaken or commissioned by Mike Griffiths and Associates (MGA); phases of fieldwork were carried out by West Yorkshire Archaeological Services (WYAS) and AOC (Scotland). Full reports on all of these stages are available online at:

www.archaeologicalplanningconsultancy.co.uk/mga/projects/noster/index.html.

From 1998 onwards, FAS continued a programme of further evaluation, watching briefs and surveys at successive areas of the Nosterfield Quarry site. The methodology and results for each investigation are presented individually: relevant feature and structure indices are appended (Appendix A and B), along with specialist reports.

Table 1 Index of Investigations

Investigation No	Intervention No	Quarry Phase	Activity	Contractor	Date
PRE-DETERMINATION ASSESSMENT AND EVALUATION					
1	-	-	Desk based assessment, walkover and test pitting	MGA	July 1991 - January 1992
2	-	-	Evaluation	AOC	January 1995
POST-DETERMINATION SURVEY, FURTHER EVALUATION AND WATCHING BRIEF					
3	Area 1, 2, 3, Trench 4	1a, 5b	Watching brief	MGA	Spring 1995
4	Trench 5	0.083	Watching brief	MGA	1996
5	-	0.083	Watching brief	WYAS	January 1997
6	-	0.083	Geophysical survey	WYAS	March 1997
7	Trench 7	0.083	Evaluation	MGA	March 1997
8	Trench 6	0.083	Watching brief	MGA	Spring 1997
9	Intervention 1, 2	1b	Watching brief	FAS	April-Sept 1998, April 1999



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Map of archaeological investigations | Scale 1:10000 | Figure 3

Investigation No	Intervention No	Quarry Phase	Activity	Contractor	Date
10	Intervention 3	2b, 5a	Walkover and contour survey	FAS	Summer 1999
11	Intervention 4	2b, 5a	Watching brief	FAS	September 1999
12	Intervention 6	2b	Walkover survey	FAS	December 1999
13	Intervention 5NE	2b	Watching brief	FAS	January - February 2000, May 2000
14	Intervention 5NW	3	Watching brief	FAS	October - November 2001
15	Intervention 5SW	3	Watching brief	FAS	April and June 2002, September 2002
16	Intervention 5SE	4	Watching brief and test pits	FAS	November - December 2003, June 2004
17	Intervention 9	0.2083	Topographic survey (Flasks)	FAS	August 2003
18	Intervention 7	0.2083	Augur survey (Flasks)	FAS	August 2003
19	Intervention 8	0.2083	Evaluation (Flasks)	FAS	September 2003

2.0 ARCHAEOLOGICAL BACKGROUND

There is now a considerable corpus of information available for the development of the Thornborough landscape, and a strong interest from both academic and public quarters. However, very little in the way of modern archaeological information was available for the area at the outset of this project in 1995. The principal prehistoric features - the henges, cursus and round barrows - had long been recognised, and had formed the focus of antiquarian attention since the 1860s. Continued interest in the 1950s added to the knowledge of these monuments, but again this activity focussed on small-scale investigations of specific monuments. Until recent work by the Vale of Mowbray Neolithic Landscape Project (Harding 1994-1997; Harding and Johnson 2003; 2004a-d), and the work at Nosterfield Quarry, little research had been undertaken to understand the wider context of these monuments. The current state of knowledge has been summarised in recent reports and large-scale assessments (Harding and Johnson 2003; FAS 2003a). Fieldwalking programmes (Harding and Johnson 1994; 2004b), environmental investigations (Howard *et al* 2000; Long and Tipping 1998; Tipping 2000), survey and excavation (Harding and Johnson 2004a-d) allow the landscape of the Thornborough monument complex to be explored further. Even so, fieldwork in the area is still seen to lag behind the more intensively studied prehistoric landscapes of southern England, and calls have been made for more comprehensive, detailed investigations of upstanding and below-ground archaeology (Harding and Johnson 2003, 9). In this context, the current work at Nosterfield quarry will provide a valuable and significant contribution to this area of research.

2.1 HISTORY OF ARCHAEOLOGICAL INVESTIGATIONS IN THE NOSTERFIELD AREA

The relative lack of knowledge at the outset of this project in 1995 can be emphasised by considering the history of investigation to that date, through antiquarian activity, early archaeological excavations and modern research. These results contrast dramatically with information that has been acquired since that date. The main focus was naturally on the prehistory of the area, but until the work of the 1990s, very little work was undertaken on a broader, landscape-wide scale.

2.1.1 Antiquarian studies

Prehistoric monuments

Antiquarians and commentators of the 18th and 19th century had long been aware of the major monuments of the Nosterfield/Thornborough area, and particularly the three Thornborough henges that lie to the south of Nosterfield Quarry (Pennant 1773, in Thomas 1955, 443). The Ordnance Survey edition of 1852 labels them as 'camps' (OS 1852), and it appears that the nature and date of these monuments was little understood. Some contemporary scholars did, however, question this identification, instead suggesting their use for cattle pens or religious assembly (Lukis 1870a, 118-9). Antiquarian activity did not, however, focus on the henges, but on the more familiar barrows that cluster around them. These were recognised as prehistoric burial sites, and as such, were expected to yield interesting finds. Excavation of these monuments, many of which had already been substantially diminished by ploughing, formed part of the pastimes of notable individuals, and most particularly for this region, of the Reverend W. Lukis (Lukis 1870a, 119). Lukis' accounts record the enthusiasm of his contemporaries for the excavation of ancient remains:

> '...in the following week the Rev. W. Greenwell, of Durham, paid me a visit, and as I knew that no manual employment would afford him greater pleasure than grave-digging, I proposed that we should make a further examination of Howe Hill....' (Lukis 1870b, 176)

Numerous barrows are known to have existed in the wider area of the vale occupied by the Rivers Swale and Ure, and a considerable number have been recognised in the immediate vicinity. Lukis describes the remains of 'Centre Hill' barrow, between the southern and central henges, and records the finds of a body, thought to have been in a log coffin, '5 feet below the apex' (Lukis 1870a, 119). To the south of the Nosterfield Quarry, a series of barrows gave 'Three Hills Field' its name, and several more barrows are known from cropmarks and upstanding remains in the area around the Thornborough henges. Lukis is known to have investigated all three of these monuments, and records, albeit briefly, finds of ceramic vessels, flint and cremated bone (Lukis 1870a, 120).

In 1846, in the more easterly area surrounding the henge at Hutton Moor, antiquarians opened a barrow. Accounts record traces of charcoal, and evidence for burning beneath a small cairn, though no burial was identified (Manby 1971, 178). Lukis also excavated three barrows on Melmerby Common in 1864, and all were found to contain cremated bone, one with an urn and one with a pygmy cup (Lukis 1870a, 120; Manby 1971, 177). Their precise locations are unknown, although one is presumed to have been the 'Burtree Barrow', as flint implements from the investigations are recorded to have come from 'a barrow west of Sixpenny Hill, Parish of Sharow'. These activities seem to have been popular for some time, and the barrow at Stapley Hill, near Kirklington, is known to have been excavated in 1903 (Manby 1971, 175).

Fortunately, Lukis and his contemporaries left some account of their activities, though the records are notably cursory (Lukis 1870; Harding and Johnson 2004a, 5). Prior to recent excavations at Nosterfield Quarry, and in the Thornborough monument complex (Harding and Johnson 2004a; 2004d), these were the only 'archaeological' records pertaining to Bronze Age monuments in the immediate vicinity, and over the centuries, the barrows have been increasingly damaged by cultivation (Harding and Johnson 2004a, 16).

Early medieval sites

Lukis also encountered burials which seem likely to date to the early medieval period. At Howe Hill, near Carthorpe, four inhumations were identified and excavated. One was found to have been buried with at least four glass beads, and other grave goods included knives, buckles and strap ends. From Lukis' descriptions, it appears that these might represent crouched burials (Lukis 1870b). Another inhumation close to Camp Hill, again with grave goods, was deemed by Lukis to be 'evidently of the Danish period' (Lukis 1870b, 180). Lukis notes the propensity for burial on the top of gravel ridges (Lukis 1870b).

Of subsequent early medieval activity little appears to have been known, and the enthusiasm for exploring any possible sites of this date is not so evident. Collingwood (1907; 1909-11) records the presence of Anglian sculpture from Magdalen Field, and from the garden of Tanfield Lodge, while Whellan (1859) records the presence of a chapel near Hall Garth. Little further attention was given to remains of this date, and the nature of activity during this period remains largely uncertain today.

Even less attention appears to have focussed on remains of later periods. Few upstanding monuments of medieval and later date are known from the vicinity; the area is considered to have been primarily common land or agricultural through to the modern period. Antiquarian activity remained directed primarily towards the prehistoric monuments.

2.1.2 Archaeological investigations of the 20th century

Prehistory

The focus on major monuments continued into the 20th century, when more detailed archaeological investigations were carried out at the Thornborough monument complex (Thomas 1955; Vatcher 1960), and in the wider area. In addition to the three monuments of the Thornborough alignment, the henges further south, at Hutton Moor, Nunwick and Cana Barn, were studied. Of these six, four were subject to some form of archaeological investigation during the early to mid-20th century. The Hutton Moor henge was investigated 'some years' before 1929 (Raistrick 1929, 364) and Nunwick was explored in 1961(Dymond 1964). During 1952, Nicholas Thomas investigated the central of the Thornborough henges (Thomas 1955). At the central henge, two small sections were cut across the inner ditch, one of which was extended to investigate the outer bank, two were cut across the known line of the cursus and a small trench was dug close to the centre of the henge (Thomas 1955, 428). A profile across the northern henge was also undertaken, with two test pits dug into the bottom of the inner ditch (Thomas 1955, 434).

During investigations of the central Thornborough henge, Thomas identified a significant quantity of gypsum, which was used to suggest that the monument banks may have been coated with white gypsum (Thomas 1955, 433). Conclusions concerning date and chronology were, however, rare, as few diagnostic finds were produced. On the basis of simplicity, the Nunwick henge was considered to be the earliest of the six (Dymond 1964, 101). Thomas (1955, 429) used climatic evidence from soil samples to suggest a date in the early Bronze Age for the construction of the henges. Only during much more recent excavations of the Thornborough complex were more secure, scientific dates produced, and various phases of construction identified (Harding 1998; Harding 2003).

Burl's classification of the henges, building on work by Atkinson and Piggott, highlighted the links between these monuments as a distinct group. Five of the six known henges in the region belong to Burl's Class IIA, of which the 'Big Rings' of Dorchester-on-Thames is the only example outside this area of North Yorkshire (Burl 1969). The recognition of these monuments as a regional group was an important move away from the concentration on monuments in southern England.

A cursus, running across the central Thornborough henge, was initially identified between 1945 and 1958 by J.K. St Joseph, whose aerial photographs revealed a linear feature at least 2.3km in length and between 44 and 58 km wide, aligned NE-SW. Thomas (1955) carried out excavations of the cursus ditch in 1952, also recording the sections of the cursus as they were removed during gravel quarrying at their western end (Thomas 1955, 429-432). Thomas showed that the cursus ditch underlies the southern bank of the central henge, and a high humus content in the lower backfill of the cursus ditch was seen to reflect the location of the monument in 'relatively close woodland under an oceanic climate with plentiful rainfall'. It was therefore concluded that 'the Thornborough cursus was constructed in the Atlantic or pre-Bronze Age climatic phase (Thomas 1955, 432).

Vatcher recorded the nature of the cursus ditch some six years later, when 'owing to extensive gravel quarrying, part of the northwest side of the cursus ditch had been exposed and part quarried away' (Vatcher 1960, 425). Although no artefacts were recovered from this fieldwork, study of the soil samples led Vatcher to support the conclusion that the monuments would have been constructed in the late Neolithic-early Bronze Age, again on the grounds of evidence for climate change (Vatcher 1960, 179). This date has since been parallelled by finds at other cursus sites in Yorkshire (Topping 1982).

During quarrying in 1958 a stone cist was uncovered, containing a crouched inhumation, on the central line of the cursus (Vatcher 1960, 181-2). This may represent continued use of the monument complex into the Bronze Age. During the 20th century, more work was also undertaken on the barrow burials. The Quernhow barrow was investigation in 1949 (Waterman 1951), revealing two phases of burial, which included cremations accompanied by food vessels.

Roman

Investigations during the 1930s to 1960s also revealed more about Roman use of the Nosterfield landscape, though the lack of major settlements in the area means that known remains are dispersed and often fragmentary. The main landscape feature that has been recognised for some time is the route of Dere Street, which formed a predecessor to the modern A1. Sections of road surface were identified at Healam Bridge in 1949 (*YAJ* 1951, 522-3) and at the Baldersby Gate cross roads in 1939 (*YAJ* 1943, 97-9). This was the only Roman route known in the area.

Major forts were known to have existed at Aldborough and Catterick, but the much closer settlement at Healam Bridge was not securely identified until the 1990s, just prior to the onset of the current investigation (Jones 1994). This fort was dated by ceramic evidence to the Hadrianic/Antonine period, though some evidence for 3rd and 4th century activity has been revealed. The settlement comprised a fort and associated *vicus*; the latter had come to dominate the site by the 4th century (Jones 1994). Additionally, a single inhumation was known from investigations (Jones 1994).

Within the more rural landscape surrounding the area of investigation, a number of smaller sites were known, including at least two villa complexes. Investigations at Well, less than 1km northwest of Nosterfield, produced evidence for a bathhouse, and tessellated pavement (Gilyard-Beer 1951), ascribed a date in the late 2nd century (Smith 1969, 78). A second villa has been recognised to the south, at Castle Dikes, where a bipartite complex was identified within a subrectangular earthwork (Berry 1953), producing evidence for mosaic floors of 2nd-century date, and fragments of painted plaster (Liversidge 1969, 141, 148). At Yamagarth, near Kirklington, a burial was found, associated with finds of 'white ware', though the only Roman evidence in the immediate vicinity comprised a bronze brooch, found in 1951 (*YAJ* 1951, 523).

Throughout the 20th century, interest in archaeological evidence of later periods increased, and the deserted medieval villages of Britain were given more attention (Beresford and Hurst 1971). The sites of East Tanfield, Yarnwick Garth, Nunwick, Howgrave and Sleningford are among the deserted settlements in the area surrounding Nosterfield; the village of East Tanfield was considered by Beresford and Hurst to be of medium quality, worthy of preservation (Beresford and Hurst 1971).

2.1.3 Modern investigations in the Nosterfield Quarry area

During fieldwork of the early 1990s, prehistorians such as Harding expressed the need to appreciate regional variation in monumentality, and to move away from using the southern complexes of Wessex as comparanda (Harding 1991). In recognising the lack of modern archaeological research directed towards the monuments of this area, and the need to explore their landscape context, the Vale of Mowbray Neolithic Landscape Project was established in 1994, and conducted a series of investigations which ran until 1999.

2.2 THE STATE OF KNOWLEDGE IN 1995

At the outset of the current investigation, the significance of the prehistory of the Nosterfield area was beginning to be recognised, tying in with a move towards wider landscape approaches to prehistory. The work by Harding was revealing the complex organisation of the landscape, as a programme of reconnaissance fieldwalking demonstrated variations in the distribution of artefacts from different periods. During the Mesolithic and early Neolithic, the area appears to have been widely used, and no discrete patterns were identified. However, during the later Neolithic and early Bronze Age, contemporary with the construction of the major monuments of the area, there appears to have been a marked change in the occupation of the landscape, and evidence for domestic occupation was found to occur at locations distant from the henge monuments. This has been interpreted as a conscious separation of sacred and profane, corresponding with major changes within the organisation of society (Harding 1994, 1995).

The watching brief that had started within Nosterfield Quarry was providing a rare opportunity to investigate large open areas within the landscape and was beginning to reveal the nature of the surviving archaeology within this area. Although much damaged, and often destroyed, by medieval, post-medieval and modern agriculture, the archaeology within the wider area was beginning to be recognised by the academic community as one of significance for the study of prehistory and landscape use in northern England.

3.0 PRE-DETERMINATION ASSESSMENT AND EVALUATION

The earliest investigations associated with the quarry were undertaken by Mike Griffiths and Associates, in support of a planning application for sand and gravel extraction at Nosterfield. A desk-based assessment was carried out, followed by an archaeological evaluation.

3.1 INVESTIGATION 1 (DESK-BASED ASSESSMENT)

In July 1991, Tilcon Ltd. commissioned a preliminary archaeological survey for an area of proposed quarrying near to Nosterfield (MGA 1991; MGA 1992). This involved a desk-based assessment of the archaeological resource, using records available at the time (Phase 1), following which attention was paid to an area in the northern part of the proposed quarry, known as the Flasks. This area was subject to a walkover survey, the recovery and sieving of samples of peat, the extraction of a 1m monolith, and the preparation of a deposit model (Phase 2).

3.1.1 Fieldwork results

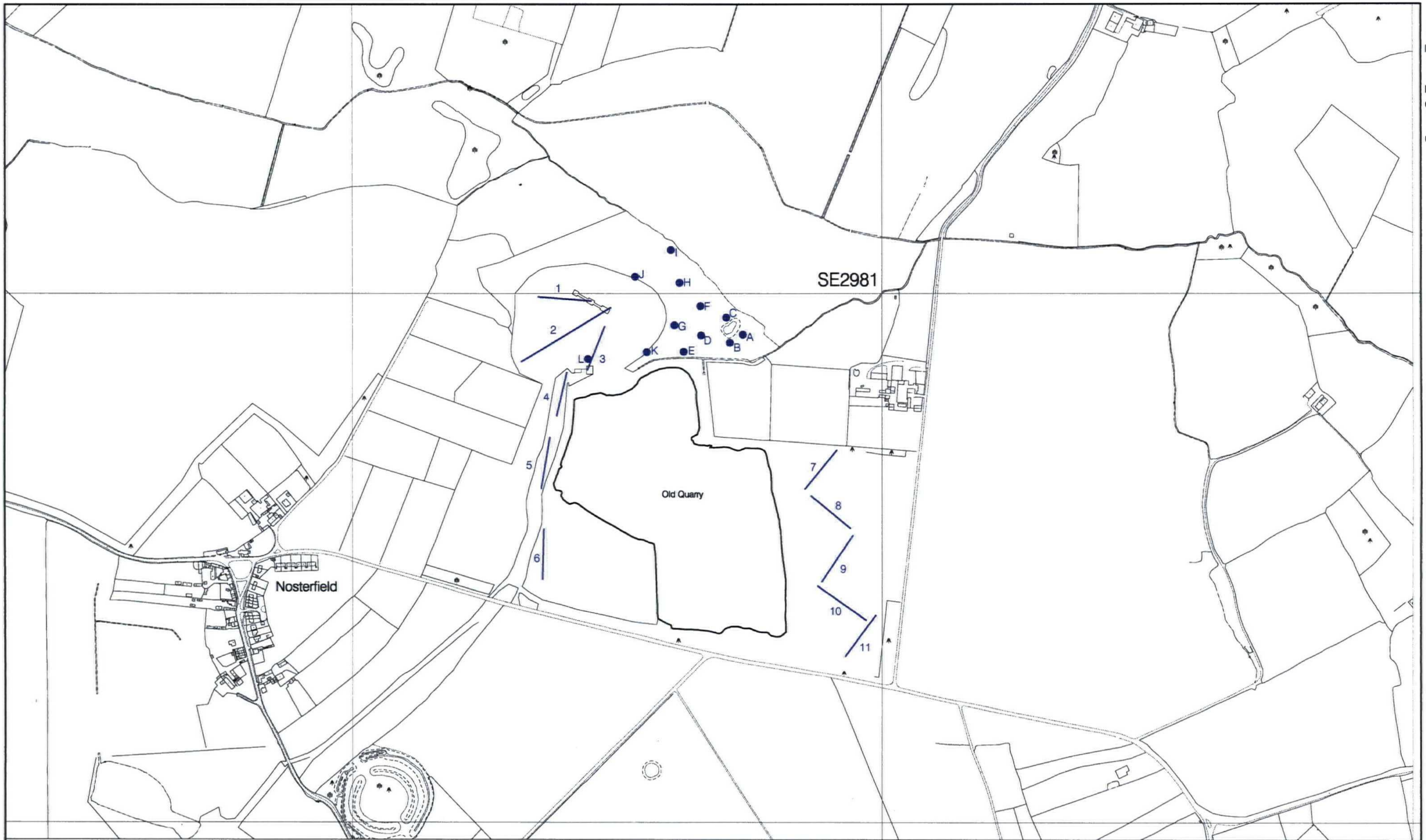
Phase 1
The desk-based assessment was compiled following an examination of records held in the North Yorkshire SMR, County Archives, local history collections and available aerial photographs. The importance of the area as a prehistoric ritual landscape was recognised, as was the fact that features associated with this landscape would extend into the area to be quarried. This research identified pre-existing soil surveys which suggested that the area of pasture beneath the Flasks contained peat deposits potentially containing palaeoenvironmental evidence. As such, investigations commenced to ascertain the extent of the peat, and the nature of remains preserved within it.

Phase 2
In October 1991, a 1m monolith was extracted from the Flasks (SE 286 808), and subject to analysis (Berg 1991), which revealed that the peat at Nosterfield is phragmites peat, formed at the edge of an ancient lake. During sampling, a number of flint items were recovered from the surface of the area, which have since been subject to specialist study and identified as flakes of uncertain date (Appendix C: Part 1).

Following these results, the area of investigation was extended, and a walkover survey of an area of pasture was undertaken. In twelve locations (A to L), 2kg samples of exposed peat/soil were collected and wet-sieved; finds recovered from this were all identified as modern brick or tile (Figure 4). This survey allowed some conclusions to be drawn concerning the extent of the peat, and the area was subsequently subject to an auger survey, which confirmed the presence of a continuous stratum of peat, which became shallower towards the north of the area. The survey also identified a number of much deeper channels which may have been formed by water.

3.2 INVESTIGATION 2 (EVALUATION)

An evaluation was carried out in January 1995 by AOC (Scotland) on behalf of Mike Griffiths and Associates, for Tilcon Ltd., in advance of the extension of the gravel quarry at Nosterfield (Quarry Phase 1a, 5b; see Figure



Location of Investigations 1 and 2 | Scale 1:10000 | Figure 4

2). Two areas were subject to investigation: a corridor to the west of the earlier quarry, for the installation of a haul road, and a rectangular area to the east of the earlier quarry. The evaluation consisted of eleven trial trenches. All trenches were 100m x 2m, with the exception of Trench 2, which measured 200m x 2m (see Figure 4). The topsoil was stripped, and visible features were cleaned, excavated and recorded (Dalland 1995).

3.2.1 Fieldwork results

The Flasks (Trenches 1 to 3)
Work on the area of the Flasks revealed a total of four features of potential archaeological interest, comprising two linear features and two sub-circular pits. Of these, one of the pits (Cut 102) and one of the ditches (Cut 104) produced modern material, and the second ditch (Cut 106) was identified as an old hedgerow. The final pit produced no datable remains.

Haul Road (Trenches 4 to 6)
Within Trenches 4 to 6, apart from a modern field drain in Trench 4, the only identifiable features were two sub-rectangular pits identified in Trench 6 (Cut 603, Cut 605). Two samples from these features revealed that they contained carbonised hazelnut shells and charcoal, as well as a flint artefacts (Holden 1995). Analysis of the flint remains suggested that they would not be out of place in a Neolithic context, but that they could not be used to ascribe a secure date (Rowe 1998; Appendix C: Part 1).

Eastern end of the old quarry pit (Trenches 7 to 11)
Within Trenches 7 to 11, just three features of archaeological potential were identified, comprising a circular pit (Cut 702), the butt-end of a ditch (Cut 1001) and a linear feature (Cut 1103), of which none produced diagnostic or dateable finds.

3.2.2 Assessment

Given the proximity of Investigation 2 to the known monument complexes of Thornborough, the lack of archaeological features identified in this area was notable. The potential of the area to produce prehistoric features was suggested by the environmental evidence and flints produced from pits (Cut 603 and Cut 605), but such features appear to have been very widely dispersed throughout the area. The excavation of trenches covered a total area of 2400m^2, and only two recorded features provided material indicative of a potentially early date; perhaps significantly, these were found in the same trench.

4.0 WATCHING BRIEF

4.1 INVESTIGATION 3 (AREA 1, 2 AND 3, TRENCH 4)

Also in 1995, a watching brief was undertaken during the stripping of topsoil in an area of Nosterfield Quarry previously evaluated by Trenches 7 to 11 of Investigation 2 (Quarry Phase 1a, 5b)(Figure 5). For the purposes of recording, this area was divided into Areas 1 and 2. A watching brief was also maintained on the construction of the haul road, referred to as Area 3, which had been covered by Trenches 4 to 6. The results of this fieldwork

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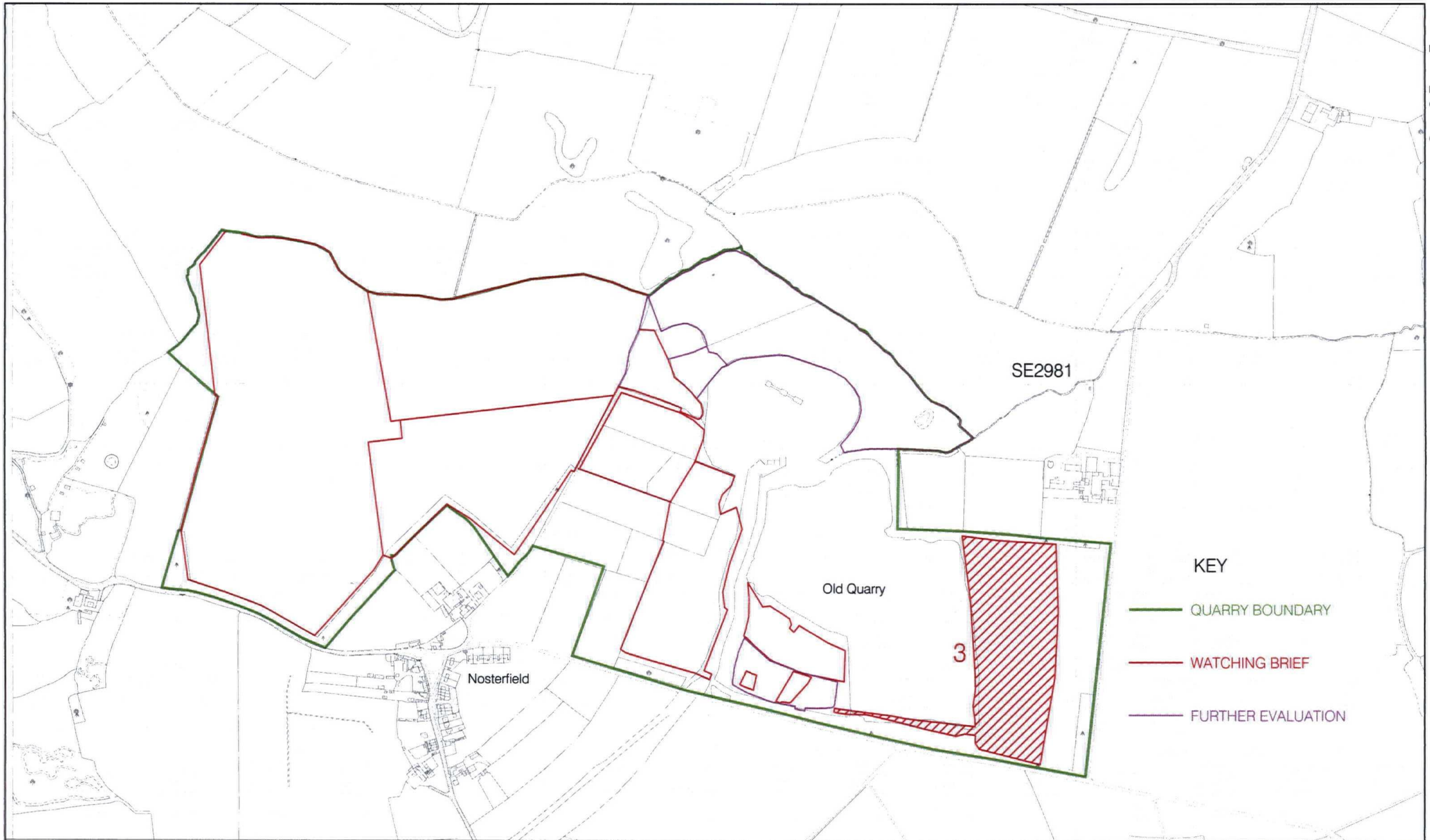

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Location of Investigation 3

Scale 1:10000

Figure 5

were reported in an earlier document, on which the following summary is based (Gledhill and Griffiths 1995).

4.1.1 Fieldwork procedure

The upper portion of the topsoil was removed using box scrapers which was a common practice on quarries in this period. The remaining topsoil was removed using large back-acting excavators fitted with a wide, toothless ditching bucket. Initially any anomaly was marked and mapped, and if considered to be a genuine feature, was excavated in half-section and recorded. In Area 1, this strategy was revised in the light of the number of features being revealed, and the speed of the topsoil stripping. Where groups of features existed, then at least one of each size was planned and sectioned. The others were located, and sectioned when working conditions allowed, or were quickly excavated to recover any material; machines were used to section the sink holes (Appendix A).

Due to the soft nature of the marl in Area 3, the topsoil and marl were excavated together, which reduced the potential for identifying archaeological features. Where possible, these were noted and recorded.

The cut numbers originally assigned are used as feature numbers for the purposes of this report, and are used to refer to the cut and related deposits as a group.

4.1.2 Fieldwork results

AREA 1 (TRENCH 4)
Area 1 was the largest of the three, and covered an area of approximately 6.2 hectares to the east of the old quarry workings and south of Ladybridge Farm, bounded to the east and south by roads. This land occupies the end of a low ridge, which extends southwards beyond the B6267 Nosterfield road. At the western part of the site, the land was found to slope away sharply towards the edge of a relict lake.

Topsoil stripping in this area revealed an orange-brown subsoil, up to 0.50m thick, over clean grey sands, grits and gravels, which were exposed in places. On the western edge of the area, where the ground surface sloped towards the in-filled lake, strips of desiccated peat were exposed which possibly marked the edge of the Pleistocene lake. Elsewhere, one large area of heavier clay was noted (50m east-west by 30m north-south). Almost the entire surface of the subsoil was found to be covered with parallel lines of disturbance 0.20m wide and 0.50m apart, which were identified as modern subsoiling. The area of clay was also cut by a series of stone-filled land drains which produced no dating evidence but which are considered to be post-medieval in date.

Pits and hearths
During excavations, a series of 83 anomalies were identified, of which 38 were excavated and recorded in detail. The remainder were located and rapidly excavated in order to retrieve dating evidence, but not fully recorded, due to time constraints. The features were found to be distributed across Area 1, forming two loose groups to the north and south (Figure 6). Within this distribution, two smaller clusters of features could be identified (Figures 7 and 8). No features were revealed on the area of clay, or on the lower slopes leading to the relict lake.

The section drawings of the 38 sectioned features reveals them to have been pits (35) or scoops (3), of which 13 were interpreted as hearths on the basis of heat affected soils or charcoal-rich fills, and the remaining 70 were

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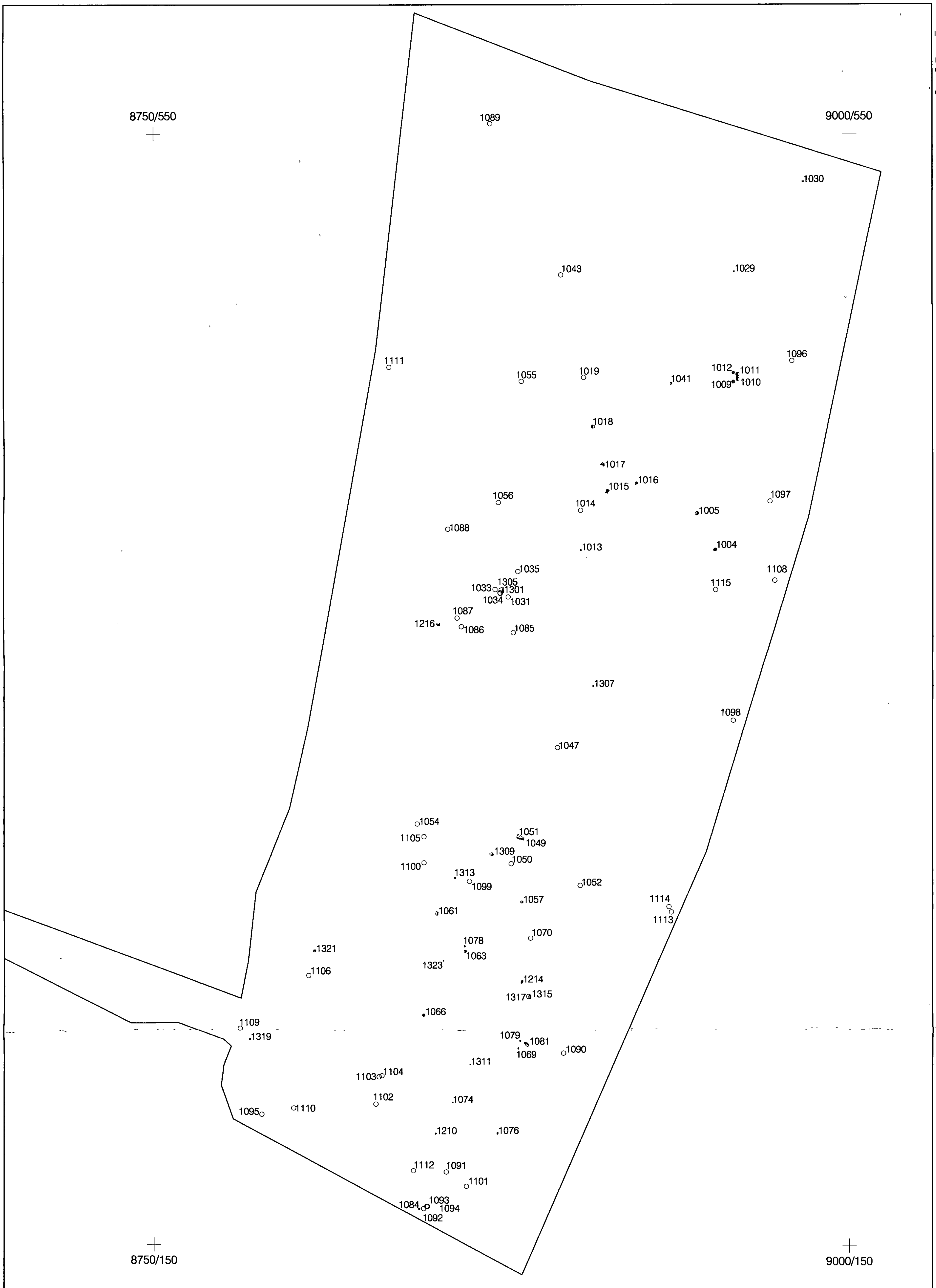

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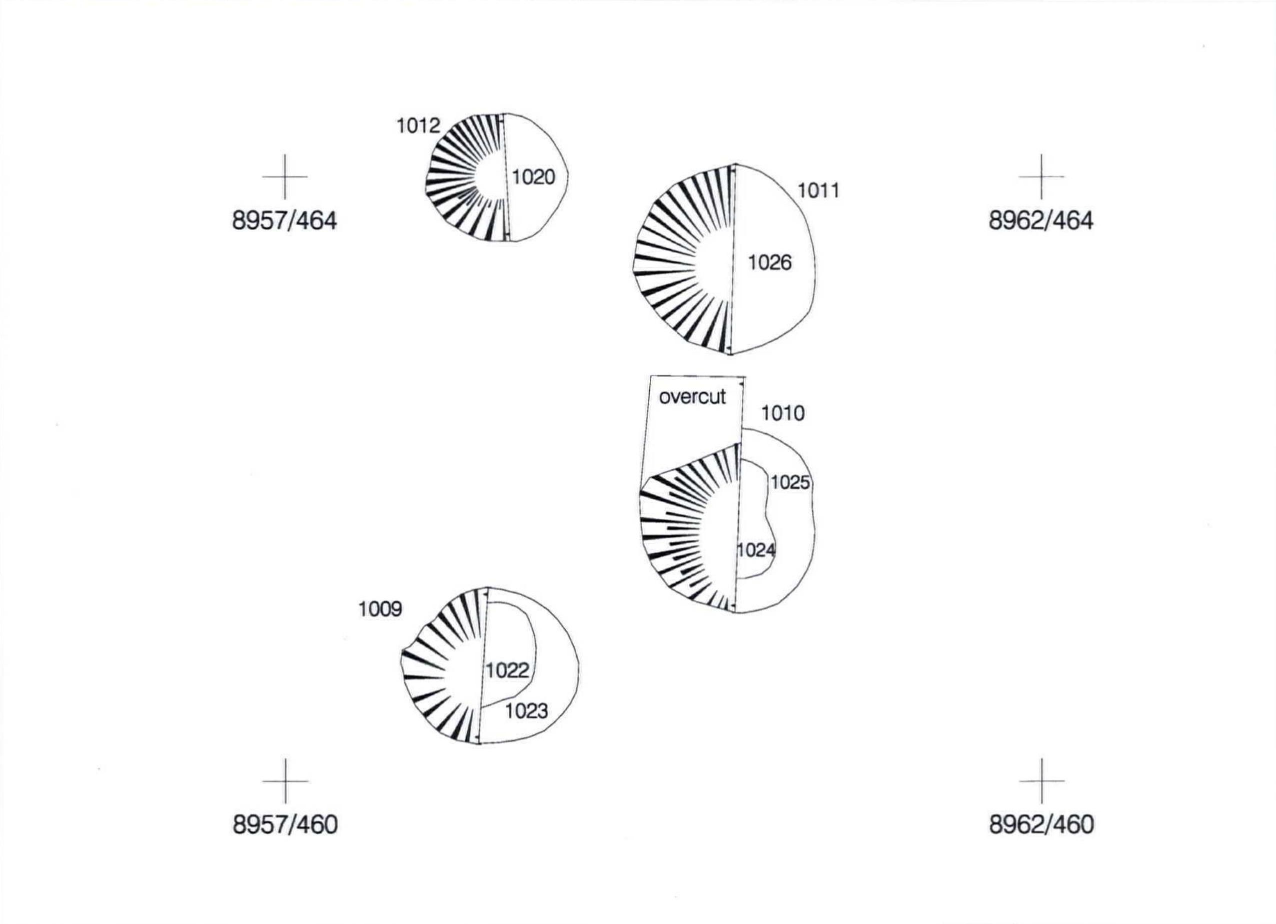
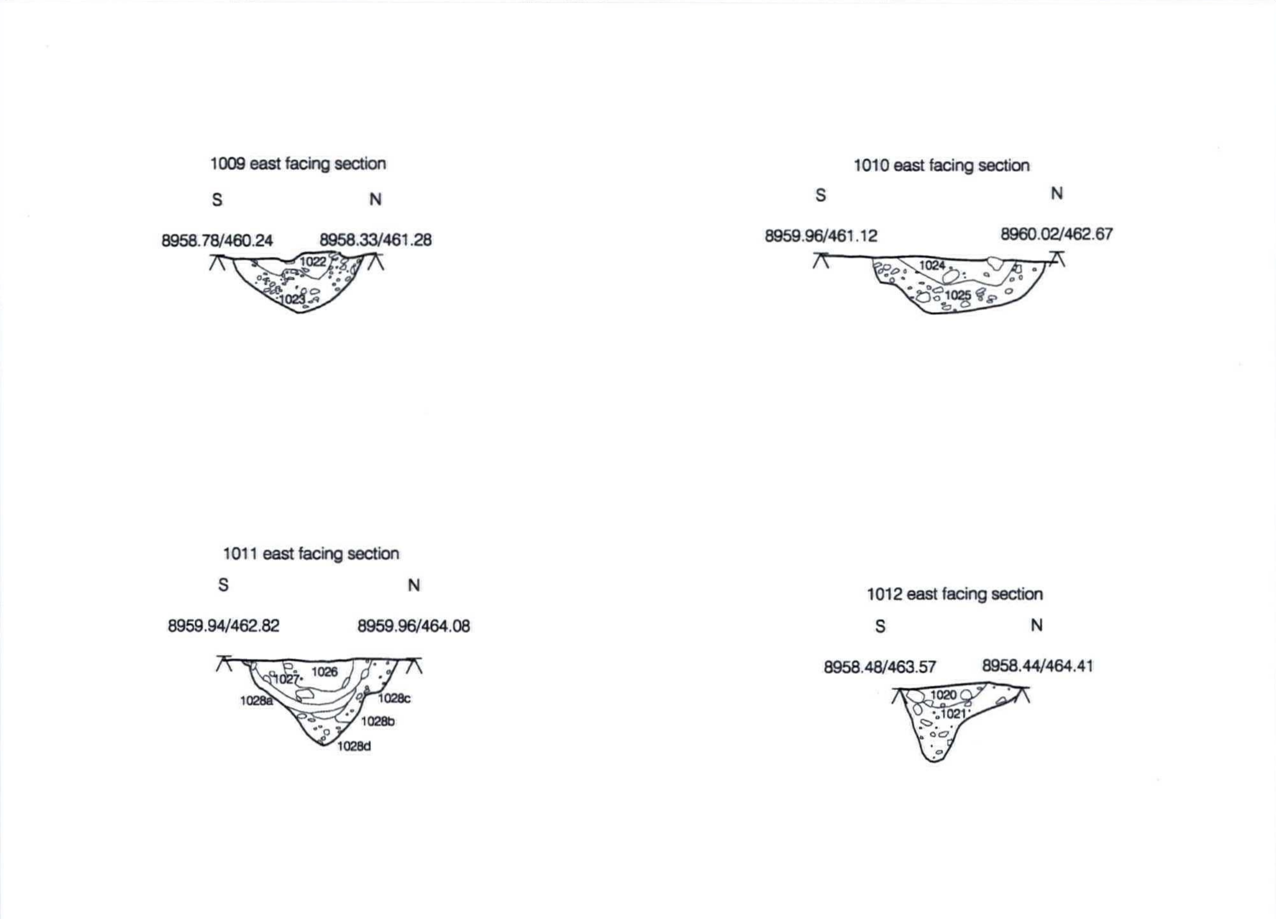
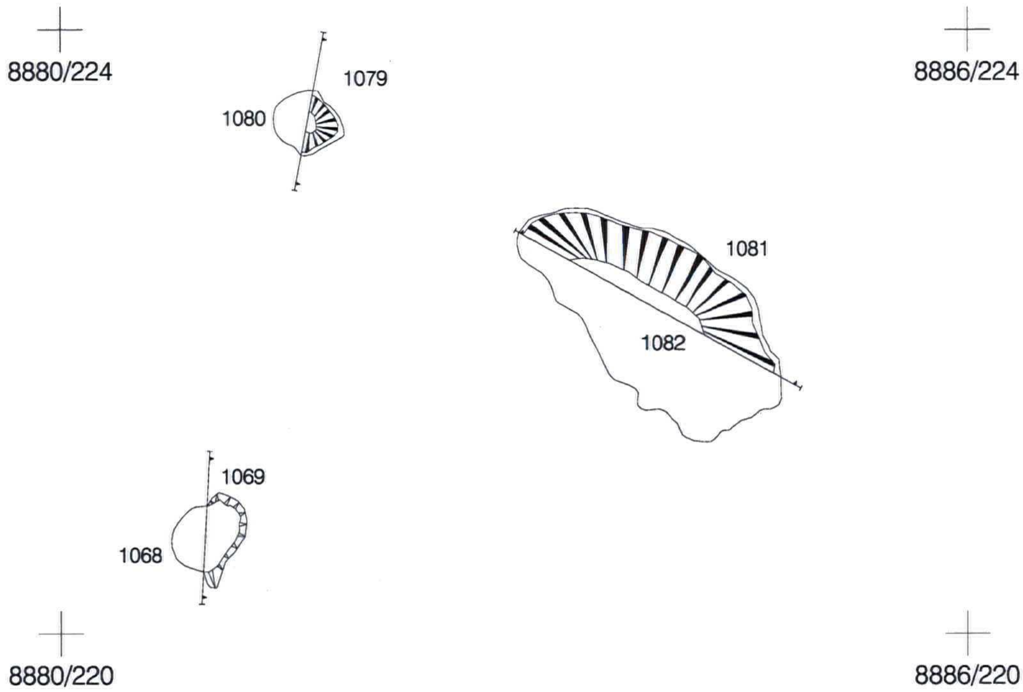
Investigation 3 (Trench 4, Area 1) map of archaeological features	Scale 1:1250	Figure 6



Investigation 3 pit complex hachure plans | Scale 1:50

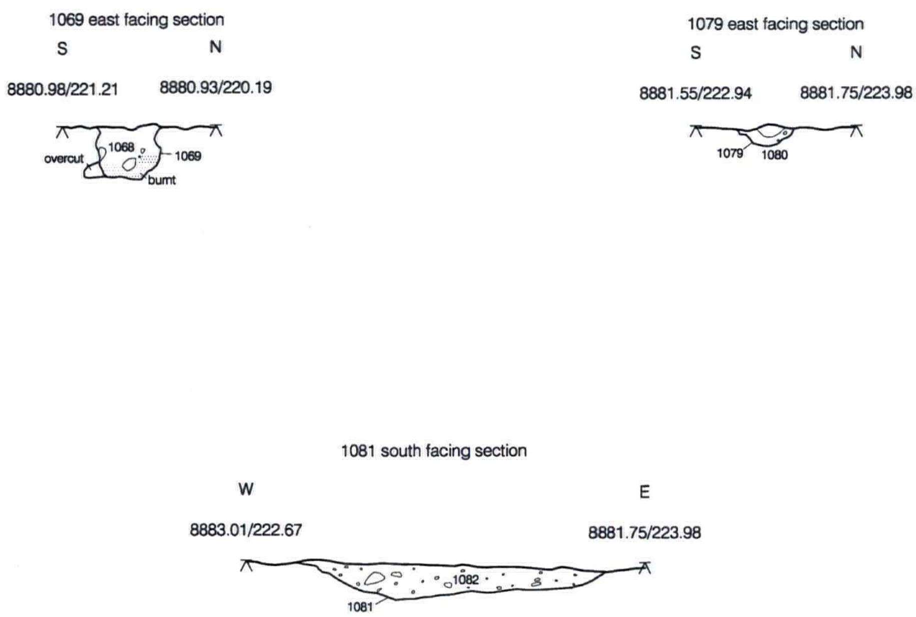


Investigation 3 pit complex sections | Scale 1:50 | Figure 7



Investigation 3 hachure plans of 1069, 1079 and 1081

Scale 1:50



Investigation 3 sections of 1068, 1080 and 1082

Scale 1:50

Figure 8

therefore classed as pits.

Features which might tentatively be identified as hearths include F1061, F1069 and F1081, the cuts of which were described as slightly heat affected soil beneath a fire. Other anomalies which appear to have been scorched, and were interpreted on site as possible hearths, included some rapidly excavated features (F1085, F1095, F1100 and F1102). Other features which are described as containing patches of soil burnt a dull brick red (F1041 and F1115) are probably pits which produced evidence of burnt material (for example F1051 produced charred hazelnut shells and burnt bone). F1051 is described as being made up of a series of features.

The pits varied in size and shape. Three different types were identified by the excavators (Type 1-3) based upon the number and the character of the fill, and the presence of finds. Type 1 pits were found to be the most common, consisting of regular U- or V-shaped profile, with a diameter of between 0.80m and 1.20m, and ranging from 0.20 to 0.80m in recorded depth. This type typically had three fills, with a sterile lower backfill, and finds of flint and rare ceramic fragments in the upper fills. The upper fill was usually stony or contained frequent burnt stones and occasional charcoal; the middle fill was charcoal-rich; the lower fill was also stony and produced only occasional charcoal, although burnt stone was rare or absent. Nine pits of Type 1 were excavated (F1005, F1015, F1030, F1057, F1066, F1210, F1216, F1313, F1321), and six other anomalies may also belong to this group (F1052, F1089, F1092, F1099, F1112, F1398).

Type 2 pits (F1009, F1010, F1012, F1016, F1017) contained two fills, lacking the 'bowl shaped second fill of Type 1'; the upper fill was a less stony silty matrix which produced occasional burnt stone and charcoal; the lower fill was stony with a coarse sand component. Finds were recovered mostly from the upper fills of these features.

Type 3 pits were smaller, with a base that was level or slightly dished (F1069, F1074, F1307). The upper fill was sandy and virtually stone free, with few charcoal flecks, but the lower fill was slightly siltier, with occasional fragments of burnt stone and more charcoal. Finds were mostly in the lower fill; pottery was common with flint less common. Of these examples, records suggest that F1074 and F1069 had only one fill, which may indicate that they may in fact belong with the remainder of the features which were not assigned to any type.

F1004 was the only pit to be fully excavated and recorded. It had apparently been re-cut with sandstone slabs positioned in the base of the re-cut. Possible re-cuts were observed in two other pits, F1011 and F1305, and a flat fire-scorched stone was found in a horizontal position close to the surface of F1009.

F1305 was a large sub-rectangular pit, and represented the only feature on the site with significant stratigraphy. The primary fill, C1304, was composed of a loose, fine, ashy material with frequent small stones and gravel. It darkened gradually toward the base from grey to almost black; much of the stone content was burnt. The upper fill, C1302, appeared to be a re-deposited subsoil (C1303). It had been cut on the north side by a re-cut F1301, filled with a grey to black deposit which consisted mostly of charcoal. Rounded pebble-sized stones which were reddened and cracked were common, particularly toward the base of the fill.

Of the remaining 45 features which were not fully recorded, 38 were identified as pits, and 7 as possible hearths.

Generally, these features are undated, although Neolithic dates have been suggested for two, on the basis of ceramic or lithic material.

Possible Sink Holes

F1117 and F1118 were two large circular features, both of which were sectioned by machine. The northern feature, F1118 was vertical-sided, 2.00m in diameter and over 1.50m deep. It contained a mid-brown loamy sand. The southern pit, F1117, was 3.00m in diameter and over 1.00m deep and several fills were noted. The upper fill was a mid-brown sand, 0.40m thick, although on the surface was a discontinuous spread of charcoal and burnt soil; below this were successive fills of stony material.

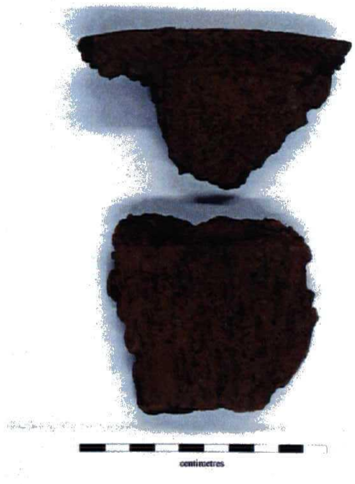


Plate 1 Peterborough ware

Finds

Nineteen of the excavated features produced finds of prehistoric date. The material consisted primarily of pottery, of which the most diagnostic fabrics are identified as Grimston Ware, Peterborough Ware and Grooved Ware (Plate 1), and lithics (Appendix D: Part 1). Although much of the lithic assemblage was largely undiagnostic, those elements that were datable are considered to be not earlier than the Neolithic, and all of the tools were concurrent with use in the early and later Neolithic. Two samples were subject to environmental analysis revealed the presence of cereal grains, probably barley, along with apple/pear seeds and hazelnut (Appendix E: Part 1).

Plate 2 Volcanic rock saw

Seventeen out of the 38 excavated features produced lithic material. Most of the features produced less than 20 pieces, although two, F1011 (33), F1216 (46), produced more. One of the unrecorded features, F1096 (340), produced a substantially greater amount (Appendix C: Part 1). A number of fragments were noted to have been burnt, but as they generally occurred with unburnt flint, this cannot be considered evidence for *in situ* burning. Of the diagnostic fragments, an end scraper knapped from a polished handaxe was identified in pit F1074 and identified as Neolithic; a similar date is suggested by a leaf point (F1018), a leaf butted arrowhead (F1069), and a volcanic rock saw (F1313; Plate 2).

The ceramic material allows for some chronological distinction to be made between the features. Of the 19 features to have produced ceramic, two produced earlier Neolithic Grimston Ware, both of which are located at the southern end of the site. Subsequent activity, evidenced by later Neolithic wares, is found throughout Area 1 (Plate 3).

Plate 3 Late Neolithic grooved ware

AREA 2

Area 2 is recorded to have been located to the south of the Flasks, and west of the old gravel pit, and probably represents topsoil stripping of the northern part of the haul road to the processing plant. Topsoiling of the area revealed a sand and gravel subsoil similar in character to that in Area 1. Three features were described situated on the better drained, higher ground. F2001 was a poorly defined feature with an irregular base. It measured L0.70m x W0.45m and was 0.17m deep. It contained a brown sandy silt fill with occasional small stones and flecks of charcoal. Some 70m further north was a sub-circular feature, F2002, 0.75m diameter and 0.60m deep, which had steep sides and a rounded base and contained two fills. About 15m north of this there was a small, superficial spread of charcoal and burnt stone, F2003. The charcoal formed three small, discrete patches about 0.30m in diameter.

AREA 3

A third area (Area 3) was stripped to form a new haul road which ran north from the main Nosterfield road to the processing site, west of the old quarry workings. The topsoil consisted of a desiccated peat, mixed with a small amount of marl, probably as a result of ploughing. Beneath the topsoil were patches of better preserved peat and a thicker deposit of marl. Where it was exposed in side channels at the south and north ends of the area the marl was at least 0.40m thick, in the centre it overlay waterlogged sands and gravels at a depth of 1.00m.

Several features were noted during the topsoil stripping. A low bank made of stone was observed in the southwest corner of the area, aligned approximately north-south. A mature ash tree grew on this close to the northern end of the bank. North of it a shallow, flat-bottomed ditch was defined on a similar alignment to the bank. These features were interpreted as a recent field boundary.

To the east of the field boundary were four sub-circular pits filled with deposits of dark brown peat. These were identified as natural sink holes, and as such were not recorded as archaeological features. Three of the pits were grouped at the northern end and one at the southern end of Area 3. These features varied in diameter from 1.20 to 1.50m and in depth from 0.70m to over 1.50m.

4.1.3 Assessment

The watching brief revealed a scatter of features, pits and scoops and possibly hearths around the margins of a former lake which had apparently largely silted up by the Neolithic. The features are all that remains of what appears to be occupation near the margins of the relict lake, close to natural sink holes, which may have contained standing water or been localised patches of marshy ground. Although occasionally grouped together in small clusters, the pits and scoops do not form any coherent pattern, nor is there anything to suggest that activity was continuous, but it is perhaps noteworthy that the features which produced earlier ceramics are located at the southern end of the site.

4.2 INVESTIGATION 4 (TRENCH 5)

A watching brief in the spring of 1996 (Trench 5) revealed a scatter of features and recent animal burials. Trench 5 was a rectangular area 204m east-west by 77m north-south, situated south of the old quarry workings and approximately 100m north of the B6267 Nosterfield road (Quarry Phase 2a). It covered an area of 1.52

hectares, and had not been the subject of any previous archaeological investigation (Figure 9).

4.2.1 Fieldwork Procedure

Topsoil from the site was stripped using back-acting excavators, fitted with toothless ditching buckets. Features were identified and mapped following topsoil stripping, and a representative sample excavated and recorded.

4.2.2 Fieldwork Results

The watching brief identified a number of features scattered widely across the area of investigation, of which two appear to have been spreads (C5003 and C5034), two were identified as vegetation pits (F5037 and F3038), and the remainder comprised a ditch and a series of scoops and pits (Figure 10).

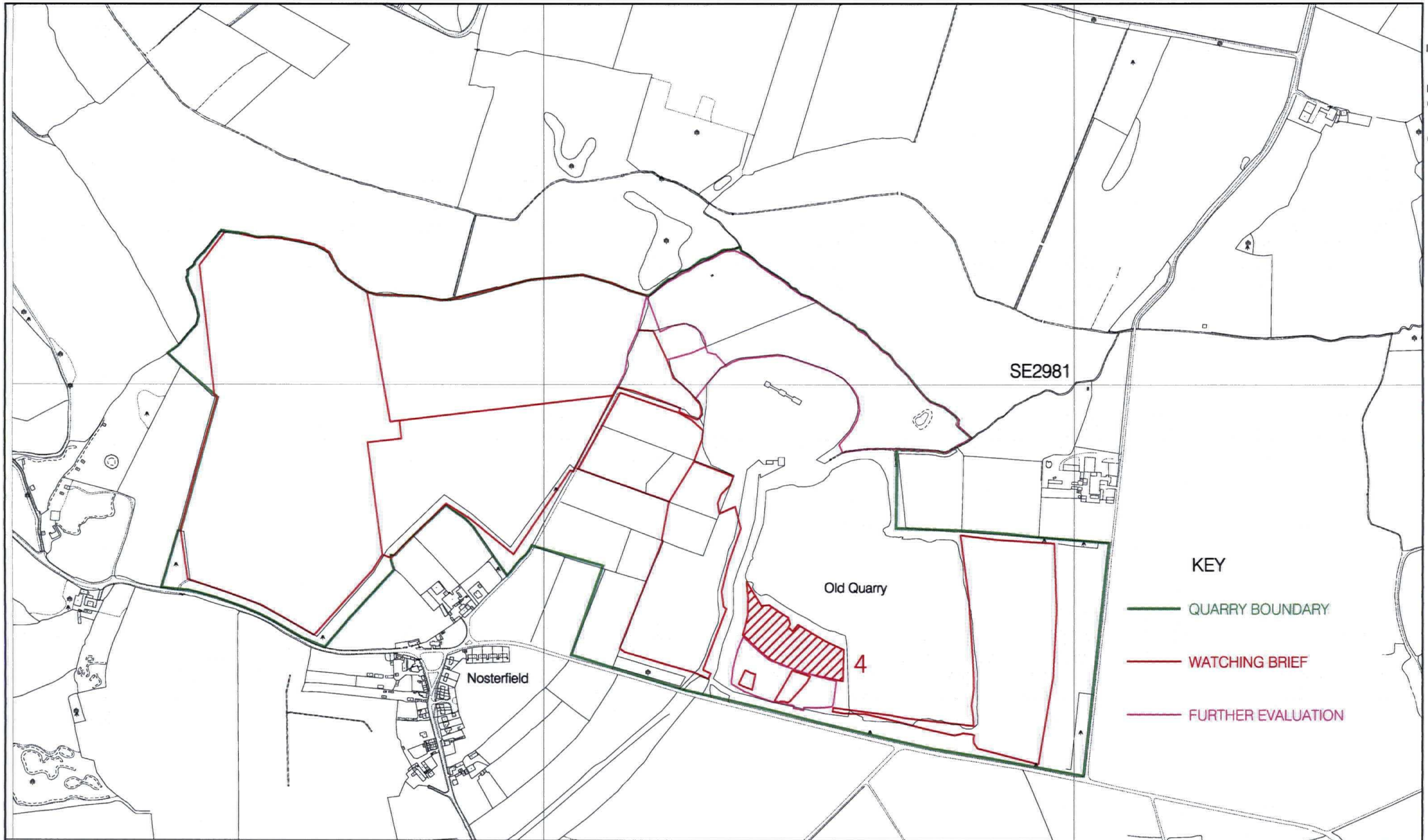
Land drains and modern animal burials
Beneath the topsoil, at least four linear field drains crossed the area on a north-south axis. No finds were recovered from these and they are assumed to be of recent date. They appear to drain water to the north. One ditch, F5007, was also considered to be modern, and therefore was not fully mapped. A series of modern animal burials were also identified; nine contained sheep and two cow skeletons, which were clustered around the northern edge of the area.

Spreads
Two unexcavated spreads were mapped (C5003 and C5034), but were found to represent natural anomalies, and were not recorded further.

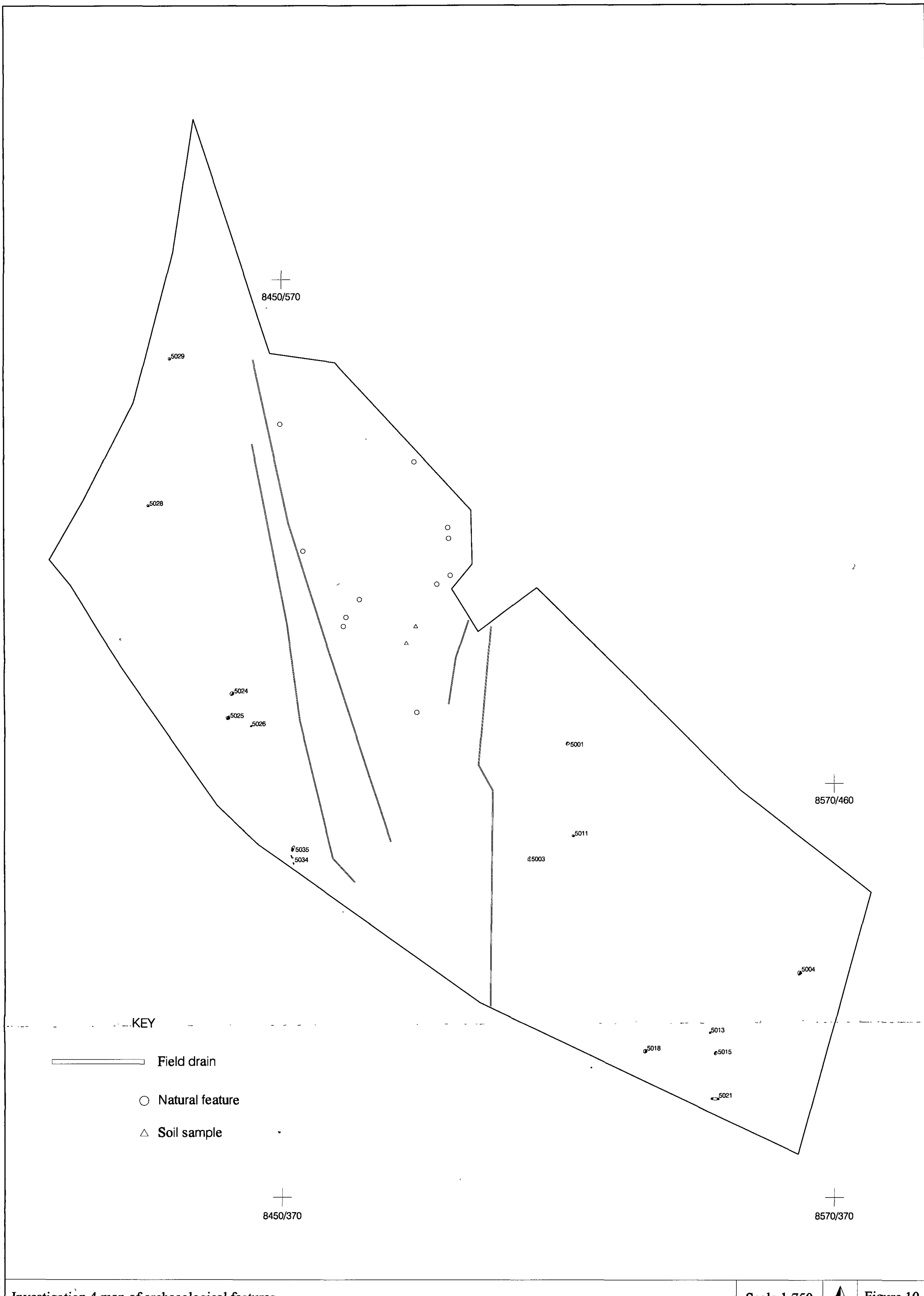
Pits and scoops
Thirteen features were excavated, distributed widely across the area with loose clusters formed by two or more features. Two more possible pits were identified but not recorded further (F5009 and F5026). Apart from three shallow scoops, all of the features were pits (Appendix A).

As a group, the excavated features were small, and all but two were found to be sub-circular or oval features, with a diameter of less than 1.00m and a depth of between 0.05m and 0.40m. F5021 and F5035 were found to be larger, sub-rectangular features measuring 1.78m x 0.55m and 1.30m x 0.52m respectively. No more than two fills were identified in each feature, and very few finds were recovered (Figures 11 and 12).

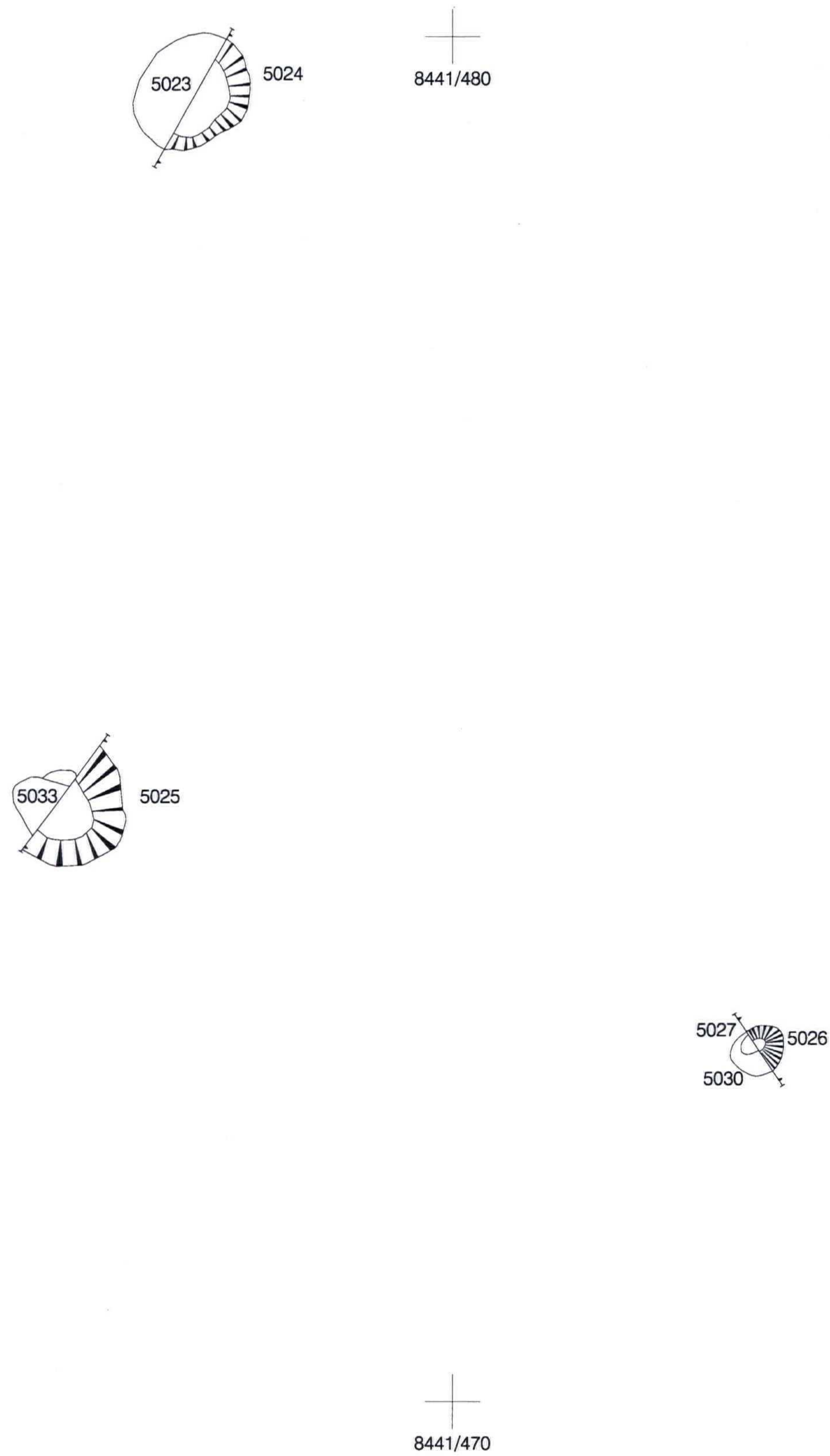
A small group of prehistoric finds (lithics and pottery) was recovered from F5004, F5013 and F5035. Very small fragments of prehistoric pottery were recovered from F5013 (C5014); diagnostic fragments were identified as late Neolithic Peterborough Ware together with a few pieces of waste flint. F5035 (C5036) produced a serrated blade and a bifacially worked tool, possibly an unfinished leaf or chisel-shaped arrowhead, dating to the late Neolithic or early Bronze Age. One other piece of flint debitage came from F5004 (C5005) and a scraper was recovered from an unstratified context (Appendix C: Part 1).



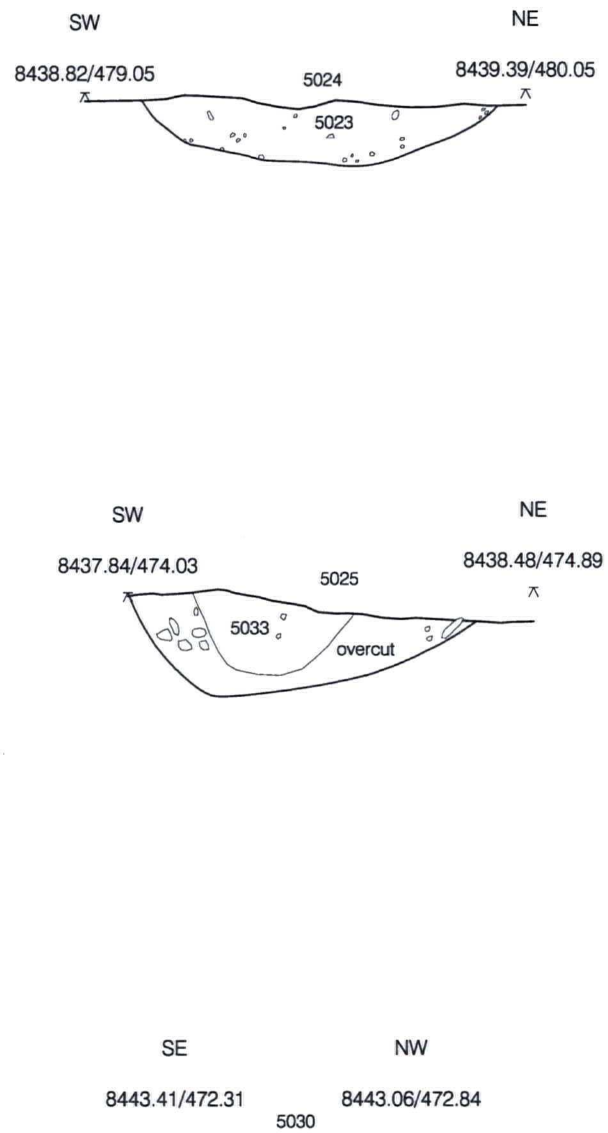
Location of Investigation 4 | Scale 1:10000 | Figure 9



Investigation 4 map of archaeological features | Scale 1:750 | Figure 10



Investigation 4 hachure plans of 5024, 5025 and 5026	Scale 1:50		Figure 11



Investigation 4 sections of 5024, 5025 and 5026	Scale 1:20	Figure 12

4.2.3 Assessment

The features, and the finds recovered, suggest that the archaeology of this area was similar in character to that identified in Investigation 3 (Area 1). Again, the recorded remains were sparsely scattered, making identification of any spatial variation problematic.

4.3 INVESTIGATION 5 (WYAS)

In late January 1997 a watching brief was undertaken within an area, 60m by 7m, along the eastern side of Trench 5 (Quarry Phase 2a). No archaeological remains were identified, and no finds retrieved (Figure 13; Appendix F: Part 1).

4.3.1 Fieldwork procedure

The area was stripped of topsoil using a tracked back-acting mechanical excavator, during which time close archaeological supervision was maintained. The topsoil was stripped and scanned for finds, and subsequently, the subsoil was removed in a series of controlled spits down to the level of natural gravel. This surface was then inspected for archaeological features.

4.3.2 Fieldwork results

No finds were recovered, and no archaeological features were identified.

4.3.3 Assessment

Given the dispersed nature of the archaeological features identified in nearby investigations, it is perhaps not surprising that archaeological features were not identified within such a small area of investigation; it is possible that archaeological remains had simply not survived in this area.

4.4 INVESTIGATION 6

During July 1997, WYAS were commissioned to undertake a gradiometer survey of a 1 hectare area between Investigation 5 (Trench 5) and the Nosterfield road (B6267) (Quarry Phase 2a) (Figure 14). The survey aimed to ascertain whether gradiometry represented a suitable evaluation technique on the local gravel geology, and to assess the nature of any remains that could be identified.

4.4.1 Fieldwork procedure

The magnetometer survey was undertaken using a Geoscan FM36 fluxgate gradiometer. Readings were taken at 0.50m intervals along 1.00m traverses. Details of methodology and technical information are detailed in the report produced by WYAS (Appendix F: Part 2)

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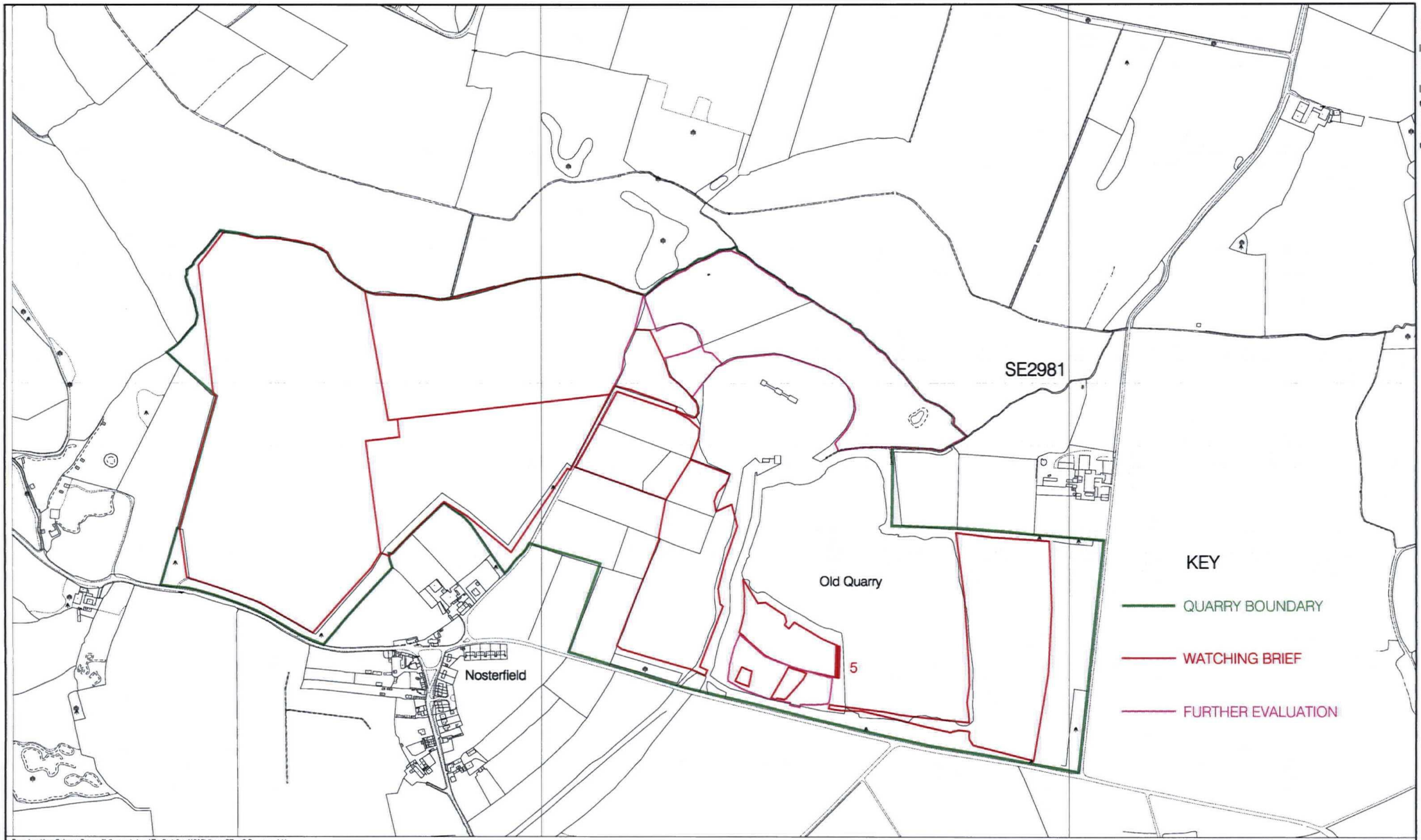
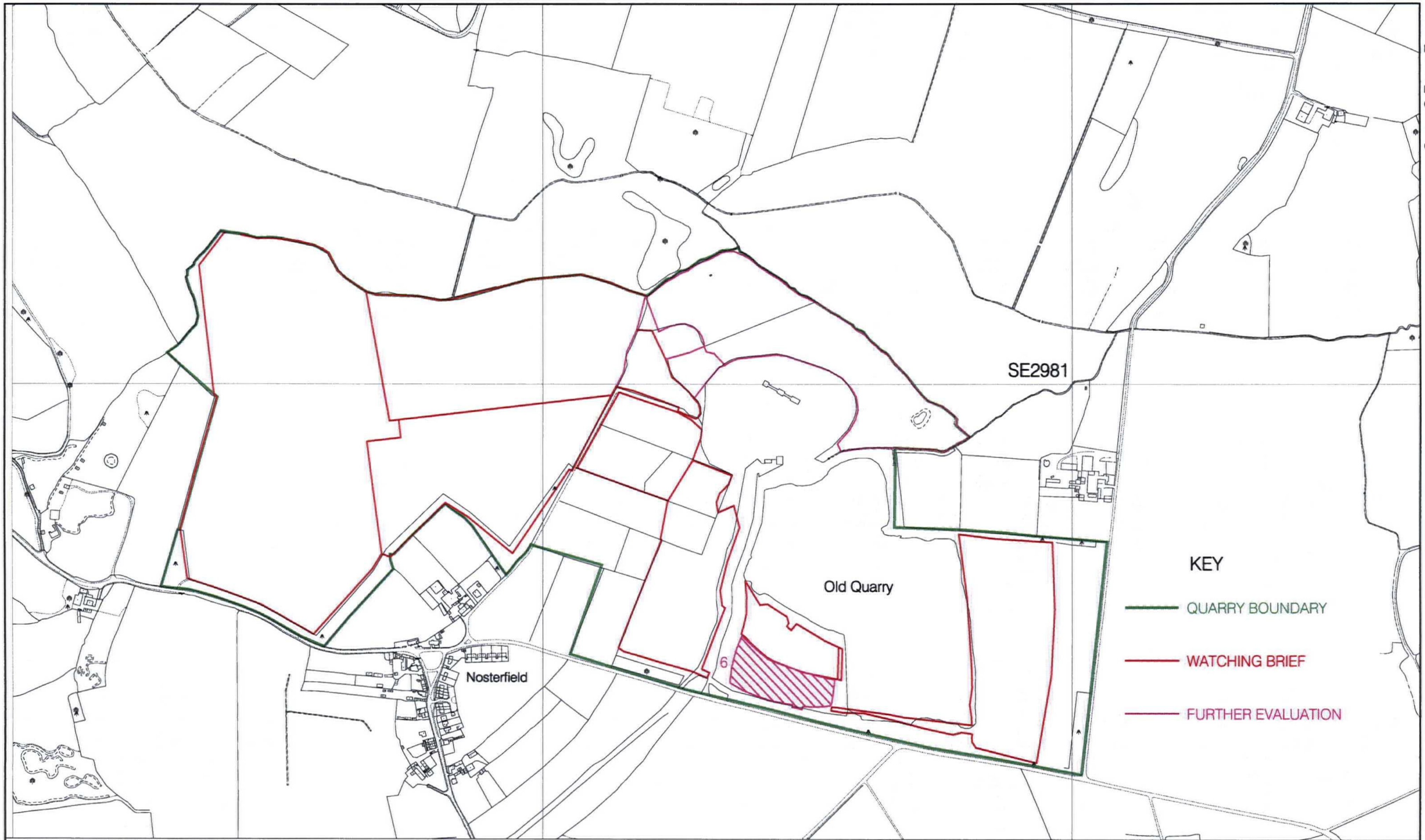


Location of Investigation 5 | Scale 1:10000 | Figure 13



Location of Investigation 6

Scale 1:10000

Figure 14

4.4.2 Fieldwork results

Three types of anomaly were identified during this survey: 'iron spikes', positive magnetic anomalies identified as possible pits, and a more general area of enhanced readings. 'Iron spikes' were common across the site, and are generally interpreted as ferrous material on the ground surface and in the topsoil. As such, they were not of archaeological interest. Three isolated responses were identified which were interpreted as possible negative features such as pits. Two of these anomalies were identified at the northeastern edge of the survey area, while a third was found to the west. A linear feature was identified to the east of the area, which was interpreted as a plastic pipe. Immediately to the south of the latter features, an area of enhanced readings was identified, possibly reflecting burning in this area.

4.4.3 Assessment

It was concluded from this survey that both discrete and linear features could be identified on the local gravel substrate. The nature and function of these features, however, remained uncertain, and the results of subsequent watching briefs in the same area demonstrated archaeological features to be much denser than the results of the magnetometer survey suggested.

4.5 INVESTIGATION 7 (TRENCH 7)

The watching brief was carried out on the south side of the quarry in the spring of 1997. The investigation covered a rectangular area of approximately 0.2 hectares, measuring 63m NE-SW by 32m NW-SE (Quarry Phase 2a). The northern limit of investigation abutted that of Investigation 4, and the site extended southwards to within 23m of the Nosterfield road (Figure 15). The results revealed that the surviving archaeological features were much denser than suggested by the gradiometer survey, and revealed a pit alignment running for much of the length of the intervention.

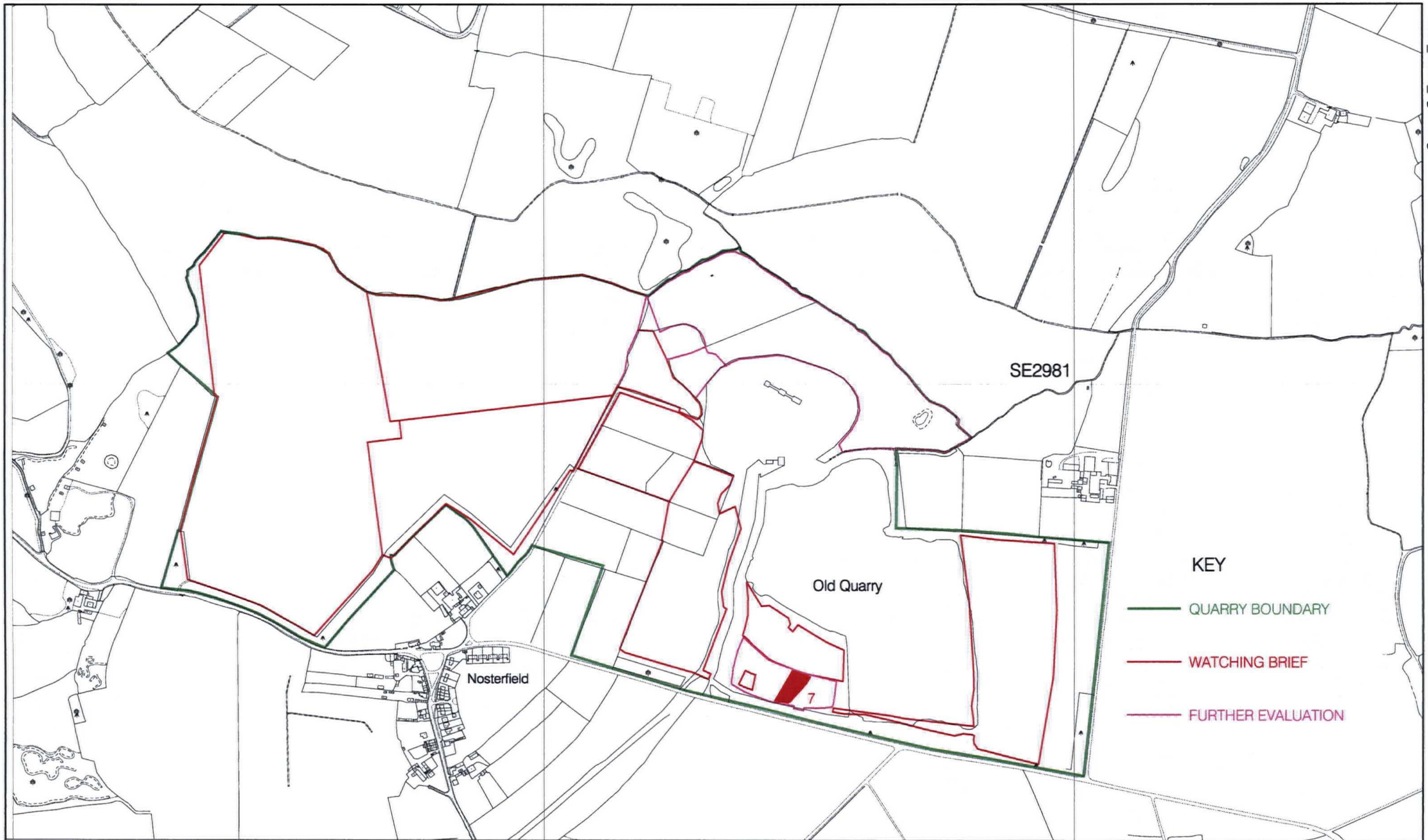
4.5.1 Fieldwork procedure

Topsoil was stripped using a tracked mechanical excavator under archaeological supervision. All archaeological features were mapped, and the majority were then half-sectioned and recorded.

4.5.2 Fieldwork Results

A total of 46 features were recorded, all of which were identified as pits. Of these, a total of 37 were found to form a pit alignment (Structure 12), which extended for 68m in an ESE-WSW direction, curving northwards at its northern edge, and apparently continuing beyond the southern limit of investigation (Figure 16; Appendix A, B).

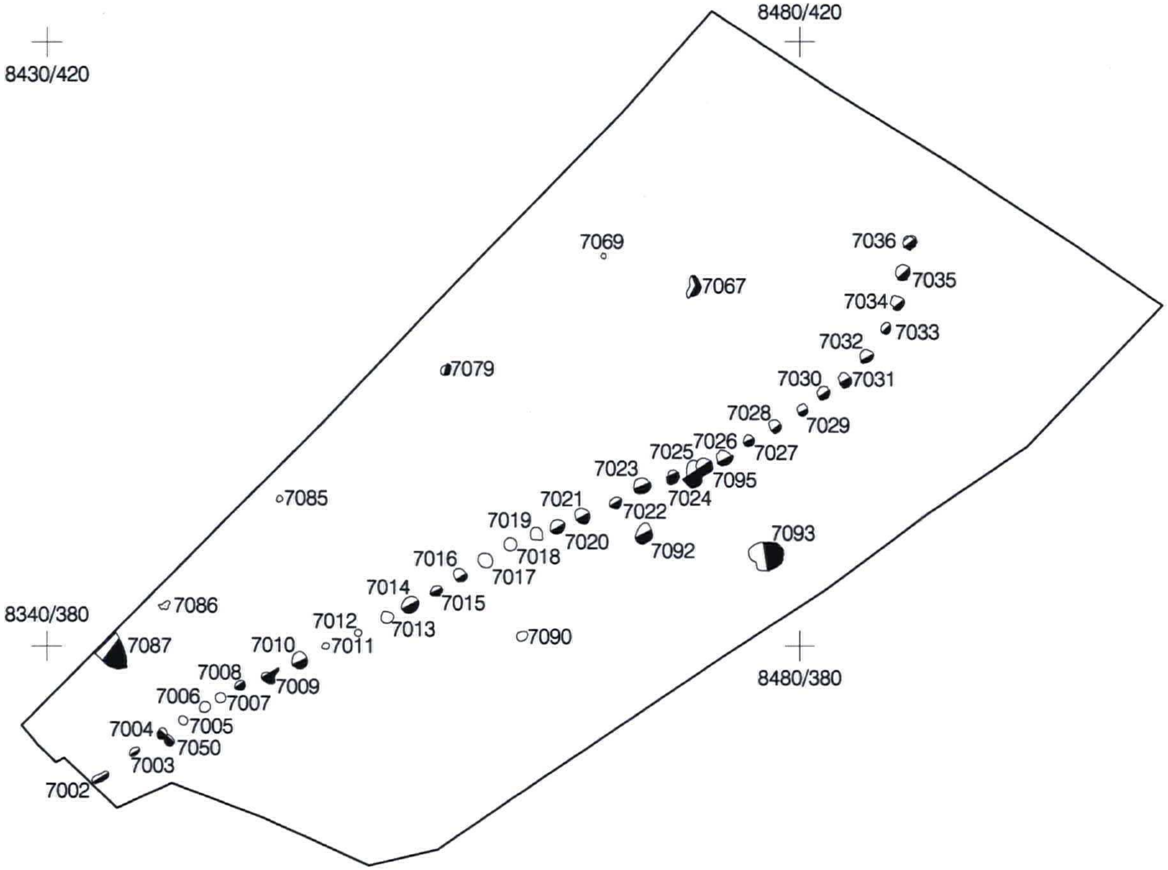
Of the 37 pits which make up the pit alignment, most were oval or sub-circular in plan, although F7002 at the south end was sub-rectangular (Figure 17 and 18). The pits were spaced at intervals which varied from 0.60 to 1.20m; the greatest distance between excavated pits measured 1.80m (F7002 to F7003). There are two examples of pits which appear to abut or cut one another, suggesting some chronological depth in the use of the pit



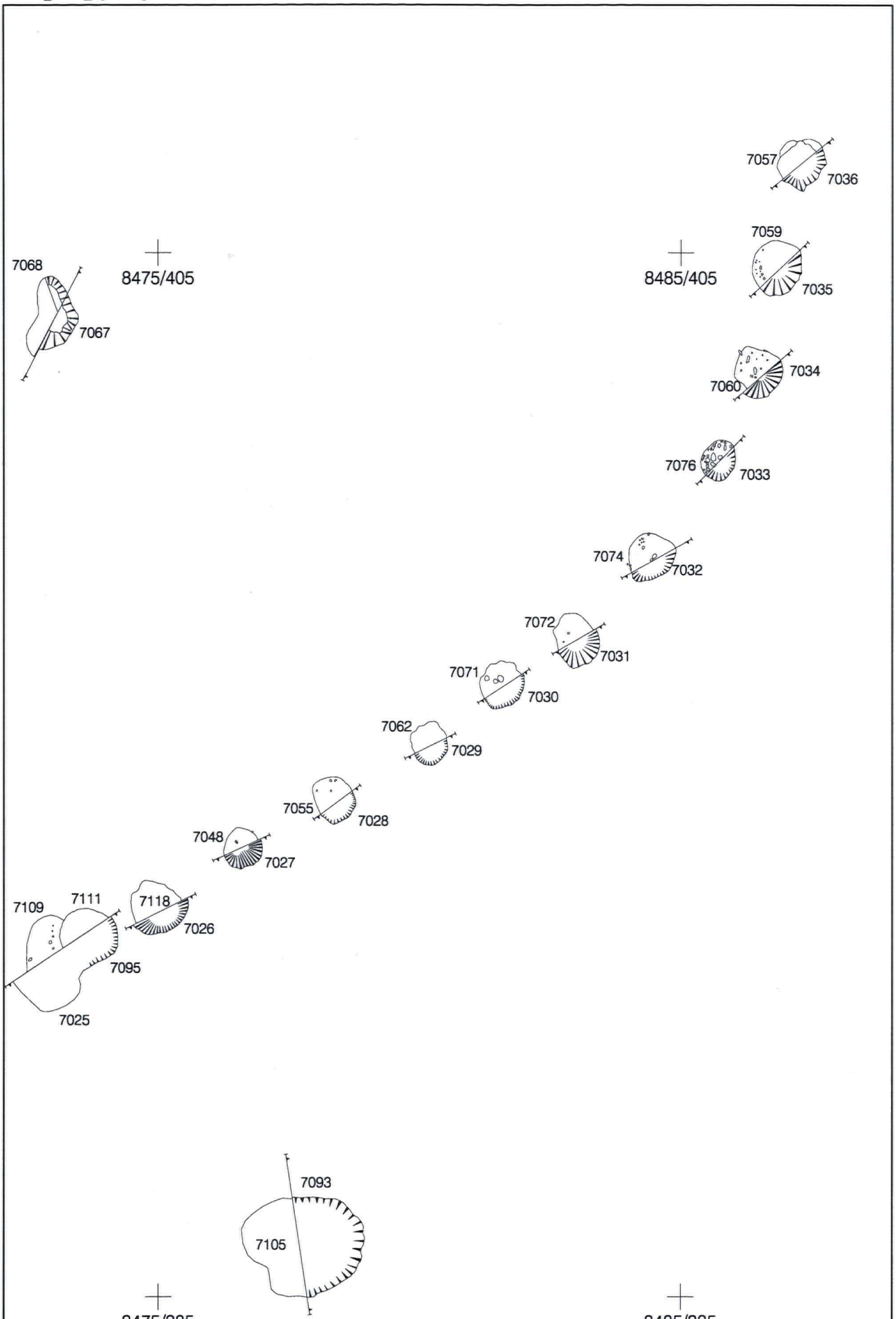
Location of Investigation 7

Scale 1:10000

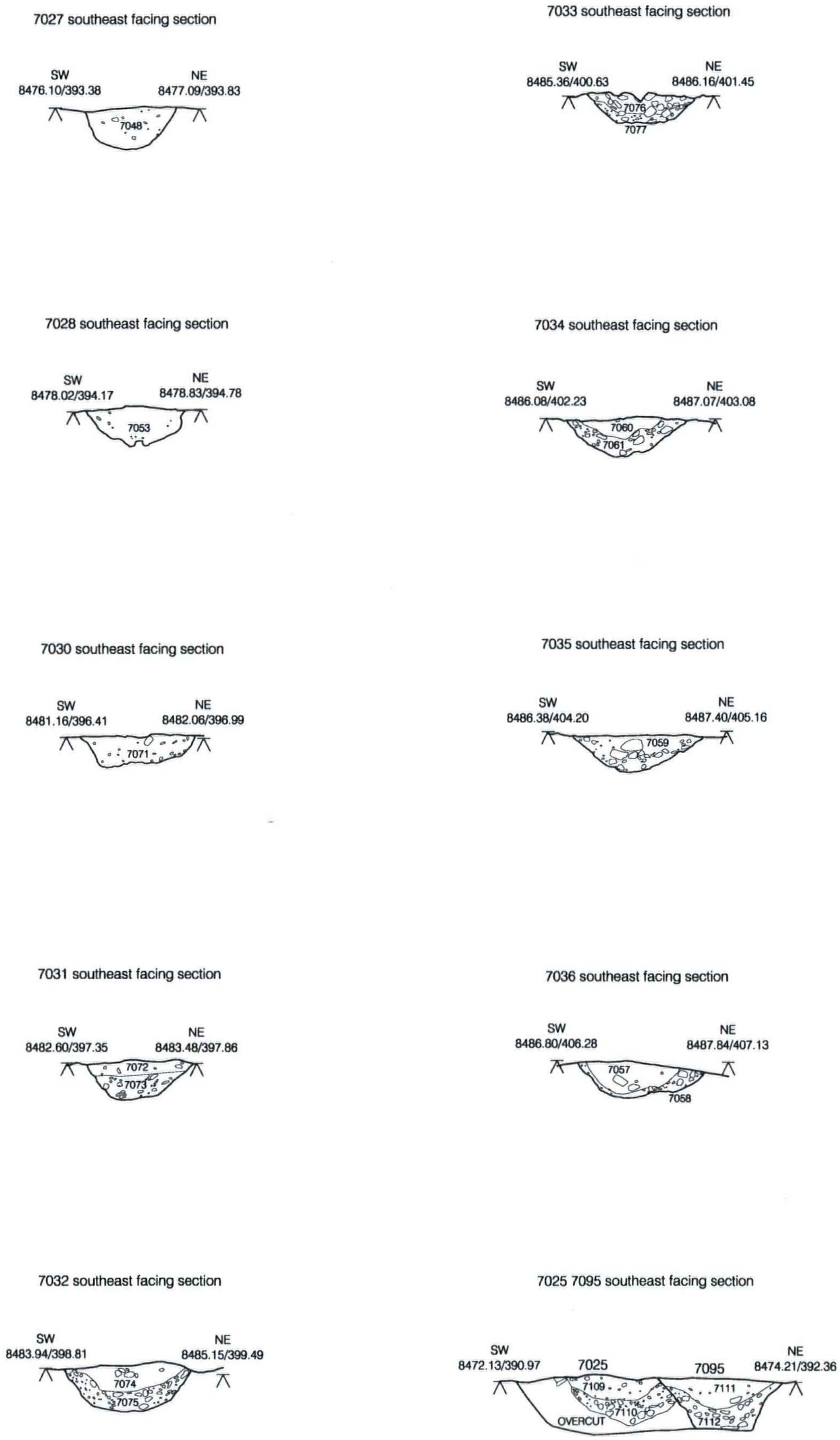
Figure 15



Investigation 7 map of archaeological features | Scale 1:500 | Figure 16



Investigation 7 detail of Structure 12	Scale 1:100		Figure 17



Investigation 7 Structure 12 sections	Scale 1:50	Figure 18

alignment. Upon excavation, the pits were found to vary in depth from 0.13 to 0.71m, and in diameter from 0.41m to 1.23m. During excavation, no finds were recovered; the majority of pits were found have one or two backfills, whilst three distinct fills were identified within two of the features. None of the pits contained post-pipes or exhibited evidence that they had originally held timber uprights.

A further nine pits were mapped in Trench 7 to either side of the pit alignment, of which four were excavated. None of these features appear to have been directly associated with Structure 12. To the east F7093, a large but shallow pit was identified, measuring 0.44m deep and 1.11m in diameter. Another large feature, possibly a pit, appeared to extend beyond the eastern edge of the area (F7087), but was not excavated.

Further to the north, four smaller pits (F7086, F7085, F7079 and F7069) appear to follow a NE-SW alignment, and may represent another linear structure. The excavation of F7079 revealed a small, steep sided V-shaped pit, 0.61m deep and 0.47m diameter, which contained a sequence of four back-fills (C7080-C7083).

4.5.3 Assessment

The significance of discoveries made during Investigation 7 rest predominantly on the pit alignment. Pit alignments are known to have been constructed from the Neolithic to the Roman period; features of a similar nature have been identified to the west in more recent watching briefs, and dated to the Iron Age (Investigation 15).

The failure of the magnetometer survey to identify the pit alignment is noteworthy, but not surprising given the often sterile and compacted backfills of these features.

4.6 INVESTIGATION 8 (TRENCH 6)

During the summer of 1997, the watching brief continued in an area to the west of Investigation 7, again on the southern side of the quarry (Quarry Phase 2a). The area was situated to the south of Trench 5 (Investigation 4), adjacent to the junction formed by the B6267 Nosterfield road and the quarry haul road which leads to the processing site. The watching brief covered an area measuring 28m north-south and 24m east-west (Figure 19).

4.6.1 Fieldwork Procedure

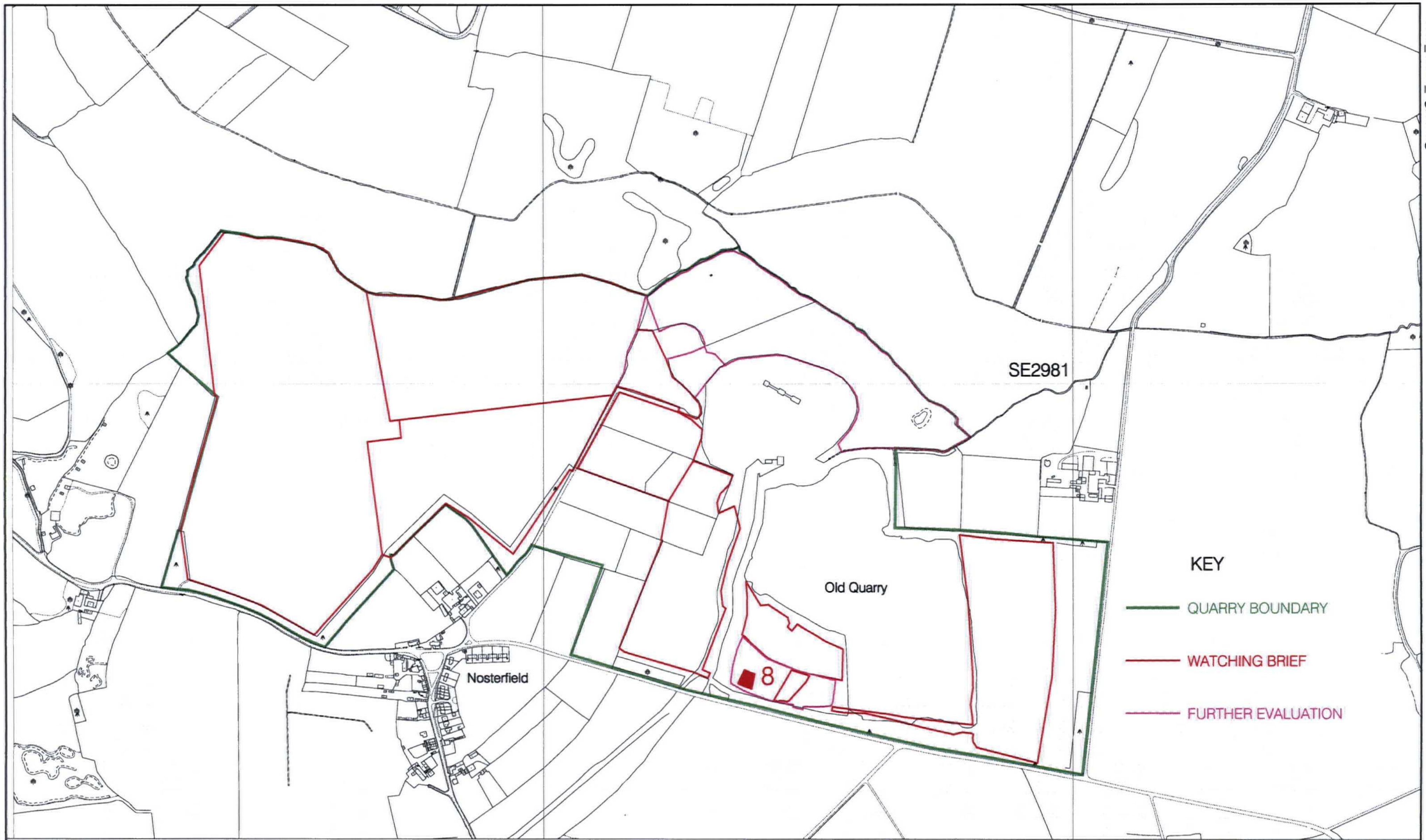
The methodology employed during Investigation 7 was continued during Investigation 8.

4.6.2 Fieldwork Results

No archaeological features were identified during this investigation.

4.7 INVESTIGATION 9 (INTERVENTION 1 AND 2)

Between July 1998 and May 1999, FAS undertook a watching brief in an area lying to the west of Investigation 4 to 7 (Quarry Phase 1b)(Figure 20). This work was carried out in two phases: Intervention 1 saw the



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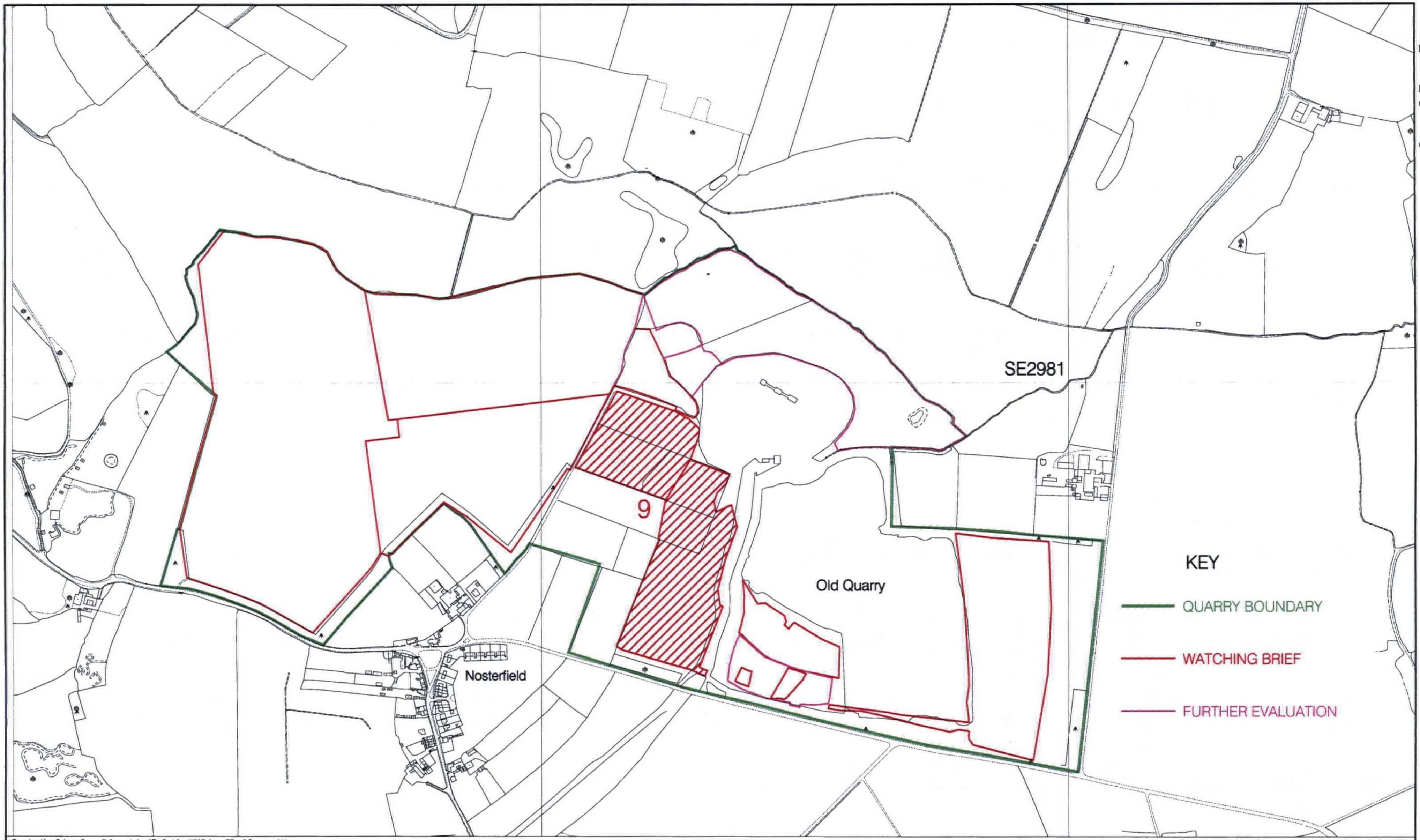
Location of Investigation 8 | Scale 1:10000 | Figure 19



Location of Investigation 9 | Scale 1:10000 | Figure 20

monitoring of topsoil stripping, and the mapping, excavation and recording of any archaeological features; Intervention 2 consisted of fieldwalking of the area, in response to the recovery of finds from the surface of the subsoil during earlier work.

The area of investigation covered 5.8 hectares, located on generally level ground between the 41 to 43m contours. The land rises gently to the south, while to the northwest, the ground slopes upwards more steeply. Areas to the north and east of the area were observed to be significantly wetter than those to the south and east. For this investigation, the area was divided into two parcels. Intervention 1(West) was situated within the right angled bend of Flask Lane, covering an area of 162m by 182m (3.0 hectares), while Intervention 1(East) occupied a larger, rectangular area, measuring 380m north-south and 145m east-west (5.2hectares) (Figure 21). The watching brief covered two seasons work on land that was both arable and pasture. Work on Intervention 1(East) began in July 1998 and continued intermittently until September; Intervention 1 (West) adjacent to Flask Lane was undertaken in April and May 1999.

4.7.1 Fieldwork Procedure

Intervention 1(E)

Topsoil was removed under archaeological supervision using a tracked mechanical excavator fitted with a broad toothless ditching bucket. Beneath the topsoil the clean subsoil surface consisted of glacial sands and gravels. Feature visibility was generally good against the sands and gravels but at the extreme northern end of the site, where the ground was wet, areas of peat and marl were exposed (in area of approximately 2152m^2), and in this inaccessible area the watching brief could only be maintained at a safe working distance.

Once an area had been topsoil stripped all anomalies were flagged and the machinery kept off the area. Larger or more extensive areas of interest were also de-limited by flags. Continuous monitoring of the weathered surface under different conditions revealed further anomalies which were also investigated.

All the anomalies were investigated in the first instance by hand cleaning and were then tested by excavation. A few anomalies disappeared after cleaning and were abandoned (identified as areas of remnant topsoil). During excavation others proved to be of geological origin and were also abandoned, but the remainder were mapped, excavated and recorded according to standard FAS field operating procedures. Feature numbers began at F1 and Contexts at C1000. All features were half-sectioned, although a few which produced finds were then completely excavated. Hachure plans were drawn either when the features were half-sectioned or once excavation was complete. The site grid was provided by the quarry based upon Ordnance Survey values. It was extended across the site as and when required to map any features and contexts.

Intervention 1 (W)

Intervention 1(W) bordered Flask Lane to the west and north, and the earlier watching brief area to the east. Land to the south was used for arable farming. The topographic situation of the site appears to influence the distribution of the archaeological remains. Activity was mapped on the higher ground which extended to the back of the site, towards Flask Lane. The eastern side commanded views over Intervention 1(E), and the peaty, wet areas further to the north and east. In the southeast corner a large drain, visible on the OS maps of the area, marked approximately the break in slope onto lower wetter areas. Other land drains were later mapped but not

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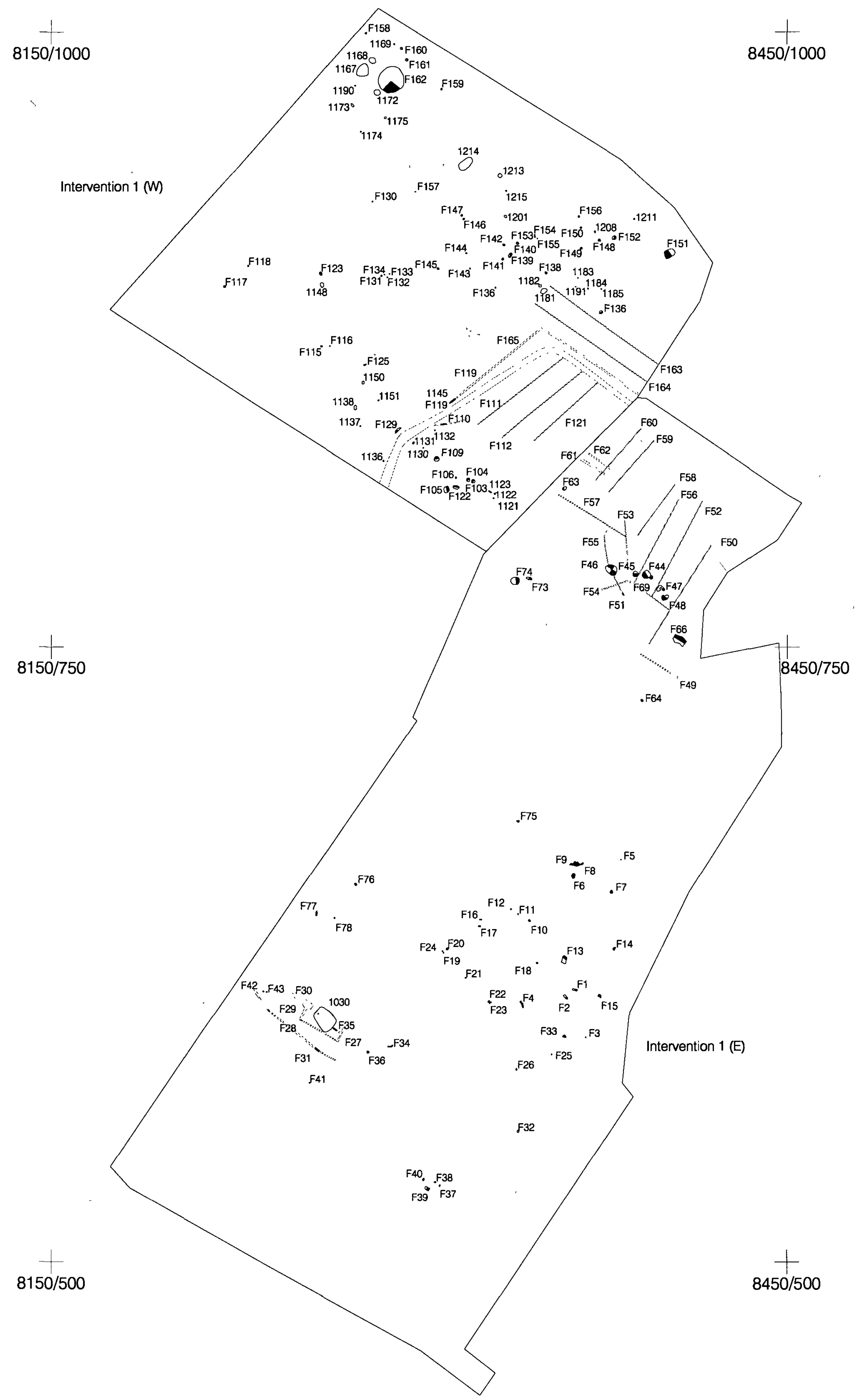


Investigation 9 map of archaeological features | Scale 1:2000 | Figure 21

excavated.

The recording system continued the indices that had been created in 1998, with Features starting at F103 and Contexts at C1121. In 1999, the recording followed the same general procedures to those laid down in 1998, with the exception that all anomalies were initially only allocated a context number until they had been tested by excavation. A few deposits contained calcined bone and where these were encountered the fill was recovered in full and processed off-site. Once topsoil had been removed, and in addition to the routine monitoring of the weathering subsoil surface, fieldwalking was conducted (Intervention 2). The purpose of the fieldwalking was to investigate the possibility of finds surviving virtually at subsoil level in pockets of remnant topsoil.

4.7.2 Fieldwork Results

INTERVENTION 1(E)

In the eastern parcel of land, the watching brief identified an initial 78 features (Appendix A), of which 6 were tested and abandoned when found not to be archaeological (F65, F76, F68, F70-2), 19 represented modern land drains, and 2 were animal burrows. Sixty-seven features were mapped, and comprised a series of pits (more than 0.10m deep), scoops (less than 0.10m deep), sinkholes and ditches, distributed in two broad groups, one at the northern end of the site overlooking the wetter area, and a second further south on the level ground.

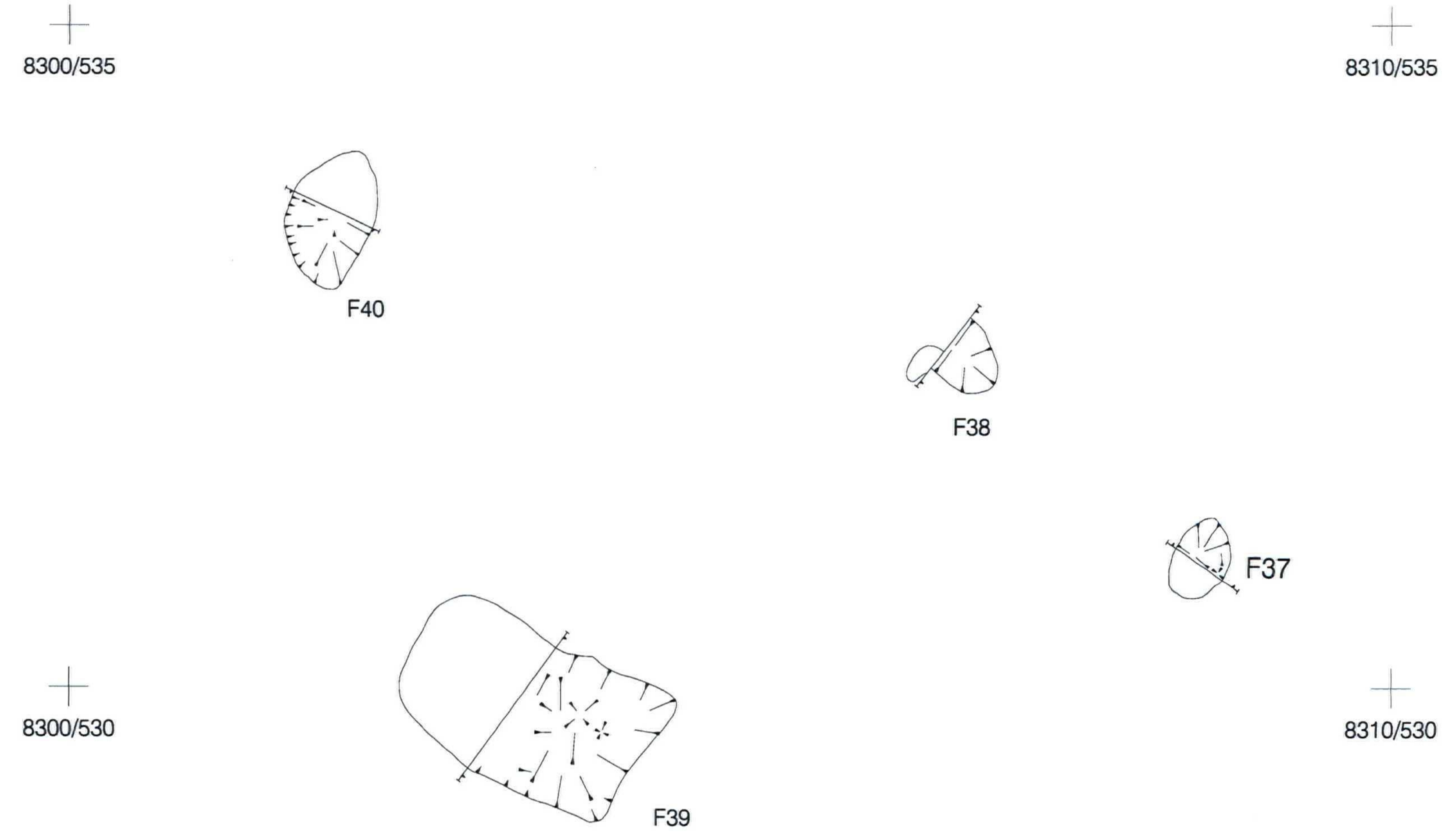
Pits and scoops

Pits represent the most common feature identified during the watching brief, and 31 were identified within Intervention 1(E). A further 14 more shallow features were identified as scoops. Although no obvious clustering is evident, and no structures have been identified, these features are more densely distributed within an area of roughly 100m^2 towards the centre of the area, and a small cluster of four features can be identified at the southern end of the site. A smaller number of isolated features were identified in the area occupied by modern drains to the north; these were more scarce, however, and of these, 3 (F44, F45, F46) were found to be sink holes.

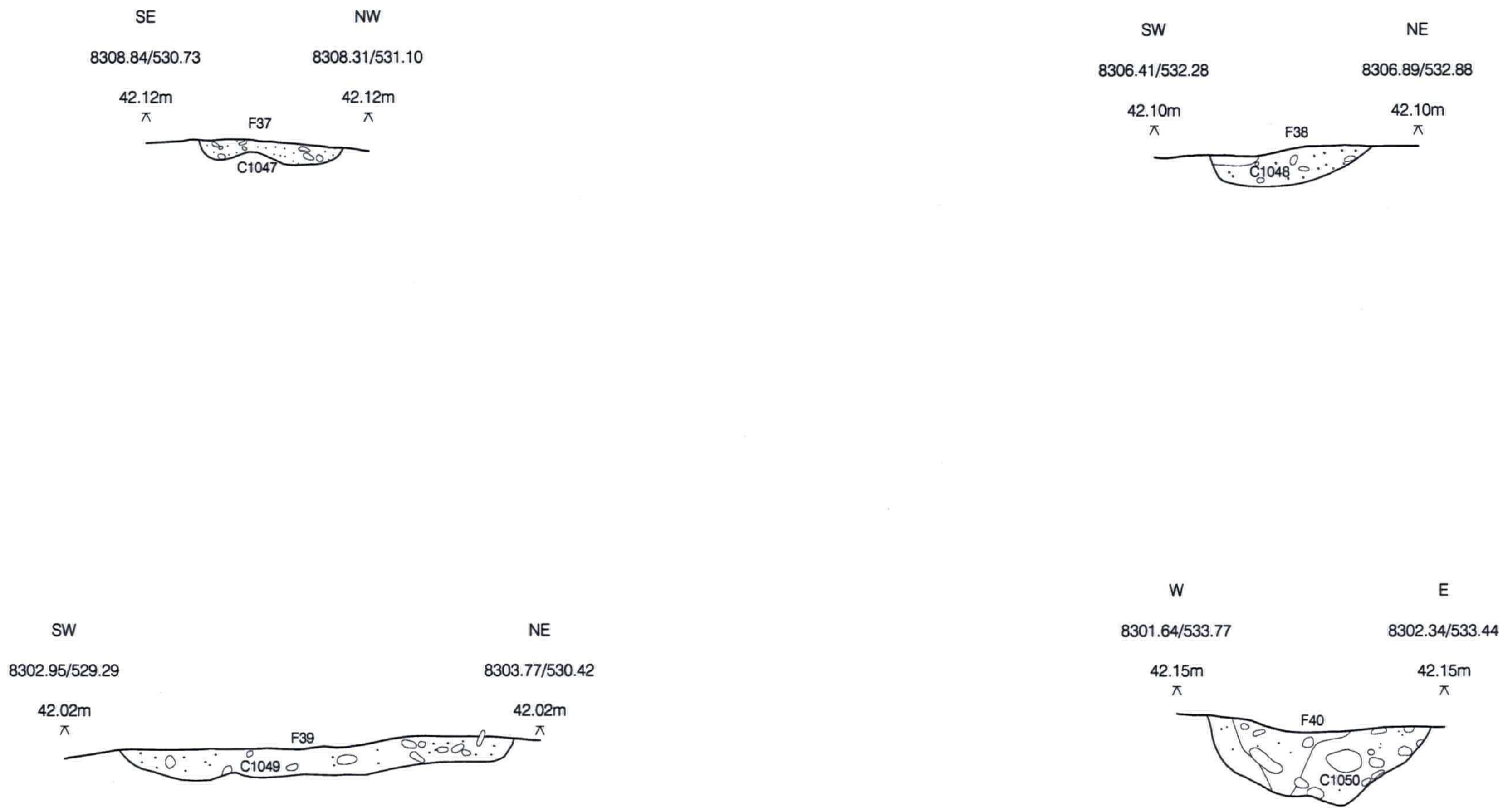
The pits and scoops were found to vary considerably in shape and size (Figures 22 and 23). The majority were oval or sub-circular in plan, measuring between 0.25 and 1.00m in average diameter, with an exceptionally large feature measuring 2.25m x 1.50m (F6). These features measured up to 0.55m in depth, and the majority were found to contain only one fill.

Five pits were sub-rectangular (F1, F4, F14, F23, F39), and upon excavation were found to be shallow, up to 0.20m deep, and varied in length from 1.00 to 3.00m long. Pits classified as irregular did not fit into any of the above categories, and measured between 0.32 to 1.85m in length and up to 0.85m wide.

During the watching brief, areas of burrowing were identified by loose and collapsing backfill; however, where disturbance was less severe it was often difficult to establish whether the feature was man-made. Three features, originally described as pits or scoops were later re-classified as animal burrows upon further investigation (F15, F16, F34).



Investigation 9 (Intervention 1) pit complex hachure plan | Scale 1:50 | Figure 22



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Investigation 9 (Intervention 1) F37, F38, F39 and F40 sections	Scale 1:20	Figure 23

Only two pits, F75 and F77, contained more than a single fill. Most of the fills varied from fairly coarse, sterile sand or silt to brown or dark grey loams and contained sparse to abundant quantities of stone (usually gravel to pebble sized). Charcoal occurred in just over half of the pit and scoop fills. The quantity reported varied from occasional, rare flecks to abundant amounts (F4, F12, F22, F23, F26, F38, F40).

F77 contained a residue from burning. The upper fill C1082 was characterised by a dark brown silty sand mixed with, unusually, patches of pale white sand. It overlay a silty sand C1083, red in colour possibly as a result of being scorched; other components included some charcoal and fragments of burnt stone. The lower fill, C1084, was a brown silty deposit with ash and abundant charcoal. The pit was irregular in shape and after excavation it appeared to consist of three small sub-circular hollows (Figure 24). It was not dissimilar in character to another small, irregular pit F19 (small hollows which abutted each other). It produced a few flecks of charcoal and a small quantity of heat-affected earth (C1021). F10 was an oval scoop, 1.00m long and 0.70m wide but only 0.06m deep. The fill, C1011, contained rare charcoal flecks and had apparently been scorched, suggesting it may be the remains of a hearth or firing from a higher level.

An oval pit, F69, was identified on the shoulder of F44 (sink hole), although no relationship was established between the features. F69 was unusually deep (1.10m). Excavation produced only a deposit of peat and occasional stones, which suggested it belonged to the cluster of sink holes that occur in the locality. The base of the pit was just below the perched water table. At the northern end of the site were two shallow scoops (F47, F48). Both these features contained a shallow, peaty fill and were similar to other nearby features identified as sink holes (F44 to F46, possibly F69).

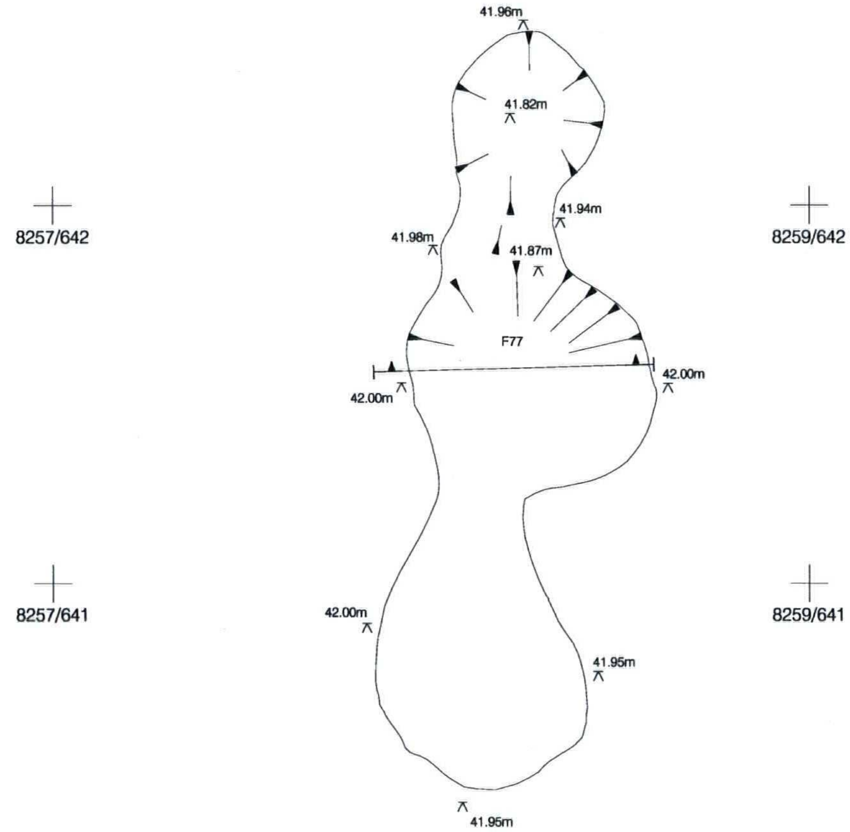
Some of the pits may have resulted from trees or bushes being grubbed-up. F74 was a large sub-circular pit, 3.60m in diameter and 0.18m deep, which produced root scars on the base of the cut. Pit F32 was found to be a modern animal burial.

Linear features

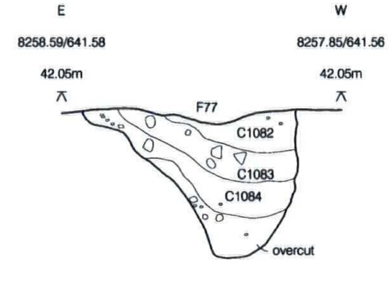
A series of land drains represented the most modern features identified. These were concentrated on the northern edge of the site, and generally followed a NE-SW alignment (F50, F52, F56, F58, F59, F60), with examples also running NW-SE (F49, F51, F53, F57, F61, F62, F69). F53 and F55 ran roughly north-south between F51 and F57, also joined by F54.

Further south, a series of conjoining ditches (F27, F28, F29, F30, F35) appeared to delimit and then lead into an area of peat (C1030), which represents a geological sink hole.

Other than the land drains, linear features consisted of one ditch and a short curvilinear feature. Feature 8 was identified as a curvilinear gully, running east-west for approximately 6m, and bearing an uncertain relationship with pit (F9), which lies centrally over it. Flint finds from F9 may suggest a prehistoric date. A second ditch was identified further to the southeast, running roughly NW-SE for a distance of *c.*45m (F31). A fragment of modern pottery, and a considerable amount of root disturbance, led to interpretation of this feature as a hedgeline.



Investigation 9 (Intervention 1) F77 post-excavation plan | Scale 1:20



Investigation 9 (Intervention 1) F77 section | Scale 1:20 | Figure 24

Sink Holes

Four sink holes were identified to the north of the site (F44, F45, F46, C1030), created by the collapse of sub-surface strata beneath ground level. These features were mapped and subject to intensive investigations for the recovery of palaeoenvironmental material. A further three features were subsequently identified which may belong to the same group of features (F47, F48, F69). Such features are specific to geological conditions, and have been noted at several locations within the surrounding landscape, occurring as small hollows, from *c.*2.0m in diameter, or much larger depressions; most notably at Snape Mires, to the north of Nosterfield, where an area of 6km^2 is believed to have collapsed during the late glacial period (FAS 2005).

These sink holes occur primarily in two locations in this investigation area, with a single example (C1030) located in the central part of the intervention, and the remainder clustered at the northern end of the site (F44 to 46, with F47 to 49). This latter group is considered to be the result of collapsing subterranean strata.

C1030 was the upper fill of a sink hole, situated at 39.46m AOD, whose extent was only mapped at the subsoil horizon. None of the buried deposits were excavated but the strata sequence was investigated using an auger array laid across both axes of the in-fill. The sink hole was situated in a larger hollow and measured 9.22m long and 6.23m wide; its upper fill (C1030) consisted of a reddish brown desiccated peat, 0.17m thick. A total of 13 augers were drilled through the surface, revealing a sequence of peat and marl sediments to a depth of approximately 1.0m. A sequence of deposits was recorded (C1030 to C1036), but further investigation was abandoned because sediment could not be recovered in the waterlogged conditions. The area around the sink hole had been the focus of relatively recent drainage activity. A series of land drains were dug in a rectangular fashion around the south side of the sink hole, presumably to improve drainage in a locally wet area. It is likely that the drains (F27 to F30, F35) carried the water off on the eastern (lower) side, although the drains were not mapped far beyond the edge of the hollow. A small segment of F28 was excavated, where it measured 0.30m wide and 0.25m deep and had a distinct square profile containing pebbles and cobbles.

A second set of sink holes were investigated to the north on the edge of the peaty area. When these features were identified, the project environmental consultant (Dr Stephen Carter) was invited to site in order to consider a revised strategy for their investigation. It was decided that the features should be excavated to the fullest possible depth with due regard to health and safety, and where possible, column samples should be taken to the base of the holes in order to assess their potential.

Initially the sink holes were excavated at least to the depth of the water table. F44 and F45 were half sectioned and F46, the largest hole, was quadranted and opposite quadrants removed to study the profile. These features were all sub-circular, measuring between 3.09m (F44), 2.25m (F45) and 4.70m (F46) in diameter (Figure 25). All three shafts reached a similar level, 36.53m AOD, 36.99m AOD and 36.92m AOD respectively. F44 and F45 contained a sequence of deposits comprising loams over layers of peat (Figure 26), which extended beyond the water table. F46 was similar, but lacked the waterlain sediments that were evident in the other two features.

F44, F45 and F46 had funnel-shaped profiles characterised by broad sub-circular tops and narrower, near-vertical shafts, probably circular in plan. The upper levels had acquired accumulations of soil, blown or ploughed into the features; these deposits may have accumulated more rapidly after the area was drained and once the land was used for arable farming on a regular basis. C1060, a deposit of stonier in-fill in F46, may have

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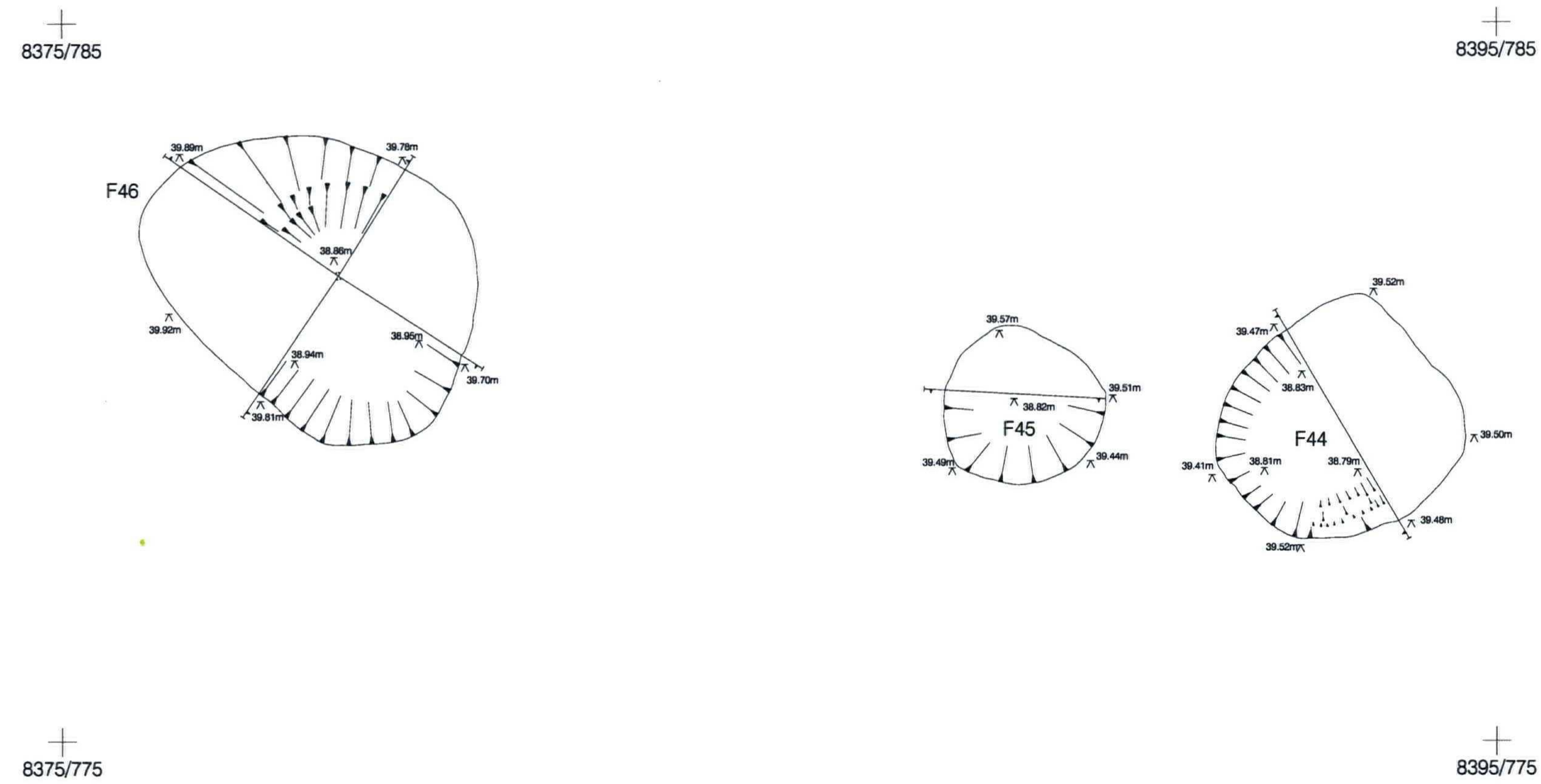
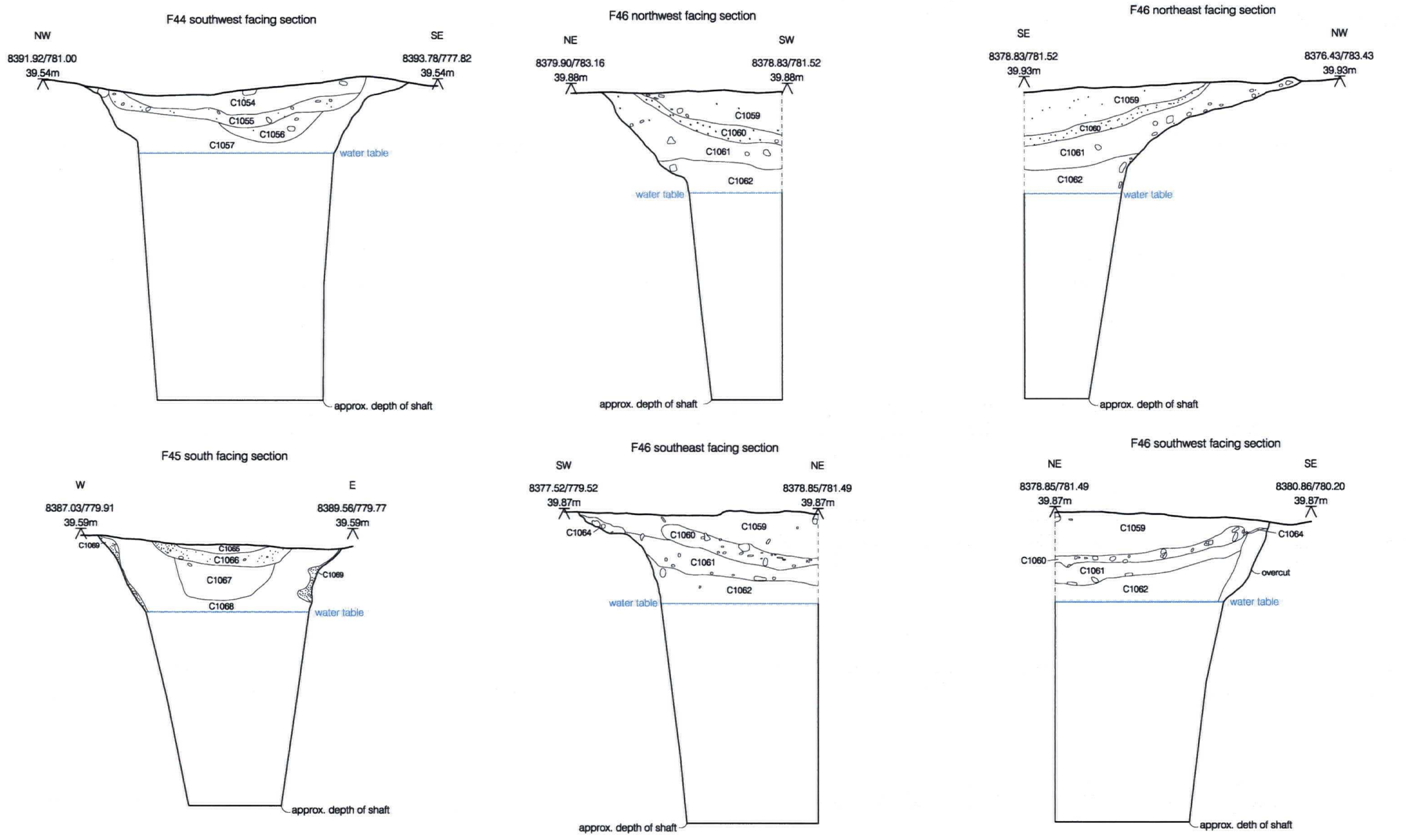


Investigation 9 (Intervention 1) F44, F45 and F46 post-excavation plans | Scale 1:100 | Figure 25



Investigation 9 (Intervention 1) F44, F45 and F46 sections | Scale 1:50 | Figure 26 been used deliberately to level up the hollows, but at some stage in the 19th century or early 20th century, a land drain was cut across F46 to a depth which suggests that the surface of the holes had stabilised.

Monolith tins were used to recover samples from the upper fills of all sink holes. At this depth, a mechanical excavator was used to reduce the level of the surrounding ground surface (box section). Hand-excavation continued for a short while but was halted rapidly by the poor working conditions. Below the water table, the gravel sides also became too unstable and flowing water caused regular collapses of the feature edge and even the box sides. Excavation ended at this point, but sampling continued using a Russian auger, producing a continuous column for each of the three pits.

The samples taken from these features were the subject of analysis at Stirling University (Appendix E: Part 2); Long and Tipping suggested initially that the shafts were man-made, presumably for the collection of water, although subsequent analysis has confirmed that these features would have formed naturally, through the collapse of underlying sediments (Appendix E: Part 3). F46 differed from F44 and F45 in that it showed no evidence for having contained standing water. Analysis of the sediment stratigraphy of these shafts led to recommendations that a programme of pollen analysis and radiocarbon dating be carried out, in order to ascertain environmental change in the vicinity.

A sample from F45 was therefore subject to further analysis (Appendix E: Part 4), which revealed evidence for the vegetational history of the area from the Late Neolithic to the late Iron Age. Nine phases of activity were defined, which included five phases of woodland recession. The earliest of these was dated to the Late Neolithic, and the latest to the Iron Age. The final stage of woodland decline is considered to have been climatically instigated, while the earlier four phases are considered to have been due to human clearance and removal of the woodland.

Analysis and radiocarbon dating was also carried out in order to investigate the interface between peat and marl sediments (Find 14) in an area immediately adjacent to the sinkholes F44, 45 and 46. The radiocarbon dating at the base of the peat demonstrated that it was forming from the early Holocene (8705-8440 cal BC: Beta-143458; Appendix E: Part 3), suggesting that the marl-forming lake had been terrestrialised by this time.

More recently, Dr Stephen Carter (Headland Archaeology) has reassessed the value of these cores with regard to palaeoenvironmental data (FAS 2005). These features were caused by the dissolution of underlying gypsum strata by groundwater, and subsequent surface subsidence, forming depressions or hollows that can act as sediment traps. However, he noted that the accumulation of material can occur in a number of ways, including intermittent, rapid collapse or blocking of the main pipe, or through more gradual infilling. Following this, secondary collapses can disturb deposits further; to assume that sediments will always represent the gradual and continuous accumulation of material is to oversimplify the complex ways that such features can be formed. For the subsidence hollows at Nosterfield, Carter suggests that the radiocarbon dates for core F45 reveal three discrete phases of rapid sediment accumulation, rather than continuous deposition, providing 'snap shots' of local vegetation on each occasion. Between 2.8 and 4.1m, no pollen survives in sediments dating to the early Holocene. From 1.4 to 0.4m, pollen is dominated by woodland taxa, dating to 4000 uncal BP, and from 0.4m upwards, is considered to have been laid down around 2300 uncal BP. This may suggest that the significance of the pollen analysis from these cores requires reconsideration.

INTERVENTION 1(W)

Features identified during the second part of this watching brief included a range similar to that reported for Intervention 1(E) (see Figure 21) (Appendix A). A total of 54 features were identified, 42 of which were pits, 4 were scoops and 8 were land drains (two were selected for excavation). In addition, a series of 33 anomalies were mapped and defined as spreads, although no feature numbers were allocated to such ephemeral remains. Unlike the 1998 season, these spreads were mapped and are included in the final horizon map of Intervention 1(W).

Spreads

The 33 anomalies identified as spreads were generally interpreted as thin patches of existing topsoil in hollows, or stone holes left over after topsoil stripping. The largest spread mapped covered an area of 10.0m x 6.0m (C1138), but varied in size from 0.38m to 5.60m in diameter. Occasionally, the spread disappeared when it was cleaned for further investigation (e.g. C1191).

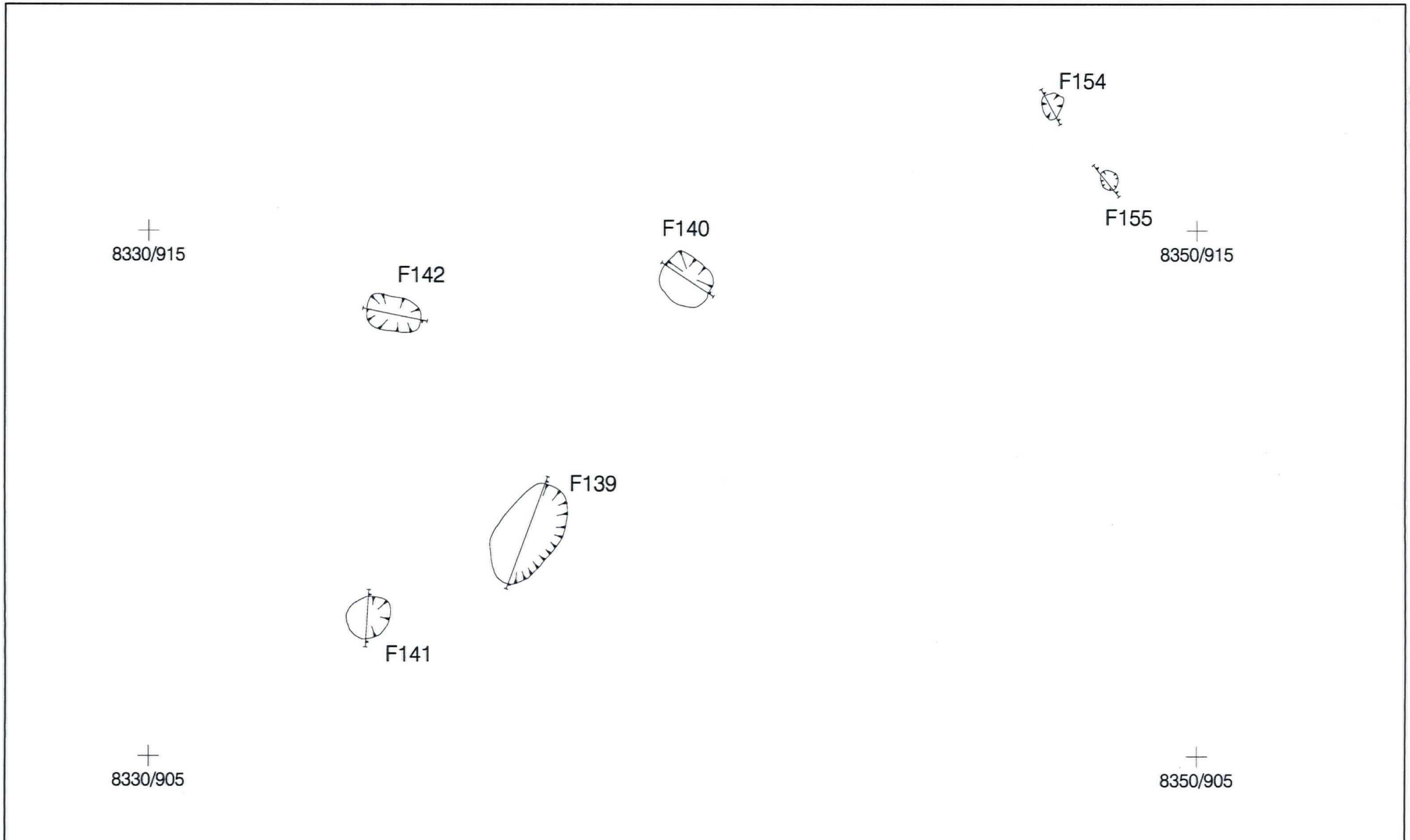
Two short, linear spreads (C1190 and C1211) were identified as the remains of wheel ruts created by the dumper trucks running in poor conditions during the topsoil stripping. The fill of 7 spreads contained charcoal (C1167, C1169, C1174, C1175, C1190, C1213, C1215) and a few produced finds. C1201 produced a fragment of field drain (discarded), C1131 animal bone, C1148, C1173 and C1214 produced pottery and flint; all might indicate that these were very truncated features. A broken jet button was recovered from C1167.

Pits and scoops

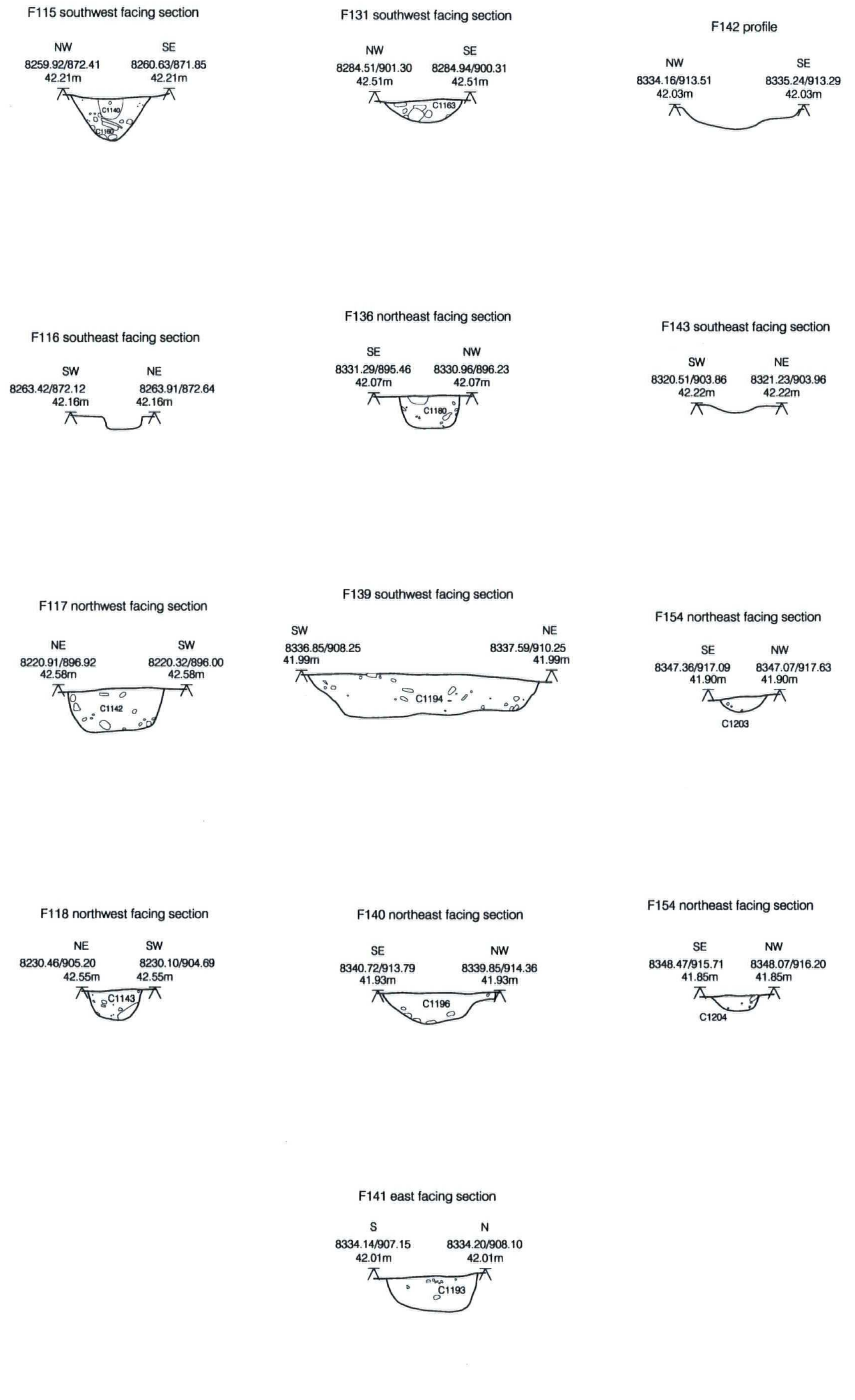
Forty-two pits were excavated, although 7 were subsequently identified as sink holes (F103 to F106, F109, F122 and F162), and a further 4 features were classed as scoops (F125, F130, F135, F143). All of the pits were distributed to the north and west of a series of land drains which cut across the southeast corner of the intervention. There was no obvious concentration, although one group appeared to cluster along the edge of the higher ground. A second group can be identified in the northwest corner of the intervention, in association with a number of spreads (Figure 27).

The pits and scoops were found to vary in shape from circular to oval features, although the largest scoop (F135) was sub-rectangular in plan. Pits reached 1.64m (F152) in diameter and 3.0m in length (F129), and scoop F135 measured 2.0m across; the majority, however, measured less than 1.0m across. A single, much larger feature was identified in the northwestern corner of the site, identified as a large pit measuring 4.40m x 3.12m in plan (F151). The pits varied in depth from 0.12 (F116) to 0.57m (F161), although F148 was exceptionally deep, 0.80m and only 0.90m in diameter (Figure 28).

The majority of the pits contained single fills, although an upper and lower fill were excavated in F115, F123 and F148 (see Figure 28). Pit fills were often described as a dark brown sandy silt or a dark grey brown loam, over 60% of which produced charcoal, and occasionally material which appears to have been burnt. Quantities of charcoal varied, and while many backfills produced only rare flecks, a few examples produced more abundant amounts (F123 C1161, F140 C1196, F147 C1199). Occasionally concentrations of silt were noted in the section (for example, F117 C1142 and F131 C1163) which appeared to form horizontal bands and which may be interpreted as the remains of a turf line.



Investigation 9 (Intervention 1) Example of Neolithic and Bronze Age pits | Scale 1:100 | Figure 27



Investigation 9 (Intervention 1) Neolithic and Bronze Age pit sections	Scale 1:50	Figure 28

Sink Holes

Seven sink holes were identified during the watching brief, all of which were clustered at the eastern edge of Intervention 1(W), forming the western edge of a wider distribution which also included F44, F45, and F46. Generally circular or oval in plan, these features varied in size from 0.60 (F106) to 2.50m (F105) in diameter. The largest sink hole F122 was 2.74 x 1.40m.

The depth of the features varied from 0.20m (F122) to 2.42m (F109), although a measure of the deeper holes was only achieved by augering from the excavated level. The excavation of both F103 and F109 was abandoned on contact with a perched water table at a depth of 0.90m and 1.30m respectively. The shallower sink holes contained peat, or the remains of desiccated peat, although F106 was in-filled with a loam which produced flecks of marl. The deeper holes contained peat at the lowest level excavated but were sealed by layers of topsoil (for example, F103, F104, F109). The profile of these deeper holes was straight-sided, rather than the funnel-shape which was characteristic of the sink holes investigated in 1998. Column samples from the excavated upper levels of F103 and F109 were recovered but were later discarded, as they were not sufficiently complete for analysis. The upper level of F109, C1129 produced the only find, a flint flake.

F162, located in the northwest corner of Intervention 1(W), was an exceptionally large feature, 10.0m in diameter. It did not contain any peat and appears to be the remains of a shallow, partially collapsed sink hole. The in-fill, C1171, produced two pieces of flint. Beneath this deposit were bands of sterile subsoil (C1219 and C1220), removed to confirm contact with the natural subsoil.

Land drains and linear features

In the southeastern corner of Intervention 1(W), a large drain enclosed the corner of the area, running for approximately 90m SW-NE before turning at a right angle, and running NW-SE for 40m beyond the area of investigation. During the watching brief, a further eight features were also identified as land drains (F110-2, F119, F121, F163-5), which appeared to drain off the slope into the larger ditch, or onto lower ground to the north.

Four land drains fed water into the ditch (F110, F111, F112 and F121). A small segment of F110 was excavated, and was found to comprise a narrow gully, 0.48m wide and 0.21m deep, containing no pipework. To the north of the main ditch F119/F165, F163 and F164 drained water directly off site into the former lake margins. The butt-end of F119 was excavated, which revealed a narrow gully 0.50m wide and 0.10m deep.

Finds

Few features yielded remains indicative of function, although twenty-four pits and scoops produced prehistoric finds. The investigation produced a small amount of lithic material, mostly flint but included a few flakes of chert and one stone axe, in a broken condition. Both waste products, utilised and worked tools were present in the assemblage, and included scrapers, a bifacially worked leaf-shaped arrowhead, and a borer or piercing tool. A small handaxe produced from a greenish-grey volcanic tuff was recovered from F141 (C1193), but in a broken

Plate 4 Prehistoric hand axe

condition (Plate 4). It would appear to come from axe factories in the northwest (Cumbria), North Wales or Scotland. The axe was split along its length into four pieces of equal thickness, and it is possible that it was fractured deliberately. An end piece is missing, but the possible presence of soot residues on the surface of the axe suggest it may have been heated, perhaps to encourage failure.

Generally, the number of flint artefacts recovered was relatively low, although F118 (C1143) and F142 (C1195) produced twelve and twenty pieces respectively. The greater part of the prehistoric ceramic assemblage was Grooved Ware (possibly Woodlands style or a local variant), but possible earlier Grimston Ware was also recovered and a small amount of Peterborough Ware was also present (Appendix D: Part 1 and 2). Some of the sherds were undiagnostic or too fragmentary to identify but belong to the tradition of Neolithic or late Neolithic ceramics. One sherd of Beaker pottery from F6 (C1007) is chronologically later than the predominantly late Neolithic assemblage (Appendix D: Part 2).

F130 has been interpreted as the remains of a hearth, and although its backfill (C1162) contained few charcoal flecks, there was a reddening of the subsoil around the excavated feature which suggested that the ground had been fired. Its backfill also incorporated fragments of cracked stones, probably broken by fire. Other features produced cracked stones (pebbles, cobbles and sandstone fragments) apparently broken by heat (e.g. F115, F116, F123, F131, F133, F140, F144, F147, 157), and a burnt flake also occurred in F4. In at least one instance, the stones were accompanied by fragments of calcined bone (F116). A limited number of features produced burnt bone (F116, F125, F134, F142), which upon analysis proved to be non-human.

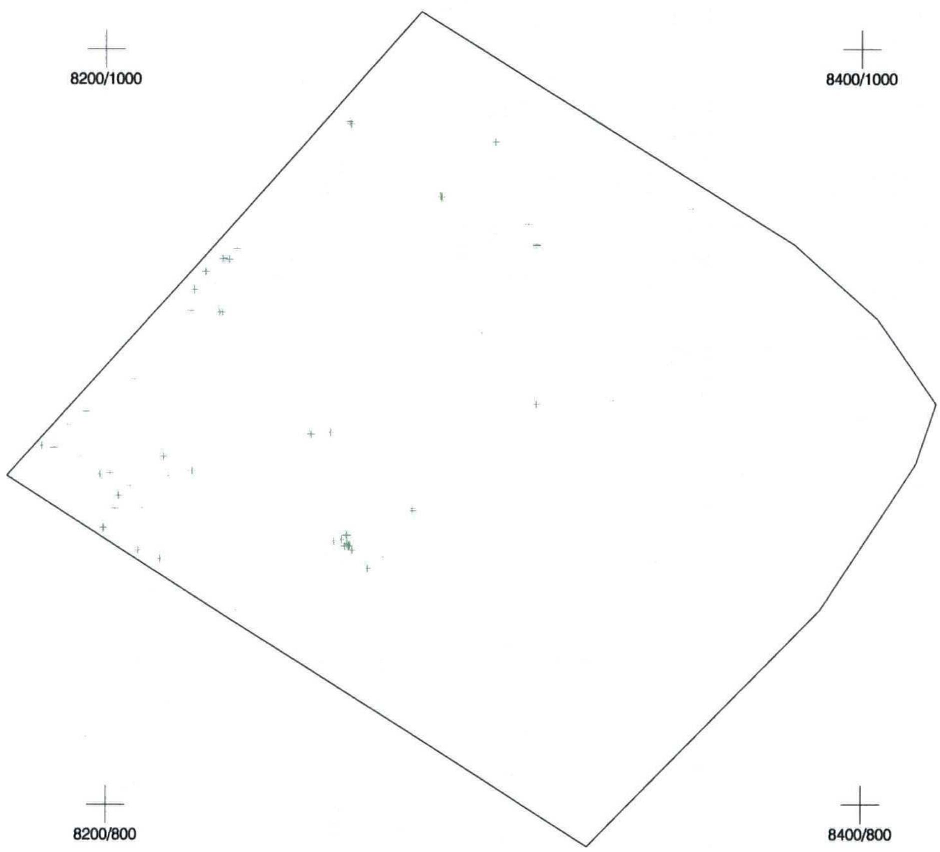
More modern activity appears to be represented by pits F137 and F151. F137 represented an old fence post; it produced a piece of wood (L0.24 x W0.14 x B0.06m) and a few fragments of modern tile. F151 produced fragments of modern brick and animal bone, and is probably the remains of a disturbed animal burial. Notably, these occur at the western limits of the area.

INTERVENTION 2 - SURFACE COLLECTION

Fieldwalking covered the entire area of Intervention 1(W) and was carried out in response to the discovery of a scatter of finds which were noted on the subsoil surface after topsoil stripping. Fifty-nine find spots (Find nos 1-59) were mapped (Figure 29), distributed over the western side of the intervention. One cluster of find spots occurred around two pits F115 and F116, and another near spread C1148 and pit F123 to the north. In the southwest corner of the intervention, a spread of material was collected in an area devoid of any archaeological features.

Lithics accounted for 51 find spots and were single finds apart from Find nos 23 and 43, where two pieces were picked up. The remaining 8 find spots produced 42 sherds and fragments of prehistoric pottery, the largest collection being Find no 37, being 17 sherds. The pottery assemblage contained little diagnostic material, apart from Find no 54, a sherd of Peterborough Ware (close to C1214). The remaining material appears to belong to the Neolithic period following the tradition of Grimston Ware and Grooved Ware recovered in larger quantities from the excavation.

The lithic assemblage contained a similar range of material to the excavation (Plates 5 and 6). It included a core



Investigation 9 (Intervention 2) find spots | Scale 1:2000 | Figure 29

(Find no 22) and a projectile point produced on a thick flake (Find no16), perhaps a crude leaf arrowhead. Scrapers were the most common tool type and it included three small thumbnail scrapers (Find nos 15, 19 and 55), a class of tool that appeared in the early Bronze Age and is a common feature of Beaker associated assemblages.

Plate 5 Flint cores

The discovery of material on the subsoil surface suggests that finds were present at the lowest levels of the ploughsoil, at the interface with the subsoil. At these levels, it appears that even fragile material such as the pottery survives at least initial disturbance by the plough, although it is unlikely to survive at higher levels in the soil profile. The cluster of finds around F115 and F116 demonstrates that ploughing is responsible for a significant amount of damage to the features, and furthermore, suggests that an unknown number of features have been lost in the southwest corner of the area.

Plate 6 Flint projectiles

4.7.3 Assessment

Intervention 1 revealed a scatter of truncated pits and scoops around the margins of a former lake, which by the Neolithic had silted up. The features provide evidence for Neolithic occupation on the site in the vicinity of a series of natural sink holes, which may have contained standing water or localised patches of marshy ground. In this respect, it is perhaps surprising that at least some of the sink-holes, apparently open in the Neolithic and Bronze Age, did not produce any finds contemporary with the occupation, but it may suggest that activity was of a relatively low intensity. Although occasionally grouped together in small clusters, the pits and scoops do not form any coherent pattern.

Activity may have reached a peak during the late Neolithic, but the presence of possibly earlier pottery and a chronologically later Beaker type assemblage (pottery and thumbnail scrapers) suggests that activity continued over a longer period. The area appears to have been abandoned at some time in the early Bronze Age, perhaps reflecting a change in use or a shift in the focus of activity. This can be correlated with the environmental evidence for periods of clearance, which began in the late Neolithic, but which appears to have been of low intensity, and was succeeded by a period of woodland restoration. During the Bronze Age, clearance appears to have occurred in more significant levels, though again this was only temporary.

For the post-medieval and modern periods, the results of the watching brief demonstrate the response to the natural topography and geology of the area: where sink holes reveal areas of the landscape likely to be wetter, field drains appear to have been used in order to drain and use the land to its maximum potential. To the south of Intervention 1(E), the earlier Ordnance Survey maps suggest that the sink hole (C1030) was situated at the end of a smaller field, and the long sinuous ditch, F31, is probably all that remains of that field boundary.

4.8 INVESTIGATION 10 (INTERVENTION 3)

A walkover and contour survey was carried out in the northwest corner of the Flasks in advance of further watching brief work (Quarry Phase 2b, 5a). The area of investigation lies to the north of Intervention 1(W) (Investigation 9), beyond the northern arm of Flask Lane (Figure 30). The field surrounded the western side of the quarry processing plant and at the time of survey was under pasture (late summer 1999). There was no indication that the ground had been ploughed in the recent past.

4.8.1 Fieldwork procedure

The purpose of the walkover survey was to identify and describe any upstanding earthworks or features of potential archaeological interest, and a contour survey was undertaken to map such features.

4.8.2 Fieldwork results

The surface of the field contained a number of hollows (possibly sink holes) and earthwork features. A drop in ground level along the eastern edge of the field appeared to mark the former edge of the in-filled lake, or a broad channel into the lake.

Nine medium to large sub-circular hollows were defined and mapped. The smaller hollows all clustered along the edge of the terrace, which runs NW-SE and represents the boundary of the former lake. A larger, though somewhat poorly defined, hollow in the southwest corner was situated 50m back from the terrace near the former gated entrance to the field. Another depression in the opposite northeast corner, 18m in diameter, appeared to be the remains of a small pond (later identified as another sink hole and some 5m in depth, sampled by Durham University in summer 2003, called Shake-Hole 1: Investigation 18). The remainder of the hollows are also likely to represent sink holes (Figure 31).

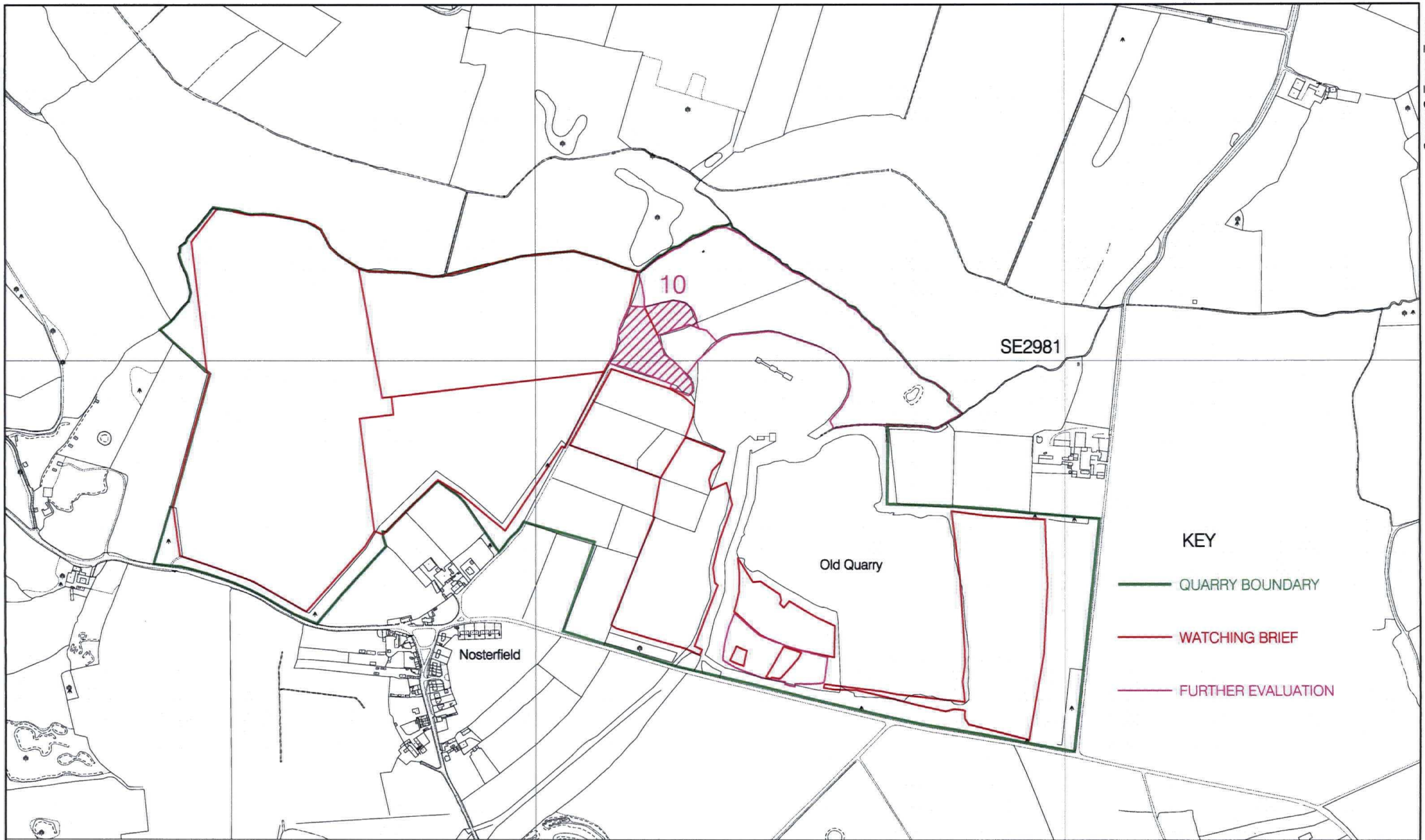
The terrace was found to run along the eastern side of the field between the 40 and 41m contour. At the north end it was crossed by a low bank (NE-SW) running toward a manhole cover situated in the southwest corner. Where it had been exposed by burrows, the soil from the lower levels appeared to consist of a desiccated peat. On the higher ground, the topsoil was shallower (0.30m) and appeared to overlie the gravel subsoil.

4.8.3 Assessment

This fieldwork identified a number of features within the area, identifying potential candidates for investigation during a subsequent phase of watching brief in the same area (Investigation 11).

4.9 INVESTIGATION 11 (INTERVENTION 4)

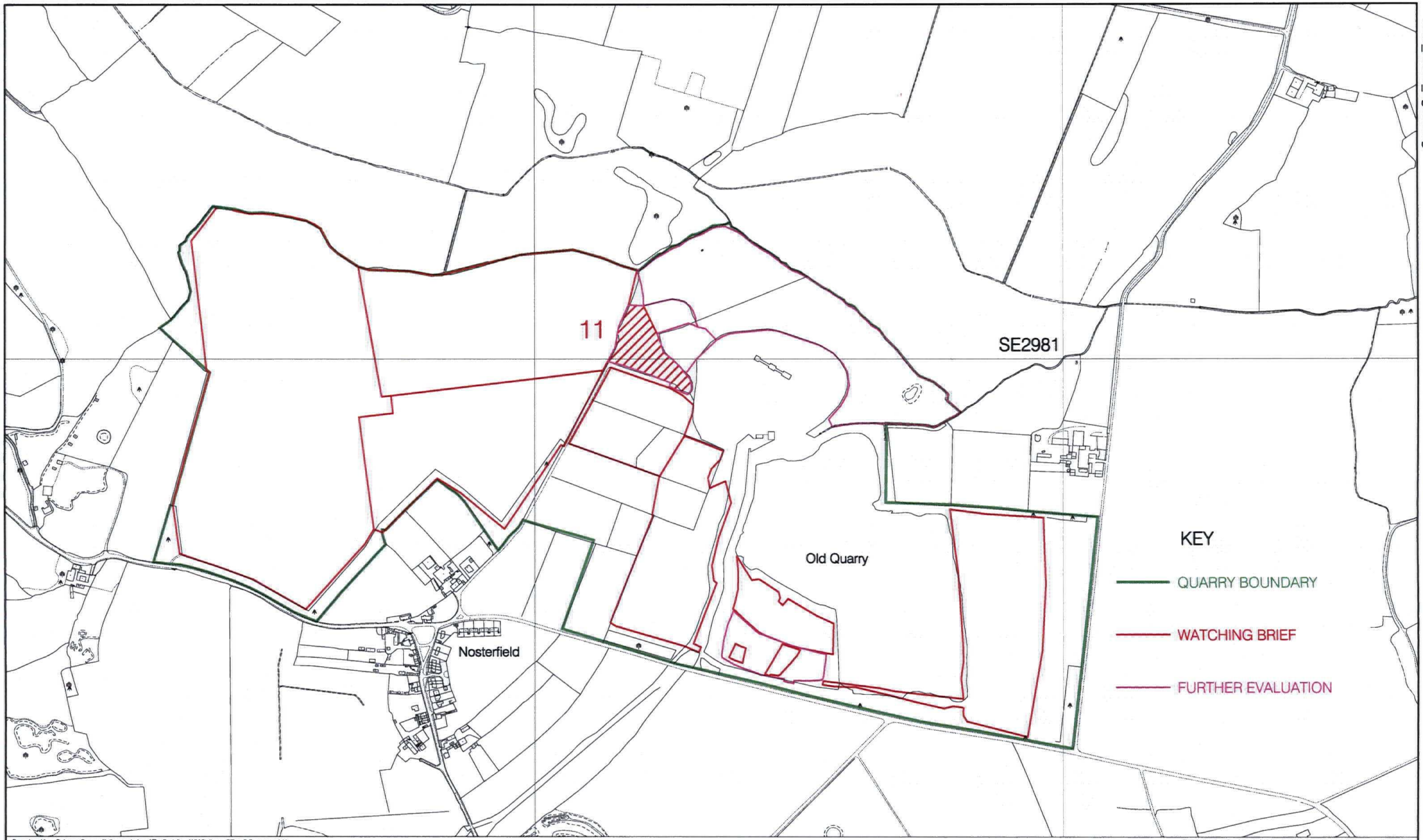
Investigation 11 (Intervention 4) was carried out on the same area of land, although a new fence had reduced the area by cutting off the northeastern corner (Quarry Phase 2b, 5a)(Figure 32). Intervention 4 therefore covered a triangular area in the northwest corner of the Flasks, to the west of the quarry processing site and north of the previous watching brief (Investigation 9). The area covered approximately 1.20 hectares, with



FAS

Location of Investigation 10 | Scale 1:10000 | Figure 30

Investigation 10 contour survey at 0.20m intervals | Scale 1:1250 | Figure 31



FAS

Location of Investigation 11

Scale 1:10000

Figure 32

maximum dimensions 120m north-south and 158m east-west. The watching brief was carried out in September 1999.

The ground cover consisted of rough pasture used for grazing sheep, and had not been recently ploughed. Ground level was relatively uneven, although the ground rose from the east side, on the 39m contour, to the west where it reached the 42m contour.

4.9.1 Fieldwork Procedure

The same fieldwork procedure employed for Intervention 1(W) was also used for this investigation, although the presence soft ground and water-logging restricted access in the eastern margins of the area during the watching brief. Features were recorded from F1 and contexts from C1000.

4.9.2 Fieldwork Results

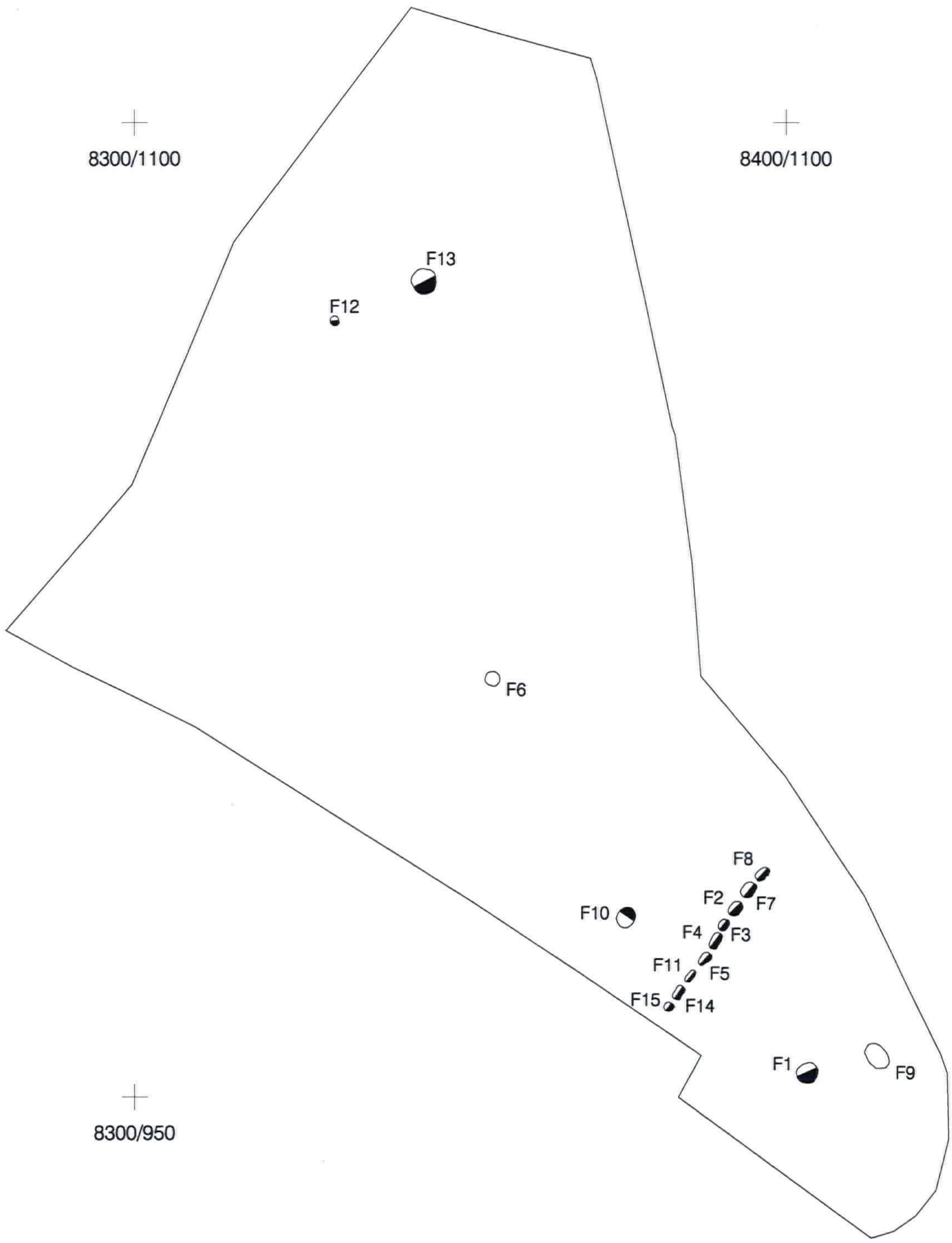
During the watching brief, a total of 15 features were identified and investigated, and 2 land drains were mapped but not excavated (Appendix A). The 15 features were all initially identified as pits; subsequently, 3 were found to represent sink holes (Figure 33).

One group of 9 pits (Structure 11) formed a length of a pit alignment. The remaining pits were identified as sink holes, although one (F6) contained only modern farm debris and no peat. A very small finds assemblage was recovered consisting of pottery, tile, animal bone and one piece of chert.

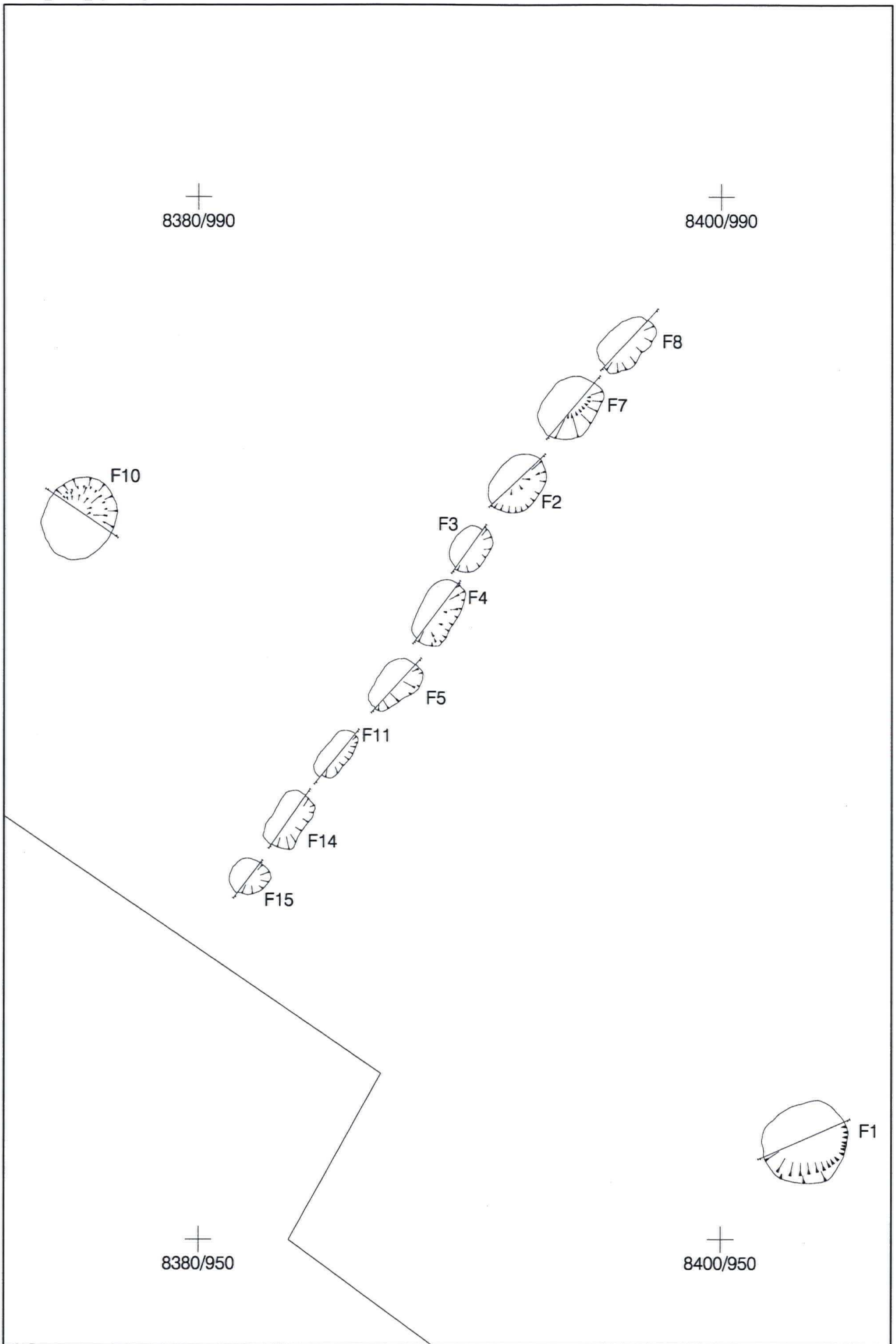
Pit alignment
Structure 11 crossed the southeast corner of the area and was orientated NE-SW from the edge of Flask Lane towards the terrace of the former lake. The pit alignment stopped approximately 4m in front of the terrace edge. Within the pit alignment, the oval or sub-rectangular pits were generally situated between 0.71m and 0.94m apart, although the distance between F3 and F4 was only 0.51m, while between F5 and F11 the distance was 1.20m (Figure 34). Most of the pits were sub-rectangular, although others were oval or circular. The largest pit (F4) was 2.76m in length but only 0.26m deep, while the deepest pit, F7, reached 0.52m in depth (Figure 35). The backfill of the pits were either brown clayey silts or sandy clays, which occasionally became stonier at lower levels (e.g. F2, F11, F14 and F15). In general, the pit bases were flat or gently sloping, although in F2 a shallow hollow was defined in the centre of the pit. The only finds from Structure 11 were an undiagnostic fragment of Roman brick from F2 (C1002), and a rim sherd of Torksey or Torksey-type Ware from F8 (C1011) dated to the 10th to 11th century AD (Appendix D: Part 4).

Isolated pits
Two other pits (F6 and F12) were not part of the pit alignment. F6 was a modern pit filled with lengths of barbed-wire and other farming debris. F12 was an isolated feature and contained a brown sandy silt (C1018), interpreted as a possible shallow sink hole.

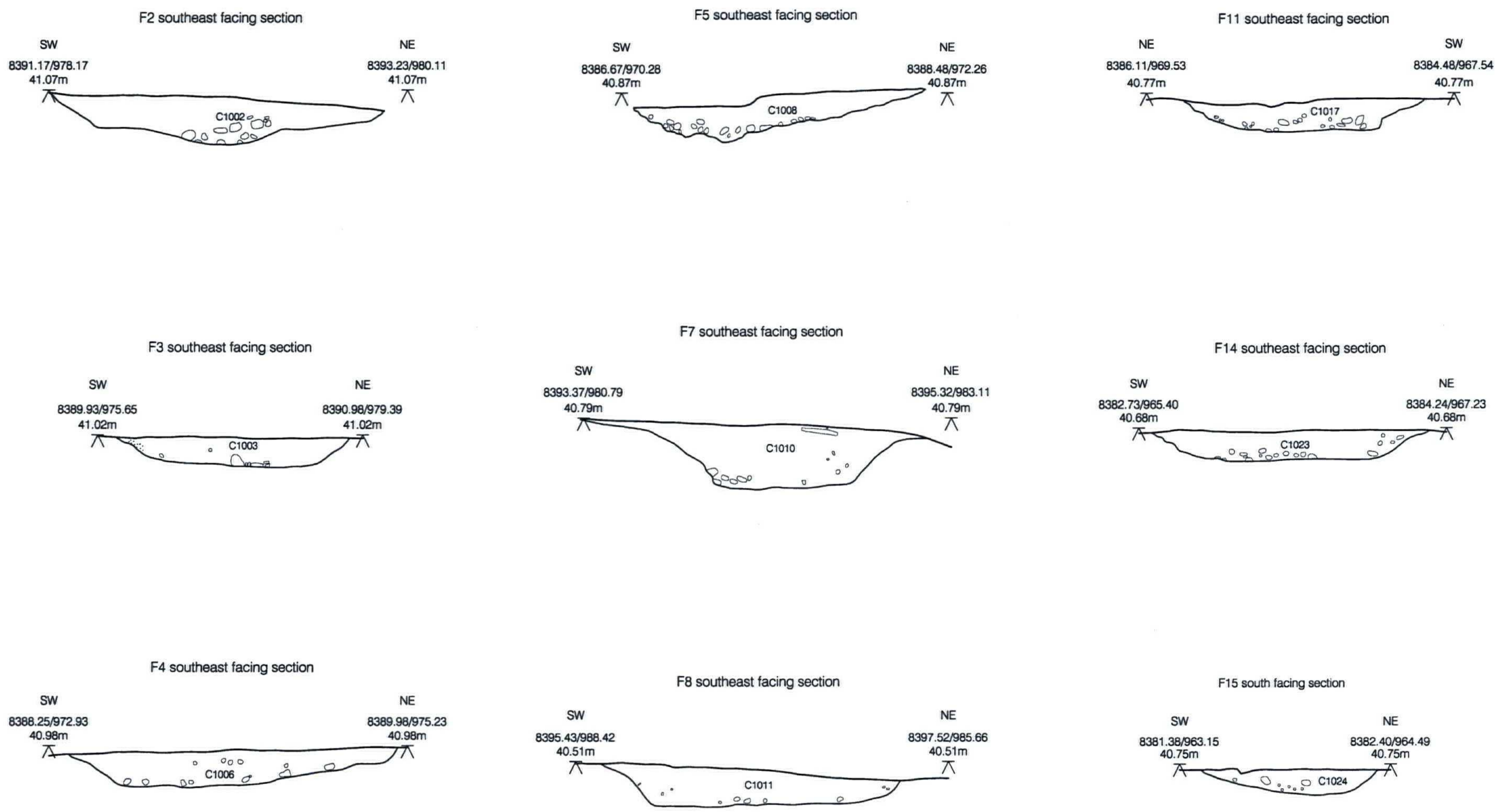
Sink Holes
Four sink holes (F1, F9, F10 and F13) were situated on the edge of the gravel terrace, with a further possible



Investigation 11 (Intervention 4) map of archaeological features	Scale 1:1000		Figure 33



Investigation 11 (Intervention 4) Structure11	Scale 1:200		Figure 34



FAS

Investigation 11 (Intervention 4) Structure 11 sections | Scale 1:50 | Figure 35

example, F12, set further back from the terrace (see Figure 33). Only F13 was fully excavated, the others being abandoned at different depths for health and safety reasons. F9, situated in soft marl, was too dangerous to excavate and was sectioned by machine and recorded remotely. Below the surface the sink holes became wetter and contained a series of layers and occasionally peaty deposits.

The upper fill of each sink hole was characterised by a well-structured soil, representing a deposit of topsoil which had accumulated in the tops of the features possibly as the underlying deposits shrank (Figure 36). F1 (C1000) produced a number of cartridge cases from shot guns (not retained), and a piece of chert from F13 with a single flake bed, possibly a core fragment, was the only lithic find from the investigation.

The lower fill of F1 and F13 contained peat. In F1 (C1007) the peat produced fragments of root and plant remains and was sealed by another peaty deposit (C1001) with lenses of marl. In F13, the peat (C1020) sealed two grey silty clay layers (C1021 and C1022). C1020 produced a fragment of tibia from a large mammal and C1022 a mandible, in a slightly fossilised condition, from a very large deer (elk or megaloceros)(Plate 7).

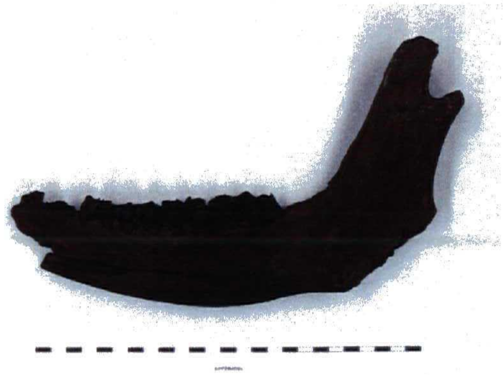


Plate 7 Elk mandible

4.9.3 Assessment

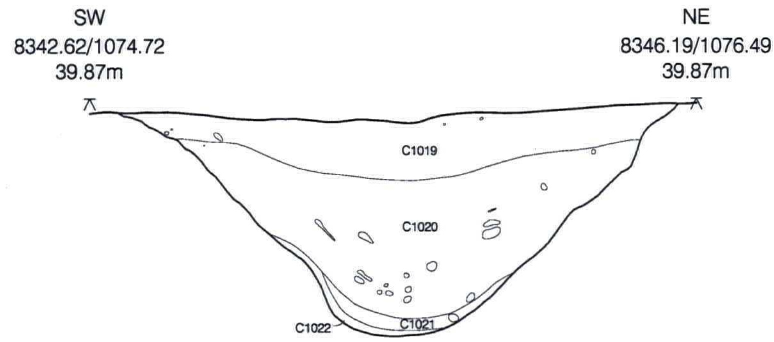
Not all of the hollows mapped in Intervention 3 were identified as features in the excavation, while the watching brief also produced one sink hole (F13) which had not been mapped as a surface feature.

The fragment of mandible from F13, from an animal extinct since the Pleistocene, suggests the possibility of a greater time depth for the formation of the deposits identified within the sink holes.

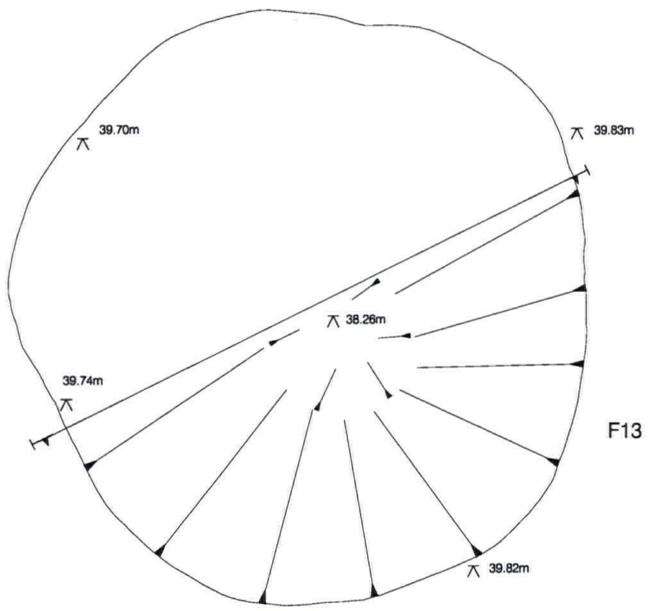
The absence of pits and any material from occupation suggests that late Neolithic activity did not extend across Flask Lane into Intervention 3. It is possible that a west/eastward extension of the pit alignment (Structure 11) could have formed the boundary to the site, although the absence of any finds of prehistoric date may suggest it could be later in the sequence.

Since Structure 11 had not appeared on the other side of the lane in Intervention 1, it is possible that it turned beneath Flask Lane and continued to the east or west. The pit alignment respects the edge of the terrace and may have terminated here on the edge of a wet peaty area. The finds from the pit alignment are difficult to interpret in terms of date. The lack of any further evidence for early medieval features or finds in the area suggests that the fragment of Torksey Ware may have been intrusive; a number of similar features identified during later stages of the watching brief were found to contain Roman ceramic, suggesting a final disuse of these features at this time.

F13 southeast facing section



Large Elk mandible recovered from F13, C1022



Investigation 11 (Intervention 4) F13	Scale 1:50		Figure 36

4.10 INVESTIGATION 12 (INTERVENTION 6)

Investigation 12 consisted of fieldwalking undertaken in the northern part of Nosterfield Quarry in advance of topsoiling (Quarry Phase 2b)(Figure 37). The area of topsoil, covering 10.88 hectares, was walked during December 1999, and a total of only 20 finds were recovered.

4.10.1 Fieldwork Procedure

Fieldwalking was undertaken in two areas of the investigation that had been planted with potatoes; the remainder of the area was under stubble at the time. Complete coverage of the available area was achieved. The finds were individually located using a total station theodolite, and their 3-D coordinates plotted.

4.10.2 Fieldwork Results

Only 20 finds were recovered during this work, consisting of pottery and lithic material (Appendix C: Part 3). Flint artefacts included a single blade, 10 flakes and 7 fragments of debitage, 2 fragments of which were found to have been burnt. A fragment of Roman pottery was also recovered. No notable clusters within the distribution were identified.

4.10.3 Assessment

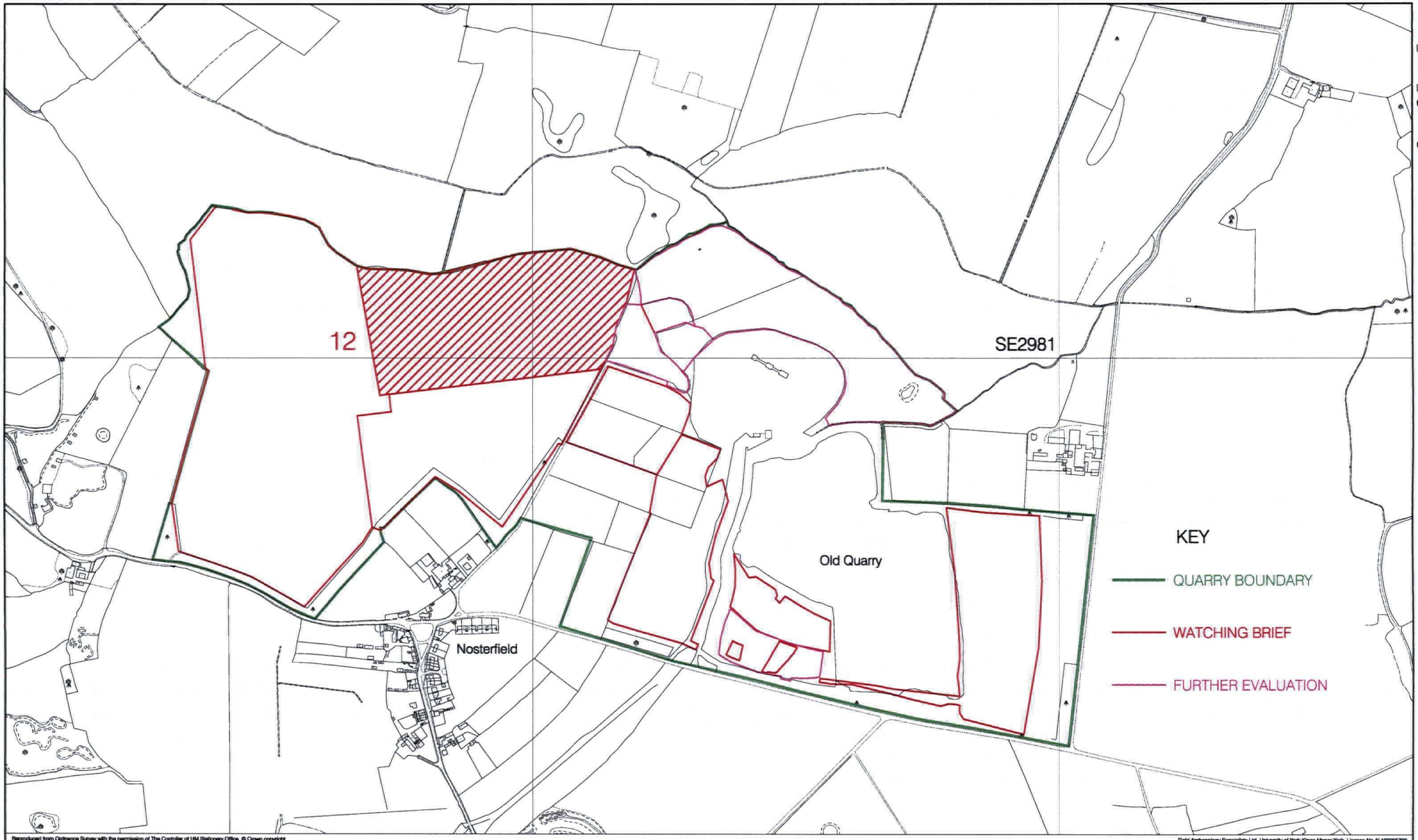
The low number of finds recovered from this phase of work, and their generally undiagnostic nature, means that few conclusions can be drawn regarding their significance. Despite their limited value, these finds add to the general assemblage of prehistoric artefacts recovered during the subsequent watching brief in the same area (Investigation 13: Intervention 5NE). The low number of finds recovered from this phase of work can be compared with the results of Investigation 9 to the east (Intervention 2).

4.11 INVESTIGATION 13 (INTERVENTION 5NE)

A watching brief was undertaken over a large area to the west of the Nosterfield Quarry site, commencing in January 2000 (Quarry Phase 2b). This represented the first of four phases of Intervention 5, the largest area of investigation, covering a total of 37.8 hectares, and measuring 840m from east to west, and 765m north to south. The work was divided into four discrete phases of watching brief (Intervention 5NE, 5NW, 5SW, 5SE), and began with Intervention 5NE, which was undertaken between January and February 2000, and completed in May 2000 (Figure 38). The watching brief in this area revealed a series of linear features, including ditches and pit alignments, which dated from prehistory to the medieval period. A series of small pits was identified, and finds from the excavated features comprised largely prehistoric pottery and lithics.

4.11.1 Fieldwork Procedure

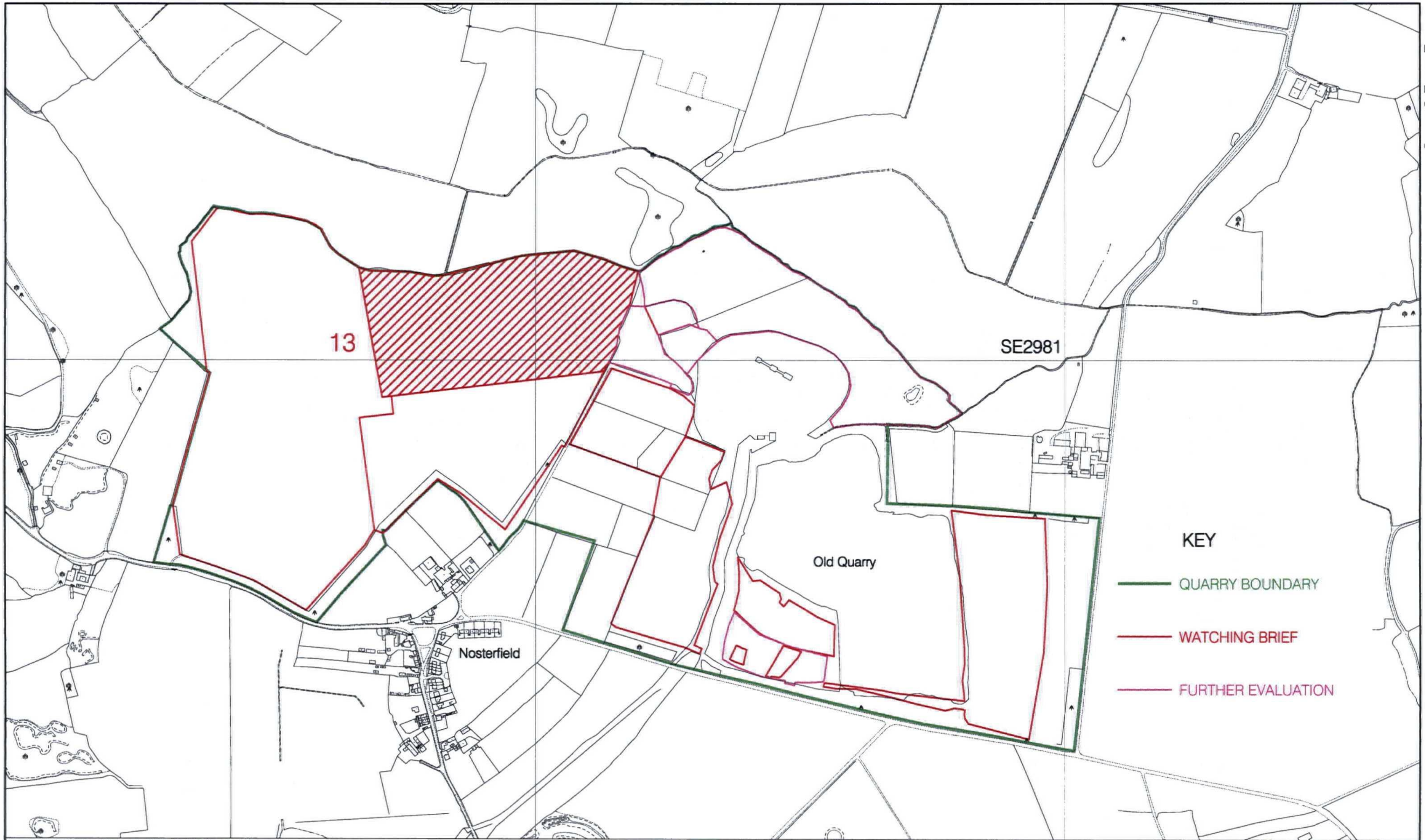
Initially, the topsoil from each area was stripped using a 360° tracked machine with a toothless ditching bucket; machinery was then prevented from running on the stripped areas until the archaeological features within each area had been fully investigated. The exposed subsoil was scanned for archaeological features, which were then



Location of Investigation 12

Scale 1:10000

Figure 37



FAS

Location of Investigation 13

Scale 1:10000

Figure 38

mapped using a total station theodolite, half-sectioned and recorded. Context records began at C1000 and feature records from F1.

4.11.2 Fieldwork Results

A total of 27 features was identified during the watching brief, of which three have been classified as ditches, and the remainder as pits. Of these, eleven pits and one ditch formed part of a pit-ditch alignment across the southern part of the area, while the remainder were dispersed throughout the area, and showed little evidence for structure or organisation (Figure 39). Dating evidence was rare, but those finds that were produced indicate that activity in the area occurred between the Mesolithic and Bronze Age.

Ditch/pit alignment

Twelve pits were found to be aligned WSW-ESE, extending the line of a substantial ditch which ran for 115m across the southern part of Intervention 5NE (Structure 10)(Figure 40). The ditch was sampled in five sections, and was found to measure approximately 3.50m wide and up to 0.90m in depth, containing a series of fills (Figures 41 and 42). The pits were found to be sub-rectangular in shape, varying in length from 1.34m to 4.10m, and in width from 0.34m to 1.56m, reaching up to 0.72m in depth (Figure 43). Little dating material was recovered from these contexts; a Neolithic fabricator was recovered from the ditch backfill (F15). F16, a pit which shared an unclear relationship with one of the pits of the alignment (F7), or formed part of the structure, produced Grooved Ware of Neolithic date (Appendix D: Part 3).

Isolated pits

A number of small pits were identified within Intervention 5NE, in two main areas. To the north of Structure 10, five small pits were sampled (F1 to F5). Each was less that 1.0m in diameter, with a maximum depth of 0.36m. An undiagnostic fragment of flint was recovered from one feature (F2), and a single fragment of animal bone was recovered from F4 (Appendix G).

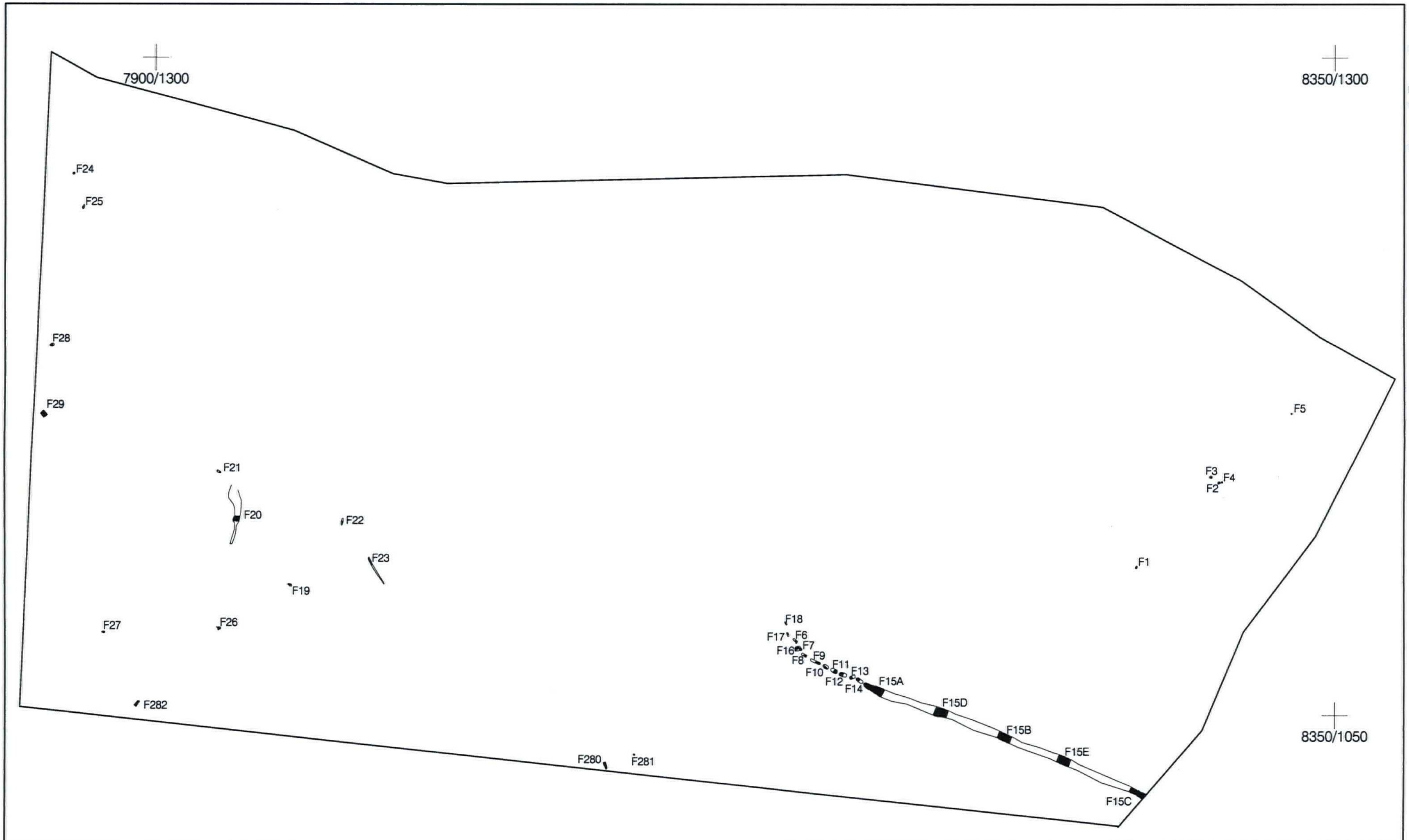
Further to the west, 7 further isolated pits were identified (F19, F20, F21, F24, F25, F26, F27), measuring on average 1.50m x 0.70m. Again, few finds were identified; fragments of flint were recovered from F26.

Linear features

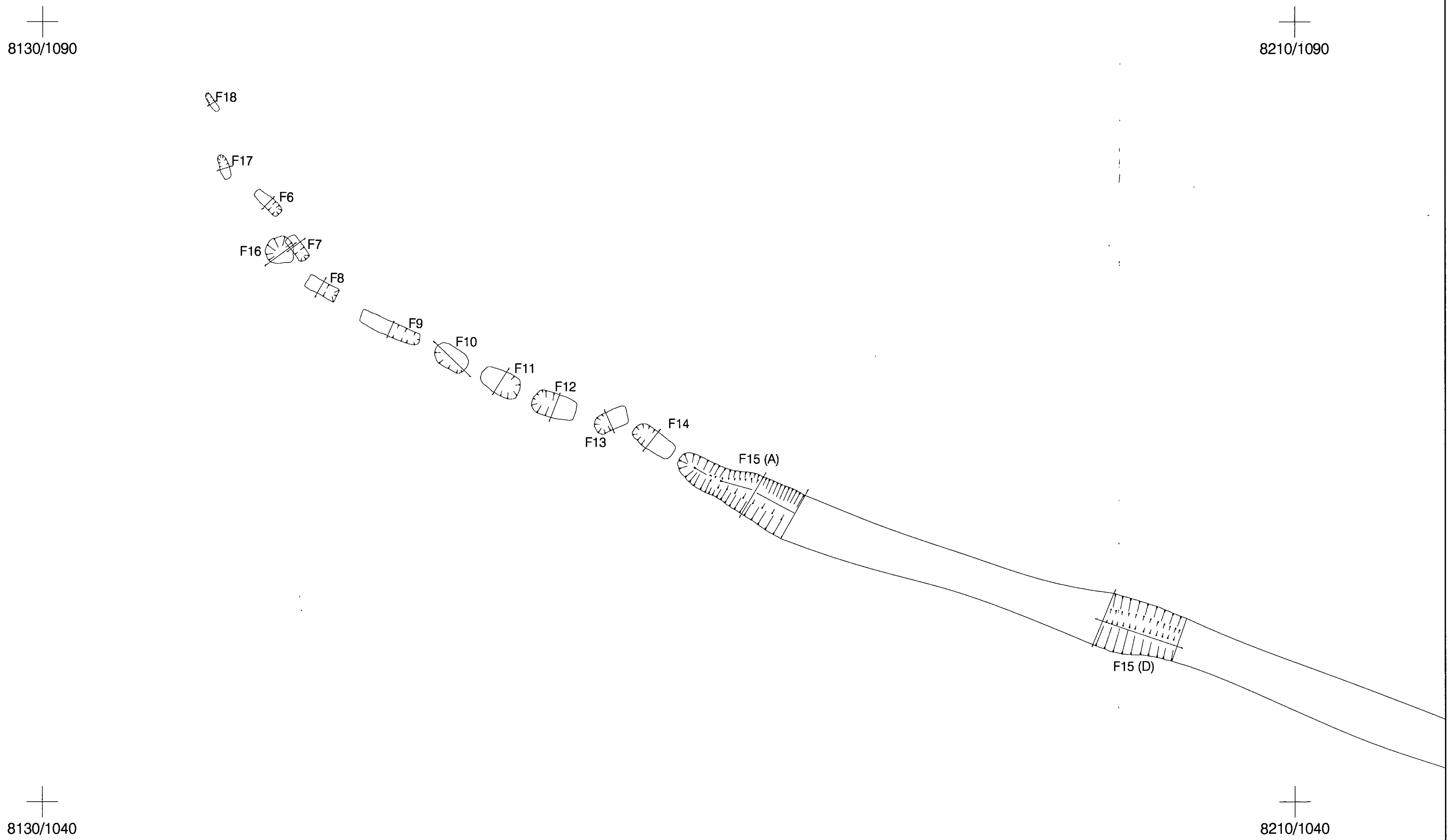
Two linear features were mapped and sampled during the watching brief, both of which lay within the western part of Intervention 5NE. F23 was found to measure 0.50m in width and up to 0.25m deep, and was defined for a distance of 12.05m. F20 represented an irregular shaped feature, apparently cut by, or draining into, an adjacent hedgerow.

4.11.3 Assessment

The majority of the archaeological features within this area provided little or no dating evidence or indication of function, and as such are difficult to interpret. Scattered pits provide some indication of human activity, but cannot be interpreted as structural. The pit-ditch alignment can tentatively be assigned a prehistoric date, although such features are known to have been constructed over a long period.



Investigation 13 (Intervention 5) map of archaeological features | Scale 1:2000 | Figure 39

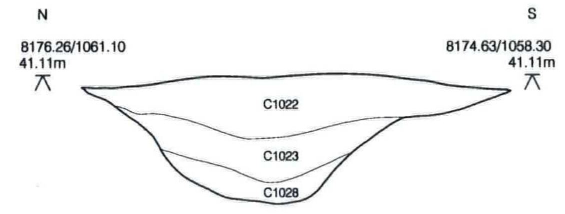


Investigation 13 (Intervention 5) eastern part of Structure 10

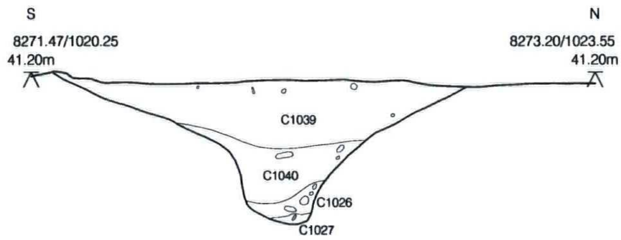
Scale 1:250

Figure 40

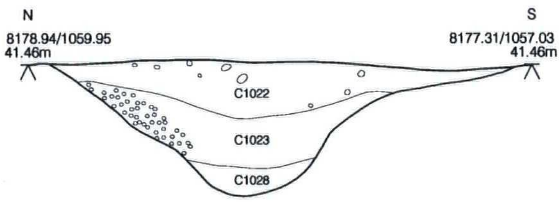
F15 (A) northwest facing section



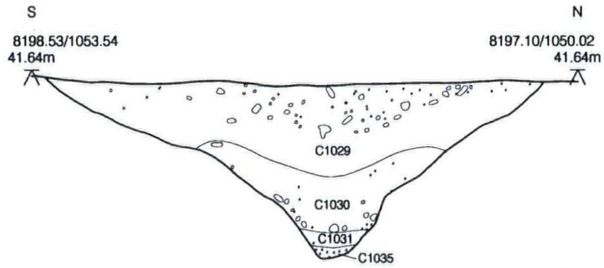
F15 (C) southeast facing section



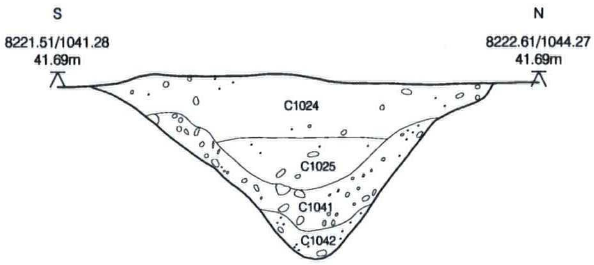
F15 (A) northwest facing section



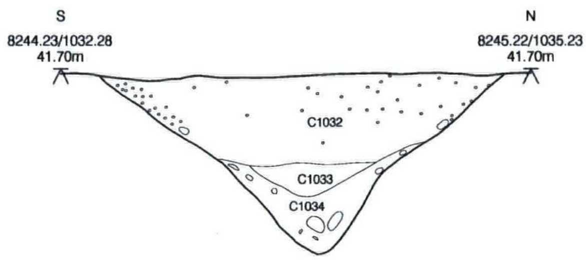
F15 (D) southeast facing section



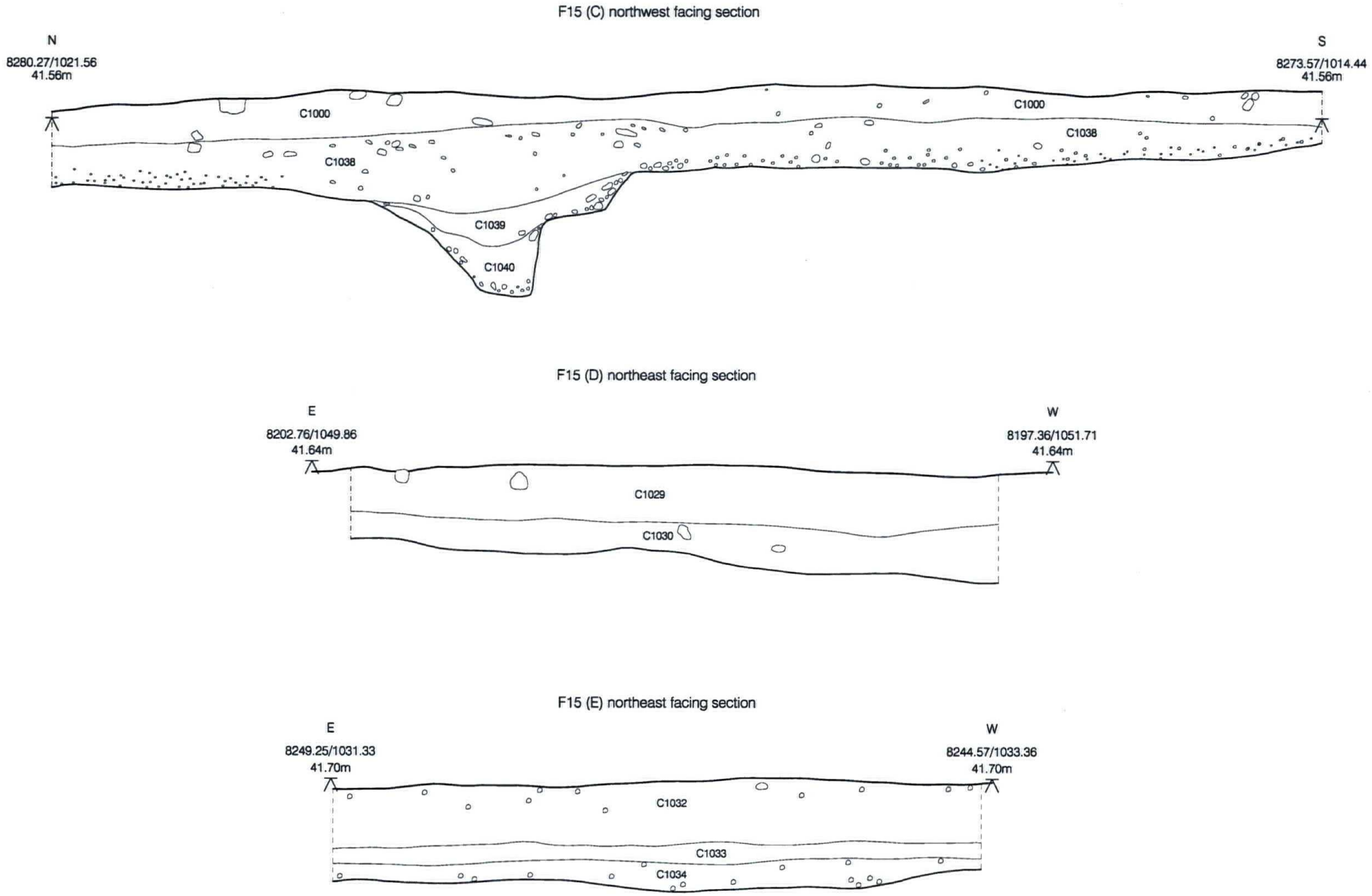
F15 (B) southeast facing section



F15 (E) southeast facing section



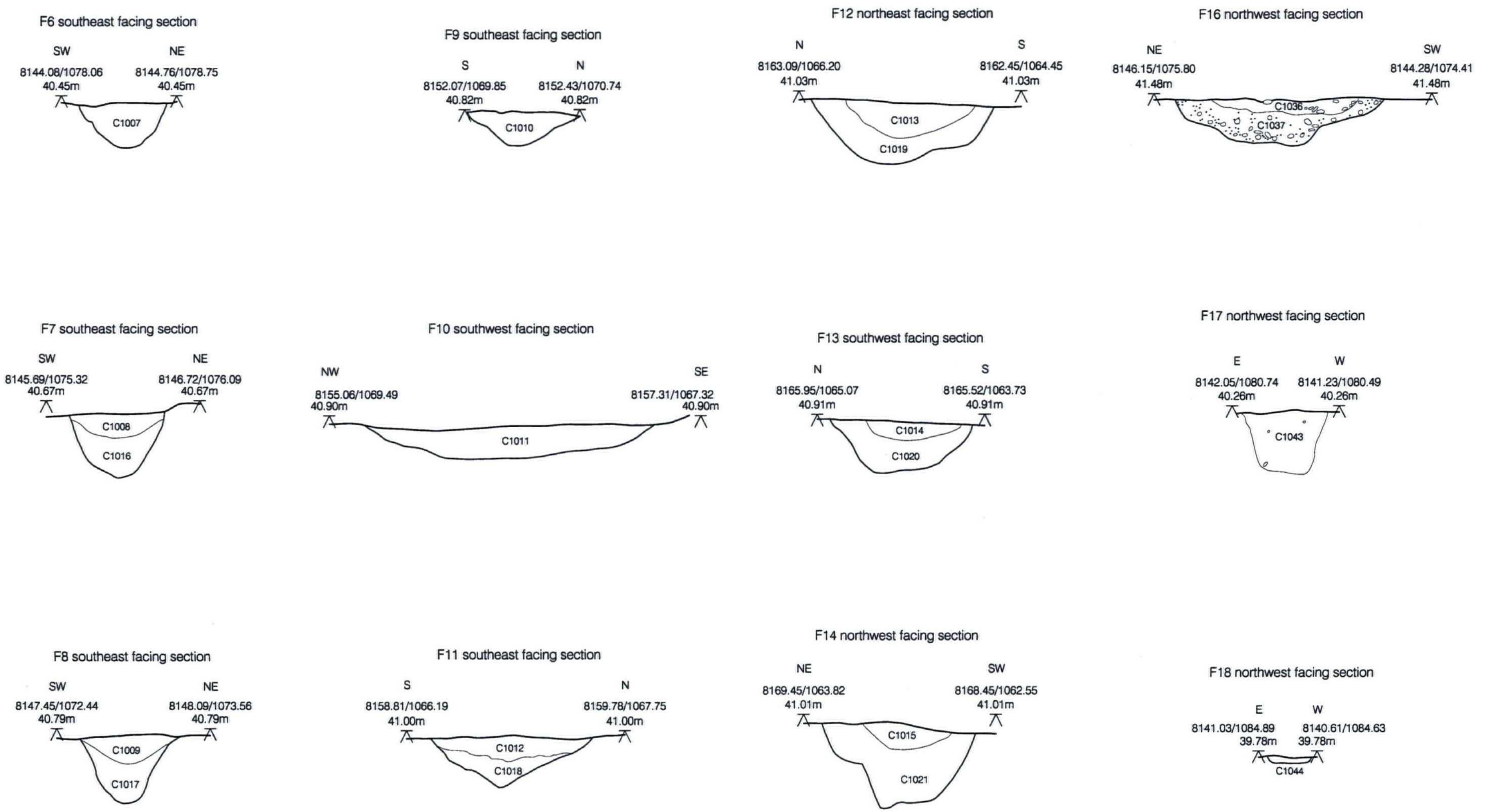
Investigation 13 (Intervention 5) Structure 10 sections	Scale 1:50	Figure 41



Investigation 13 (Intervention 5) Structure 10 sections

Scale 1:50

Figure 42



Investigation 13 (Intervention 5) Structure 10 sections

Scale 1:50

Figure 43

4.12 INVESTIGATION 14 (INTERVENTION 5NW)

A watching brief was subsequently carried out in an area to the west of Intervention 5NE, between October and November 2001; this area was extended southwards slightly in advance of the construction of a new processing plant (Quarry Phase 3) (Figure 44). The archaeological remains identified included land drains, linear features, ditches and hedges. A small number of pits were identified within the area, and upon investigation a number of features were found to be natural, formed by vegetation.

4.12.1 Fieldwork Procedure

The fieldwork strategy adopted for Intervention 5NW had proved adequate for the sampling and recording of the sporadic features that were identified, and as such, the same procedure was adopted for Intervention 5NW.

4.12.2 Fieldwork Results

A total of 31 features were investigated within Intervention 5NW (Figure 45). Five features were found to be natural, caused by vegetation, while the remainder consisted of scattered pits and scoops, and a number of linear features which appear to represent medieval or post-medieval land divisions.

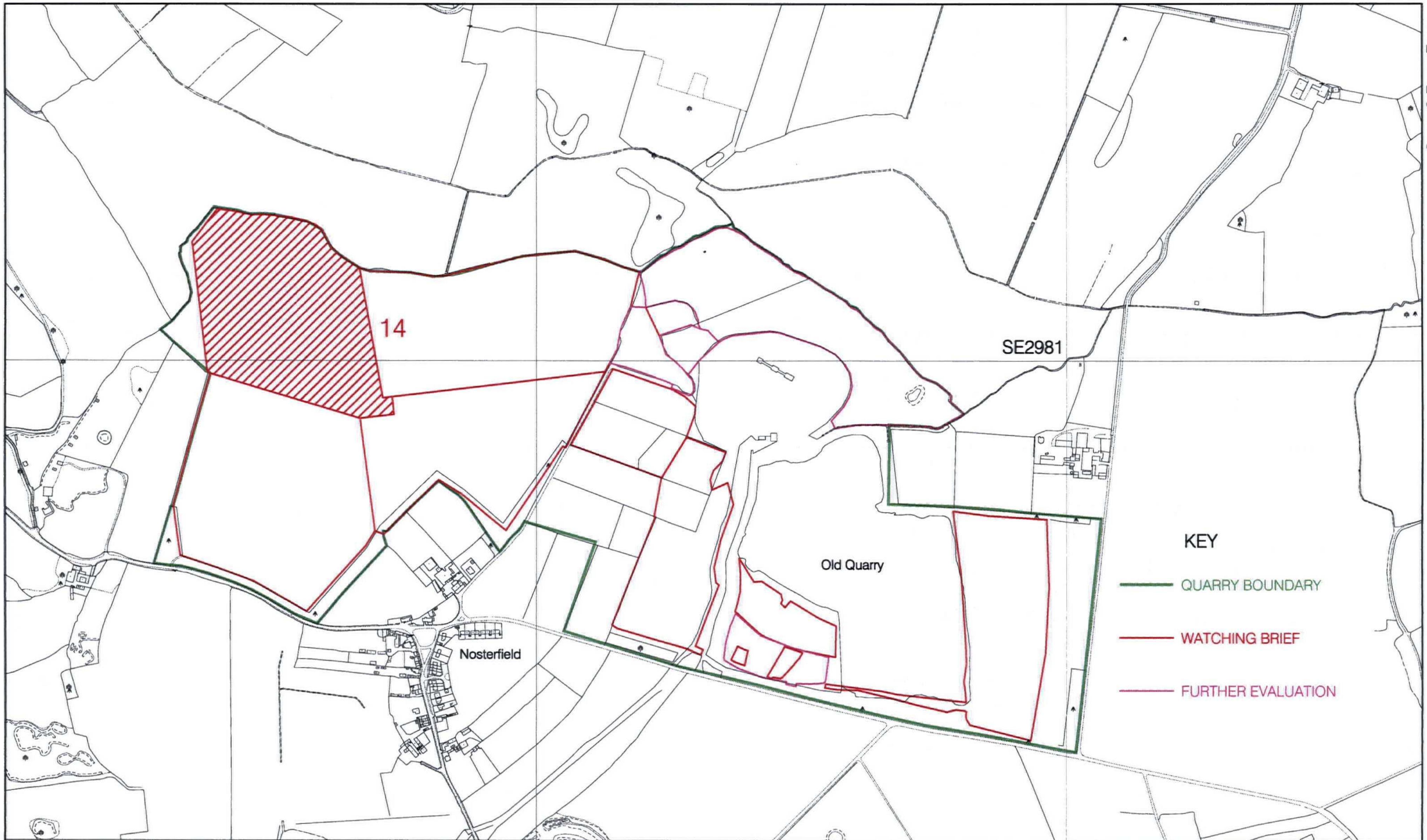
Natural features
Five features from Intervention 5NW were investigated and found to have been caused by natural factors, predominantly represented by tree boles (F50, F51, F53, F56, F57). These features formed a small cluster at the westernmost part of the Intervention, with an isolated example towards the centre.

Pits
The majority of the remaining features were either pits, of which 16 were identified, or scoops, which represented a further 5 features. These pits were scattered throughout the area of investigation and show no discernible pattern, although it has been noted that they occur on areas away from standing water, presumably on higher land. These features ranged in size from 1.7m by 1.04m to 0.60m by 0.50m, and reached up to 0.30m deep. Much more ephemeral were the 5 scoops, which measured between 0.02m and 0.08m deep, and had a maximum diameter of 0.90m. Generally, these features produced very few finds, and no securely dateable evidence was recovered (Figures 46 and 47).

Linear features
The area of investigation was dissected by a number of extensive linear features. Two ditches (F44 and F42/54), reaching lengths of 296m and 174m respectively, were found to run parallel to each other, approximately 60m apart, on a NNW-SSE alignment. Fragments of flint and medieval pottery were retrieved from the backfill of F44.

4.12.3 Assessment

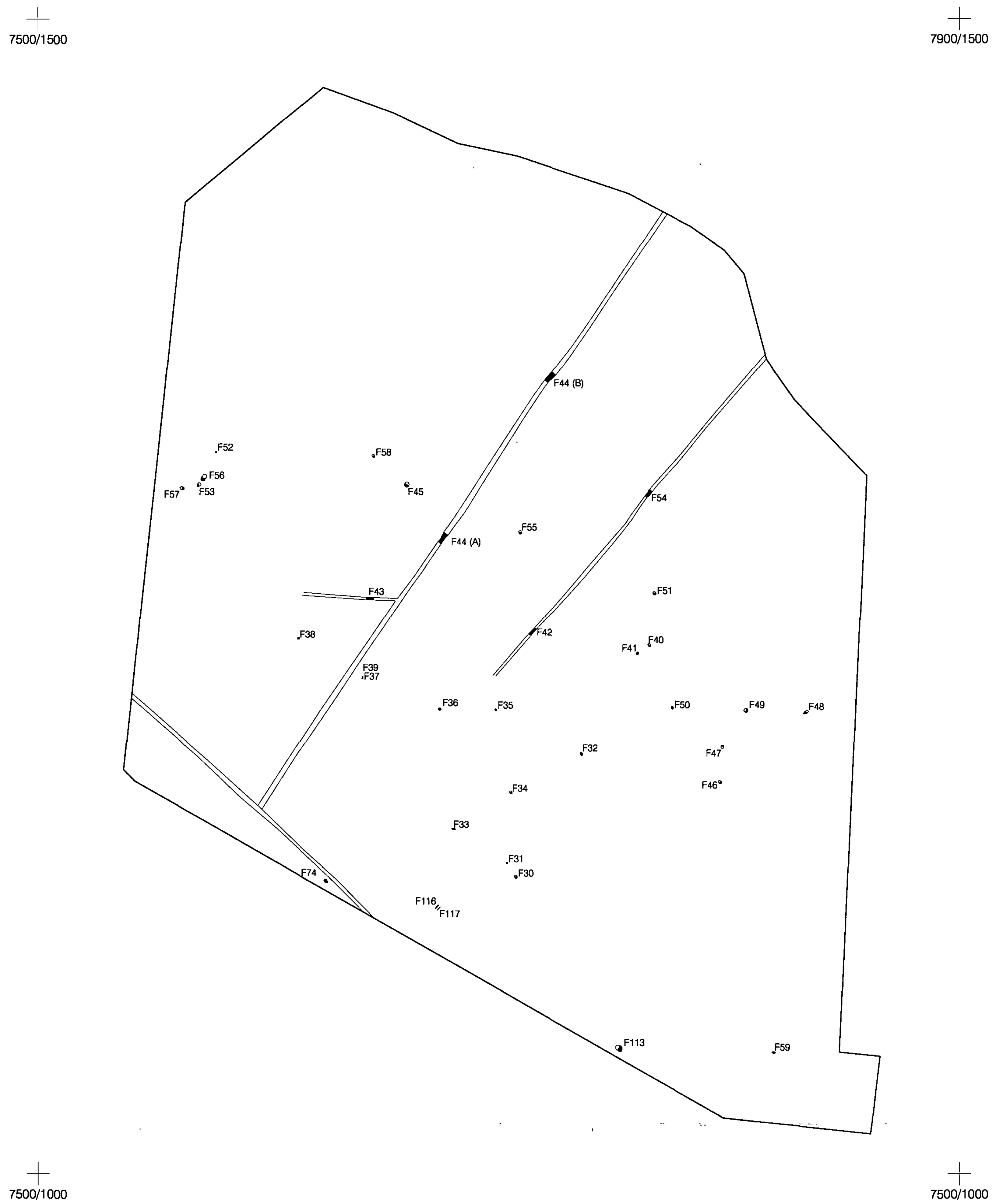
The ditches identified within Intervention 5NW would seem to represent medieval land divisions. The results of investigations in this area produced similar results to those in Intervention 5NE; dispersed pits and scoops



Location of Investigation 14

Scale 1:10000

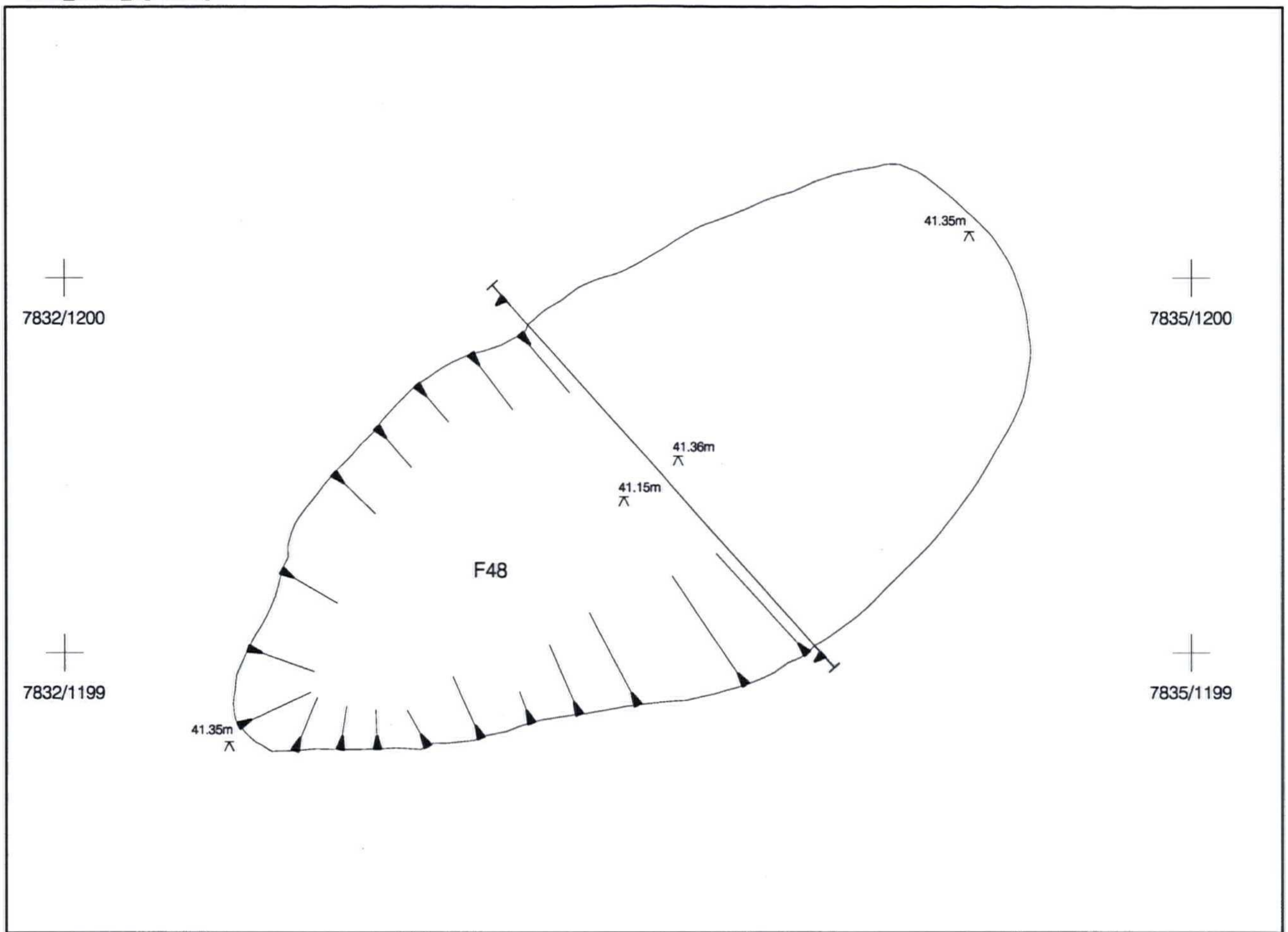
Figure 44



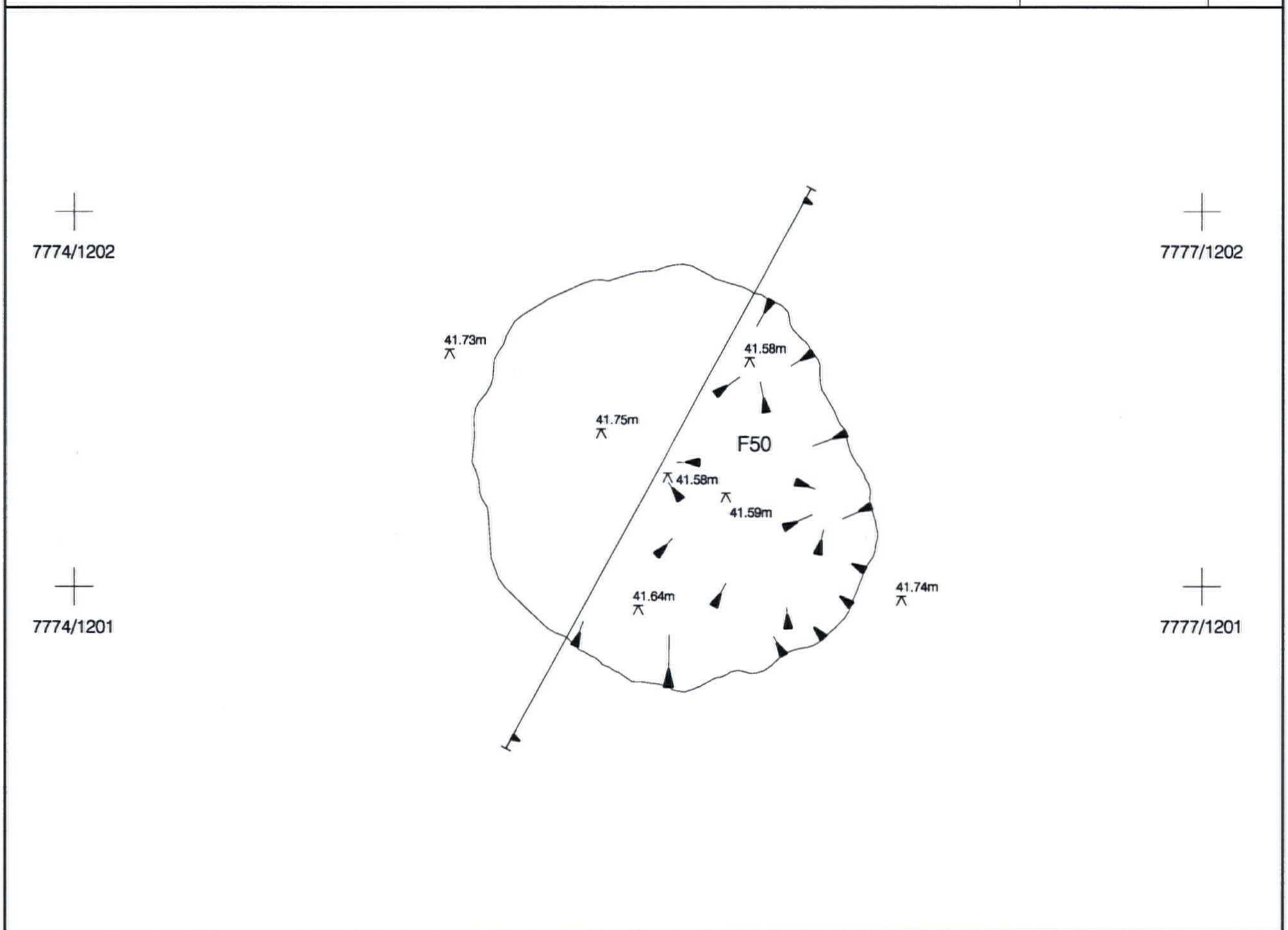
Investigation 14 (Intervention 5) map of archaeological features

Scale 1:2000

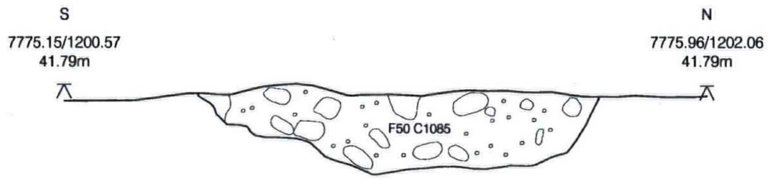
Figure 45



Investigation 14 (Intervention 5) F48 post-excavation plan | Scale 1:20

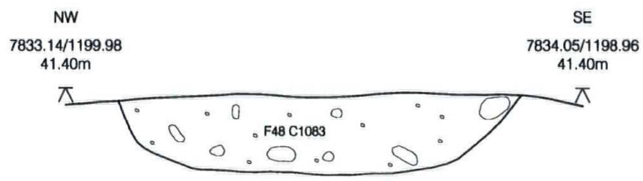


Investigation 14 (Intervention 5) F50 post-excavation plan | Scale 1:100 | Figure 46



Investigation 14 (Intervention 5) F48 section

Scale 1:20



Investigation 14 (Intervention 5) F50 section

Scale 1:20

Figure 47

provide evidence for some degree of activity within this landscape, but little indication of function or date.

4.13 INVESTIGATION 15 (INTERVENTION 5SW)

An archaeological watching brief was undertaken to the south of Investigation 13 between April and June 2002, and was completed in September 2003 (Quarry Phase 3)(Figure 48). The stripping of topsoil in this area exposed a much denser distribution of features than in areas to the north, revealing funerary activity which has been dated to the Bronze Age, and at least four pit alignments which divide the landscape. Modern land divisions were also observed and recorded.

4.13.1 Fieldwork Procedure

Although the fieldwork strategy had proved sufficient for the recording and sampling of the dispersed features encountered following the stripping of Intervention 5NW and Intervention 5NE, the removal of topsoil in to the south of these areas, in Intervention 5SW, revealed a much denser distribution of archaeological features. The identification of 4 pit alignments, 3 ring ditches and a series of cremations prompted a revision of the working methodology. As a result, a change was implemented to the level of monitoring over the site, and the sampling strategies employed. Any finds observed on the surface during fieldwork were subsequently collected and located using a total station theodolite.

A review of the environmental sampling strategy was undertaken by Dr Stephen Carter, and the resulting recommendations adopted. Bulk samples were taken from all features: 10 litre samples from each context within ditches, 30 litres from ring-ditches and two pits from each alignment, 10 litres from isolated pits, and 30 litre samples from charcoal-rich fills within archaeological features.

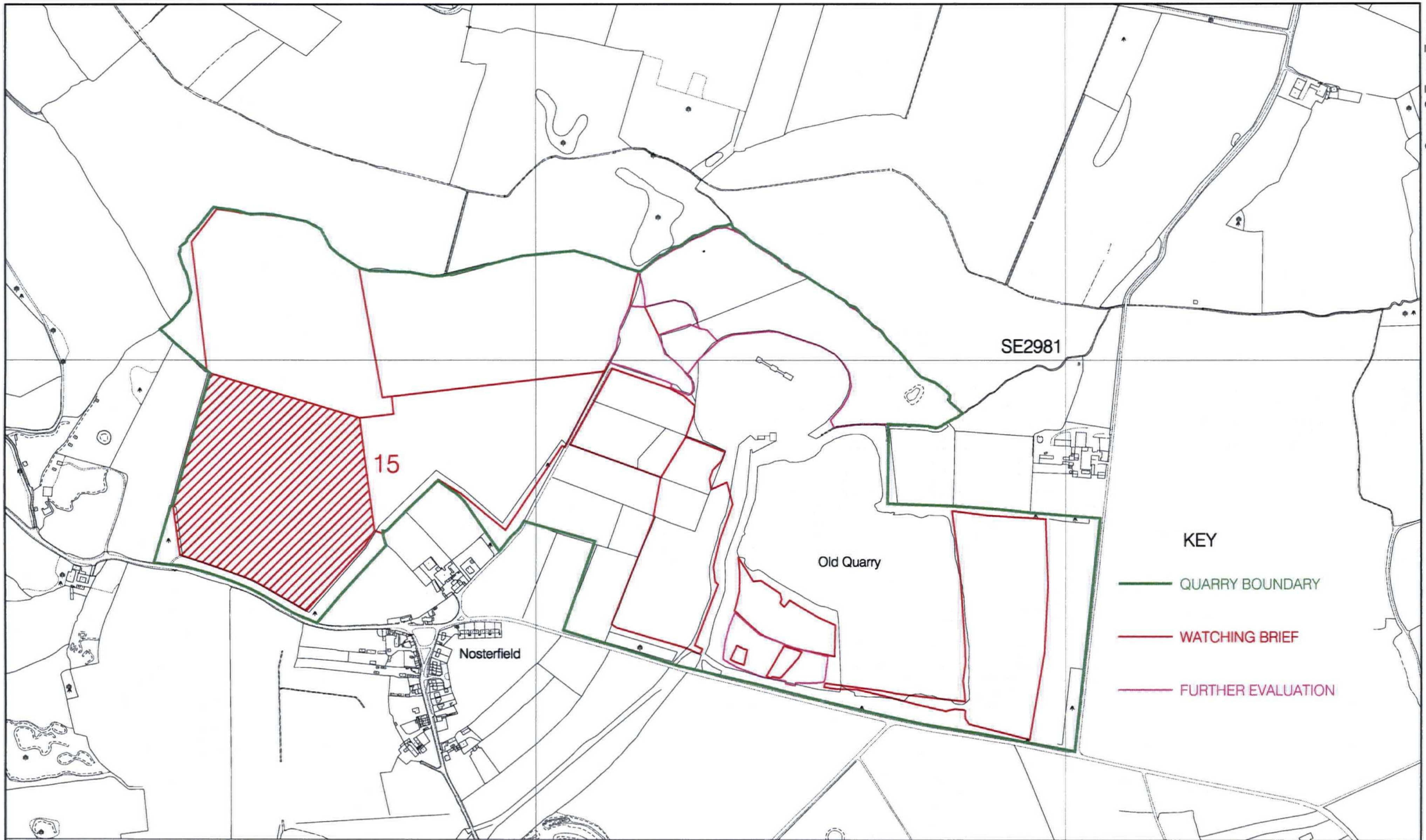
4.13.2 Fieldwork Results

Within Intervention 5SW, a total of 217 features were identified and recorded, representing over three times the number of features identified in the more northerly areas. Of these, 14 proved to be of natural origin, either caused by vegetation or geological anomalies. 126 features were pits, which were found to form part of 4 pit alignments (Structures 1, 2, 4 and 5). Two *foci* of funerary activity were also identified, one focussed on a ring-ditch to the west of the area (Structure 3), and the other comprising a group of cremations and a possible associated ring-ditch to the northeast of the area (Structure 7). All burials were severely plough-damaged, with clear evidence for plough truncation and disturbance. Roman activity was represented by a corn-drying oven (Structure 6), while a timber- and stone-lined well identified in the eastern half of the area produced evidence for a modern date (F202). As with the areas further north, the landscape was found to have been divided by a series of hedgerows and ditches (Figure 49).

Ring-ditches and associated burials

Three ring ditches were identified during the watching brief, and although direct dating evidence was not retrieved, evidence from associated burials has suggested a date in the Bronze Age for their construction.

The largest of the ring-ditches, F264, is situated to the west of Intervention 5SW, measuring approximately 17m

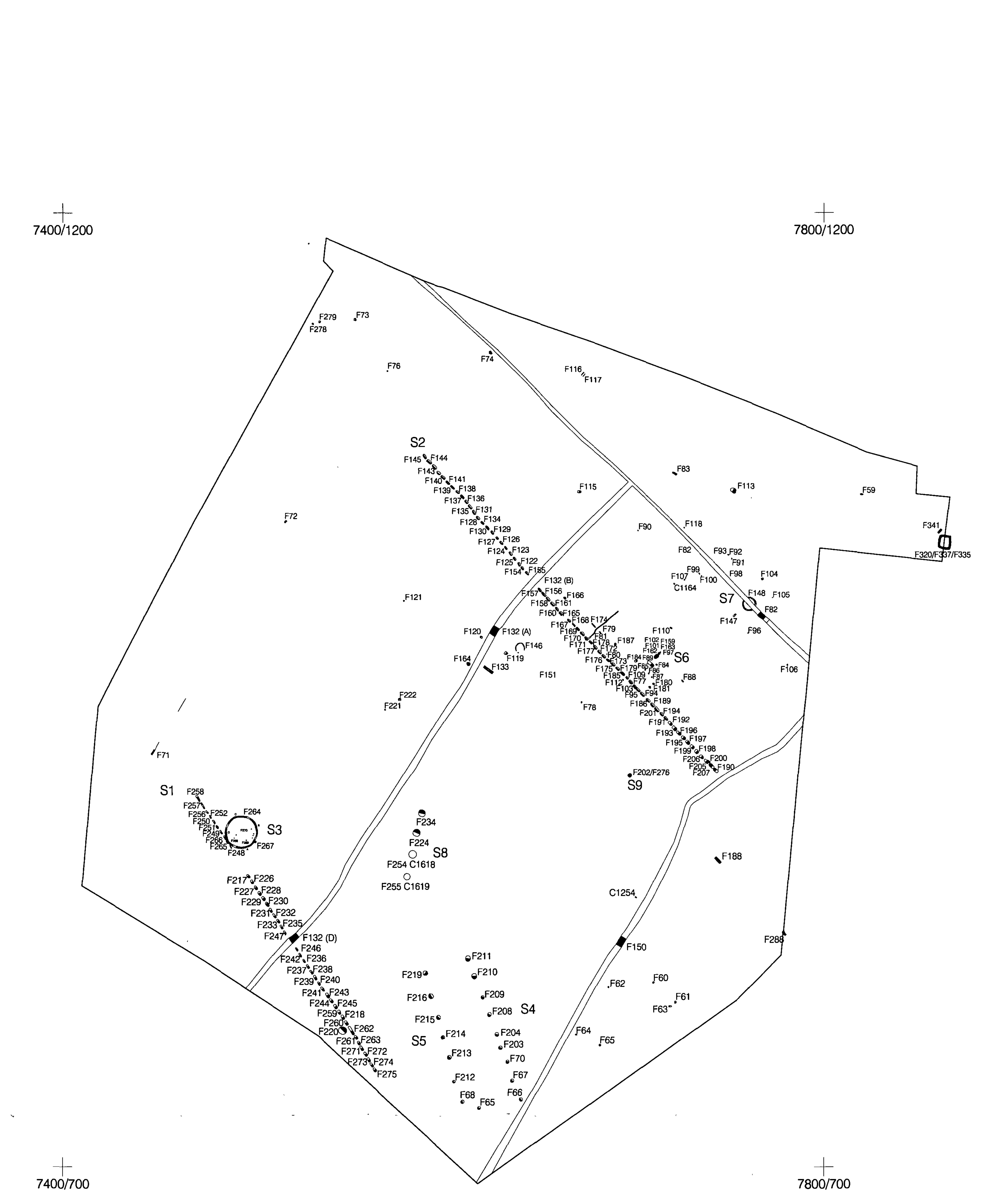


FAS

Location of Investigation 15

Scale 1:10000

Figure 48



Investigation 15 (Intervention 5) map of archaeological features | Scale 1:2000 | Figure 49

in diameter, and is associated with at least two burials (Structure 3)(Figure 50). Within the central area delimited by the ring-ditch, a single cremation was excavated within a pit (F269), which has provided a radiocarbon date of 1605 ±35 BC (SUERC-3786 GU-12287), placing it within the early to mid-Bronze Age (Figure 51: Appendix H: Part 1). A poorly preserved inhumation identified to the east of the ring-ditch (F267) provided a later date of 1240±40 BC (SUERC-3779 GU-12283; Appendix H: Part 1).

Plate 8 F92 and F93, Intervention 5, double cremation burial

In the northern section of Intervention 5SW, a group of 10 pits and scoops containing cremated human remains were identified within an area of approximately 100m x 40m, which also contained a ring-ditch (Structure 7: F90, F91, F92, F93, F96, F98, F99, F100, F105, F106)(Figures 52 and 53; Plate 8). Four of these cremations (F92, F93, F96, F106) were submitted for radiocarbon dating, providing a close range of dates between 1050±35BC and 1135±35BC (Appendix H: Part 1). These dates corroborated the identification of the urns, found inverted within at least four of the burials, as mid-Bronze Age (Plates 9 and 10; Appendix D: Part 3). The burials generally clustered around a ring-ditch (F148), with outliers to the northwest (F90) and southeast (F106). The ring-ditch in this area measured just 7m in diameter, and while it showed no stratigraphic relationship with the human remains, may have formed an original focus for burial.

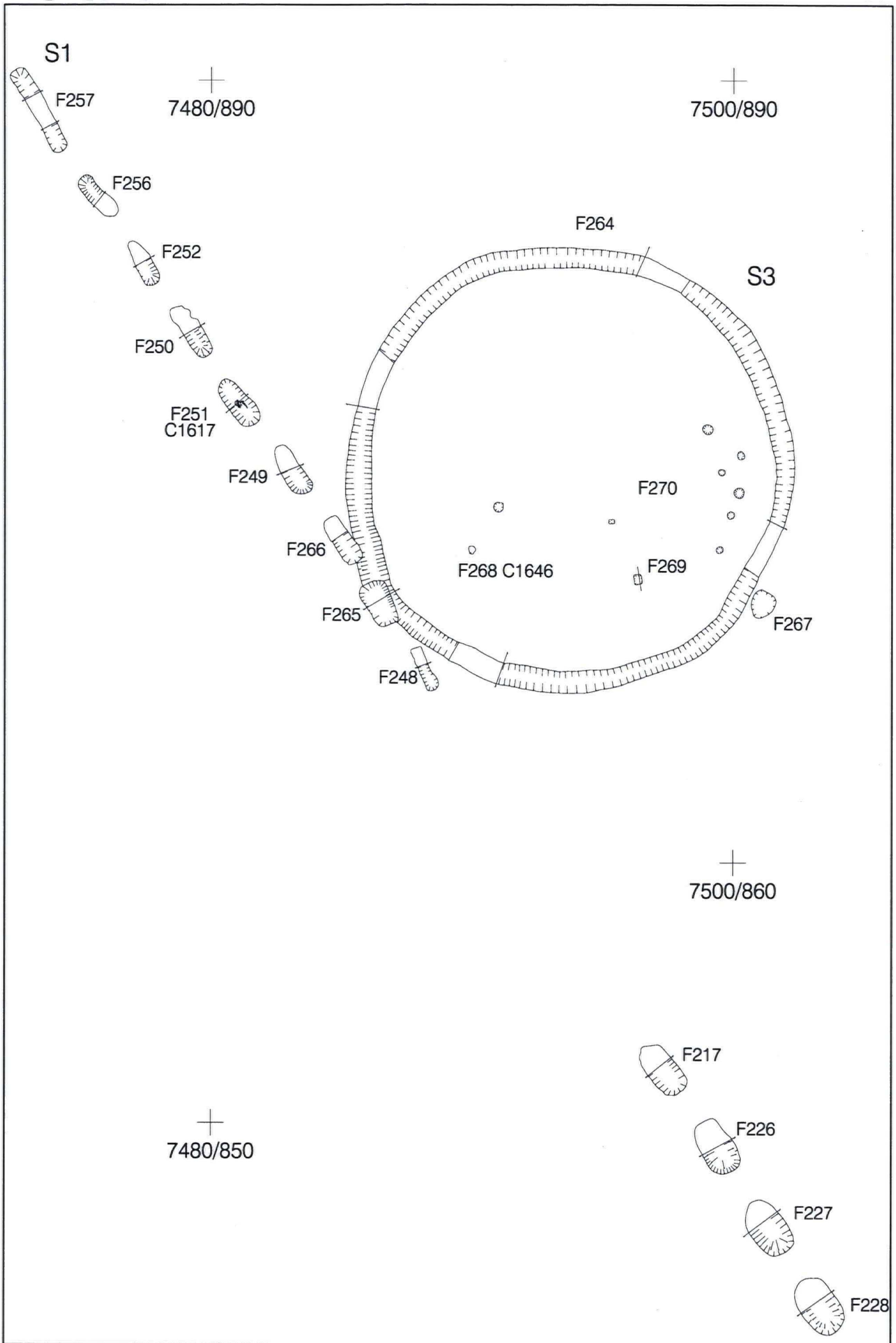
Plate 9 Cremation during excavation

A third, less complete ring-ditch was identified between the two areas of burial (F146)(Plate 11). The feature measured less than 5m in diameter, and upon excavation, the ditch was found to measure up to 0.15m in depth (Figure 54).

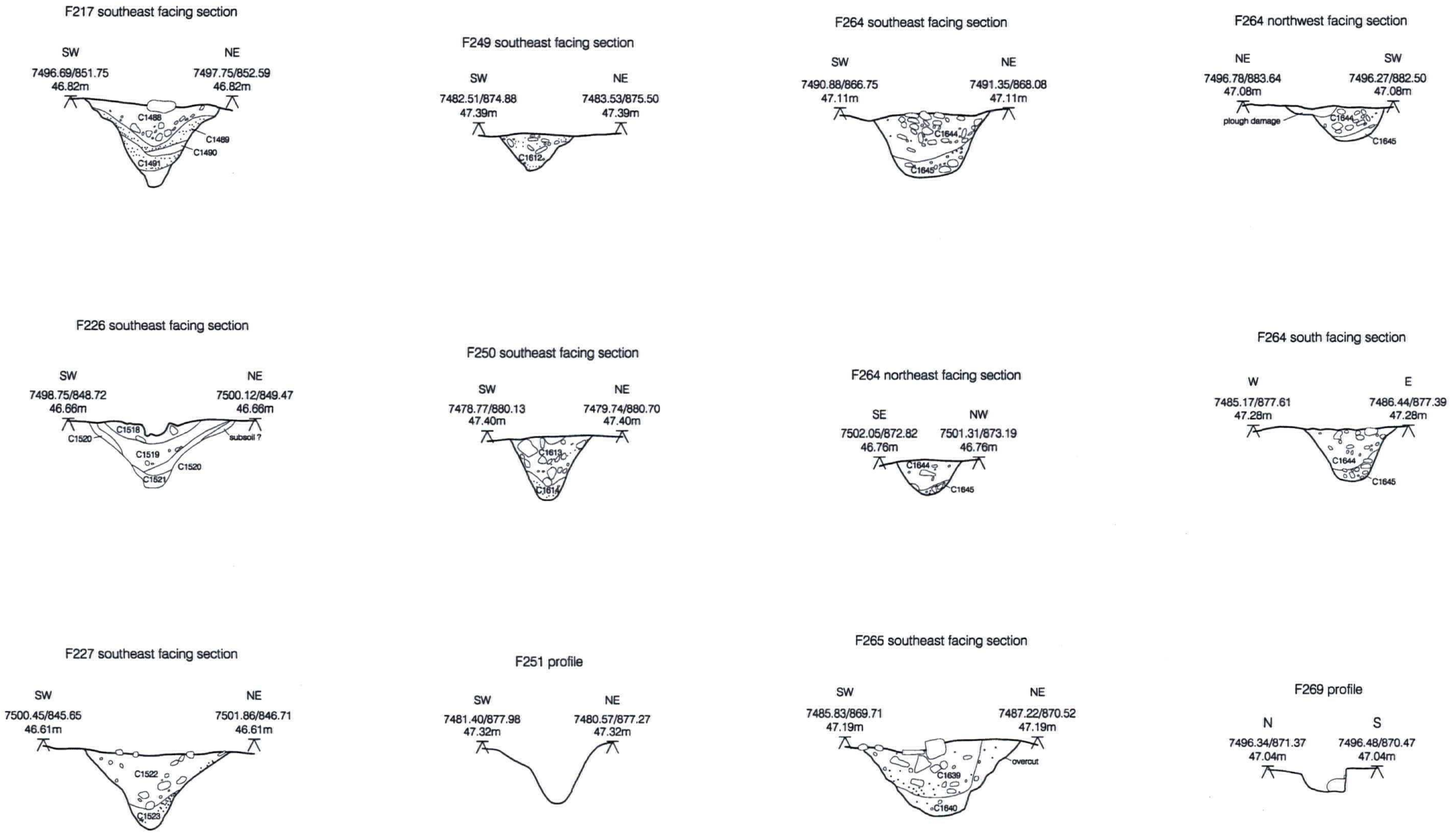
Plate 10 Middle Bronze Age urn

Pit alignments

Cutting the ring-ditch of Structure 3 was an alignment of pits, extending for 172m NW-SW. This pit alignment (Structure 1) comprised forty-three pits, evenly spaced, the majority of gaps measuring between 0.80m and 1.20m (Figure 55). Generally, these features were found to be sub-rectangular in shape, measuring between 1.76m and 5.10m in length, between 0.40m and 1.50m in width and varying in depth (Plate 12; Figure 56). A disarticulated human skeleton was recovered from the upper fills of one of the pits (Plate 13). Osteological analysis suggested that the body had been excarnated prior to deposition in an already silted pit. These remains produced a radiocarbon date of AD40 ± 35 (Appendix H: Part 1; Appendix I: Part 1). The upper fills of a number of the pits produced pottery of Late Iron Age or Roman date, indicating that the feature may have been visible at this time (Appendix D: Part 5).



Investigation 15 (Intervention 5) Structure 3 | Scale 1:200 | Figure 50

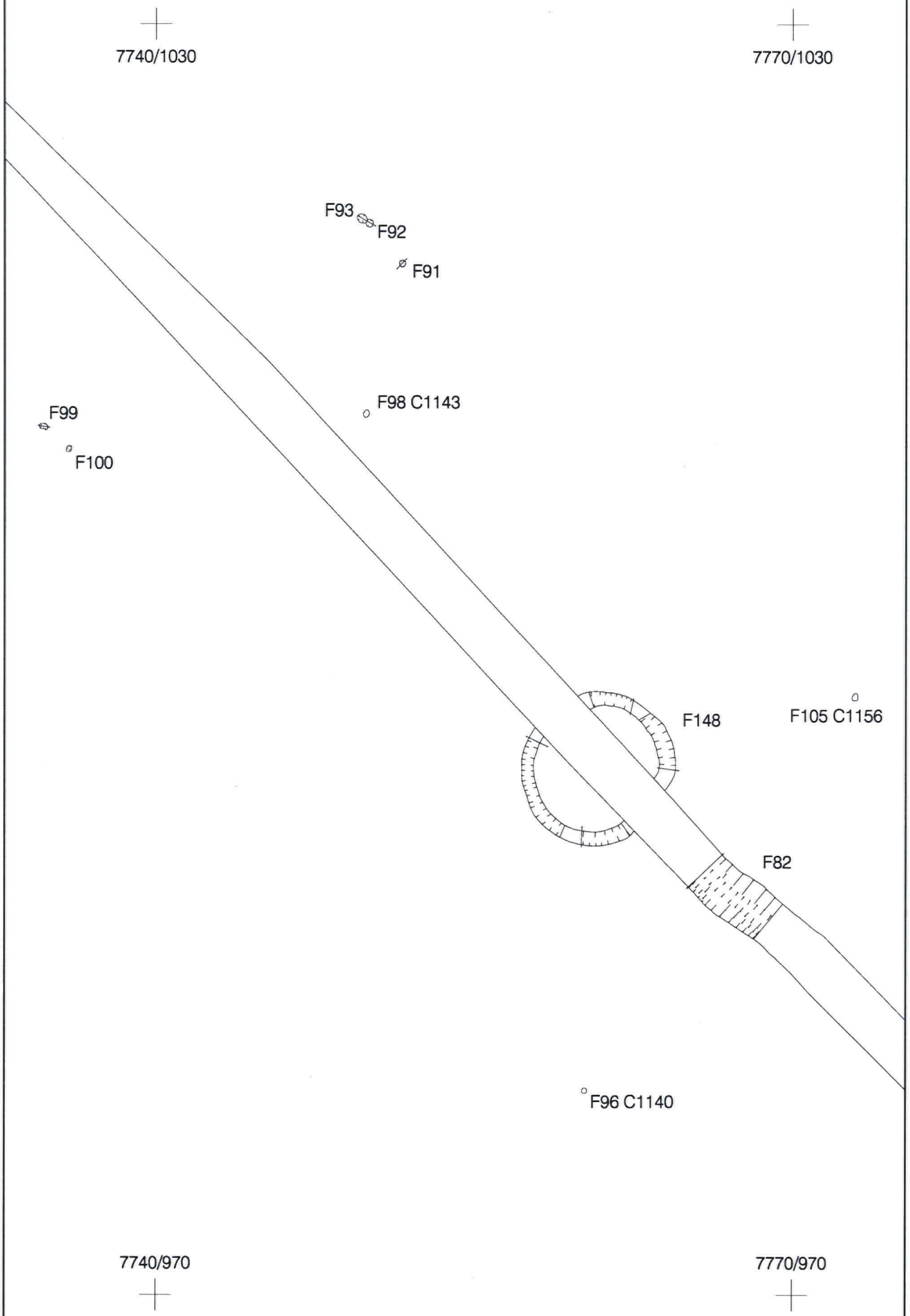


FAS

Investigation 15 (Intervention 5) Structure 3 sections

Scale 1:50

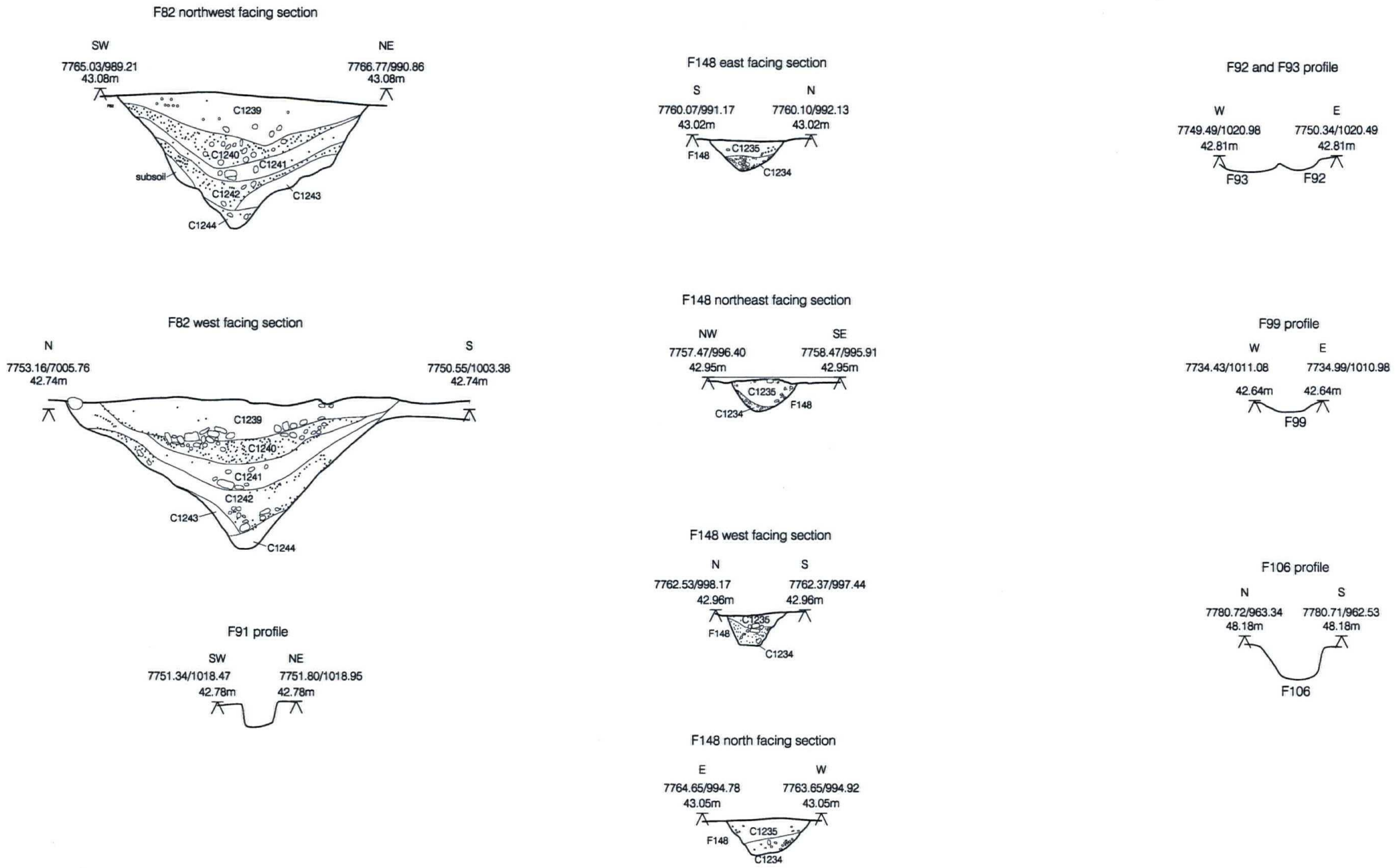
Figure 51



Investigation 15 (Intervention 5)
Structure 7, ring ditch and pits containing cremated bone

Scale 1:250

Figure 52

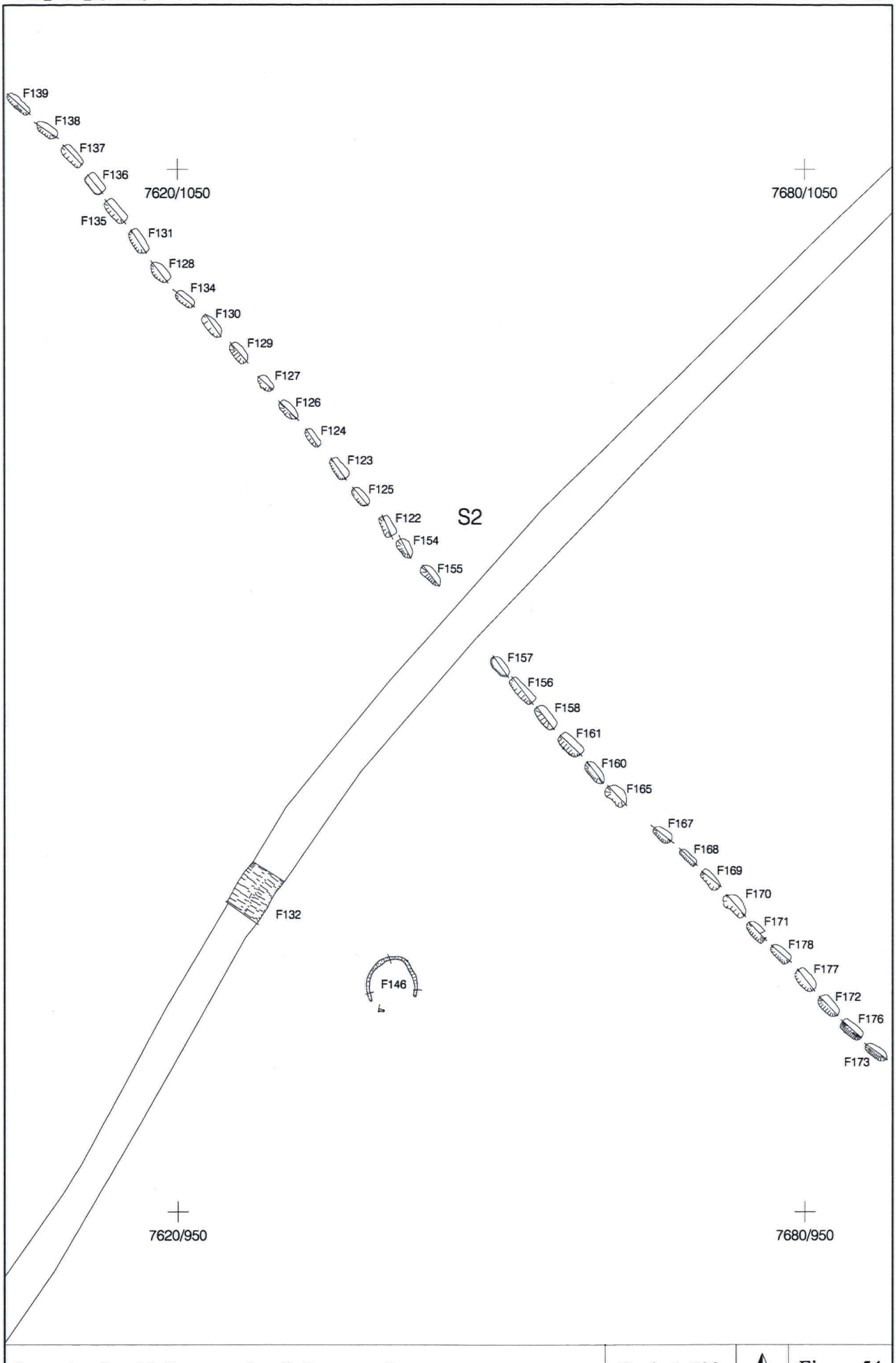


FAS

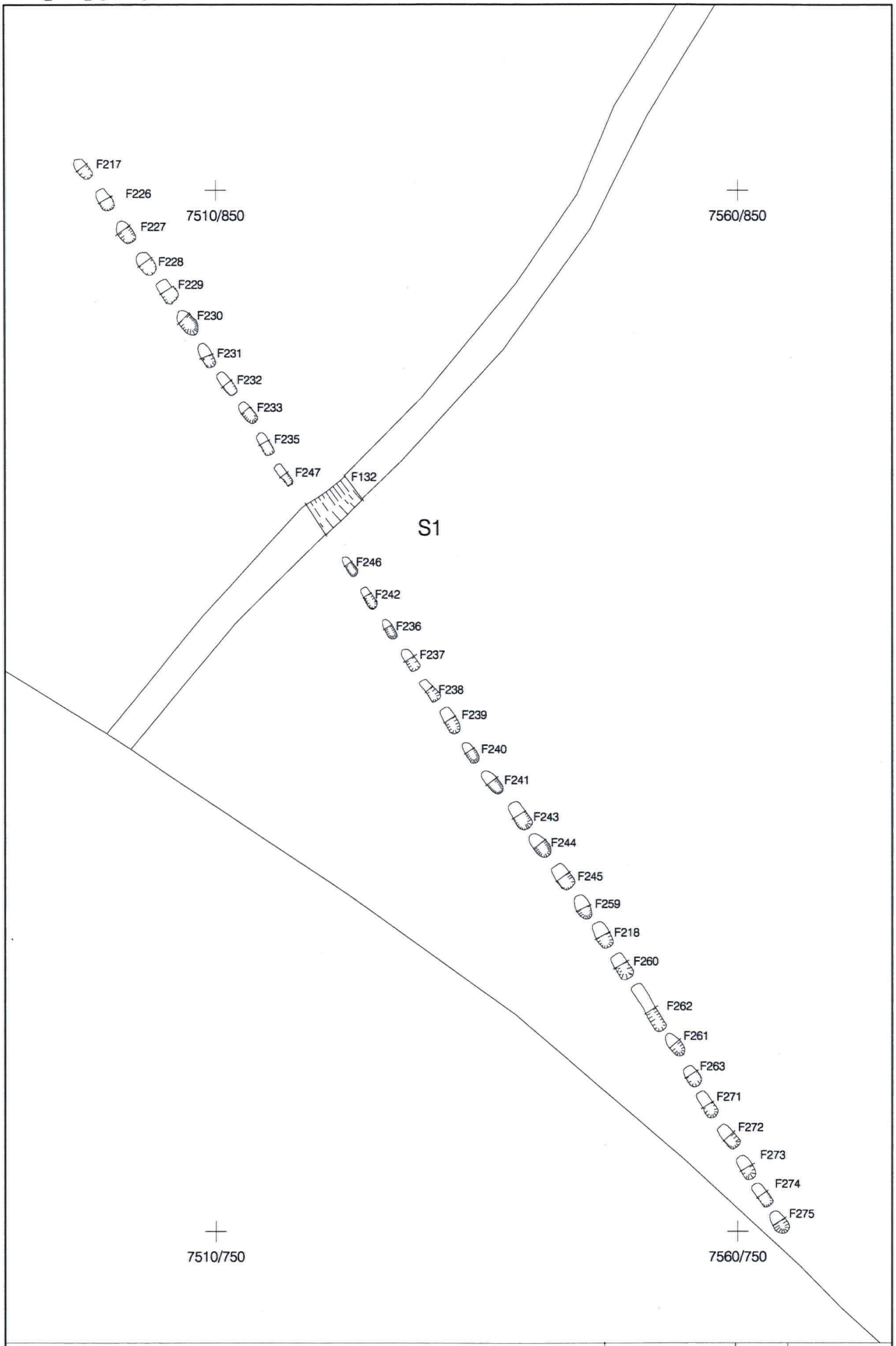
Investigation 15 (Intervention 5) Structure 7 sections

Scale 1:50

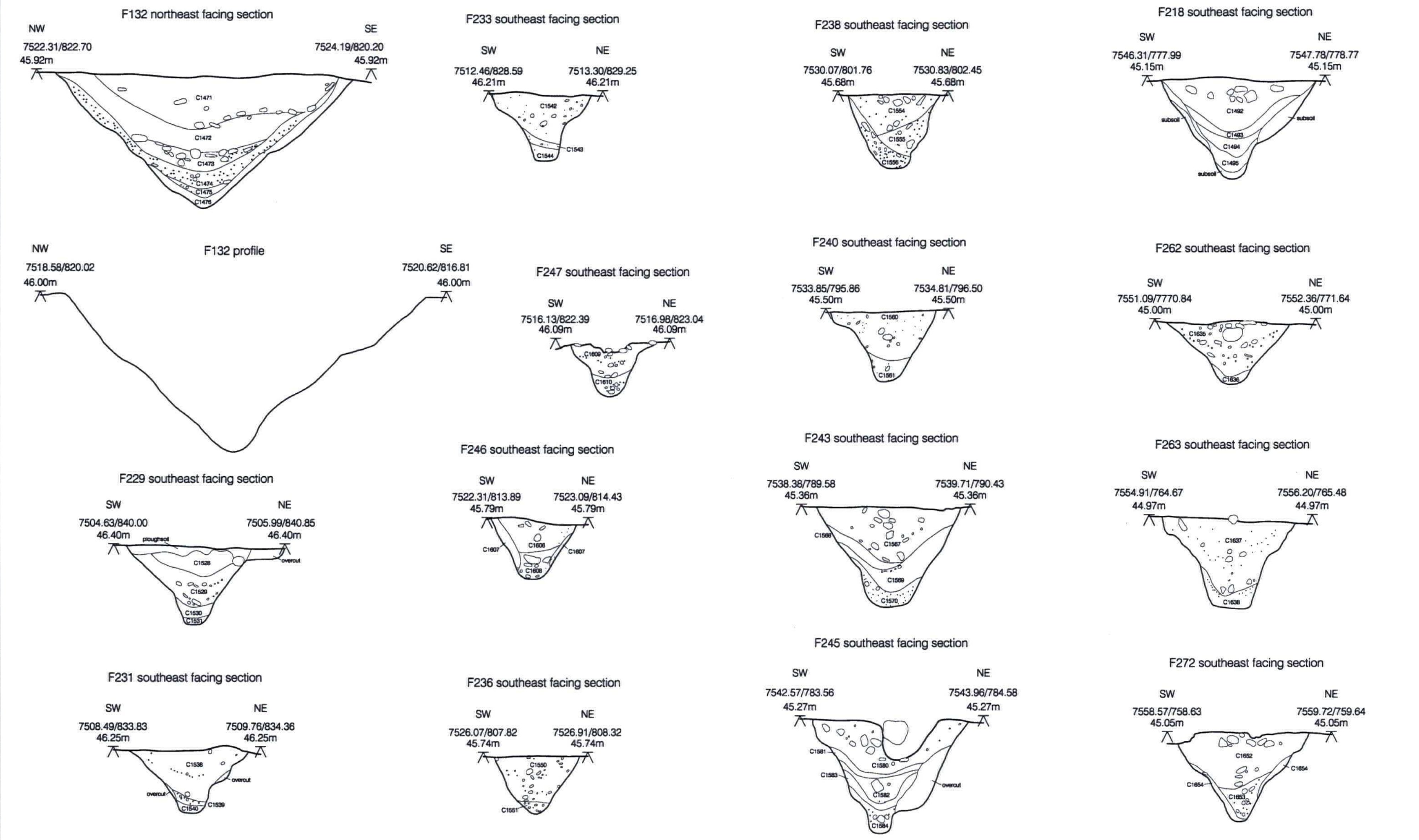
Figure 53



Investigation 15 (Intervention 5) Structure 2 | Scale 1:500 | Figure 54



Investigation 15 (Intervention 5) Structure 1 | Scale 1:500 | Figure 55



FAS

Investigation 15 (Intervention 5) Structure 1 sections | Scale 1:50 | Figure 56

Running parallel to pit alignment Structure 1, approximately 225m to the northeast, a second pit alignment was identified (Structure 2), comprising a total of 65 pits, with 2 possible outliers running for a distance of 228m NW-SE (see Figure 54). When the area of investigation was extended slightly to the northwest in 2003, two further pits were identified on a similar alignment, approximately 90m to the northwest. The pits of Structure 2 are similar in shape and spacing to those of Structure 1, and are generally sub-rectangular in plan, measuring between 1.40m and 3.25m in length, and between 0.70m and 1.80m in width (Figure 57; Plate 14).

Plate 11 F146, Intervention 5

Two further pit alignments, of a different character, were identified in the southern area of Intervention 5SW (Structures 4 and 5)(Figure 58). Structure 4 comprised 7 pits, aligned NNW-SSE, spaced at intervals of between 10 and 13m for a distance of 72m. Structure 5 showed similar layout and spacing, running parallel to Structure 4 at a distance of 22m to 28m, for a length of 81m. The pits measured between 1.45m and 3.02m in maximum length, and up to 2.40m in depth, generally with a U-shaped profile (Figure 59). Sediments from within one of the pits (F216) were submitted for radiocarbon dating and produced a date of 4675±60 BC, within the later Mesolithic to early Neolithic (AA-51419, GU-10384; Appendix H: Part 2).

Plate 12 F260, Intervention 5

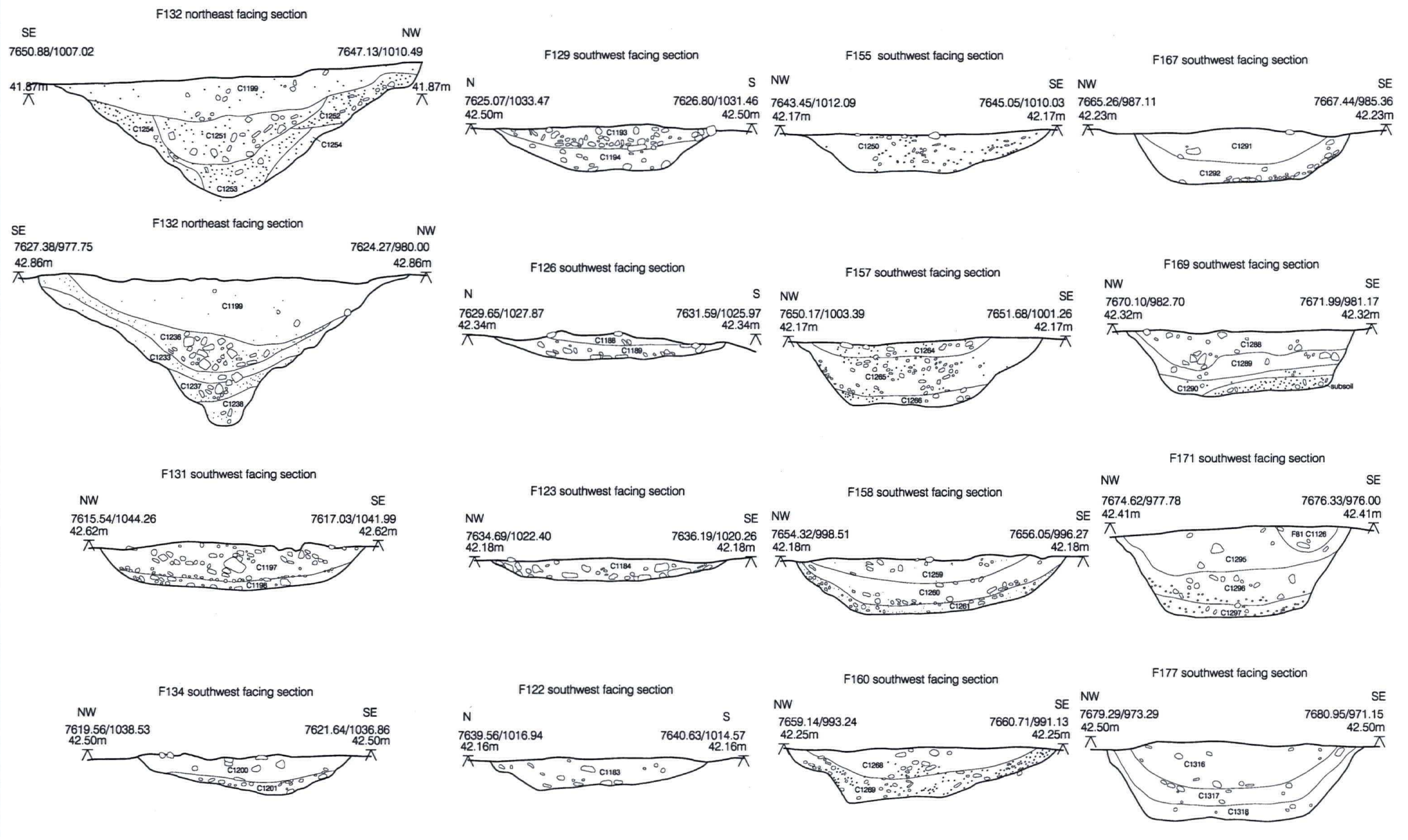
An alignment of four pits, with a possible outlier to the south, were identified towards the centre of Intervention 5SW; despite finds of Mesolithic lithics and a Neolithic arrowhead within their backfills (Appendix C:Part 3), it appears that these features represent natural solution holes into which deposits and finds have later silted.

Plate 13 F251 and F253, Intervention 5

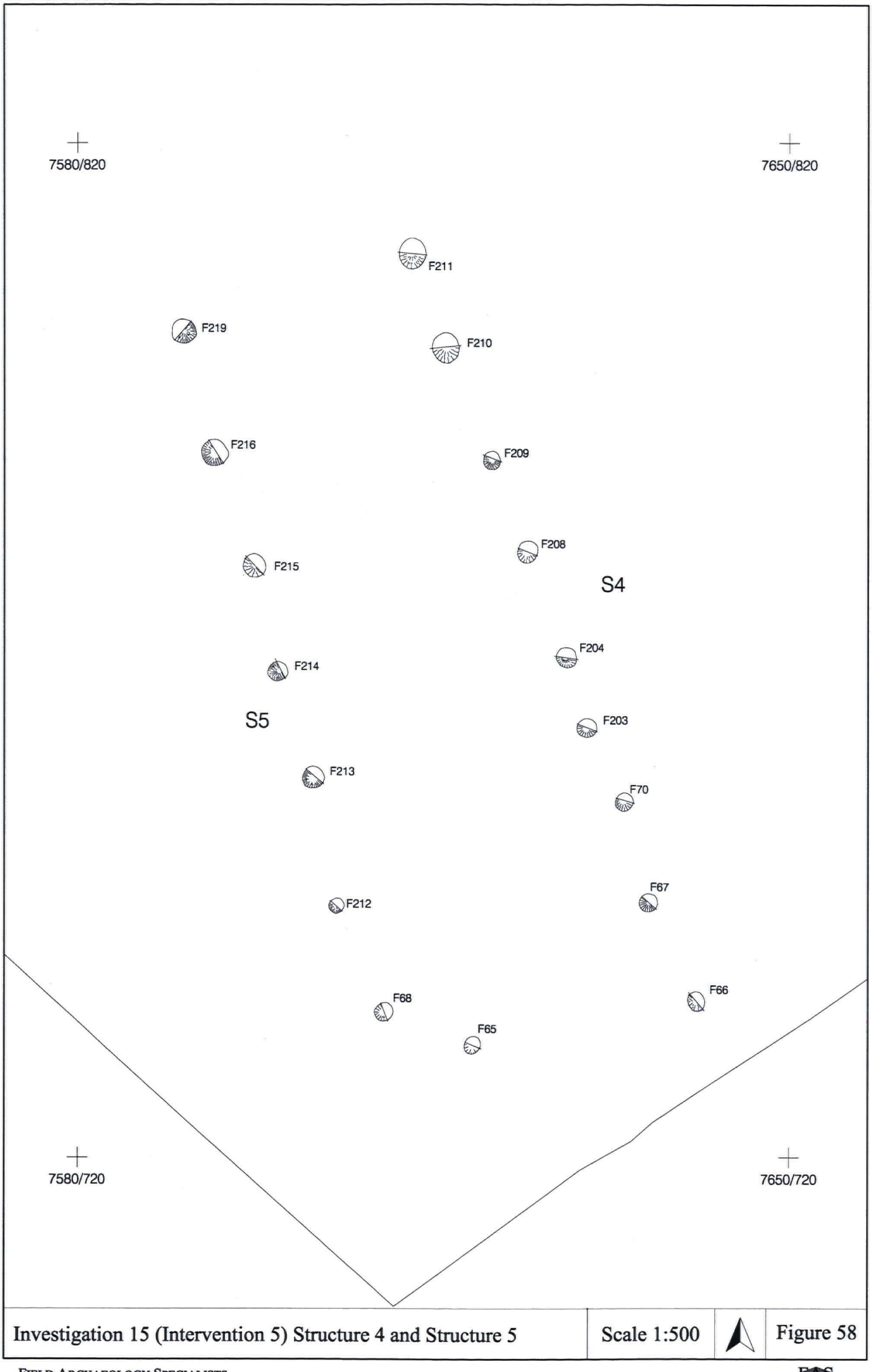
Roman corn-drying kiln

To the northwest of pit alignment Structure 2, a drying oven (Structure 6) was excavated (Plate 15). The feature comprised a series of pits and structural features, which were interpreted as a stoking pit, oven, flue and two post holes (Figures 60 and 61). F101 was allocated to the main oven chamber, within which an oval brick structure had been constructed (F159). This chamber was joined at its southwest side by a flue leading to a larger pit (F97), interpreted as an access point for the kiln, and to the northeast by a stoking pit or flue shaft (F102). A phase of refurbishment was identified, when the flue structures were supported by two further postholes (F162, F163).

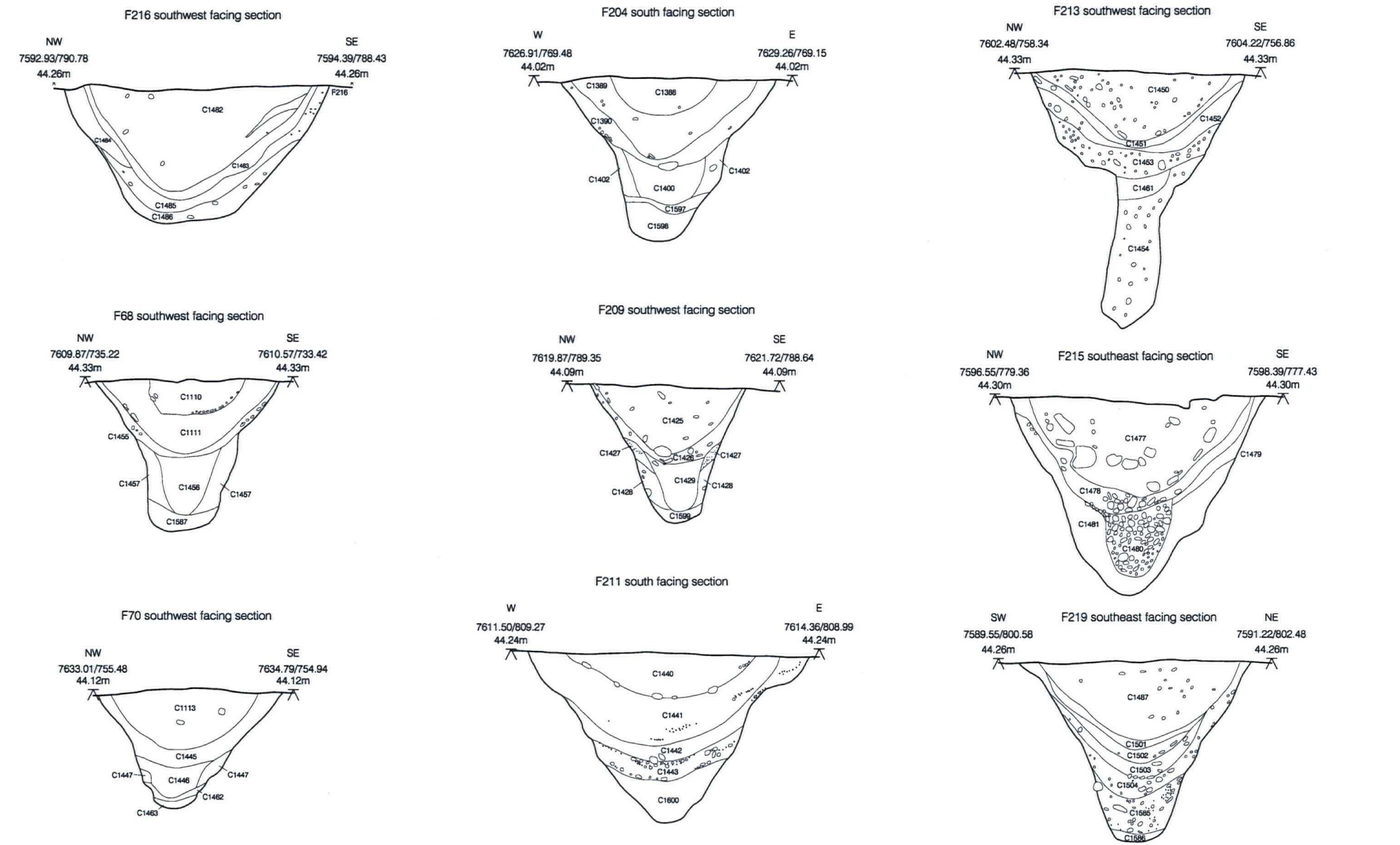
Plate 14 F172, Intervention 5



Investigation 15 (Intervention 5) Structure 2 sections | Scale 1:50 | Figure 57



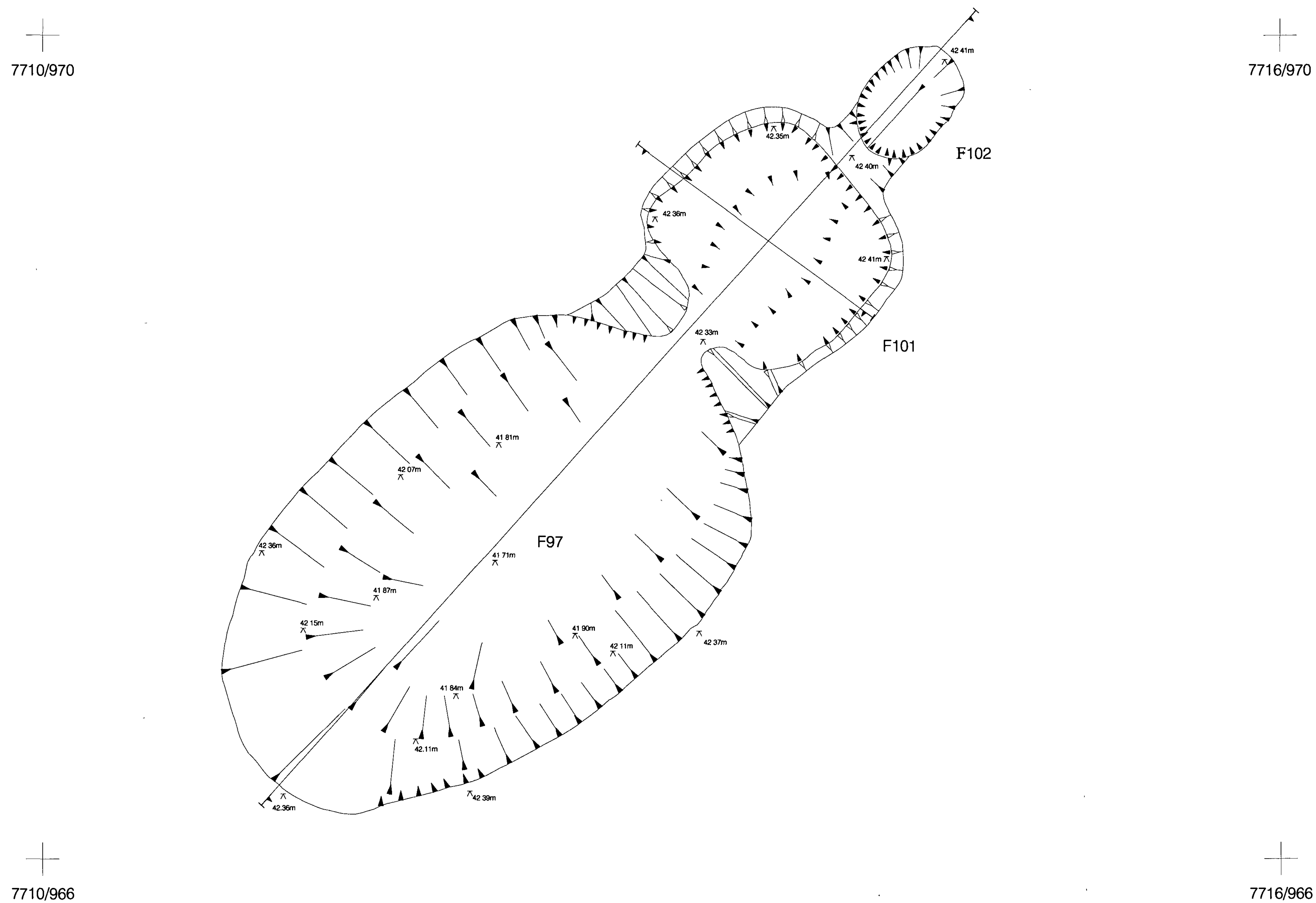
Investigation 15 (Intervention 5) Structure 4 and Structure 5 | Scale 1:500 | Figure 58



Investigation 15 (Intervention 5) Structure 4 and Structure 5 sections

Scale 1:50

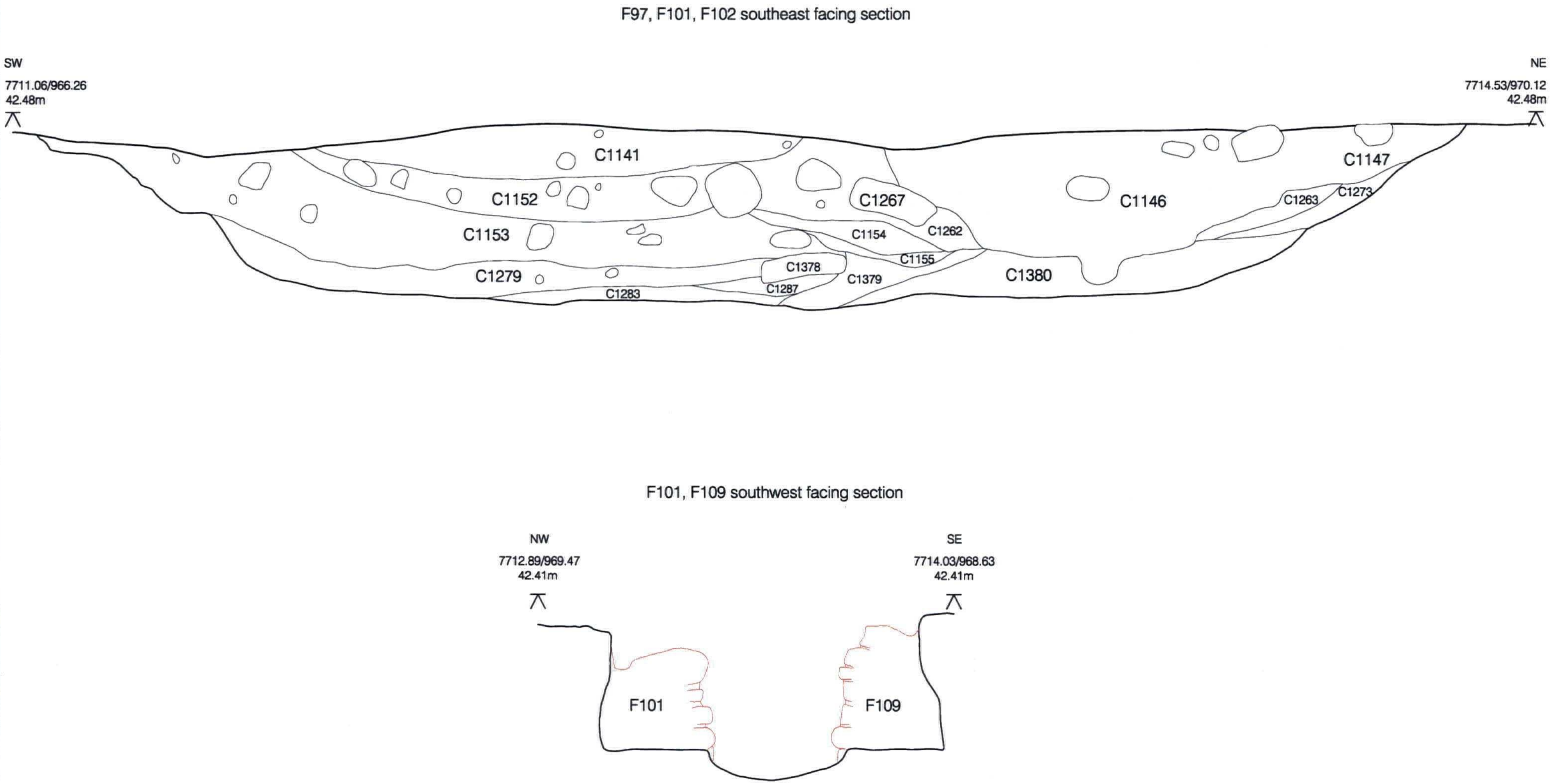
Figure 59



Investigation 15 (Intervention 5) Structure 6

Scale 1:20

Figure 60



FAS

Investigation 15 (Intervention 5) Structure 6 sections | Scale 1:20 | Figure 61

Archaeomagnetic dating of the feature revealed that the oven had last been fired between AD 100 and AD 170 (Appendix H: Part 3). No charred grain was identified, but the feature has been interpreted tentatively as a drying oven.

Roman ceramic was also produced from a number of small pits in the same area as the kiln. A linear feature, interpreted during excavation as a furrow, appears to follow the alignment of these pits, and it may be that these features represent some form of enclosure or structure associated with the kiln. A pit to the southeast of the kiln, measuring 4.02m by 1.48m, produced sherds of Roman amphora and Eboracum Ware, and may have been associated with this phase of activity.

Plate 15 F162 and F163, Intervention 5

Linear features

Numerous more modern linear features were identified within Intervention 5SW, providing evidence for land boundaries and agricultural activity. A ditch (F82), measuring 2.10m wide and up to 1.10m in depth was found to run on a NW-SE alignment for 327m, extending into Intervention 5NW (Plate 16). This feature cut ring ditch F148, suggesting a post-Bronze Age date, while the upper fills were found to contain early Roman pottery. The upper fill (C1239) has been interpreted as a possible Roman ploughsoil, dishing into the top of an earlier feature.

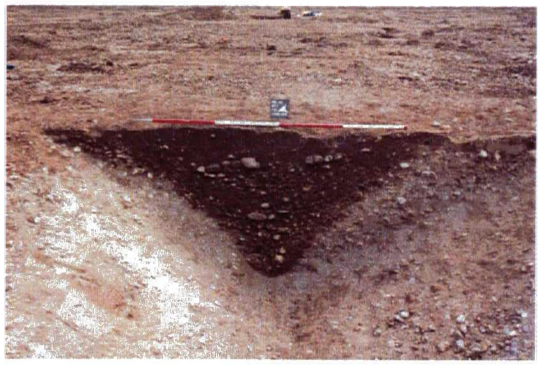


Plate 16 F82, Intervention 5

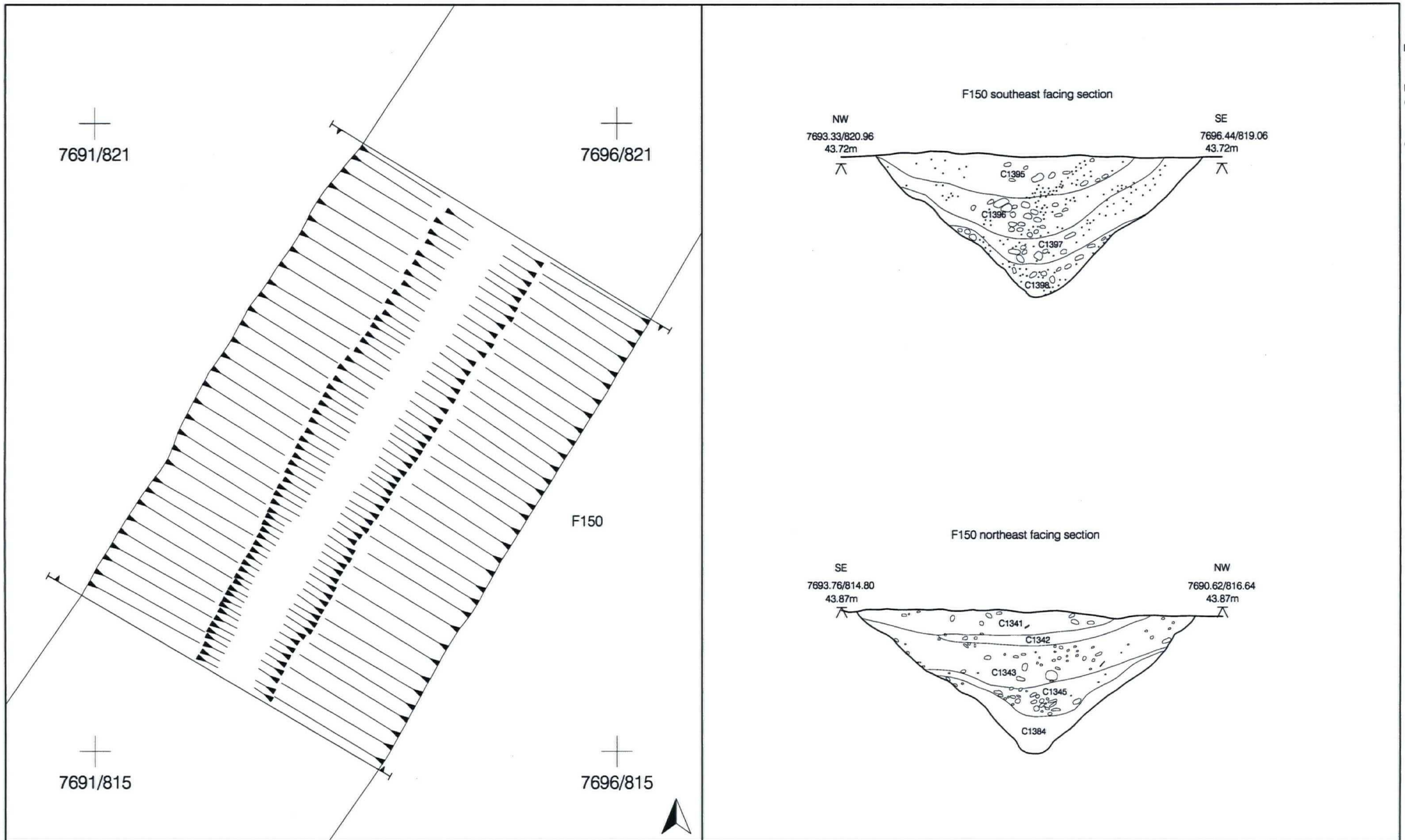
Parallel to this feature (which also runs parallel to pit alignment S1), a number of ditches and furrows were identified (including F188 and F133) and recorded.

Perpendicular to F82, a second ditch was found to run NE-SW for a distance of 325m towards the southern edge of the intervention (F150)(Figure 62). This was later found to represent part of F82; two fragments of post-medieval ceramic in the uppermost fill might therefore represent a late infilling of a hollow, or intrusive finds caused by later disturbance. A second ditch running NE-SW was identified to the west (F132), and also produced Roman pottery from its upper fills as well as a Roman coin, identified as a silver *denarius*, dating to between AD222 and 235 (C. Barclay *pers. comm.*; Plate 17). Later drainage ditches were found across the area following a similar alignment.

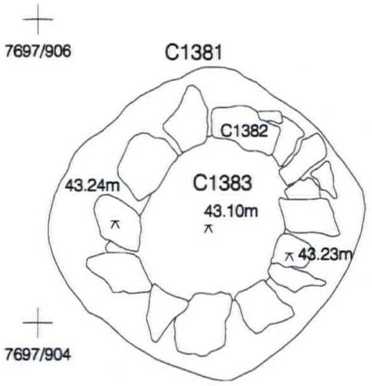
Plate 17 Roman coin showing obverse side

Well

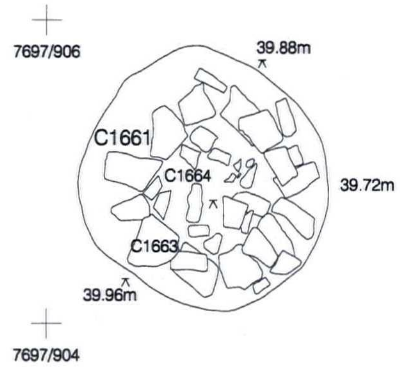
Cutting one of the linear features across the Intervention, a well (F202; Structure 9) was identified and mapped, but initially not excavated further (Figure 63). Subsequently, a 2.50m section of the well was exposed during quarrying, and further recording of the feature took place (Figure 64). The feature (F276) was found to comprise a stone-lined shaft, beneath which a timber raft (F277) was identified.



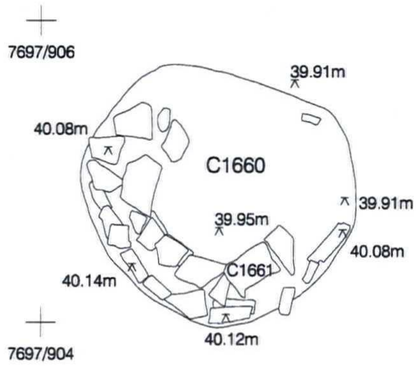
Investigation 15 (Intervention 5) F150 post-excavation plan and sections | Scale 1:50 | Figure 62



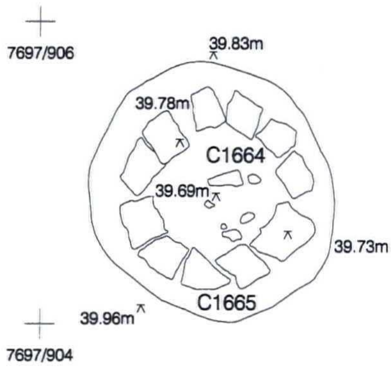
F202 Pre-excavation plan



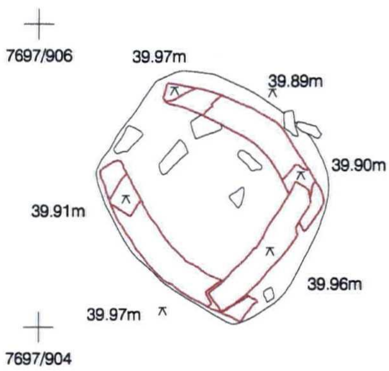
F276 Pre-excavation plan



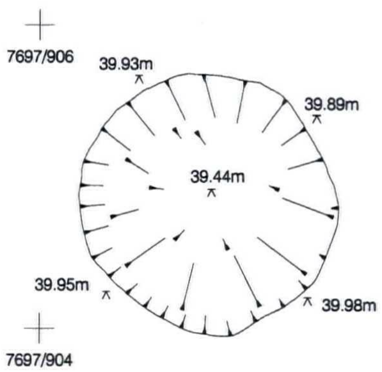
F276 C1661 Pre-excavation plan



F276 C1664 C1665 Pre-excavation plan

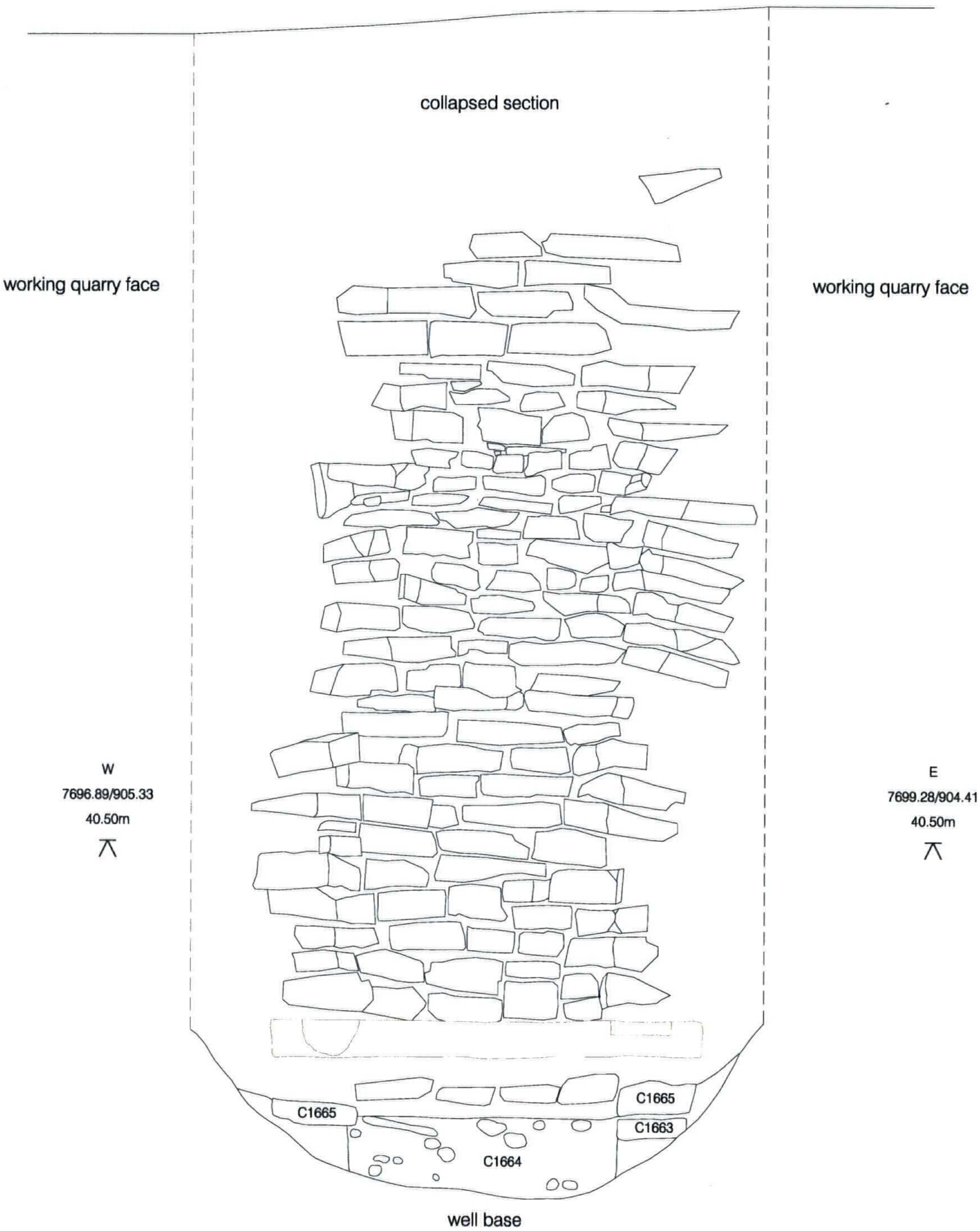


F277 C1662 Pre-excavation plan



F276 Post-excavation plan

Investigation 15 (Intervention 5) F202	Scale 1:50		Figure 63



Investigation 15 (Intervention 5) F202 - Structure 9 elevation	Scale 1:20	Figure 64

Beneath this, the shaft continued, but further excavation was not undertaken for safety reasons. Material within the well provided a 19th century date for the feature. Notably, the feature did not reach the current water table, suggesting a drop in water levels since that time.

A second possible well (F74) was identified in plan as a circular setting of modern brick and mortar, backfilled with modern debris, approximately 0.70m in diameter. This feature was not further excavated, and has been interpreted as either a well or cistern.

Isolated pits and scoops

A further 33 features were identified as isolated pits or scoops, which were found dispersed widely throughout the area, showing no clear distribution. These features ranged in diameter from 0.40m to 4.02m in maximum dimensions and measured up to 0.55m in depth. Few finds were recovered, other than occasional lithic artefacts, including a large assemblage of knapped flint found in pit F164, and an unassociated, and possibly residual, Mesolithic microlith (Plate 18 and 19)(Appendix C: Part 3).

Plate 18 Flint microliths

Ploughsoil, overburden

Within the southern part of the intervention, a large spread of material (C1513) was identified as an area of ploughsoil or overburden, from which ceramic of Roman date was recovered.

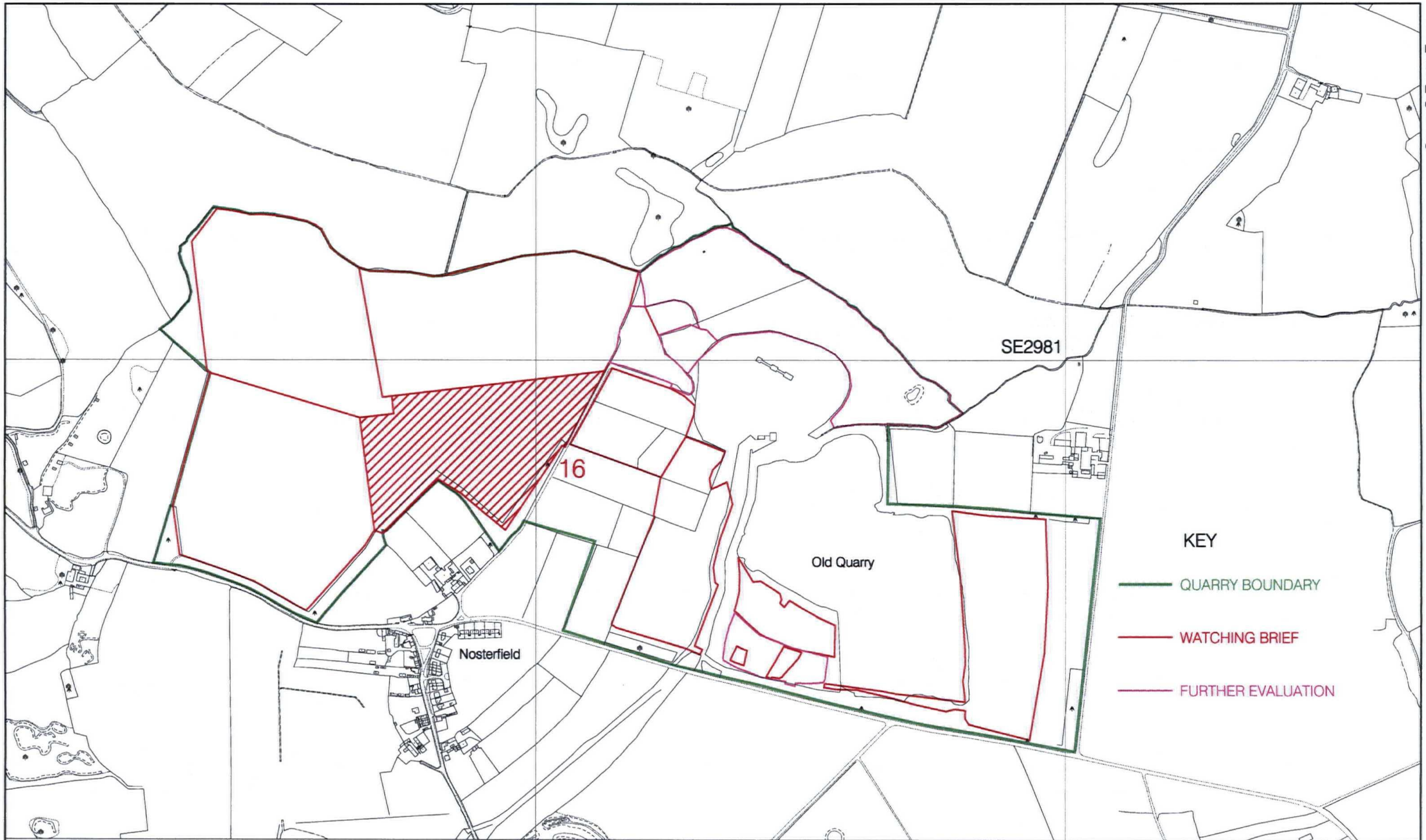
Plate 19 Flint microburin

4.13.3 Assessment

The results from Investigation 15 indicate periods of human activity in this area of the quarry from the Mesolithic to the modern day. A radiocarbon date for the pit alignment (Structure 5) and microliths redeposited in later features are indicative of some presence in the Mesolithic period, although the nature of this activity remains unclear. In the Bronze Age, the site became a funerary focus, with two possible barrows and a cremation cemetery; the burials date to the early-middle Bronze Age. In the Iron Age, a substantial ditch and two pit alignments represent the demarcation of boundaries and the division of the landscape. By the 2nd century, the presence of a possible corn-drying oven suggests the processing of grain, and as with later periods, the archaeological deposits indicate a shift towards an agricultural landscape.

4.14 INVESTIGATION 16 (INTERVENTION 5SE)

A watching brief was undertaken in the final quadrant of Intervention 5 (SE), during November to December 2003, and was completed in June 2004 (Quarry Phase 4)(Figure 65). Archaeological finds were dominated by two square-ditch enclosures, which provided evidence for Iron Age funerary activity.



FAS

Location of Investigation 16 | Scale 1:10000 | Figure 65

4.14.1 Fieldwork Procedure

The fieldwork procedure followed the revised methodology adopted for Intervention 5SW, with the addition of an initial programme of test pitting and sieving undertaken prior to topsoiling. During November to December 2003, the western part of the intervention was subject to a watching brief, following the methodology outlined. Due to the lithic and pottery assemblage recovered from the ploughsoil/subsoil interface during Investigation 12 to the north, and prior to the extension of this area eastwards, 31 test pits were excavated. This involved a grid of three transects 20m apart, with test pits at 10m intervals, and a further four transects across the remaining area (Figure 66). Each test pit measured 1.0m x 1.0m, and was excavated to an average depth of 0.30m, in sieved 0.10m spits. During the watching brief, a final test pit was excavated to investigate the nature of the clay marl into which many of the features had been cut (F413).

4.14.2 Fieldwork Results

Test pits
Sieving of the contexts from the 31 test pits produced few finds (F347-F377; C1769-C1799). Only 19 items were identified, including a fragment of modern glass, iron nails, and pottery, which included modern and medieval vessel sherds, and a single fragment of Roman pottery. Three lithic artefacts were identified.

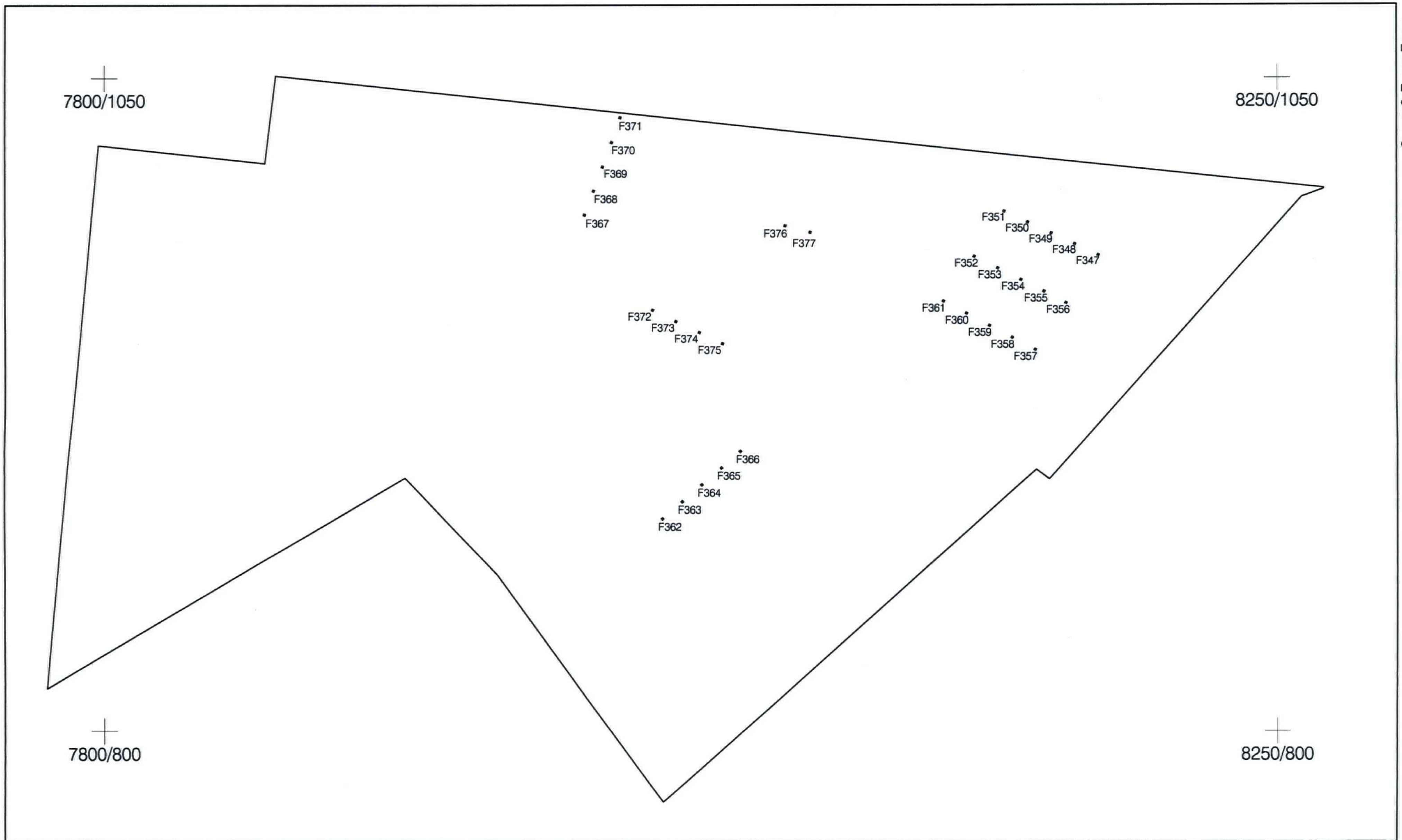
Watching brief
The watching brief undertaken in this area identified a total of 117 features, of which 46 proved to be caused by vegetation, and two were quarry test pits that were not recorded further (Figure 67). The remaining features comprised ditches, pits, scoops, furrows and hedgelines, and also included two square-ditch enclosures, one of which was probably of Iron Age date, while the other was undated.

Natural features
A number of potentially natural features were identified and tested. These generally comprised large, irregular pits, identified as tree boles (F294, F299, F301, F302, F309, F310, F312-5, F317, F318, F324-8, F330-4, F338-40, F343-4, F345-6, F378-9, F382, F386-7, F396-407, F424-5). A large number of these features were clustered to the south of Intervention 5SW, and around the parallel furrows to the north of the area.

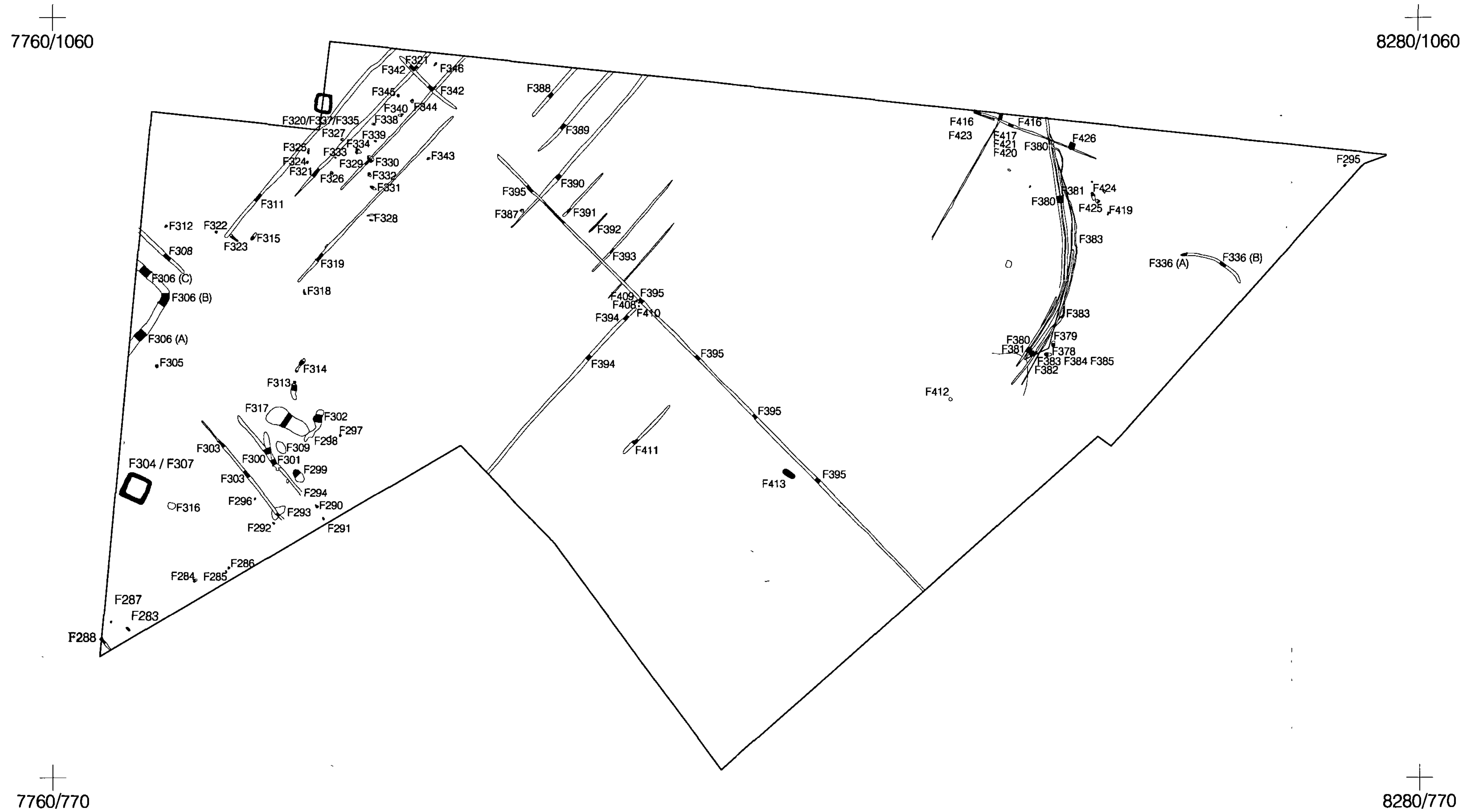
A number of pits and scoops were tested and recorded, but produced homogenous sterile fills which suggest that they were simply natural undulations in the geology; as such they have been classified as natural features (F284-6, F289-92, F296, F419).

Quarry test pits
Two features were identified as test pits undertaken by the Quarry (F415, 418), and were not subject to further investigation.

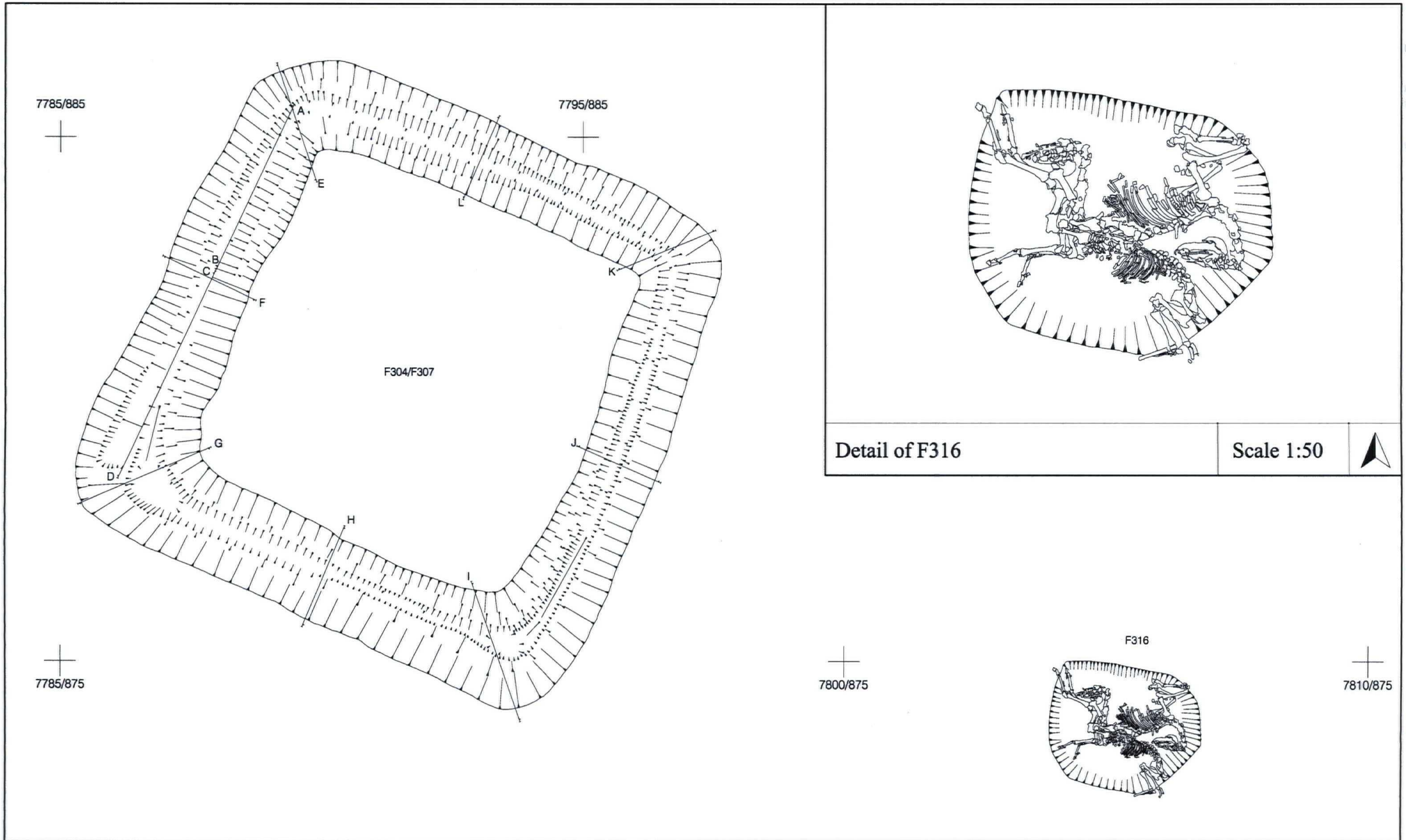
Square barrows and inhumation burial
Two square-ditch enclosures (F304 and F320) were identified within Intervention 5SE, each measuring approximately 10m square, and upon excavation, the ditches were found to measure up to 0.75m and 0.42m in depth respectively (Figures 68 and 69; Plates 20 and 21). Each had been the subject of an episode of recutting



Investigation 16 (Intervention 5) Location of test pits | Scale 1:2000 | Figure 66



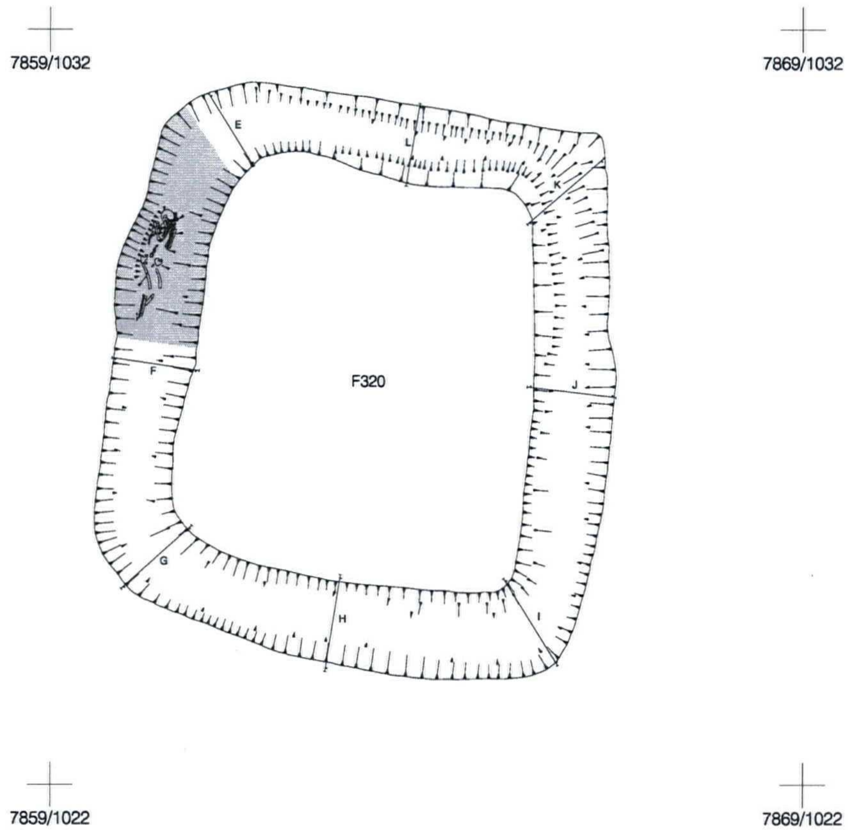
Investigation 16 (Intervention 5) map of archaeological features | Scale 1:2000 | Figure 67



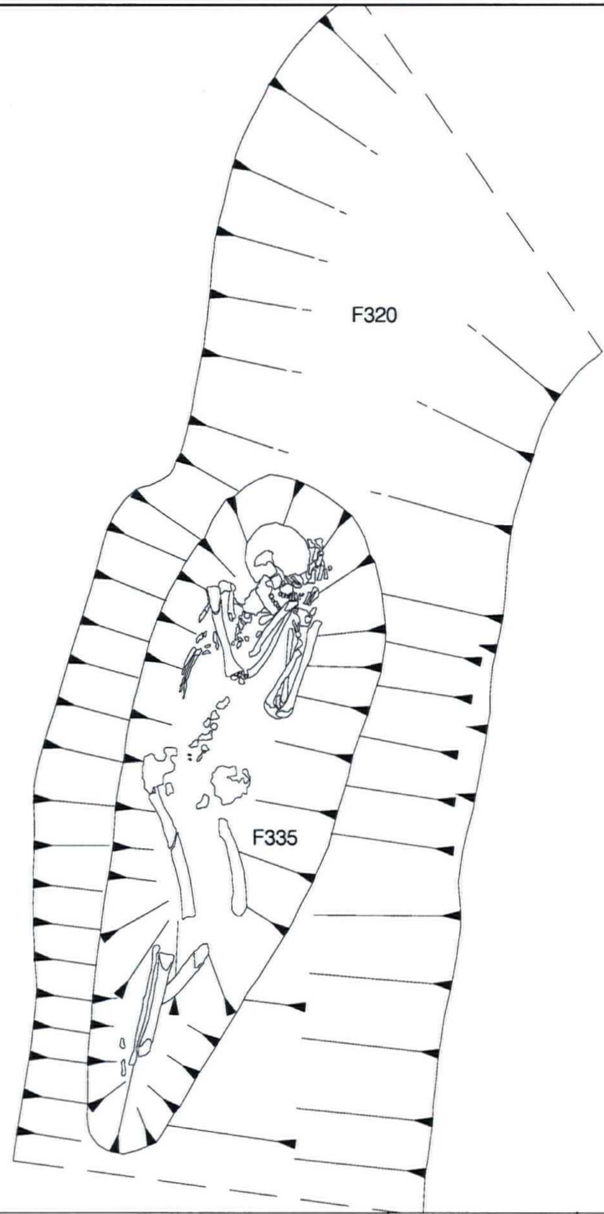
Investigation 16 (Intervention 5) F304 and F316

Scale 1:100

Figure 68



Investigation 16 (Intervention 5) F320 | Scale 1:100



Detail of F335 | Scale 1:20

Figure 69

(F307 and F337 respectively)(Figure 70). F304/307 was found at the western edge of the intervention (Plate 22), while F320/F337 was identified 160m to the north. These features are of a form often dated to the Iron Age, and are frequently interpreted as square barrows. Although F304/307 produced no dateable material, an Iron Age date was supported for F320/F337 following the excavation of a single inhumation (F335) within the ditch (F320), which predated its recutting (F337)(Plate 23). The skeletal remains provided a radiocarbon date of 135±35 BC (SUERC-3780 GU-12284; Appendix H: Part 1) and were identified as belonging to a male, thirty to forty years of age (Appendix I: Part 2).

Horse burial

At a distance of approximately 9m to the east of F304/307, a sub-rectangular pit was excavated, and was found to contain the remains of a quadruple horse burial. The burial was badly plough-damaged, and while two skeletons were partially complete and excavated *in situ*, the remains of two further individuals were identified only by zooarchaeological assessment (F316)(Plate 24) (Appendix G: Part 1). The pit itself measured 2.90m by 2.40m, and up to 0.60m in depth. A horse femur was selected for radiocarbon dating and returned a date of AD 50±35 (SUERC-2974 GU-11688C; Appendix H: Part 4).

Linear and curvilinear features

At the eastern edge of the intervention, a length of curvilinear ditch was excavated, running approximately east-west. Excavation revealed the feature to measure up to 0.30m deep, and Neolithic pottery was recovered from the backfill of the feature (Appendix D: Part 3).

A number of linear features were identified in the western part of Intervention. An L-shaped section of ditch, orientated NW-SE and NE-SW was investigated in three segments (F306), and measured 3.30m in width and up to 1.30m deep (Plates 25 and 26). Finds recovered from the backfill of this feature comprised early Roman and Roman pottery, with some flint. This ditch represents the convergence of ditches F82 and F150, excavated during the watching brief in Intervention 5SW.

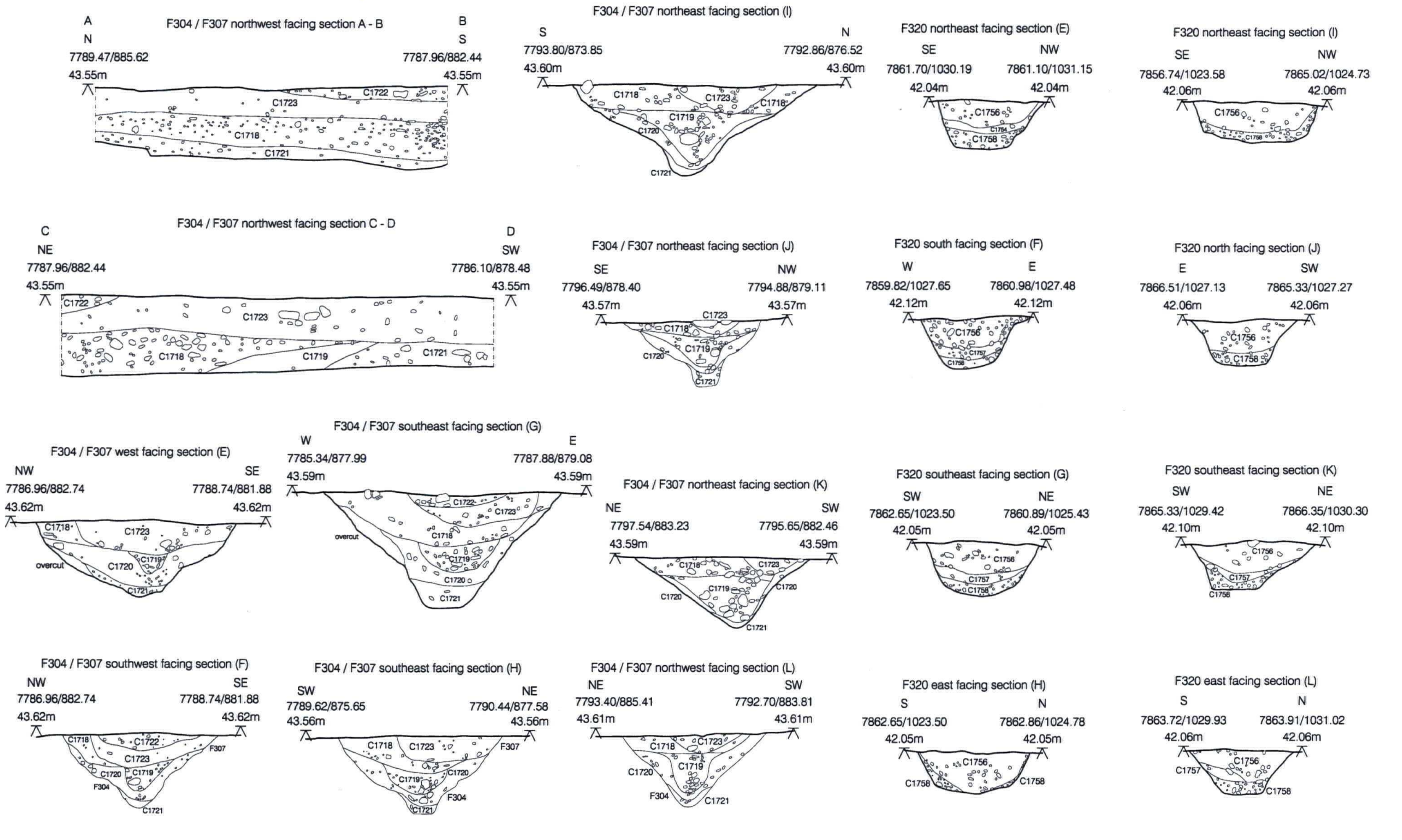
Plate 20 F304, Intervention 5, post-excavation

Plate 21 F320, Intervention 5, post-excavation

Plate 22 F304 and F307, Intervention 5, section L

Plate 23 F335, Intervention 5

To the northwest, a series of five linear features was identified running parallel on a NE-SW alignment, for



FAS

Investigation 16 (Intervention 5) F304 and F320 sections | Scale 1:50 | Figure 70 distances of up to 104m and extending beyond the northern limit of the watching brief. These features were found to be uniform in their spacing, measuring between 9 and 11 m apart. Upon excavation, four of these features (F311, F319, F321, F329, F341) were found be up to 1.25m wide and up to 0.22m deep, and were interpreted as furrows or remnants of hedgerows. Ceramic material from F311 provided a post-medieval date for the backfilling of the feature. In the later phase of watching brief undertaken in Intervention 5SE, a further nine linear features were found to follow the same alignment and regular spacing (F388-394, F411).

Plate 24 F316, Intervention 5, horse burial

Bisecting a number of these features, a linear feature was found to run on a NW-SE alignment for a distance of 30.0m (F342); this appears to represent a continuation of an extensive ditch (F395), which runs for 232m across the area of Intervention 5SE that was stripped in June 2004. Medieval pottery was found within the backfill of F342 (Appendix D: Part 5). To the southwest, shorter ditches were found to run on the same alignment (F308, F323), and at the southern limit of the intervention, three further furrows were also found to be orientated NW-SE, again running approximately 10m (10.2m) apart (F288, F293, F301, F303). F288 was found to follow the same alignment as F188 and F133 in Intervention 5SW. Shorter lengths of linear features were identified at the northern limits of the intervention (F280, F282); F282 produced medieval ceramic (Appendix D: Part 5).

Plate 25 F306, Intervention 5

Plate 26 F306, Intervention 5

At the eastern end of Intervention 5SE, a series of curvilinear features, running roughly north-south, were identified and excavated. These appear to represent a series of at least six gullies (F380, F381, F383, F384, F385, F414), following very similar alignments. The earliest of the sequence, F380 and F381, were found to run parallel for a distance of approximately 100m. A third, F383, runs roughly parallel to these features, to the east, but for a shorter distance. All three features were cut by a subsequent ditch, which ran for a similar distance to F380, following the same curving route. Finally, a more modern feature, F385, was found to cut F384, and contained a ceramic drainage pipe.

Further drainage features were identified a short distance to the west of these gullies. A stone-lined culvert was identified, running in a NNE-SSW alignment, associated with a ditch which appears to have been recut at least once (F417, F420, F421, F422).

All but the latest of these north-south features appear to have been cut by a ditch (interpreted as a hedgeline or boundary ditch) running perpendicular to F417 (F416). This had cut a narrow gully on the same alignment

F423, which had also produced no dateable finds.

Isolated pits

Within the intervention area, a number of isolated pits were identified, which were subject to testing and recording. Three such features (F408, F409, F410) were found in a gap between boundary ditches F394 and F395. It was suggested during investigation that these features may represent truncated postholes related to some kind of gate setting.

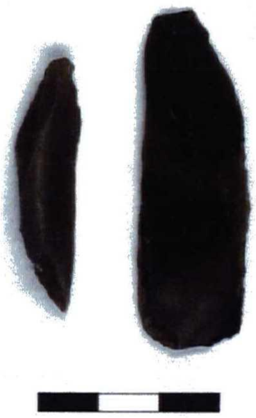


Plate 27 Flint drill (right) and piercer (left)

Three pits/scoops (F295, F297, F298, F305) were found to measure between 0.40 and 1.50m in diameter, and contained charcoal-rich fills, possibly indicative of *in situ* burning, and lithic artefacts (Plate 27). These were found to be located in the southern part of the intervention, with F295 representing an outlier at the eastern edge of the area.

The remaining pits (F283, F322, F427) were found to measure between 0.88m and 2.0m in diameter; of these, only F322 produced any finds, which comprised flecks of CBM.

Two pits were found to contain modern sheep burials (F287, F281).

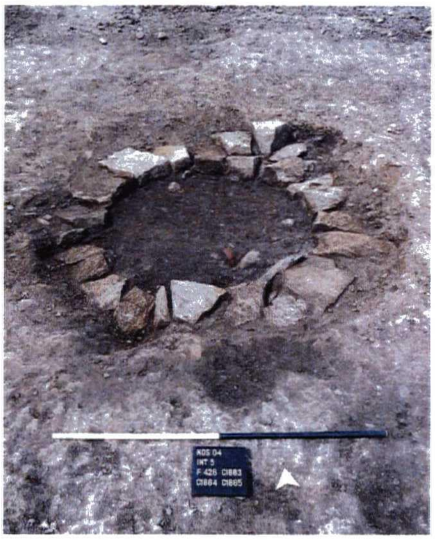


Plate 28 F426 well, Intervention 5

Well

Cutting the WNW-ESE aligned ditch (F416) in the northeastern corner of the intervention, the watching brief identified the remains of a well (F426). Sub-rectangular in shape, the well was found to measure 2.6m x 2.1m, and contained a circular, stone-built shaft, *c.*1.75m in diameter. The backfill of the shaft was found to contain very modern material, including barbed wire and nylon rope (Plate 28).

4.14.3 Assessment

The watching brief undertaken in Investigation 16 revealed some evidence for prehistoric activity in the southern part of the quarry site, although most of the features were heavily plough-truncated, and several could not be dated. A single ditch produced Neolithic ceramic (F336); this was in the same area as one of the charcoal-filled pits, which also produced fragments of flint, indicating human activity of uncertain date.

The watching brief revealed evidence for Iron Age activity in the area, in the form of two possible square barrows and the horse burial. The recutting of both of the ditches suggests at least two phases of use, and the presence of dated burials between the earlier and later ditches places F320/337 firmly in the Iron Age. Although F304/307 produced no independent dating evidence, the similarity of the two features in terms of size and form led to an Iron Age date also being ascribed to this feature. Neither produced evidence for a central burial. The quadruple horse burial identified within 10m of the southern barrow produced a radiocarbon date in the late Iron Age.

The remainder of the features appear to represent medieval or post-medieval division of the land for agricultural purposes, representing hedgerows, gullies or furrows.

4.15 INVESTIGATION 17 (INTERVENTION 9)

A topographic survey was undertaken on an area lying to the northeast of the Nosterfield Quarry, known as the Flasks (Quarry phase 5a)(Figure 71). The area of investigation covered an area of 8.1 hectares, divided into two fields (Field A and Field B), and is characterised by poor drainage (Plate 29). The survey was undertaken during August 2003 in conjunction with an auger survey of the same area (Investigation 18). The results revealed a number of anomalies which were then subject to archaeological evaluation (Intervention 19).

Plate 29 The Flasks

4.15.1 Fieldwork Procedure

Survey data was captured using a total station theodolite, and following downloading from the instrument, was used to create a contour map. Additional points were collected for the hachure plan, and once plotted, were taken into the field so that the drawing could be completed by hand. Hand-drawn plans were subsequently digitised to produce an integrated digital record.

The feature numbers allocated for this investigation began a new index at Feature 1 (Appendix B: Part 2).

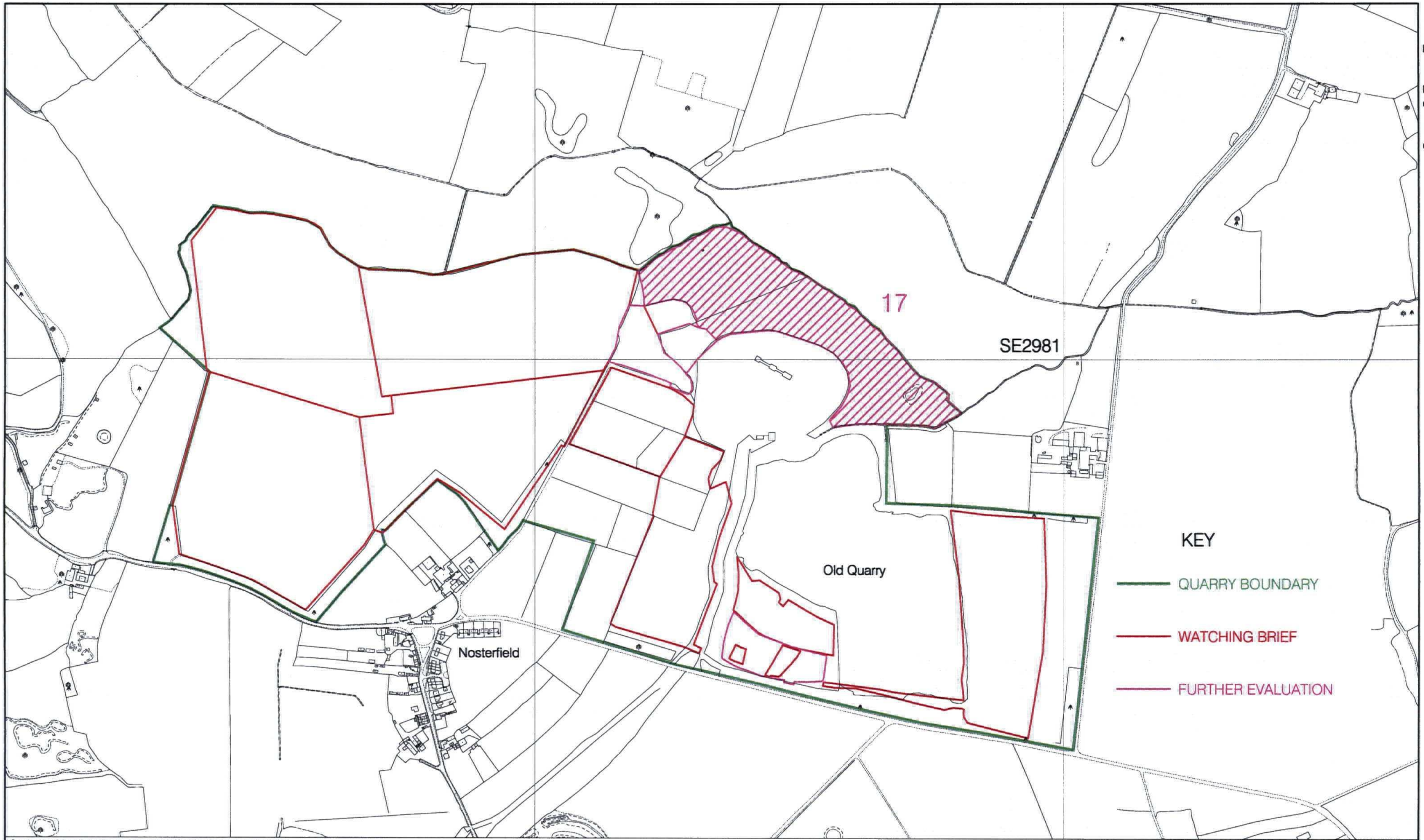
4.15.2 Fieldwork Results

The contour and hachure plans illustrate the topography of the Flasks (Figures 72 and 73), and revealed a number of anomalies within the area, primarily within Field A. Generally, the ground was found to rise from south to north, with the lowest point calculated to be 38.84m AOD.

In the southern field (Field A), to the southeast, two large mounds were identified (Feature 1 and 2), reaching heights of 41.75m AOD. A third mound, Feature 3, was found to reach a height of 41.06m AOD. The contour map demonstrated that the southern mounds (Feature 1 and 2) occupied a fairly level area of land, which varied by only 1.0m over a distance of 300m.

A number of narrow channels were also identified in Field A, running in a southerly direction from the northern field boundary; none appeared to extend to more than 40m to 50m in length. The surface of Field A was also found to contain a number of broad, flat hollows, possibly representing the remains of shallow ponds. At the southern edge of Field A, a shallow hollow ran down to a shallow ford across the adjacent stream.

Three sink holes were identified; Feature 7 and Feature 9 lay within Field A, while Feature 8 was situated at the southern edge of Field B. The largest of these, Feature 8, was found to be 10m in diameter, and was situated



FAS

Location of Investigation 17

Scale 1:10000

Figure 71

Investigation 17 (Intervention 9) contour map at 0.20m intervals

Scale 1:3000

Figure 72

Investigation 17 (Intervention 9) hachure plan

Scale 1:3000

Figure 73

in a large hollow.

Two linear banks were identified to either side of Field A (Feature 4 and 5). Feature 4 was found to run along the line of the eastern boundary of Field A, and has therefore been interpreted as a field boundary; it appears to have been formed from the upcast of an adjacent drainage ditch. Feature 5 runs along a similar alignment, although its function is less clear.

During investigations, a single sherd of Samian pottery was identified, recovered from an area of animal disturbance on the southern slope of Feature 3 (Appendix C: Part 5).

4.15.3 Assessment

The topographic survey of the site revealed a number of anomalies that were deemed worthy of further investigation. One of the shallow channels running across the site, and one of the large mounds (Feature 1) were selected for further archaeological evaluation, in order to ascertain whether they were man-made. The remainder of the features were considered to be geological.

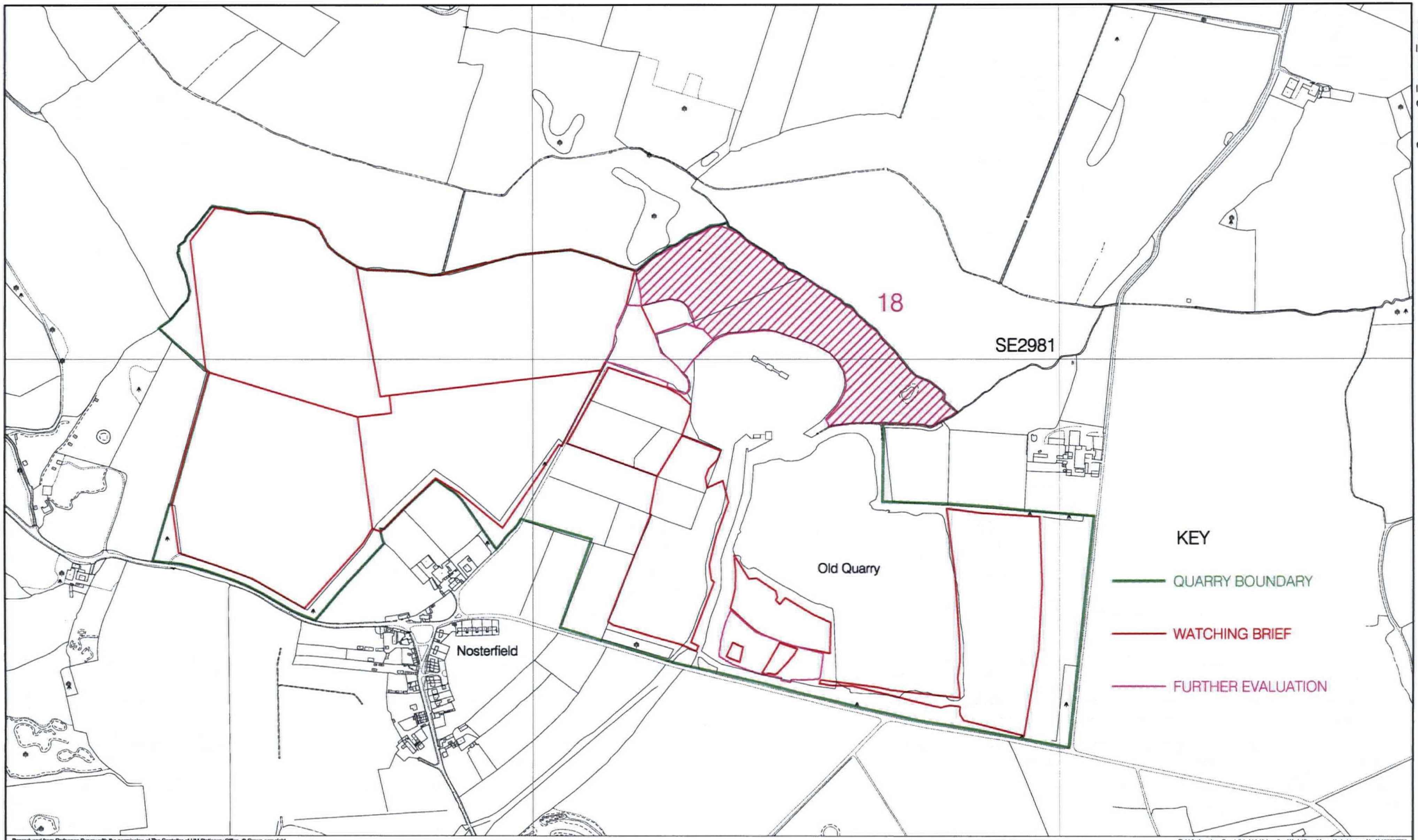
4.16 INVESTIGATION 18 (INTERVENTION 7)

During August 2003, an auger survey was carried out of the same 8.1 hectare site that had previously been subject to a topographic survey (Quarry Phase 5b)(Figure 74). The area of investigation is known to have been occupied previously by a prehistoric lake; the aim of the survey was to investigate the depth, extent and character of the deposits in this area, and to attempt to identify the margins of the lake. Palynological studies and radiocarbon dating of selected sediments revealed that the lake is likely to have disappeared in the mid-9th millennium BC, and provided evidence for the changing nature of the landscape in this area.

4.16.1 Fieldwork Procedure

The auger survey was carried out based on a grid of 20m squares, covering the whole 8.1 hectares (Figure 75). Where geological anomalies such as ponded areas and sink holes had previously been identified, further augering was undertaken. Notably, one such location (Auger 210) lay outside the main area of investigation, over a large sink hole.

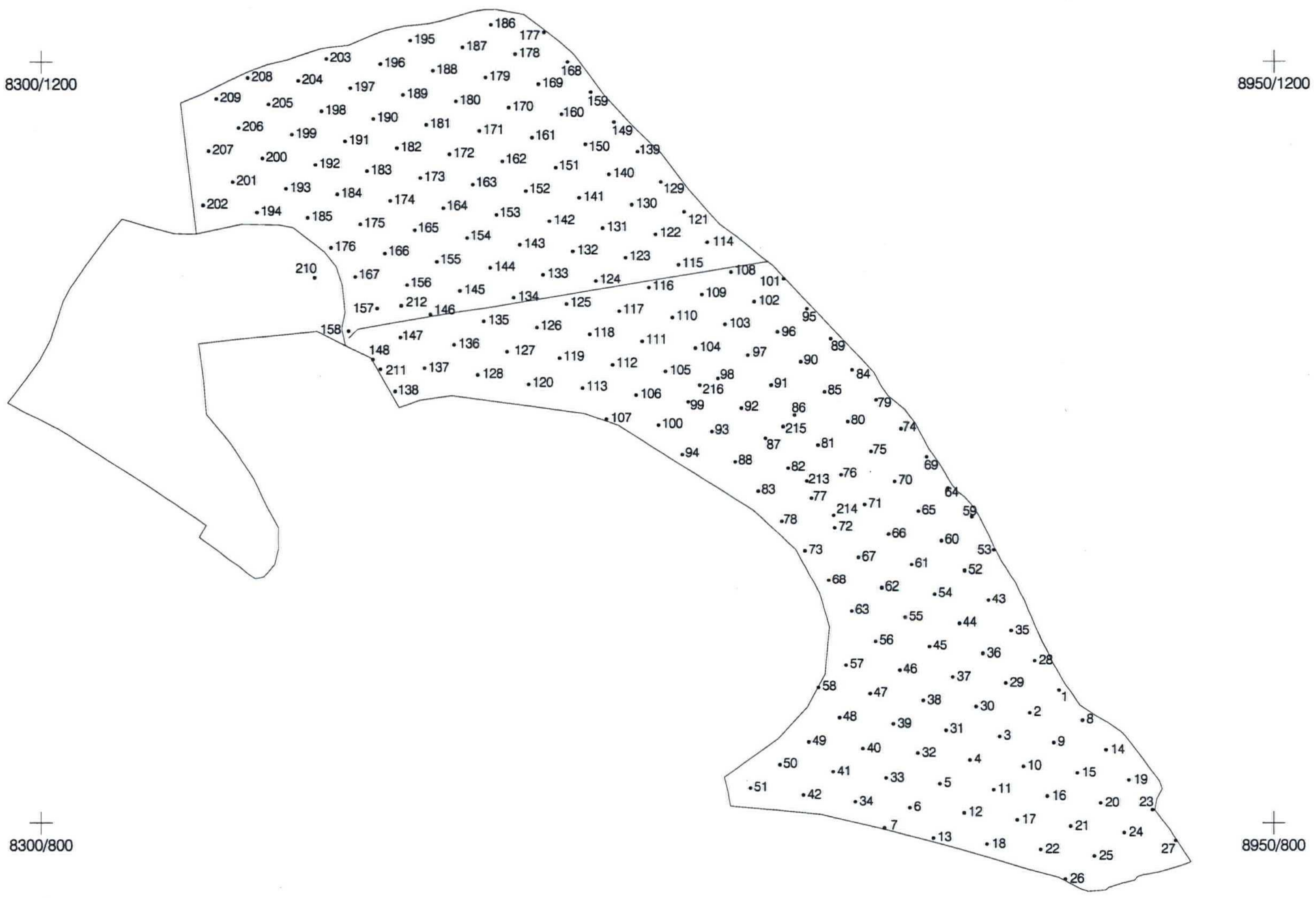
Augering was undertaken to a depth of 1.50m, using a 30mm gouge auger, in order to create a deposit model across the site, and the deposits and sediments identified were recorded using Munsell colour charts (Phase 1). Following the initial survey, two auger holes were selected for further detailed environmental study on the advice of Mairead Rutherford and Dr Jim Innes (Department of Geography, University of Durham)(Phase 2). The sediments from these cores were subject to pollen analysis as part of the Swale-Ure Washlands Project, funded by English Heritage as part of the Aggregates Levy Sustainability Fund.



Location of Investigation 18

Scale 1:10000

Figure 74



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Investigation 18 (Intervention 7) location of augers

Scale 1:3000

Figure 75

4.16.2 Fieldwork Results

Phase 1

Buried strata were measured and described at 216 locations across the area of the Flasks. The resulting deposit model revealed that buried deposits were deeper within Field A, to the south of the site (Figure 76 and 77). In this area, most of the strata measured in excess of 0.50m in depth, and the majority were above 1.50m deep. The upper layers comprised a light, friable silty loam topsoil, 0.30m thick, overlying a coarse sandy gravel subsoil. Occasionally the topsoil was represented by a desiccated peat over subsoil; where deeper deposits occurred, this gave way to a well-humified peat. These deeper peats often became waterlogged at depths of 0.40m, and in places reached up to 0.80m thick, overlying grey layers of sandy silts or silty clays (Auger 30), silty sands (Auger hole 7), or sand (Auger 39). Most of these silts, clays and sands contained macroscopic plant remains, and the peat retained a strong organic odour. Small mollusc shells were present in some of the gleyed layers (Auger 65, 69, 74). Auger 48 produced flecks of charcoal within a clayey silt matrix at depths of 0.78m to 0.85m.

Occasionally the strata contained a second layer of peat, sealed beneath grey silts, sands and clays (Augers 42, 50, 74, 84, 85, 94, 101), and it is possible that this forms a consistent layer across all of the area, though falling beneath the maximum 1.5m depth of the survey.

In Field B, the deeper strata were restricted to isolated hollows, which were found to contain peat and the basal layers of grey sand and silts. Only in larger sink holes was the maximum depth of 1.50m achieved.

Calcareous layers in Augers 24, 25, 26 have been interpreted as a marl sediment which in-filled the prehistoric lake.

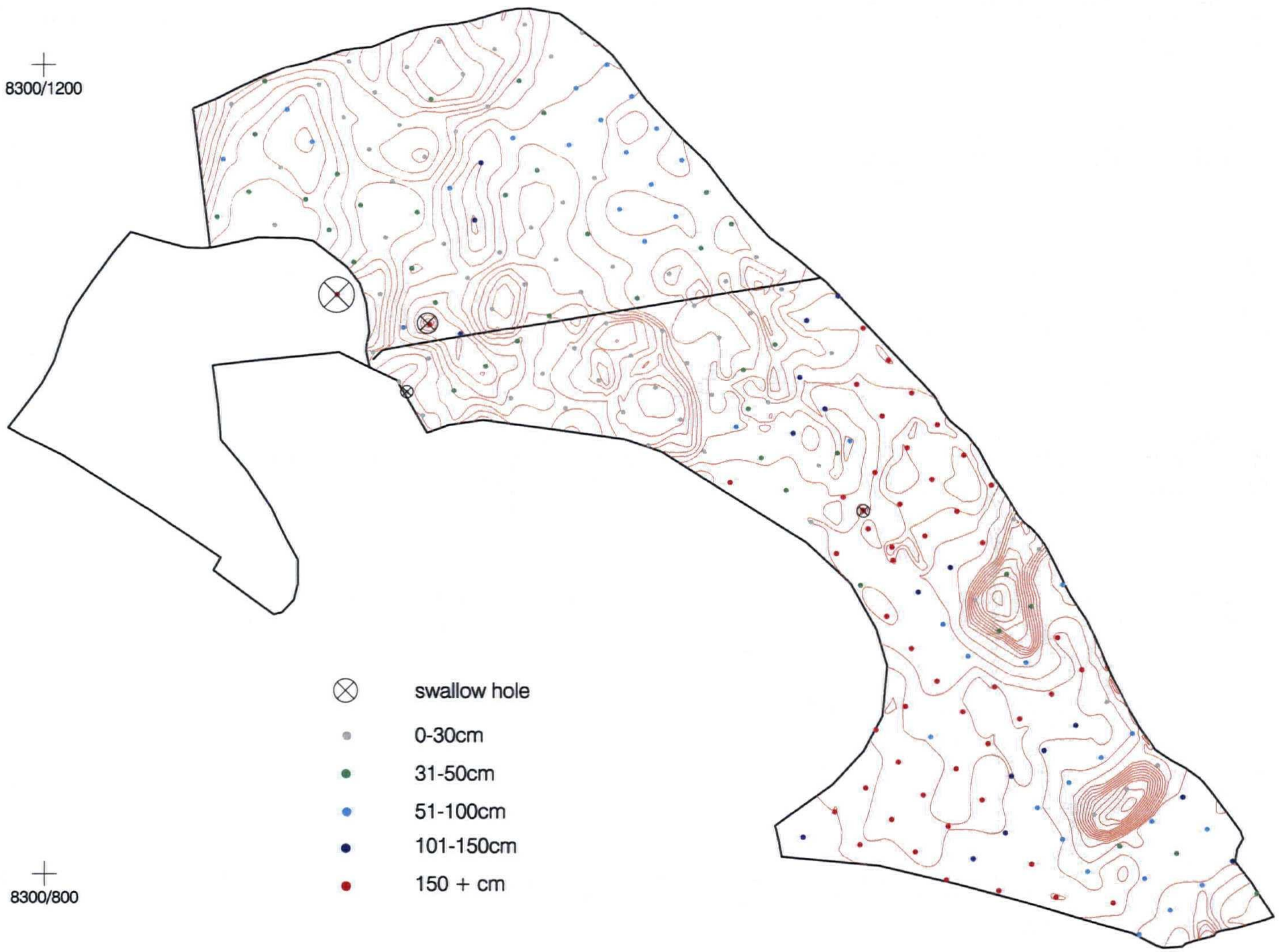
Phase 2

Two auger locations (Auger 69 and 210) were selected as representative of the overall sequence of buried deposits, and were therefore subject to further environmental sampling. The palynology of Auger 69 revealed evidence for the changing landscape of the surrounding area from the Late Glacial period to the Holocene. Initially, a series of organic sediments were laid down within the lake, during a temperate Late Glacial interstadial, at which time the area was characterised by birch and willow woodlands. During the subsequent stadial, as the climate cooled, the landscape was characterised by open vegetation, or sedge tundra, before reverting to birch and willow woodland during the temperate Holocene, at which point the lake is believed to have been largely in-filled (Appendix E: Part 5).

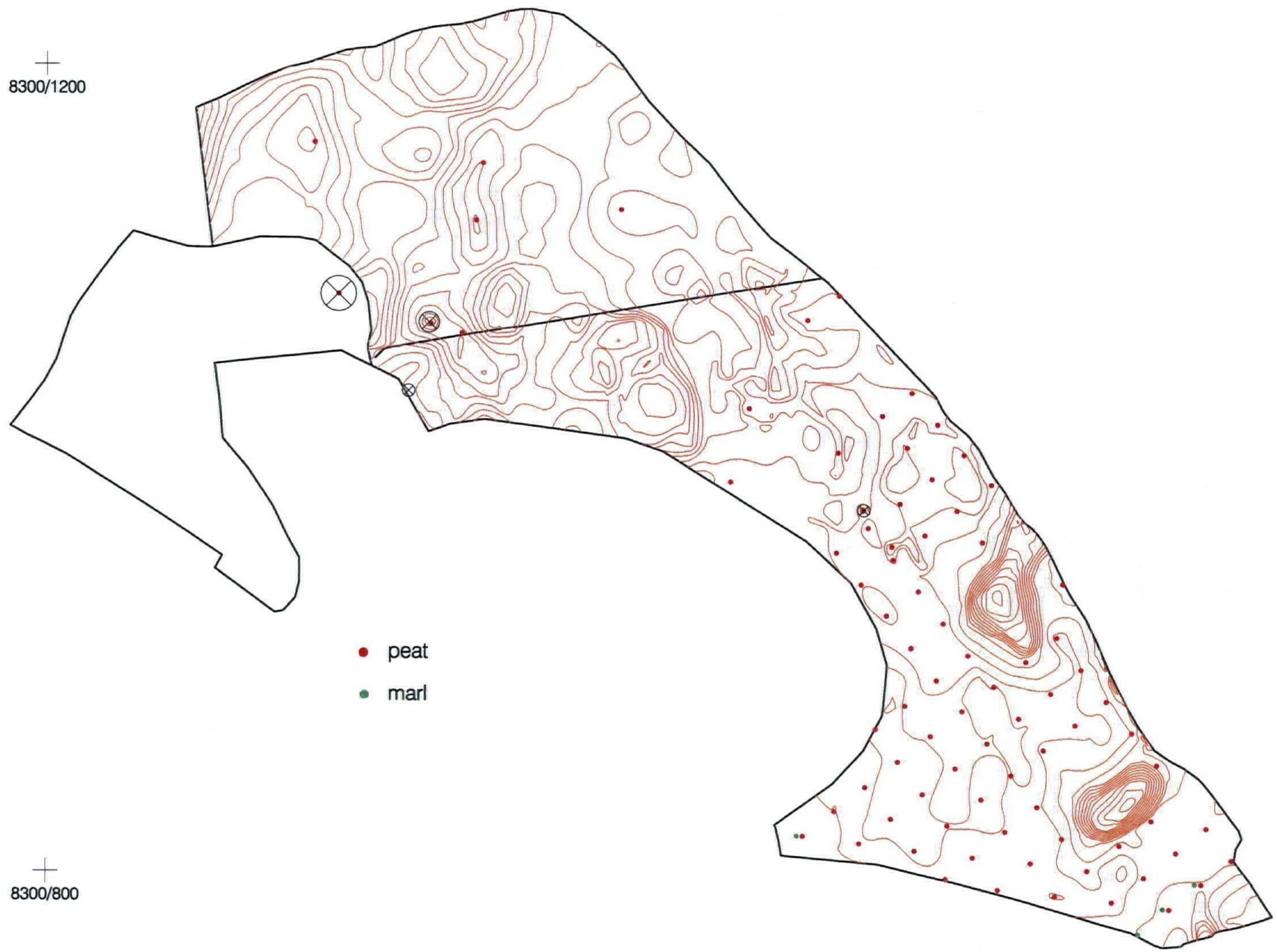
Palynological study of Core 210, within Shake Hole (sink hole) 1, revealed a similar sequence (Appendix E: Part 6). Sediments had collected within the hollow as a result of the dissolution of the underlying Magnesian limestone, and the pollen contained within it revealed a landscape initially dominated by deciduous woodland, giving way to more open grassland with some cereals.

4.16.3 Assessment

The depth of sediments identified within Field A of the Flasks strongly suggests that this area lay within the



Investigation 18 (Intervention 7) deposit map | Scale 1:3000 | Figure 76



Investigation 18 (Intervention7) location of the peat deposits

Scale 1:3000

Figure 77

extent of the prehistoric lake, and the analysis of pollen from within these deposits revealed evidence for the surrounding Late Glacial and Holocene landscape. The nearby sink hole revealed evidence for widespread clearance of surrounding woodland at an unspecified date; this will hopefully be clarified by radiocarbon dating.

4.17 INVESTIGATION 19 (INTERVENTION 8)

During September 2003, an archaeological evaluation was carried out within the area of the Flasks (Quarry Phase 5b)(Figure 78). Two trenches were excavated, directed at two anomalies highlighted during the topographic survey, with the intention of ascertaining whether they were natural or man-made (Figure 79). Excavation of a large mound revealed the feature to be geological, and investigation of a narrow channel produced evidence to suggest that it had been formed as an erosion gully.

4.17.1 Fieldwork Procedure

A small three-ton excavator, fitted with a toothless bucket, was used to open the excavation trenches. Trench A was situated over a linear gully, in the northern half of Field A, aligned east-west and measuring 20m in length and 2m wide. Trench B was located over the large mound (Feature 1) identified during topographic survey. The trench measured 30m by 2m, and was orientated NE-SW. In each trench, the topsoil was removed using the machine, and the surface of the underlying subsoil was hand-cleaned. The sections were cut, cleaned, and the whole trench photographed. One of the longer sections in each trench was selected for recording.

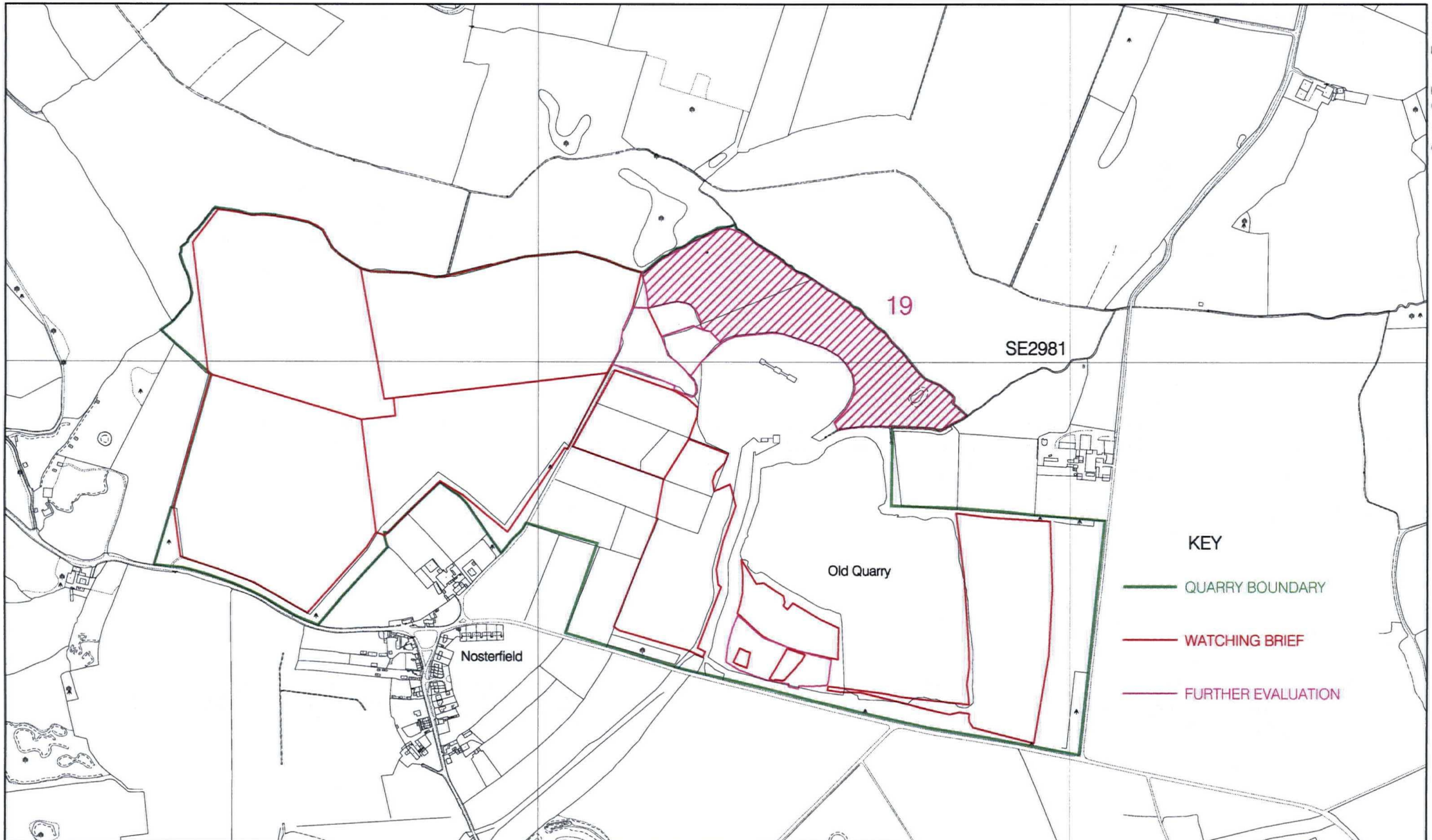
4.17.2 Fieldwork Results

In Trench A, removal of a dark brown silt topsoil revealed two areas of subsoil: a gravel subsoil (C1006) to the west, and a marl (C1007) to the east. These were divided by a linear feature, F1, which comprised a broad, shallow ditch, 3.60m wide and 0.43m deep, filled with a coarse peat (C1001). The lack of evidence for upcast, and the presence of peat within the feature, suggest that the channel was not excavated for the extraction of peat or for drainage purposes. The presence of two distinct types of geology led to the interpretation of this feature as a geological anomaly. Possible evidence was also noted in section for previously unrecorded ploughing in the area, although this convoluted subsoil interface may have been the result of periodic waterlogged conditions (Figure 80).

In Trench B, following removal of topsoil, a 'dirty' subsoil was encountered, at a depth of 0.30m. A dump of burnt stones was identified on the top of the mound, within a shallow scoop (F2/F3), but represented the only apparent man-made feature. Two sondages, excavated through the apparent subsoil make-up of the mound, led to an interpretation of the feature as a geological anomaly, disturbed though animal activity. Finds within the topsoil included flints, animal bone, and medieval to post-medieval pottery.

4.17.3 Assessment

The investigation of both anomalies revealed them to be geological, and the few finds produced might suggest that human activity in the region occurred sporadically and that this particular area was not densely occupied.



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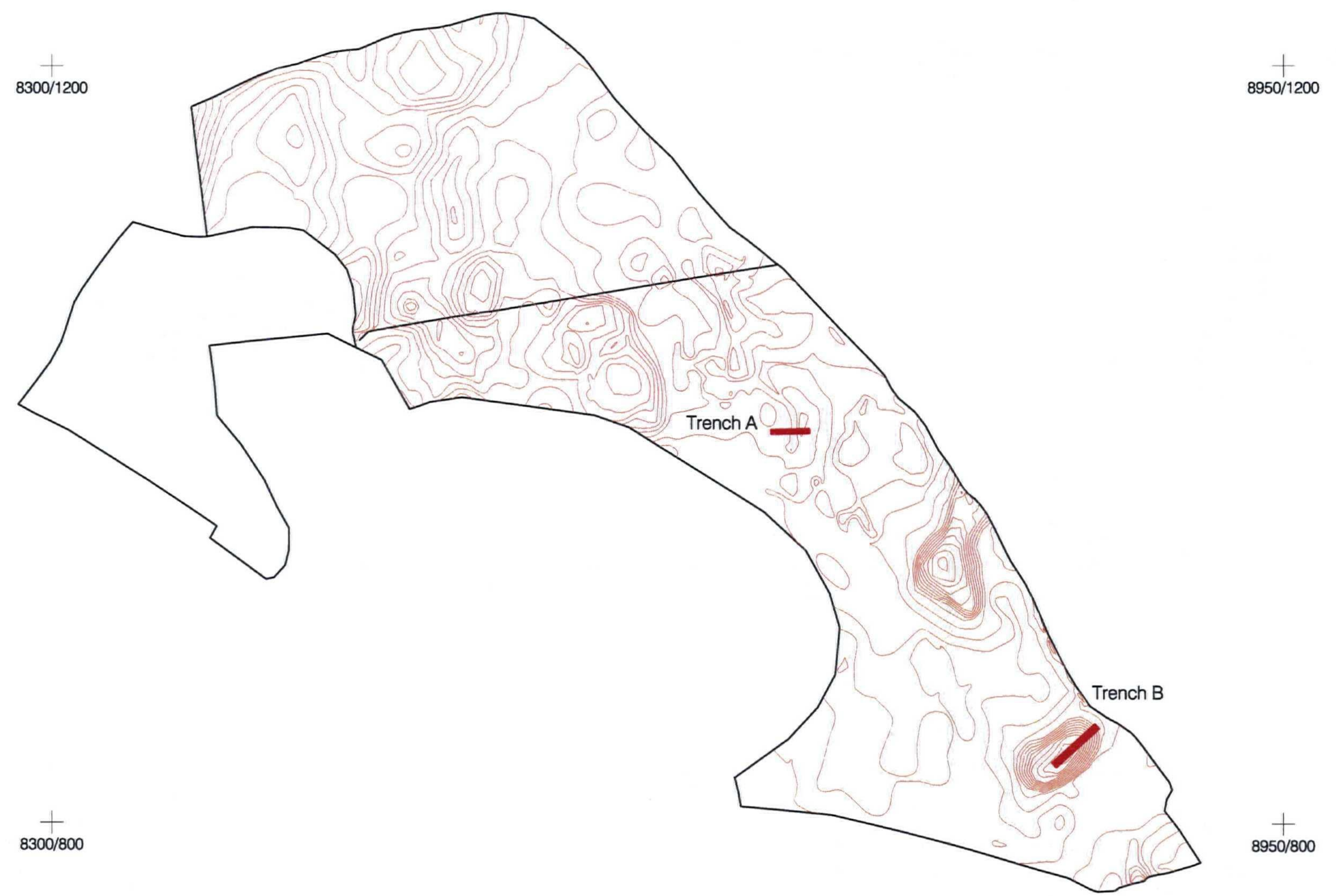
Location of Investigation 19

Scale 1:10000

Figure 78



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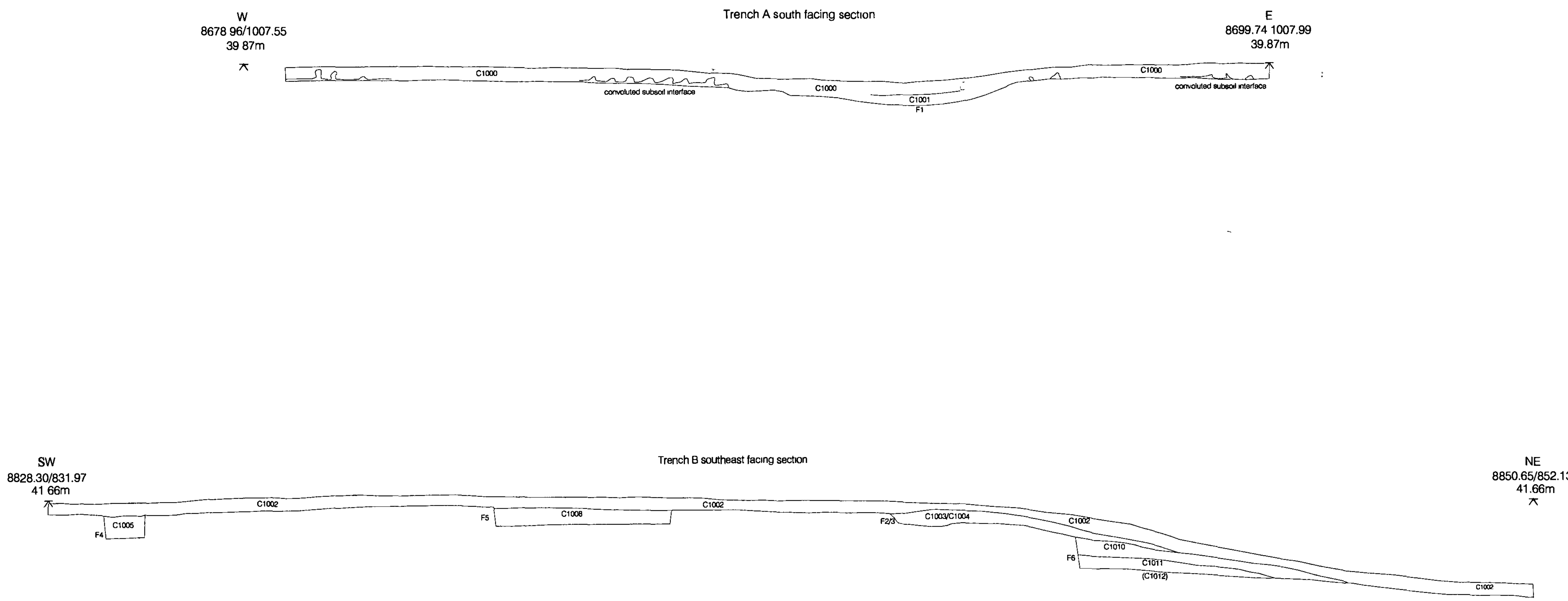
Investigation 19 (Intervention 8) location of trenches

Scale 1:3000

Figure 79



Investigation 19 (Intervention 8) trench sections

Scale 1:100

Figure 80

5.0 DISCUSSION

The investigations that have been undertaken at Nosterfield Quarry since the 1990s have provided valuable evidence regarding the nature and extent of archaeological features within the area. Over successive phases of investigation, methodologies have been developed that have permitted the surviving archaeology to be suitably recorded and sampled, allowing a detailed picture to be created of the nature and extent of archaeological survival, and its significance regarding the development of landscape use in this area from the Mesolithic to the modern day.

5.1 FEATURE-TYPE AND PRESERVATION

A large number of features were identified across the whole area, but these showed considerable variation in terms of preservation, density and character. A significant number of features were identified as natural during excavation, including tree boles or vegetation pits (65 examples recorded), natural scoops (15 recorded), or animal disturbance (5 burrows recorded). In addition, at least 19 features were identified as sink holes; although a limited number contained archaeological material, they were formed due to underlying geology.

A proportion of features could be associated with the drainage and division of the land for post-medieval or modern agricultural purposes. Five features were identified as old hedgerows, 31 land drains were mapped, 2 culverts identified, and 19 furrows recorded. In addition, 2 modern wells were investigated and recorded.

Of the remaining features, pits and scoops predominated, comprising 420 pits and 39 scoops. These tend to fall into two groups. The better-preserved examples tended to be those which formed part of pit alignments, of which 6, and 1 ditch-pit alignment (182 pits in total), were identified. While these pits tend to be significantly deeper than the isolated pits identified across the rest of the quarry site, they generally consist of shallow cuts, U-shaped in profile, most of which seem to have been badly truncated by later agricultural activity. To these, a total of 9 possible hearths can be added, although such identifications remain tentative.

The pit alignments generally occur towards the southwest of the site, where archaeological features appear to be densest and most diagnostic. Across the remainder of the area, isolated pits seem to be widely dispersed, occurring most frequently in the northern, central and eastern parts of the quarry site.

A total of 31 ditches were recorded; during post-excavation, a number were shown to belong to the same features, but had been identified during different phases of investigation. Excavated ditches included successive curvilinear features, which appear to have been for drainage (Investigation 16). Rectilinear arrangements of ditches and furrows were identified, predominantly in the central part of the quarry site. In the western part of the quarry, a substantial, right-angled ditch was identified (initially as three separate features), which in plan was shown to form part of a rectilinear division of the land, in association with a second NE-SW orientated ditch and two of the pit alignments (Structures 1 and 2).

Also in the western part of the site, a series of three ring-ditches was identified, roughly aligned WSW-ENE. Within one of these, a pit containing human remains was identified, and the northeasterly example was located in the vicinity of ten pits which were found to contain cremated human remains. Two rectilinear ditches (possible square barrows) were also identified in the western part of the site, and both were shown to have been recut.

Human remains, representing both cremation and inhumation, were identified in a number of pits, all of which occurred in the southwestern part of the quarry site. Eleven pits or scoops were found to contain cremated human bone, some of which had been placed within inverted urns. Two pits produced human remains which showed signs of having been excarnated, one within the southern ring-ditch F264, and one in the upper fills of a pit (F251, F253) in Structure 1. An intact inhumation burial, disturbed by recutting, was identified in the ditch of one of the possible square barrows, and a quadruple horse burial was also identified.

Again in the western part of the site, a corn-drying oven was excavated. Comprehensive excavation and recording of the feature allowed for reconstruction of the different phases of development and use of this structure.

5.2 DATING AND CHRONOLOGY

Overall, only a small proportion of features provided secure evidence for dating; ten of the features containing human or animal bone (horse burial) were subject to radiocarbon dating, as was sediment from one pit of Structure 4. The corn-drying oven provided an archaeomagnetic date in the 2nd century AD. For the remaining archaeological features, dating relies heavily on ceramic and lithic assemblages, as is frequently the case for prehistoric sites (Table 2; Figure 81).

Table 2 Phases of activity

Phase	**Date range**	**Nature of activity**
MESOLITHIC	*c.* 8000BC - *c.*4500BC	Finds
NEOLITHIC	*c.* 4500BC - *c.*2500BC	Pits, finds, possible ditches
BRONZE AGE	*c.* 2500BC - *c.*700BC	Burials, possible ring ditches
IRON AGE	*c.* 700BC - AD43	Burials, pit alignments, enclosures, possible square barrows
ROMAN	AD43 - AD409	Oven, pits, disuse of earlier features
POST-ROMAN TO MODERN	AD 409 - modern	Agricultural, quarrying

Pits: dating

Of the 459 pits and scoops within the study area, only a limited number provided dating evidence (83). The best dated were those which contained cremated and unburnt human bones. Nine of the cremations were found to cluster in one area of Investigation 15 (Structure 7); four contained urns of Middle Bronze Age date, and the cremated remains were radiocarbon-dated to the same period. A pit containing cremated human remains within the southern ring-ditch produced an Early to Middle Bronze Age date, and an inhumation in a pit outside the same ring-ditch provided a Middle to later Bronze Age date. Inhumed remains in the upper fills of a pit within alignment (Structure 1) provided a late Iron Age date, and the horse burial produced a similar late Iron Age date (AD 50±35).

Of the isolated pits and scoops (i.e. not in alignments), a further 51 produced Neolithic ceramics (11%), and 4

Provisional phase map | Scale 1:5000 | Figure 81 have been ascribed a broad date in the Neolithic-Bronze Age using diagnostic lithic artefacts (1%) Roman pottery was identified in 6 of these pits (4%) Of the remaining examples, 13 produced undiagnostic flint, and 3 produced Mesolithic microliths considered to have been residual

A small number of pits from within alignments provided dateable material, and could therefore be used to date a larger number by association Twelve pits from Structures 1 and 2 were found to contain late Iron Age or early Roman pottery in their upper fills, and human remains from the upper fills of one pit (Structure 1) provided a radiocarbon date of AD 40±35 These finds suggests disuse of the feature, and therefore a valuable *terminus ante quem* in the late Iron Age a broad Iron Age date for such features is widely accepted (Harding and Johnson 2003)

A pit-ditch alignment to the north of the quarry area produced an assemblage of Neolithic ceramic from an associated pit, and a Neolithic fabricator within the ditch fill No further dateable material was recovered, a possible Neolithic date can be tentatively suggested A single pit from a pit alignment (Structure 11) produced an anomalous fragment of Torksey Ware (dated to the 10th or 11th century AD), which may have been intrusive, while no dating evidence at all was produced for the southernmost pit alignment (Structure 12)

The double pit alignment identified at the southwestern corner of the site (Investigation 15) produced an unexpectedly early date A sediment sample from one pit (F216) within the pit alignment provided a radiocarbon date of 4675±60 BC (6625±60BP AA-51419, GU-10384), which places the monument in the later Mesolithic, bordering on the traditional transition to the Neolithic The sediment that was dated derived from the latest fill within the pit, which would suggest that the structure had been constructed at an earlier date Such a date would place the monument very early in the known sequence of landscape development in the Nosterfield and Thornborough area, and would be unique as a later Mesolithic pit alignment The dating of this pit alignment currently relies on one radiocarbon date derived from sediment, and will be the subject of further analysis

Ditches dating

The majority of linear features have been interpreted as modem drainage ditches, field boundaries or furrows, and are therefore considered to be post-medieval or modern in date Several could be overlaid with maps of historic boundaries which identified them as likely post-medieval or modern enclosures

Only a small number of ditches provided dating evidence A curvilinear section of ditch in the central part of the quarry site produced Neolithic pottery Further west, the right-angled ditch (identified initially as three separate features, F82, F150 and F306) and a second ditch, running perpendicular to the pit alignments, and between gaps in both, has been seen to form part of a wider enclosure of rectangular areas of land These features again produced Roman ceramic in their upper fills, and have been assigned an Iron Age date

Ring-ditches and square-ditch enclosures dating

Although ring-ditches (possible round barrows) and square-ditch enclosures (possible square barrows) are generally considered, on the grounds of form, to belong to the Bronze Age and Iron Age respectively, all but one of the features from the Nosterfield Quarry site lack independent dating evidence, and can only be given such dates on the grounds of association

Dating evidence is lacking from all three ring-ditches identified in the southwestern part of the site, and a Bronze Age date can only be tentatively suggested, due to spatial association with securely dated burials F264 encircles an Early to Middle Bronze Age cremation, and a Bronze Age inhumation lies just outside it To the northeast, F148 appears to form the focus for the cluster of cremations ascribed to Structure 7

Of the square-ditch enclosures, F320/F337 was dated to the Iron Age by the presence of inhumation burial (F335) between two distinct phases of ditch construction Although lying 10m from the quadruple horse burial, the second feature of this type (F304/F307) lacked dating evidence, and can be given an Iron Age date only on the grounds of similarity of size, form and sequence to F320/F337

5 3 PRELIMINARY INTERPRETATIONS

Bearing the limitations of the evidence in mind, in terms of preservation and dating, consideration of landscape use throughout prehistory can be undertaken on tentative grounds, and the conclusions drawn await refinement as post-excavation analysis and comparative research continues However, the available results demonstrate that the work at Nosterfield Quarry has provided a unique opportunity to discuss the changing use of a wide tract of landscape from the Mesolithic to the modem day

5 3 1 Mesolithic

Typically for this period of prehistory, there is very little secure evidence for Mesolithic activity in the area, beyond the presence of worked flints found in later contexts Fieldwalking undertaken by the Vale of Mowbray Neolithic Landscape project revealed dispersed evidence for Mesolithic and early Neolithic activity, in the form of lithic scatters, most notably in the region of Ladybridge Farm, to the east of the Nosterfield Quarry site (Harding 1994, 1998, 36-7) Recent excavations of a burial monument to the south of the quarry site also produced Mesolithic flint artefacts from a later Neolithic or Bronze Age context (Harding 2004d, 16) The finds from various phases of work at Nosterfield support a growing picture of dispersed Mesolithic activity within this wider landscape, although the scattered and relatively scarce nature of the material does not yet allow for more detailed conclusions to be drawn

Although Mesolithic activity is predominantly represented by lithic assemblages, as modern archaeological investigation continues, more secure evidence for Mesolithic activity is being produced Since the publication of Star Carr in 1954 (Clark 1954), further Mesolithic material has been subject to study in the Yorkshire area Lithic assemblages at Chapel Cave were found in association with hearth features, radiocarbon-dated charcoal from within the excavated sequence provided a date of 6575±59 BP (OxA-8837· Donahue and Lovis 2003, 313) Further afield, evidence for Mesolithic activity has been produced from a site which later formed a focus for Neolithic monumentality, at Billown, on the Isle of Man (Darvill 1999, 2000, 2003) A hearth-pit (4658-4369 cal BC Beta-89312), pit fill (4542-4464 cal BC, Beta-125767) and a burnt plank (4899-4719 cal BC Beta-1106691) provided evidence for some, probably temporary, Mesolithic activity on the site The hearth-pit and flint scatters were found to occur in the same location as later enclosures and pits of Neolithic and Bronze Age date, notably, this area may also have sink holes which may have formed the focal point for later activity (Darvill 2000, 68-70) Recent landscape studies have suggested that natural places and features that were visited with regularity during the Mesolithic came to have a permanent significance for societies, which 'ultimately set the scene for the construction of monuments in the Neolithic' (Cummings 2003, 74) Such a scenario may present a possible context for the construction of the double pit alignment at Nosterfield in the late Mesolithic

The nearest parallels for the pit alignments in the surrounding area have, so far, all produced later dates Pit alignments are traditionally considered to date from the later Neolithic to the Roman period, and double pit alignments are generally thought to date to the later Neolithic (Harding and Johnson 2003, 23) Within the Nosterfield area, a number of double pit alignments have been investigated archaeologically, and have provided dating material in the form of radiocarbon-dated charcoal and ceramic

During excavation of the Thornborough double pit alignment, between 1995 and 1998, evidence for timber uprights was identified, and Bronze Age pottery and lithic material was recovered from recuts, which have been associated with the removal of the posts themselves A series of three radiocarbon dates the from post-pipe and recut of one pit, returned dates of 1750-1590 cal BC (3385±38 BP OxA-11009), 1000-825 cal BC (2761±35 BP. OxA-11033) and 925-800 cal BC (2716±37 BP OxA-11010) (Harding and Johnson 2003, 23) These dates are associated with the disuse of the feature, and have been used to suggest an approximate date for construction in the later Neolithic or early Bronze Age

Three further double pit alignments were identified during the widening of the A1 at Dishforth, one of which also provided later Neolithic dates (Tavener 1996, 185-6), and radiocarbon dating of the two double post rows at the site of the Devil's Arrows provided dates of 4234±80 BP (RCD-1596) and 4314±87 BP (RCD-1597)(Harding and Johnson 2003, 23) Although similar in form to the Nosterfield double pit alignment, the examples within the wider area do differ in terms of scale The nearest parallel is that adjacent to the Thornborough henges, which has pits every 5 to 7m along alignments spaced 10 to 11m apart In contrast, the rows of pits forming the Nosterfield double pit alignment are 22 to 28m apart, with pits every 10 to 13m, in terms of scale, the Nosterfield pit alignment represents the widest spaced example in the area

The interpretation and dating of features identified during the Nosterfield Quarry watching brief is at a preliminary stage and as such, conclusions are necessarily tentative However, preliminary results suggest that the double pit alignment at Nosterfield is one of the earliest of its kind, representing rare, and highly significant, evidence for the development of monumentality within the Mesolithic landscape, and elucidating the way that societies during the Mesolithic exploited and shaped their surroundings

5 3 2 Neolithic

For the Neolithic period, which is seen traditionally as a period of transition from small-scale agricultural communities to a more stratified society, evidence for occupation and activity becomes more substantial The earlier part of this period is not well-represented, but is seems that by the later Neolithic, the area surrounding of the in-filled lake appears to have become the focus for domestic activity Pits and possible hearths, producing ceramic and flint, are found grouped to the west, southwest and southeast of what would have been a broad, marshy area, such features are not attested in the western part of the quarry area

An WNW-ESE pit-ditch alignment (Structure 10), tentatively assigned to the Neolithic, appears to delineate the northern extent of this activity, beyond which few pits of any date have been identified It is possible that the smaller pit alignment to the east (Structure 11) represents an extension of this boundary, after it continues beneath Flask lane, although no dating evidence has been provided for this structure

The Neolithic also saw the development of the Thornborough monument complex, located to the south of the quarry site The cursus monument is considered to have been established by the early to mid-Neolithic, and was added to through the construction of the three henges in the later Neolithic (Harding 1998, 29) Evidence for contemporary activity within the quarry site is restricted to its eastern side, and very little material of this date has been identified from the more westerly parts of the study area (Investigations 14 and 15)

5 3 3 Bronze Age

Evidence for Bronze Age activity is primarily funerary, and located in the western part of the quarry site Finds of Bronze Age ceramic in isolated pits, and the loosely dated lithic artefacts, may represent activity in the wider area, but are rare and therefore difficult to intecpret

There appears to have been a focus for funerary activity in the Bronze Age, with cremation and inhumation burials concentrated seemingly on two of three ring-ditches These features have only been identified within one area of investigation, given the extensive area that has been subject to archaeological study, it seems likely that this distribution reflects a real variation in landscape use

The only dates provided for these burials at Nosterfield fall within the Bronze Age, in contrast, recent excavation of a barrow close to the henge complex has been used to suggest a later Neolithic date for the onset of monument construction (Harding 2004a, 2004d) A number of barrows subject to antiquarian investigations in the surrounding area produced ceramic evidence indicative of Bronze Age cremations

5 3 4 Iron Age

The watching brief at Nosterfield also encountered rare evidence for Iron Age activity Previous investigations have produced little or no evidence dating to this period, leading to suggestions that the area was not occupied, explained as due to exhaustion of the soils during the Bronze Age (Tavener 1996) Climatic deterioration was attested by the sediment analysis undertaken within the quarry, but the presence of communities within the wider landscape is demonstrated by the construction of a large enclosure, possible square barrows and associated burials which have been assigned an Iron Age date

The large enclosure, demarcated by a rectilinear system of ditches and pit alignments suggests some reorganisation of the landscape at this time Outside this enclosure, the presence of possible square barrows, associated with human and horse burials, demonstrates potentially contemporary funerary activity

It is unclear how such activity relates to the pre-existing Bronze Age landscape Juxtaposition of sections of ditch and pit alignment over two of the three ring-ditches may be of significance, but awaits further research The possible erection of square barrows may have been focussed on the site of earlier burials, or may have been placed external to the rectilinear enclosures. The recutting of these features suggests that they remained in use for some considerable period of time

5 3 5 Roman

Durmg the Roman period, the landscape seems to have changed in character, and it seems that much of the land was given over to arable and agricultural functions The upper fills of the pit alignments and associated ditches contained pottery of early Roman date, demonstrating that they continued into the Roman period as landscape features, but that they appear to have fallen out of use at this time The pottery assemblage from the quarry has been used to suggest the presence of a high-status, highly Romanised community in the vicinity, and the oven, which is known to have been in use during the 2nd century AD, may have been associated with such a community

The area surrounding Nosterfield appears to have been occupied by communities living a highly Romanised lifestyle, presumably centred on villa estates, such as those identified in Well and at Castle Dikes The establishment of such sites, and the administrative network within which they operated, is likely to have meant considerable change to the organisation and exploitation of the landscape, leading to the disuse of existing monuments (such as the henges, pit alignments and ring-ditches)

5 3 6 Medieval and Post-medieval

The character of later features certainly indicates an agricultural landscape Throughout medieval, post-medieval and modern periods, the archaeological features reveal the enclosure of fields, and suggest that demarcation and drainage of land were the main activities across the whole area The variable geology of the region meant that considerable measures were required to drain certain areas of land, particularly in the modern period, and the falling watertable evidenced within one of the well structures may attest to the success of these operations

The archaeological investigation at Nosterfield Quarry has clearly illustrated the destructive impact of recent agricultural regimes on the archaeological resource of the area The remains of prehistoric activity defined during the watching briefs had suffered damage from ploughing, and particularly in the case of prehistoric burials, the degree of truncation and disturbance was found to be severe

6.0 CONCLUSIONS

The ongoing work undertaken at Nosterfield Quarry over the last decade has revealed an increasing amount of information regarding the past development of the area, and the state of preservation of surviving remains A methodology for identifying, mapping and sampling features has been developed over time which allows for the comprehensive recording of the features and artefacts that survived in this area

The scale of the investigations permitted the mapping of features over a wide area, and will allow zonation of different types of activity to be identified, rather than the more limited perspective provided by smaller excavations The consideration of geological changes and diversity within the landscape will allow for the changing activities within the landscape to be viewed within the context of changing vegetation and ground conditions, from the Mesolithic to the modern day

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APPENDIX A FEATURE INDICES FOR INVESTIGATIONS 3, 4, 7, 9, 11

PART 1 INVESTIGATION 3

AREA 1 (TRENCH 4)

Feature No	Identity	Contexts	Dimensions (m)	Dating evidence or finds
1004	Pit	1001, 1002, 1003	L1 23 x W1 05 x D0 74	Flint (some burnt), Grooved Ware Late Neolithic
1005	Pit	1006, 1007, 1008	L1 14 x W1 14 x D0 77	
1009	Pit	1022, 1023	L1 18 x W0 85 x D0 39	Flint (some burnt), Grooved Ware Late Neolithic
1010	Pit	1024, 1025	L1 14 x W1 14 x D0 35	Flint, Grooved Ware Late Neolithic
1011	Pit	1026, 1027, 1028	L1 03 x W1 03 x D0 55	Flint (some burnt), Grooved Ware Late Neolithic
1012	Pit	1020, 1021	L0 81 x W0 81 x D0 49	Flint, Grooved Ware Late Neolithic
1013	Pit	1201	L0 40 x W0 33 x D0 17	Flint, Grooved Ware Late Neolithic
1014	Pit?	-	-	
1015	Pit	1206, 1207	L0 67 x W0 67 x D0 49	Grooved Ware Late Neolithic
1016	Pit	1203, 1204	L0 75 x W0 75 x D0 40	Grooved Ware Late Neolithic
1017	Pit	1202, 1205	L1 38 x W1 18 x D0 70	Flint, Grooved Ware Late Neolithic
1018	Pit	1045, 1046	L1 26 x W1 08 x D0 20	Leaf point Neolithic?
1019	Pit?	-	-	
1029	Pit	1040	L0 81 x W0 81 x D0 22	
1030	Pit	1037, 1038, 1039	L0 74 x W0 45 x D0 12	
1031	Pit?	-	-	
1033	Pit?	-	-	
1034	Pit?	-	-	
1035	Pit?	-	-	
1036	-	-	-	
1041	Pit	1042	L1 06 x W0 80 x D0 08	
1043	Pit	-	-	
1047	Pit	-	-	
1049	Pit?	-	-	
1050	Pit	-	-	
1051	Pit	1208, 1209	L2 77 x W1 34 x D0 22	
1052	Pit	-	-	
1054	Pit	-	-	Grooved Ware Late Neolithic
1055	Pit	-	-	
1056	Pit	-	-	
1057	Pit	1058, 1059, 1060	L0 75 x W0 75 x D0 34	
1061	Hearth?	1062	L1 39 x W0 82	
1063	Pit	1064, 1065	L0 93 x W0 93 x D0 23	Peterborough Ware Late Neolithic
1066	Pit	1067, 1116	L0 91 x W0 91 x D0 30	
1069	Pit	1068	L0 50 x W0 45 x D0 32	Leaf butted arrowhead, Grimston Ware Neolithic
1070	Hearth?	-	-	
1074	Pit	1072, 1073	L0 17 x W0 17	End scraper, Grooved Ware Late Neolithic
1076	Pit	1075	L0 52 x W0 49	Flint, Grimston and Grooved Ware Late Neolithic
1078	Pit	1077	L0 50 x W0 44	

Feature No	Identity	Contexts	Dimensions (m)	Dating evidence or finds
1079	Pit	1080	L0 44 x W0 30 x D0 14	
1081	Hearth?	1082	L2 08 x W0 98 x D 0 21	
1084	Pit	1083	L0 45 x W0 45 x D0 21	
1085	Hearth?	-	-	
1086	Pit?	-	-	
1087	Pit	-	-	
1088	Pit	-	-	
1089	Pit	-	-	
1090	Hearth/ slot?	-	-	Grooved Ware Late Neolithic
1091	Pit	-	-	
1092	Pit	-	-	
1093	Pit	-	-	
1094	Pit?	-	-	
1095	Hearth?	-	-	
1096	Pit	-	-	Grooved Ware Late Neolithic
1097	Pit	-	-	Grooved Ware Late Neolithic
1098	Pit	-	-	
1099	Pit	-	-	Grooved Ware Late Neolithic
1100	Hearth?	-	-	
1101	Pit	-	-	Grooved Ware Late Neolithic
1102	Hearth?	-	-	
1103	Pit	-	-	
1104	Pit	-	-	
1105	Pit	-	-	Grooved Ware Late Neolithic
1106	Pit	-	-	
1107	Pit	-	-	
1108	Pit	-	-	
1109	Pit	-	-	
1110	Burrow	-	-	
1111	Pit	-	-	
1112	Pit	-	-	
1113	Pit	-	-	Grooved Ware Late Neolithic
1114	Pit	-	-	Grooved Ware Late Neolithic
1115	Hearth?	-	-	
1210	Pit	1211, 1212, 1213	L0 47 x W0 47 x D0 27	Flint
1214	Pit	1215	L1 14 x W0 56 x D0 22	
1216	Pit	1217, 1218, 1219	L1 18 x W1 18 x D0 44	Flint (inc burnt), Grooved Ware Late Neolithic
1301	Pit	1032	L1 76 x W0 98 x D0 40	Neolithic?
1303	Pit	1302	L0 51 x W0 51 x D0 27	
1305	Pit	1304	L1 50 x W1 00 x D0 50	
1307	Pit	1306	L1 19 x W1 19 x D0 40	Flint, Peterborough Ware Late Neolithic
1309	Pit	1308	L1 42 x W1 04 x D0 20	Flint, Grooved Ware Late Neolithic
1311	Pit	1310	L0 27 x W0 27 x D0 10	Grooved Ware Late Neolithic

Feature No	Identity	Contexts	Dimensions (m)	Dating evidence or finds
1313	Pit	1312	L0 67 x W0 59	Flint (chert saw), Peterborough Ware Late Neolithic
1315	Pit	1314	L1 51 x W0 85 x D0 17	
1317	Pit	-	-	
1319	Pit	1318	L0 53 x W0 53	
1321	Pit	1320	L1 07 x W0 79 x D0 37	Flint, Peterborough and Grooved Late Neolithic
1323	Pit	1322	L0 45 x W0 45 x D0 06	

AREA 2

Feature No	Identity	Contexts	Dimensions (m)	Dating evidence, finds
2001	Pit?		L0 70 x W0 45 x D0 17	
2002	Pit?		L0 75 x W0 75 x D0 60	
2003	Spread		L0 30 x w0 30	Flint spall

PART 2 INVESTIGATION 4

(TRENCH 5)

Feature No	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
5001	Pit	5002	L0 76 x W0 76 x D0 12	U-shaped	
5004	Pit	5005, 5006	L0 96 x W0 89 x D0 28	U-shaped	Flint prehistoric
5007	Ditch	-	-	-	
5009	Pit?	-	-	-	
5011	Scoop	5012	L0 57 x W0 47 x D0 07	U-shaped	
5013	Scoop	5014	L0 42 x W0 40 x D0 09	U-shaped	Flint, Peterborough Ware Late Neolithic
5015	Pit	5016, 5017	L0 84 x W0 58 x D0 40	U-shaped	
5018	Pit	5010, 5020	L0 77 x W0 87 x D0 29	U-shaped	
5021	Pit	5022	L1 78 x W0 55 x D0 17	U-shaped	
5024	Pit	5023	L0 92 x W0 78 x D0 17	U-shaped	
5025	Pit	5033	L0 66 x W0 53 x D0 28	U-shaped	
5026	Pit	-	-	-	
5028	Scoop	5031	L0 56 x W0 53 x D0 05	U-shaped	
5029	Pit	5032	L0 57 x W0 61 x D0 13	U-shaped	
5035	Pit	5036	L1 30 x W0 52 x D0 11	U-shaped	Flint Neolithic-Bronze Age
5037	Veg pit	-	-	-	
5039	Veg pit	-	-	-	
	Spread	5003	L0 95 xW0 50		
	Spread	5034	L0 81 x W0 26		

PART 3 INVESTIGATION 7

(TRENCH 7)

Feature No	Structure No	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
7002	12	Pit	7001	L1 23 x W0 50 x D0 19	U-shaped	
7003	12	Pit	7038	L0 77 x W0 50 x D0 13	U-shaped	

Feature No	Structure No	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
7004	12	Pit	7039	Diameter 0 64	-	
7005	12	Pit	7120	Diameter 0 56	-	
7006	12	Pit	7121	Diameter 0 76	-	
7007	12	Pit	7122	Diameter 0 69	-	
7008	12	Pit	7051, 7052	Diameter 0 64 x D0 27	U-shaped	
7009	12	Pit	7054	L1 34 x W0 95	-	
7010	12	Pit	7056	Diameter 1 09 x D0 49	-	
7011	12	Pit	7123	Diameter 0 44	-	
7012	12	Pit	7124	Diameter 0 49	-	
7013	12	Pit	7125	Diameter 0 41	-	
7014	12	Pit	7063, 7064	Diameter 1 22 x D0 71	U-shaped	
7015	12	Pit	7065	Diameter 0 82 x D0 41	-	
7016	12	Pit	7066	Diameter 0 80 x D0 41	-	
7017	12	Pit	7126	Diameter 0 94	-	
7018	12	Pit	7127	Diameter 0 88	-	
7019	12	Pit	7128	Diameter 0 83	-	
7020	12	Pit	7037	Diameter 1 08 x D0 33	U-shaped	
7021	12	Pit	7043, 7044, 7045	Diameter 0 98 x D0 48	U-shaped	
7022	12	Pit	7046, 7047	Diameter 0 90 x D0 57	U-shaped	
7023	12	Pit	7113, 7114, 7115	Diameter 1 18 x D0 46	U-shaped	
7024	12	Pit	7116, 7117	Diameter 0 78 x D0 48	U-shaped	
7025	12	Pit	7109, 7110	Diameter 0 80 x D0 38	U-shaped	
7026	12	Pit	7118	Diameter 1 05	-	
7027	12	Pit	7048	Diameter 0 76 x D0 32	U-shaped	
7028	12	Pit	7053, 7055	Diameter 0 75 x D0 30	U-shaped	
7029	12	Pit	7062	Diameter 0 69	U-shaped	
7030	12	Pit	7071	Diameter 0 89 x D0 24	U-shaped	
7031	12	Pit	7072, 7073	Diameter 0 84 x D0 31	U-shaped	
7032	12	Pit	7074, 7075	Diameter 0 96 x D0 35	U-shaped	
7033	12	Pit	7076, 7077	Diameter 0 77 x D0 24	U-shaped	
7034	12	Pit	7060, 7061	Diameter 0 95 x D0 29	U-shaped	
7035	12	Pit	7059	Diameter 1 05 x D0 29	U-shaped	
7036	12	Pit	7057, 7058	Diameter 0 99 x D0 28	U-shaped	
7050	12	Pit	7049	Diameter 0 68	-	
7067		Pit	7068	Diameter 1 34 x D0 27	U-shaped	
7069		Pit	7070	Diameter 0 35	-	
7079		Pit	7080, 7081, 7082, 7083	Diameter 0 47 x D0 61	V-shaped	
7085		Pit	7097	Diameter 0 43	-	
7086		Pit	7098	Diameter 0 73	-	
7087		Pit	7099	L2 13 x W1 64	-	
7090		Pit	7101	Diameter 0 59	-	
7092		Pit	7104	Diameter 1 19	-	
7093		Pit	7105	Diameter 1 11 x D0 44	Square	

Feature No	Structure No	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
7095		Pit	7111, 7112	Diameter 1 09 x D0 44	U-shaped	

PART 4 INVESTIGATION 9

INTERVENTION 1(E)

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
1	Pit	1002	L2 25 x W0 75 x D0 20	U-shaped	
2	Pit	1003	L1 85 x W0 85 x D0 40	U-shaped	
3	Scoop	1004	Diameter 0 30 x D0 07	U-shaped	
4	Pit	1005	L3 00 x W0 40 x D0 20	U-shaped	Flint, Grimston ware Neolithic
5	Veg pit	1006	Diameter 0 25 x D0 10	U-shaped	
6	Pit	1007	L2 25 x W1 50 x D0 55	U-shaped	Peterborough Ware, Grooved Ware, Beaker Vessel, Late Neolithic- Early Bronze Age
7	Pit	1008	Diameter 1 00 x D0 30	U-shaped	
8	Ditch	1009	W0 42 x D0 17	U-shaped	
9	Pit	1010	Diameter 1 60 x D0 34	U-shaped	Flint prehistoric
10	Scoop	1011	L1 00 x W0 70 x D0 06	-	
11	Pit	1012	Diameter 0 45 x D0 10	U-shaped	
12	Pit	1013	Diameter 0 35 x D0 20	U-shaped	
13	Scoop	1014	L3 00 x W1 70 x D0 20	U-shaped	
14	Natural pit	1015, 1016	L1 40 x W0 70 x D0 10	U-shaped	
15	Burrow	1017	Diameter 1 30 x D0 16	-	
16	Burrow	1018	L0 90 x W0 45 x D0 07	-	
17	Pit	1019	L1 00 x W0 40 x D0 32	U-shaped	
18	Pit	1020	Diameter 0 70 x D0 10	U-shaped	
19	Pit	1021	L0 40 x W0 29 x D0 10	U-shaped	
20	Scoop	1022	L1 30 x W0 68 x D0 07	-	
21	Pit	1023	Diameter 0 35 x D0 27	U-shaped	
22	Pit	1024	L0 90 x W0 38 x D0 14	U-shaped	
23	Pit	1025	L1 00 x W0 45 x D0 13	U-shaped	
24	Burrow	1026	L0 32 x W0 16 x D0 13	U-shaped	
25	Pit	1027	Diameter 0 65 x D0 33	U-shaped	
26	Scoop	1028	L0 70 x W0 30 x D0 08	U-shaped	
27	Land drain	-	-	-	
28	Land drain	1043	W0 30 x D0 25	Square	
29	Land drain	-	-	-	
30	Land drain	-	-	-	
31	Ditch	1041	W0 57 x D0 20	U-shaped	
32	Pit	1029	Diameter 0 70 x D0 20	U-shaped	
33	Pit	1037, 1038	Diameter 1 00 x D0 20	U-shaped	
34	Scoop	1039	L2 50 x W0 25 x D0 10	-	
35	Land drain	1046	W0 30 x D0 10	U-shaped	
36	Pit	1040	Diameter 1 00 x D0 12	U-shaped	

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
37	Scoop	1047	L0 60 x W0 40 x D0 07	-	Flint prehistoric
38	Pit	1048	L0 60 x W0 50 x D0 11	U-shaped	
39	Pit	1049	L1 90 x W1 14 x D0 10	U-shaped	Flint, (leaf-shaped arrowhead) Neolithic-Bronze Age
40	Pit	1050	L1 10 x W0 66 x D0 22	U-shaped	Flint
41	Pit	1051	Diameter 0 42 x D0 12	U-shaped	
42	Veg scoop	1052	L0 40 x W0 22 x D0 03	-	
43	Veg scoop	1053	L0 85 x W0 64 x D0 06	-	
44	Sink hole	1054, 1055, 1056, 1057	Diameter 3 09 (depth unseen)	U-shaped	
45	Sink hole	1065, 1066, 1067, 1068, 1069	Diameter 2 25 (depth unseen)	U-shaped	
46	Sink hole	1059, 1060, 1061, 1062, 1064	L4 80 x W3 72 (depth unseen)	U-shaped	
47	Scoop	1074	L2 80 x W2 55 x D0 05	-	
48	Scoop	1073	Diameter 2 44 x D0 10	-	
49	Land drain	-	-	-	
50	Land drain	-	-	-	
51	Land drain	-	-	-	
52	Land drain	-	-	-	
53	Land drain	-	-	-	
54	Land drain	-	-	-	
55	Land drain	-	-	-	
56	Land drain	-	-	-	
57	Land drain	-	-	-	
58	Land drain	-	-	-	
59	Land drain	-	-	-	
60	Land drain	-	-	-	
61	Land drain	-	-	-	
62	Land drain	-	-	-	
63	Scoop	1071	L1 68 x W1 30 x X0 09	-	
64	Pit	1058	L1 11 x W0 79 x D0 20	U-shaped	
65	(Not used)				
66	Scoop	1070	L5 20 x W3 25 x D0 10	-	
67	(Not used)				
68	(Not used)				
69	Pit	1072	Diameter 1 40 x D1 10	U-shaped	
70	(Not used)				
71	(Not used)				
72	(Not used)				
73	Burrow	1077	L2 50 x W0 50 x D0 12	-	
74	Pit	1076	Diameter 3 60 x D0 18	U-shaped	
75	Pit	1080, 1081	L1 15 x W0 50 x D0 12	U-shaped	

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
76	Pit	1105	L1 12 x W0 80 x D0 20	U-shaped	
77	Pit	1082, 1083, 1084	L1 00 x W0 64 x D0 27	U-shaped	
78	Scoop	1106	Diameter 0 37 x D0 08	U-shaped	

INTERVENTION 1(W)

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
103	Sink hole	1124, 1156, 1157	Diameter 1 40 x D2 03	U-shaped	
104	Sink hole	1125, 1153, 1154, 1155	Diameter 1 46 x D1 02	U-shaped	
105	Sink hole	1126, 1152	Diameter 2 50 x D0 40	U-shaped	
106	Sink hole	1128	Diameter 0 60 x D0 70	U-shaped	
109	Sink hole	1129, 1158, 1159	Diameter 2 08 x D1 30	U-shaped	Flint prehistoric
110	Land drain	1133	W0 48 x D0 21	U-shaped	
111	Land drain	1134	-	-	
112	Land drain	1135	-	-	
115	Pit	1140, 1160	Diameter 0 64 x D0 37	U-shaped	Flint, Grooved Ware (x7) Late Neolithic
116	Pit	1141	Diameter 0 32 x D0 12	U-shaped	Flint, Grooved Ware Late Neolithic
117	Pit	1142	Diameter 0 92 x D0 37	U-shaped	Flint, Grimston Ware Neolithic
118	Pit	1143	L0 61 X W0 46 X D0 28	U-shaped	Flint, Grooved Ware Late Neolithic
119/165	Land drain	1144	-	-	
121	Land drain	1146	-	-	
122	Sink hole	1127	L2 74 x W1 40 x D 20	U-shaped	
123	Pit	1147, 1161	L1 40 x W1 00 x D0 30	U-shaped	
125	Scoop	1149	L1 16 x W0 50 x D0 09	-	
129	Pit	1139	L3 00 x W0 80 x D0 24	U-shaped	
130	Scoop	1162	Diameter 0 50 x D0 08	-	
131	Pit	1163	L0 70 x W0 53 x D0 19	U-shaped	Flint, Grooved Ware Late Neolithic
132	Pit	1164	Diameter 0 40 x D0 14	U-shaped	Flint prehistoric
133	Pit	1165	Diameter 0 40 x D0 13	U-shaped	
134	Pit	1166	Diameter 0 40 x D0 20	U-shaped	Flint scraper, Prehistoric ceramic Late Neolithic tradition
135	Scoop	1186	L 2 00 x W1 20	-	
136	Pit	1180	Diameter 0 56 x D0 29	U-shaped	Peterborough Ware Late Neolithic
137	Pit	1192	L1 40 x W1 13 xD0 13	U-shaped	
138	Pit	1197	L1 06 x W0 77 x D	-	
139	Pit	1194	L2 00 x W1 14 x D0 39	U-shaped	Grooved Ware Late Neolithic
140	Pit	1196	Diameter 1 00 x D0 27	U-shaped	Flint scraper, Grooved Ware Late Neolithic
141	Pit	1193	Diameter 0 80 x D0 30	U-shaped	Flint, stone axe, Peterborough Ware late Neolithic
142	Pit	1195	L1 05 x W0 66 x D0 20	U-shaped	Flint scraper, Grooved Ware (x8) Late Neolithic
143	Scoop	1179	L0 50 x W0 40 x D0 08	-	Flint, Grimston Ware Neolithic
144	Pit	1178	Diameter 0 60 x D0 17	U-shaped	

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
145	Pit	1177	L0 75 x W0 59 x D0 20	U-shaped	
146	Pit	1198	Diameter 0 68 x D0 18	U-shaped	
147	Pit	1199	Diameter 0 78 x D0 25	U-shaped	
148	Pit	1206, 1216	Diameter 0 90 x D0 80	U-shaped	Flint prehistoric
149	Pit	1205	Diameter 0 84 x D0 41	U-shaped	
150	Pit	1209	Diameter 0 67 x D0 21	U-shaped	
151	Pit	1212	L4 40 x W3 12 x D0 41	U-shaped	
152	Pit	1207	Diameter 1 64 x D0 46	U-shaped	Flint prehistoric
153	Pit	1202	Diameter 0 47 x D0 21	U-shaped	Late Neolithic pottery
154	Pit	1203	Diameter 0 44 x D0 12	U-shaped	Grooved Ware Late Neolithic
155	Pit	1204	Diameter 0 40 x D0 14	U-shaped	Flint, Grooved Ware Late Neolithic
156	Pit	1210	Diameter 0 60 x D0 38	U-shaped	
157	Pit	1200	Diameter 0 38 x D0 15	U-shaped	
158	Pit	1217	Diameter 0 92 x D0 24	U-shaped	Flint, Peterborough Ware Late Neolithic
159	Pit	1176	Diameter 0 72 x D0 28	U-shaped	Flint, Late Neolithic pottery
160	Pit	1170	L1 12 x W0 83 x D0 47	U-shaped	Flint Prehistoric
161	Pit	1218	Diameter 1 06 x D0 57	U-shaped	Flint Prehistoric
162	Sink hole	1171, 1219, 1220	Diameter 10 00	U-shaped	Flint Prehistoric
163	Field drain	1187	-	-	
164	Field drain	1188	-	-	
165	Field drain	1189	-	-	

PART 5 INVESTIGATION 11

(INTERVENTION 4)

Feature	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating
1		Sink hole	1000 1001 1007	L3 30 x W2 70 x (D1 00)	(U-shaped)	
2	11	Pit	1002	L2 60 x W1 80 x D0 37	U-shaped	(Roman brick)
3	11	Pit	1003	L1 94 x W1 42 x D0 22	U-shaped	
4	11	Pit	1006	L2 76 x W1 46 x D0 26	U-shaped	
5	11	Pit	1008	L2 30 x W1 43 x D0 28	U-shaped	
6		Pit	1009	Diameter2 20	n/a	
7	11	Pit	1010	L2 60 x W2 00 x D0 52	U-shaped	
8	11	Pit	1011	L2 47 x W1 40 x D0 30	U-shaped	(Torksey ware)
9		Sink hole	1012	(D2 00)	n/a	
10		Sink hole	1013 1014 1015 1016	Diameter2 70 x (D1 40)	U-shaped	
11	11	Pit	1017	L2 00 x W1 00 x D0 15	U-shaped	
12		Pit	1018	Diameter1 28 x D0 50	U-shaped	
13		Sink hole	1019 1020 1021 1022	Diameter3 74 x D1 40	U-shaped	
14	11	Pit	1023	L2 30 x W1 30 x D0 22	U-shaped	
15	11	Pit	1024	dia 1 47 x D0 20	U-shaped	

PART 6 INVESTIGATION 13 TO 16

Intervention	Feature No	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
NE	1		Pit	1002	L0 90 x W0 60 x D0 30	U-shaped	
NE	2		Pit	1003	L1 00 x W0 80 x D0 30	U-shaped	Bronze Age (flint)
NE	3		Pit	1004	dia 1 00 x D0 36	U-shaped	
NE	4		Pit	1005	L0 60 x W0 50 x D0 30	U-shaped	
NE	5		Pit	1006	dia 0 50 x D0 16	U-shaped	
NE	6	10	Pit	1007	L2 06 x W0 74 x D0 40	U-shaped	
NE	7	10	Pit	1008 1016	L1 76 x W0 76 x D0 52	U-shaped	
NE	8	10	Pit	1009 1017	L2 12 x W0 86 x D0 56	U-shaped	
NE	9	10	Pit	1010	L4 10 x W0 94 x D0 31	U-shaped	
NE	10	10	Pit	1011	L2 36 x W1 40 x D0 25	U-shaped	
NE	11	10	Pit	1012 1018	L2 64 x W1 52 x D0 46	U-shaped	
NE	12	10	Pit	1013 1019	L2 84 x 1 56 x D0 52	U-shaped	
NE	13	10	Pit	1014 1020	L2 26 x W1 18 x 0 44	U-shaped	
NE	14	10	Pit	1015 1021	L2 90 x W1 32 x D0 72	U-shaped	
NE	15	10	Ditch	1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1039 1040 1041 1042	L115 60 x W3 50 x D0 90	U-shaped	Neolithic (fabricator)
NE	16	10	Pit	1036 1037	L1 90 x W1 80 x 0 42	U-shaped	Grooved ware Late Neolithic
NE	17	10	Pit	1043	L1 61 x W0 64 x D0 48	U-shaped	
NE	18	10	Pit	1044	L1 34 x W0 34 x D0 05	U-shaped	
NE	19		Pit	1045	L1 45 x W0 70 x D0 20	U-shaped	
NE	20		Ditch	1046	L24 00 x W2 00 x D0 35	U-shaped	
NE	21		Pit	1047	L1 67 x W 0 64 x D0 11	U-shaped	
NE	22		Pit	1048	L2 45 x W0 70 x D0 17	U-shaped	
NE	23		Ditch	1049 1050	L12 05 x W0 50 x D0 25	U-shaped	
NE	24		Pit	1051	dia 0 70 x D0 48	U-shaped	Modern glass
NE	25		Pit	1052	L1 64 x W0 70 x D0 14	U-shaped	
NE	26		Pit	1053	L1 60 x W0 80 x D0 17	U-shaped	
NE	27		Pit	1054	L1 16 x W0 54 x D0 15	U-shaped	
NW	28		Pit	1055	L1 57 x W1 04 x D0 30	U-shaped	
NW	29		Furrow	1056	L75 00 x W2 25 x D0 13	U-shaped	
NW	30		Scoop	1057	L1 50 x W1 10 x D0 02	U-shaped	
NW	31		Pit	1058 1061	dia 0 75 x D0 15	U-shaped	
NW	32		Pit	1059 1060	L1 40 x W0 95 x D0 20	U-shaped	
NW	33		Pit	1062	L1 62 x W1 56 x D0 22	U-shaped	
NW	34		Scoop	1034	L1 38 x W1 04 x 0 03	U-shaped	
NW	35		Scoop	1065	dia 0 85 x D0 08	U-shaped	
NW	36		Pit	1063 1066	L1 06 x W1 00 x D0 15	U-shaped	
NW	37		Pit	1067	L0 60 x W0 50 x D0 20	U-shaped	
NW	38		Pit	1068	dia 0 90 x D0 16	U-shaped	
NW	39		Pit	1069	dia 0 50 x D0 2	U-shaped	
NW	40		Pit	1070	L1 48 x W1 04 x D0 18	U-shaped	

Intervention	Feature No	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
NW	41		Pit	1071	L1 18 x W1 00 x D0 19	U-shaped	
NW	42		Ditch	1072	L174 00 x W1 20 x D0 25	U-shaped	
NW	43		Ditch	1073	L40 75 x W1 20 x D0 30	U-shaped	
NW	44		Ditch	1074 1077 1095 1096	L296 00 x W2 20 x D0 50	U-shaped	Medieval ceramic
NW	45		Pit	1075 1076	L1 64 x W1 52 x D0 26	U-shaped	
NW	46		Scoop	1079	L1 48 x W1 06 x D0 08	U-shaped	
NW	47		Pit	1080 1081 1082	L1 65 x W1 14 x D0 25	U-shaped	
NW	48		Pit	1083	L2 4 x W1 15 x D0 20	U-shaped	
NW	49		Pit	1084	dia 1 76 x D0 20	U-shaped	Eboracum ware early Roman
NW	50		Veg Pit	1085	dia 1 10 x D0 2	U-shaped	
NW	51		Veg Scoop	1086	L1 54 x W1 40 D0 05	U-shaped	
NW	52		Scoop	1087	L0 70 x W0 50 x D0 06	U-shaped	
NW	53		Veg Pit	1088	L1 90 x W1 38 x D0 44	U-shaped	
NW	54		Ditch	1086	L174 00 x W1 20 x D0 25	U-shaped	
NW	55		Pit	1090 1091	L1 50 x W1 10 x D0 13	U-shaped	
NW	56		Veg Pit	1092	L3 20 x W1 70 x D0 35	U-shaped	
NW	57		Veg Pit	1093	L1 90 x W1 44 x D0 45	Irregular	
NW	58		Pit	1094	L1 38 x W1 14 x D0 14	U-shaped	
SW	59		Pit	1097	L1 50 x W0 70 x D0 40	U-shaped	
SW	60		Scoop	1098 1099	L1 00 x W0 74 x D0 06	U-shaped	
SW	61		Pit	1100	L1 26 x W1 04 x D0 32	U-shaped	
SW	62		Pit	1101	L0 88 x W0 72 x D0 26	U-shaped	
SW	63		Pit	1102	L1 60 x W0 80 x D0 15	Stepped	
SW	64		Pit	1103	L1 00 x W0 55 x D0 22	V-shaped	
SW	65		Pit	1104 1105	L1 50 x W 05 x D0 16	U-shaped	
SW	66	4	Pit	1106 1107 1590	L1 9 x W1 7 x D0 92	U-shaped	
SW	67	4	Pit	1108 1109 1591 1592 1593 1594 1595 1596	dia 1 8 x D1 26	U-shaped	
SW	68	5	Pit	1110 1111 1455 1456 1457 1587	L1 85 x W1 78 x D1 4	Stepped	
SW	69		Pit	1112	L1 80 x W1 30 x D0 55	U-shaped	
SW	70	4	Pit	1113 1445 1446 1447 1462 1463	L1 76 x W1 68 x D1 10	U-shaped	
SW	71		Land Drain	1114	L153 00 x W0 60 x D0 16	U-shaped	
SW	72		Land Drain	1115 1116	L153 00 x W0 7 x D0 15	U-shaped	
SW	73		Pit	1117 1118	dia 1 20x D0 28	U-shaped	
SW	74		Well	1119 1120	dia 0 70		
SW	75		Veg Pits	1167	Variable	Variable	
SW	76		Scoop	1121	dia 0 60 x D0 08	U-shaped	
SW	77	2	Pit	1122 1169	L2 54 x W1 40 x 0 40	U-shaped	(Roman amphorae, Samian, mortaria, oxidised ware)
SW	78		Scoop	1123	dia 0 60 x D0 10	U-shaped	
SW	79		Pit	1124	L1 06 x W0 46 xD0 20	U-shaped	
SW	80		Posthole	1125	dia 0 40 x D0 20	U-shaped	
SW	81		Ditch	1126	L23 00 x W0 60 x D0 25	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	82		Ditch	1239 1240 1241 1242 1243 1244	L327 00 x W2 10 x 1 10	V-shaped	(early Roman mortaria, oxidised ware) Undiagnostic prehistoric?
SW	83		Ditch	1129	L99 00 x W0 60 x D0 25	U-shaped	
SW	84		Veg Scoop	1127	L0 95 x W0 60 x D0 10	U-shaped	
SW	85		Pit	1128	L0 90 x W0 55 x D0 15	U-shaped	(Roman amphora, samian)
SW	86		Posthole	1130	L0 60 x W0 60 x D0 20	Stepped	
SW	87		Posthole	1131	L0 60 x W0 50 x D0 25	Stepped	
SW	88		Pit	1132	L1 40 x W0 50 x D0 25	U-shaped	
SW	89		Pit	1133	L4 02 x W1 48 x D0 55	U-shaped	(Roman amphora, samian, Eboraeum ware)
SW	90	7	Pit	1134	L0 32 x W0 28 x D0 08	U-shaped	mid to Late Bronze Age?
SW	91	7	Pit	1135	dia 0 30 x D0 22	U-shaped	mid to Late Bronze Age
SW	92	7	Pit	1136 1142	dia 0 35 x D0 13	U-shaped	mid to Late Bronze Age
SW	93	7	Pit	1137	L0 50 x W0 42 x D0 11	U-shaped	mid to Late Bronze Age
SW	94	2	Pit	1138 1161	L2 75 x W1 30 x D0 45	U-shaped	(early Roman grey ware)
SW	95	2	Pit	1139 1159	L2 58 x W1 35 x D0 53	U-shaped	(Roman black burnished ware)
SW	96	7	Pit	1140	dia 0 25 x D0 15	U-shaped	mid to Late Bronze Age
SW	97	6	Pit	1141 1152 1153 1154 1155 1262 1267 1279	L2 90 x W1 80 x D0 65	U-shaped	Roman
SW	98	7	Scoop	1143	L0 35 x W0 25 x D0 05	U-shaped	mid to Late Bronze Age?
SW	99	7	Scoop	1144	L0 40 x W0 25 x D0 10	U-shaped	mid to Late Bronze Age?
SW	100	7	Scoop	1145	L0 40 x W0 25 x D0 05	U-shaped	mid to Late Bronze Age?
SW	101	6	Pit	1146 1380	L1 08 x W1 00 x D0 48	U-shaped	Roman
SW	102	6	Flue	1147 1263 1273	L0 72 x W0 45 x D0 40	-	Roman (medieval pottery)
SW	103	2	Pit	1148 1149 1158	L2 41 x W1 30 x D0 49	U-shaped	(Neolithic and Roman pottery)
SW	104		Veg Scoop	1150 1151	L1 20 x W1 10 x D0 08	U-shaped	
SW	105	7	Scoop	1156	L0 35 x W0 28 x D0 02	U-shaped	mid to Late Bronze Age?
SW	106	7	Pit	1157 1165	dia 0 45 x D0 32	U-shaped	mid to Late Bronze Age
SW	107		Pit	1160	L0 62 x W0 44 x D0 15	U-shaped	
SW	108		Natural Scoop	1166	Variable	Variable	
SW	109	2	Pit	1162	L1 62 x W1 02 x D0 45	U-shaped	
SW	110		Pit	1163	L1 25 x W0 50 x D0 20	Irregular	
SW	111		Pit	1164	L0 80 x W0 60 x D0 10	unseen	
SW	112		natural	1168	L1 40 x W0 9 x D0 15	U-shaped	
SW	113		Veg Pit	1170	L3 20 x W2 30 x D0 15	Variable	
SW	114		natural	1172	not recorded	not recorded	
SW	115		Veg Pit	1173	L1 90 x W1 20 x D0 12	U-shaped	
SW	116		Ditch	1174	L25 00 x W0 20 x D0 10	U-shaped	
SW	117		Ditch	1175	L25 00 x W0 15 x D0 05	V-shaped	
SW	118		Scoop	1176	dia 0 30 x D0 07	U-shaped	
SW	119		Pit	1177 1180	L1 80 x W1 60 x D0 24	U-shaped	
SW	120		Pit	1178 1179	L1 40 x W1 04 x D0 35	U-shaped	
SW	121		Pit	1181 1182	L0 70 x W0 60 x D0 35	U-shaped	
SW	122	2	Pit	1183	L2 06 x W1 28 x D0 32	U-shaped	

Intervention	Feature No	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	123	2	Pit	1184	L2 26 x W1 24 x D0 25	U-shaped	
SW	124	2	Pit	1185	L1 94 x W0 90 x D0 40	U-shaped	
SW	125	2	Pit	1186 1187	L2 05 x W1 05 x D0 37	U-shaped	
SW	126	2	Pit	1188 1189	L2 23 x W1 15 x D0 28	U-shaped	
SW	127	2	Pit	1190 1191	L1 76 x W1 08 x D0 15	U-shaped	
SW	128	2	Pit	1192	L2 22 x W1 3 0x D0 22	U-shaped	
SW	129	2	Pit	1193 1194	L2 20 x W1 18 x D0 45	U-shaped	Neolithic Grooved ware
SW	130	2	Pit	1195 1196	L2 53 x W1 10 x D0 43	U-shaped	
SW	131	2	Pit	1197 1198	L2 52 x W1 28 x D0 40	U-shaped	
SW	132		Ditch	1199 1233 1236 1237 1238 1251 1252 1253 1254 1497 1498 1499 1500 1471 1472 1473 1474 1475 1476	L325 00 x W3 6 x D1 40	V-shaped	Late Iron Age/Roman pottery
SW	133		Ditch	1245	L109 00 x W1 3 x D0 20	U-shaped	Medieval pottery
SW	134	2	Pit	1200 1201	L2 04 x W0 98 x D0 36	U-shaped	
SW	135	2	Pit	1202 1207	L2 60 x W1 20 x D0 48	U-shaped	Late Neolithic plain ware
SW	136	2	Pit	1203 1204	L2 10 x W1 24 x D0 60	U-shaped	
SW	137	2	Pit	1205 1206	L2 52 x W1 16 x D0 58	U-shaped	
SW	138	2	Pit	1208 1209 1210	L2 30 x W1 12 x D0 50	U-shaped	
SW	139	2	Pit	1211 1212 1213	L2 65 x W1 00 x D0 48	U-shaped	
SW	140	2	Pit	1214 1215	L2 58 x W1 26 x D0 42	U-shaped	
SW	141	2	Pit	1217 1218	L2 52 x W1 06 x D0 56	U-shaped	
SW	142	2	Pit	1219 1220	L2 18 x W1 36 x D0 48	U-shaped	
SW	143	2	Pit	1221 1222 1223	L2 70 x W1 54 x D0 58	U-shaped	
SW	144	2	Pit	1224 1225	L2 93 x W1 38 x D0 58	U-shaped	
SW	145	2	Pit	1226 1227	L2 82 x W1 12 x D0 38	U-shaped	
SW	146		Ring-ditch	1228 1230 1231 1232	L11 00 x W0 40 x D0 15	U-shaped	
SW	147		Pit	1229	L1 66 x W0 90 x D0 30	U-shaped	
SW	148		Ring-ditch	1234 1235	L22 98 x W0 60 x D0 30	U-shaped	
SW	149		Ditch	1246	L44 40 x W0 70 x 0 25	U-shaped	
SW	150		Ditch	1341 1342 1343 1345 1384	L260 00 x W3 34 x 1 40	V-shaped	(post-medieval pottery - upper fill)
SW	151		Spread	-	dia 3 00 x D0 05		
SW	152		Not Used				
SW	153		same as F150				
SW	154	2	Pit	1247 1248 1249	L2 00 x W1 25 x D0 54	U-shaped	
SW	155	2	Pit	1250	L2 42 x W1 08 x D0 38	U-shaped	
SW	156	2	Pit	1255 1256 1257	L2 98 x W1 14 x D0 58	U-shaped	
SW	157	2	Pit	1264 1265 1266	L2 32 x W1 16 x D0 64	U-shaped	
SW	158	2	Pit	1259 1260 1261	L2 56 x W1 28 x D0 54	U-shaped	
SW	159	6	Wall	1258	L0 80 x W0 24 x D0 50		
SW	160	2	Pit	1268 1269	L2 62 x W1 12 x D0 46	U-shaped	
SW	161	2	Pit	1270 1271 1272	L2 61 x W1 38 x D0 58	U-shaped	
SW	162	6	Setting	1275	L0 22 x W0 15		

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	163	6	Setting	1276	L0 34 x W0 18		
SW	164		Pit	1277 1278	L2 05 x W1 75 x D0 40	U-shaped	(Mesolithic microlith)
SW	165	2	Pit	1280 1281 1282	L2 40 x W1 42 x D0 42	U-shaped	
SW	166	2	Pit	1284 1285 1286	L1 40 x W1 02 x D0 54	U-shaped	
SW	167	2	Pit	1291 1292	L2 05 x W1 16 x D0 52	U-shaped	
SW	168	2	Pit	1293 1294	L2 02 x W0 70 x D0 45	U-shaped	
SW	169	2	Pit	1288 1289 1290	L2 21 x W1 05 x D0 61	U-shaped	
SW	170	2	Pit	1301 1302 1303 1304	L2 72 x W1 40 x D0 70	U-shaped	
SW	171	2	Pit	1295 1296 1294	L2 26 x W1 24 x D0 84	U-shaped	
SW	172	2	Pit	1298 1299 1300	L2 40 x W1 30 x D0 34	U-shaped	(early Roman amphora)
SW	173	2	Pit	1305 1306 1307	L2 42 x W1 06 x D0 58	U-shaped	
SW	174		Ditch	1308 1309	L4 00+ x W0 50 x D0 40	U-shaped	(Roman black burnished ware)
SW	175	2	Pit	1310 1311 1312	L2 25 x W1 43 x D0 65	U-shaped	
SW	176	2	Pit	1313 1314 1315	L2 36 x W1 20 x D0 62	U-shaped	
SW	177	2	Pit	1316 1317 1318	L2 40 x W1 41 x D0 70	U-shaped	
SW	178	2	Pit	1319 1320 1321	L2 20 x W1 08 x D0 76	U-shaped	
SW	179	2	Pit	1322 1323 1324	L2 34 x W1 30 x D0 32	U-shaped	
SW	180		Pit	1325	L1 20 x W0 86 x D0 20	U-shaped	
SW	181		Pit	1326	L1 20 x W 0 82 x D0 15	U-shaped	
SW	182		Furrow	1328	L? x W0 45 x 0 02	U-shaped	
SW	183		Furrow	1329	L? x W0 40 x 0 04	U-shaped	
SW	184		Veg pit	1330	L1 60 x W1 00 x D0 15	U-shaped	
SW	185	2	Pit	1331 1332 1333	L2 66 x W1 24 x D0 66	U-shaped	
SW	186	2	Pit	1334 1335 1336 1337	L2 54 x W1 32 x D0 62	U-shaped	
SW	187		Scoop	1327	L1 00 x W1 00 x D0 05	Stepped	
SW	188		Furrow	1346	L178 00 x W1 35 x D0 22	U-shaped	
SW	189	2	Pit	1338 1339 1340	L2 64 x W1 50 x D0 68	U-shaped	
SW	190	2	Pit	1375 1376 1237	L2 90 x W1 50 x D0 86	U-shaped	
SW	191	2	Pit	1347 1378	L2 54 x W1 26 x D0 51	U-shaped	
SW	192	2	Pit	1349 1350 1351	L2 54 x W1 40 x D0 60	U-shaped	(early Roman mortaria)
SW	193	2	Pit	1352 1353	L2 72 x W1 72 x D0 75	U-shaped	
SW	194	2	Pit	1354 1355	L2 50 x W1 34 x D0 60	U-shaped	
SW	195	2	Pit	1356 1357 1358	L2 56 x W1 60 x D0 62	U-shaped	
SW	196	2	Pit	1359 1360	L2 82 x W1 42 x D0 56	U-shaped	
SW	197	2	Pit	1361 1362 1363	L2 58 x W1 62 x D0 61	U-shaped	
SW	198	2	Pit	1364 1365	L2 18 x W1 80 x D0 56	U-shaped	(early Roman Eboracum ware)
SW	199	2	Pit	1367 1368	L2 47 x W1 62 x D0 60	U-shaped	(Roman black burnished, grey ware)
SW	200		Pit	1369	L1 60 x W0 82 x D0 20	U-shaped	
SW	201	2	Pit	1370 1371 1372 1373 1374	L2 90 x W1 78 x D0 98	U-shaped	
SW	202	9	Well	1381 1382 1383	dia 1 90		
SW	203	4	Pit	1385 1386 1387 1437 1438 1588 1589	dia 1 88 x D1 50	V-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	204	4	Pit	1388 1389 1390 1400 1402 1597 1598	dia 2 10 x D1 50	V-shaped	
SW	205	2	Pit	1391 1392	L2 72 x W1 58 x D0 81	U-shaped	(Late Iron Age/Roman grey ware)
SW	206	2	Pit	1399 1403 1404 1405 1406 1407 1408 1409 1410 1411	L2 50 x W1 50 x D1 00	U-shaped	(Roman black burnished, grey ware)
SW	207	2	Pit	1412 1413 1414 1415 1416 1417 1418	L3 25 x W1 68 x D0 94	U-shaped	
SW	208	4	Pit	1419 1420 1421 1422 1423 1424 1439	L2 20 x W1 85 x D1 58	U-shaped	
SW	209	4	Pit	1425 1426 1427 1428 1429 1599	L1 80 x W1 65 x D1 30	U-shaped	
SW	210	4	Pit	1430 1431 1432 1433 1434 1435 1601 1602 1603 1604 1605	L3 00 x W2 70 x D1 70	U-shaped	
SW	211	4	Pit	1440 1441 1442 1443 1460 1600	L3 02 x W1 64 x D1 58	U-shaped	
SW	212	5	Pit	1448 1449 1458 1459	dia 1 45 x D1 08	U-shaped	
SW	213	5	Pit	1450 1451 1452 1453 1454 1461	dia 1 90 x D2 40	Stepped	
SW	214	5	Pit	1464 1465 1466 1467 1468 1469	L1 95 x W1 84 x D1 25	U-shaped	
SW	215	5	Pit	1477 1478 1479 1480 1481	L2 25 x W2 10 x D1 80	U-shaped	
SW	216	5	Pit	1482 1483 1484 1485 1486	L2 60 x W2 40 x D1 20+	U-shaped	
SW	217	1	Pit	1488 1489 1490 1491 1496	L2 26 x W1 12 x D0 75	V-shaped	
SW	218	1	Pit	1492 1493 1494 1495	L2 65 x W1 42 x D0 90	V-shaped	
SW	219	5	Pit	1487 1501 1502 1503 1504	dia 2 40 x D1 76	U-shaped	
SW	220	8	Solution Hole	1506 1508 1515 1516 1517	L4 32 x W4 10 x D1 10	Stepped	
SW	221		Pit	1509	L0 50 x W0 45 x D0 17	U-shaped	
SW	222		Pit	1510 1511	L1 44 x W1 40 x D0 28	U-shaped	
SW	223		Veg Pits	1512	dia 1 2 x D0 30	U-shaped	
SW	224		Solution Hole	1514 1527 1535 1536 1537	L3 82 x W3 72 x D1 20	Stepped	2 Mesolithic microliths Neolithic leaf arrowhead
SW	225		Pit	1524	L1 00 x W0 55 x D0 10	U-shaped	
SW	226	1	Pit	1518 1519 1520 1521	L2 20 x W1 30 x D0 55	V-shaped	
SW	227	1	Pit	1522 1523	L2 30 x W1 38 x D0 65	V-shaped	
SW	228	1	Pit	1525	L2 38 x W1 45 x D0 72	V-shaped	
SW	229	1	Pit	1528 1529 1530 1531	L2 35 x W1 50 x D0 75	V-shaped	
SW	230	1	Pit	1532 1533 1534	L2 72 x W1 42 x D0 81	V-shaped	
SW	231	1	Pit	1538 1539 1540	L2 45 x W1 10 x D0 60	Stepped	
SW	232	1	Pit	1541	L2 48 x W1 02 x D0 58	Stepped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	233	1	Pit	1542 1543 1544	L2 28 x W1 10 x D0 70	Stepped	
SW	234	8	Solution Hole	1545 1546 1547	dia 3 60 x D1 16	Stepped	
SW	235	1	Pit	1548 1549	L2 33 x W0 96 x D0 65	U-shaped	
SW	236	1	Pit	1550 1551	L2 06 x W0 84 x D0 52	U-shaped	
SW	237	1	Pit	1552 1553	L2 35 x W1 00 x D0 60	U-shaped	
SW	238	1	Pit	1554 1555 1556	L2 42 x W1 00 x D0 72	U-shaped	(early Roman samian)
SW	239	1	Pit	1557 1558 1559	L2 70 x W1 20 x D0 65	U-shaped	(Mesolithic microliths)
SW	240	1	Pit	1560 1561	L2 24 x W1 00 x D0 66	U-shaped	
SW	241	1	Pit	1562 1563 1564	L2 62 x W1 14 x D0 72	U-shaped	
SW	242	1	Pit	1565 1566	L2 26 x W0 84 x D0 64	U-shaped	(Mesolithic microlith)
SW	243	1	Pit	1567 1568 1569 1570	L2 90 x W1 40 x D0 95	U-shaped	
SW	244	1	Pit	1576 1577 1578 1579	L2 60 x W1 42 x D1 01	U-shaped	
SW	245	1	Pit	1580 1581 1582 1583 1584	L2 56 x W1 44 x D1 08	Irregular	
SW	246	1	Pit	1606 1607 1608	L2 12 x W0 88 x D0 56	U-shaped	
SW	247	1	Pit	1609 1610	L2 36 x W0 78 x D0 48	U-shaped	
SW	248	1	Pit	1611	L1 76 x W0 40 x D0 18	U-shaped	
SW	249	1	Pit	1612	L2 12 x W0 82 x D0 38	U-shaped	
SW	250	1	Pit	1613 1614	L2 28 x W0 76 x D0 52	U-shaped	
SW	251	1	Pit	1615 1624	L2 20 x W0 92 x D0 52	U-shaped	
SW	252	1	Pit	1616	L1 90 x W0 68 x D0 42	U-shaped	
SW	253	1	Burial	1617	L0 60 x W0 50		Iron Age (c14)
SW	254	8	Solution Hole	1618	dia 4 08	Not excavated	
SW	255	8	Solution Hole	1619	dia 3 36	Not excavated	
SW	256	1	Pit	1620	L1 86 x W0 65 x D0 38	V-shaped	
SW	257	1	Pit	1621 1622	L3 60 x W0 68 x D0 42	V-shaped	
SW	258	1	Pit	1623	L3 60 x W1 00 x D0 60	U-shaped	
SW	259	1	Pit	1625 1626 1627 1628	L2 44 x W1 40 x D0 98	V-shaped	
SW	260	1	Pit	1629 1630 1631	L2 60 x W1 30 x D0 60	V-shaped	
SW	261	1	Pit	1632 1633 1634	L2 46 x W1 20 x D0 70	V-shaped	
SW	262	1	Pit	1635 1636	L5 10 x W1 20 x D0 60	V-shaped	
SW	263	1	Pit	1637 1638	L2 10 x W1 30 x D0 86	Stepped	
SW	264	3	Ring-ditch	1644 1645	dia 17 42 x cir 54 70 x D0 60	U-shaped	Bronze Age?
SW	265	1	Pit	1639 1640	L1 8 x W1 12 x D0 62	U-shaped	
SW	266	1	Pit	1641 1648	L2 00 x W0 77 x D0 47	U-shaped	(late Iron Age/Roman pottery)
SW	267	3?	Pit	1642 1643	L1 06 x W0 83 x D0 12	U-shaped	mid to late Bronze Age
SW	268	-	natural (not a feature)	-	-	-	-
SW	269	3	Pit	1647	L0 37 x W0 30 x D0 20	U-shaped	early to middle Bronze Age
SW	270	3	Scoops	1649	dia 0 4 x D0 16	U-shaped	
SW	271	1	Pit	1650 1651	L2 80 x W1 22 x D0 67	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	272	1	Pit	1652 1653 1654	L2 52 x W1 20 x D0 82	U-shaped	
SW	273	1	Pit	1655 1656	L2 45 x W1 25 x D0 70	U-shaped	
SW	274	1	Pit	1657 1658	L2 48 x W1 08 x D0 62	Stepped	
SW	275	1	Pit	1659 1660	L2 36 x W1 40 x D0 82	U-shaped	
SW	276	9	Well	1659 1660 1661 1663 1665	dia 0 9 x D3 75	U-shaped	Modern
SW	277	9	Well				Modern
SW	278	2	Pit	1666	L1 00 x W0 62 x D0 12	U-shaped	
SW	279	2	Pit	1667	L1 16 x W1 06 x D0 27	U-shaped	
SE	280		Ditch	1668	L9 00 x W0 90 x D0 10	U-shaped	
SE	281		Pit	1669	L0 75 x W0 50 x D0 15	U-shaped	
SE	282		Hedgeline	1670	L15 00 x W1 10 x D0 20	U-shaped	Medieval pottery
SE	283		Pit (sheep burial)	1671	L2 00 x W0 92 x D0 30	U-shaped	
SE	284		Natural scoop	1672	L1 70 x W0 78 x D0 10	U-shaped	
SE	285		Natural pit	1673	L0 60 x W0 50 x D0 13	U-shaped	
SE	286		Natural scoop	1674	L1 00 x W0 66 x D0 07	U-shaped	
SE	287		Pit	1675	L0 83 x W0 63 x D0 60	U-shaped	
SE	288		Ditch	1678	L8 00 x W1 26 x D0 20	U-shaped	
SE	289		Natural scoop	1677	L1 60 x W0 60 x D0 04	Irregular	
SE	290		Natural scoop	1698	L1 18 x W1 14 x D0 05	U-shaped	
SE	291		Natural scoop	1679	L0 92 x W0 66 x D0 10	U-shaped	
SE	292		Natural pit	1680	dia 0 65 x D0 13	U-shaped	
SE	293		Furrow	1681	L48 70 x W1 40 x 0 05	U-shaped	
SE	294		Natural pit	1682 1683	L6 59 x W3 35 x D0 28	U-shaped	
SE	295		Pit	1684 1685	L0 92 x W0 75 x D0 11	U-shaped	
SE	296		Natural scoop	1686	L1 01 x W0 54 x D0 10	U-shaped	
SE	297		Scoop	1688	L0 80 x W0 75 x D0 07	U-shaped	
SE	298		Scoop	1689	dia 0 40 x D0 03	U-shaped	
SE	299		Veg Pit	1690	L5 56 x W3 36 x D0 40	U-shaped	
SE	300		Furrow	1691	L38 70 x W1 60 x D0 10	U-shaped	Medieval pottery
SE	301		Veg Pit	1692	L15 40 x W2 11 x D0 25	Irregular	
SE	302		Veg Pit	1693	L13 60 x W3 55 x D0 12	U-shaped	
SE	303		Furrow	1694	L48 70 x W1 40 x 0 05	U-shaped	Medieval pottery
SE	304		Rectilinear Ditch	1718 1719 1720 1721	L10 25 x W10 10 x D0 75	Stepped	
SE	305		Pit	1696	L1 20 x W1 12 x 0 11	U-shaped	
SE	306		Ditch	1697 1698 1699 1700 1701 1702 1703 1706 1707 1708 1709 1710 1711 1714 1715 1716 1717	L44 00 x W3 30 x D1 30	V-shaped	(early Roman, Roman mortaria, white ware, Eboracum ware)
SE	307		Rectilinear Ditch	1722 1723	L10 20 x W10 10 x D0 20	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SE	308		Furrow	1712	L24 47 x W1 50 x 0 10	U-shaped	
SE	309		Veg Pit	1713	L5 30 x W2 90 x D0 25	U-shaped	
SE	310		Veg Pit	1724	L5 05 x W2 50 x D0 25	U-shaped	
SE	311		Hedgeline	1725	L104 20 x W1 20 x D0 22	U-shaped	Medieval/post medieval?
SE	312		Veg Pit	1726	L1 27 x W0 66 x D0 15	U-shaped	
SE	313		Veg Scoop	1727	dia 1 00 x D0 09	U-shaped	
SE	314		Veg Pit	1728	L6 11 x W1 65 x D0 15	U-shaped	
SE	315		Veg Pit	1729	L3 38 x W1 14 x D0 22	U-shaped	
SE	316		Pit (horse burial)	1730 1731 1732 1733	L2 93 x W2 65 x D0 61	U-shaped	late Iron Age (C14)
SE	317		Veg Pit	1734 1735	L16 95 x W7 10 x D0 50	Stepped	
SE	318		Veg Pit	1736	L2 25 x W0 70 x D0 14	Irregular	
SE	319		Furrow	1737	L86 40 x W1 10 x D0 08	U-shaped	
SE	320		Rectilinear Ditch	1757 1758	L7 48 x W6 47 x D0 42	U-shaped	
SE	321		Furrow	1739	L75 60 x W1 25 x 0 10	U-shaped	
SE	322		Pit	1740	L0 88 x W0 85 x D0 22	U-shaped	
SE	323		Hedgeline	1741	L4 00 x W0 87 x D0 25	U-shaped	
SE	324		Veg Pit	1742	L1 16 x W0 56 x D0 13	U-shaped	
SE	325		Veg Pit	1743	L2 22 x W0 56 x D0 13	U-shaped	
SE	326		Veg Pit	1744	L1 40 x W1 00 x D0 21	U-shaped	
SE	327		Veg Pit	1745	L1 31 x W0 96 x D0 18	U-shaped	
SE	328		Veg Pit	1746	L1 40 x W0 52 x D0 16	U-shaped	
SE	329		Furrow	1747	L69 50 x W0 85 x D0 15	U-shaped	
SE	330		Veg Pit	1748	L2 68 x W2 10 x D0 15	U-shaped	
SE	331		Veg Pit	1749	L2 71 x W1 06 x D0 20	U-shaped	
SE	332		Veg Pit	1750	L1 87 x W1 07 x D0 15	U-shaped	
SE	333		Veg Pit	1751	dia 0 60 x D0 30	U-shaped	
SE	334		Veg Pit	1752	L2 26 x W0 90 x D0 18	Irregular	
SE	335		Pit (burial)	1753 1754	L1 90 x W0 60 x D0 40	U-shaped	Iron Age (C14)
SE	336		Ditch	1755 1759	L26 48 x W1 10 x D0 30	U-shaped	Grimston? Neolithic
SE	337		Rectilinear Ditch	1756	L7 48 x W6 45 x D0 40	U-shaped	
SE	338		Veg Pit	1760	L1 42 x W0 72 x D0 25	U-shaped	
SE	339		Veg Scoop	1761	L1 00 x W0 52 x D0 07	U-shaped	
SE	340		Veg Pit	1762	L2 07 x W0 92 x D0 52	U-shaped	
SE	341		Furrow	1763	L61 00 x W0 80 x D0 15	U-shaped	
SE	342		Ditch	1764	L30 00 x W1 10 x D0 22	U-shaped	Medieval pottery
SE	343		Veg Pit	1765	L1 36 x W0 76 x D0 36	U-shaped	
SE	344		Veg Pit	1766	L1 51 x W0 91 x D0 15	U-shaped	
SE	345		Veg pit	1767	dia 1 05 x D0 14	U-shaped	
SE	346		Veg Pit	1768	L1 63 x W0 64 x 0 25	Irregular	
SE	347		Test Pit	1769	L1 00 x W1 00 x D0 22		
SE	348		Test Pit	1770	L1 00 x W1 00 x D0 27		
SE	349		Test Pit	1771	L1 00 x W1 00 x D0 25		
SE	350		Test Pit	1772	L1 00 x W1 00 x D0 34		
SE	351		Test Pit	1773	L1 00 x W1 00 x D0 56		

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SE	352		Test Pit	1774	L1 00 x W1 00 x D0 24		
SE	353		Test Pit	1775	L1 00 x W1 00 x D0 34		
SE	354		Test Pit	1776	L1 00 x W1 00 x D0 44		
SE	355		Test Pit	1777	L1 00 x W1 00 x D0 38		
SE	356		Test Pit	1778	L1 00 x W1 00 x D0 30		
SE	357		Test Pit	1779	L1 00 x W1 00 x D0 27		
SE	358		Test Pit	1780	L1 00 x W1 00 x D0 34		
SE	359		Test Pit	1781	L1 00 x W1 00 x D0 27		
SE	360		Test Pit	1782	L1 00 x W1 00 x D0 33		
SE	361		Test Pit	1783	L1 00 x W1 00 x D0 25		
SE	362		Test Pit	1784	L1 00 x W1 00 x D0 32		
SE	363		Test Pit	1785	L1 00 x W1 00 x D0 64		
SE	364		Test Pit	1786	L1 00 x W1 00 x D0 31		
SE	365		Test Pit	1787	L1 00 x W1 00 x D0 32		
SE	366		Test Pit	1788	L1 00 x W1 00 x D0 25		
SE	367		Test Pit	1789	L1 00 x W1 00 x D0 29		
SE	368		Test Pit	1790	L1 00 x W1 00 x D0 30		
SE	369		Test Pit	1791	L1 00 x W1 00 x D0 28		
SE	370		Test Pit	1792	L1 00 x W1 00 x D0 30		
SE	371		Test Pit	1793	L1 00 x W1 00 x D0 25		
SE	372		Test Pit	1794	L1 00 x W1 00 x D0 28		
SE	373		Test Pit	1795	L1 00 x W1 00 x D0 25		
SE	374		Test Pit	1796	L1 00 x W1 00 x D0 25		
SE	375		Test Pit	1797	L1 00 x W1 00 x D0 30		
SE	376		Test Pit	1798	L1 00 x W1 00 x D0 28		
SE	377		Test Pit	1799	L1 00 x W1 00 x D0 25		
SE	378		Veg Pit	1800 1801	L2 66 x W1 30 x D0 50	U-shaped	
SE	379		Veg Pit	1802 1803	L2 32 x W1 28 x D0 45	U-shaped	
SE	380		Ditch	1S04	L35 00 x W0 80 x D0 13	U-shaped	
SE	381		Ditch	1805	L33 00 x W0 85 x D0 15	U-shaped	
SE	382		Veg Pit	1806	L1 80 x W1 30 x D0 32	Irregular	
SE	383		Ditch	1807	L38 00 x W0 75 x D0 43	Irregular	
SE	384		Land Drain	1808	L64 00 x W0 30 x D0 30	U-shaped	
SE	385		Land Dram	1809 1810	L36 80 x W0 20 x D0 30	U-shaped	
SE	386		Veg Pit	1814	L1 40 x W0 82 x D0 15	U-shaped	
SE	387		Veg Pit	1815	dia 1 20 x D0 20	U-shaped	
SE	388		Furrow	1816	L25 00 x W1 40 x D0 04	U-shaped	
SE	389		Furrow	1817	L41 20 x W1 40 x D0 09	U-shaped	
SE	390		Furrow	1818	L78 80 x W1 8 x D0 12	U-shaped	
SE	391		Furrow	1819	L22 50 x W0 80 x D0 03	U-shaped	
SE	392		Furrow	1820	L10 00 x W0 52 x D0 02	U-shaped	
SE	393		Eurrow	1821	L46 25 x W1 10 x D0 04	U-shaped	
SE	394		Hedgeline	1822	L84 85 x W1 00 x D0 20	U-shaped	
SE	395		Ditch	1824	L232 00 x W1 05 x D0 35	Irreguar	
SE	396		Veg Pit	1824	dia 0 72 x D0 10	Irregular	
SE	397		Veg Pit	1825	L1 60 x W0 72 x D0 15	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SE	398		Veg Pit	1826	L2 00 x W1 20 x D0 25	U-shaped	
SE	399		Veg Pit	1827	L2 70 x W1 10 x D0 30	U-shaped	
SE	400		Veg Pit	1828	L2 30 x W1 10 x D0 20	U-shaped	
SE	401		Veg Pit	1829	L2 50 x W1 30 x D0 25	U-shaped	
SE	402		Veg Pit	1830	L2 50 x W1 40 x D0 25	U-shaped	
SE	403		Veg Pit	1831	L4 10 x W1 80 x D0 20	Irregular	
SE	404		Veg Pit	1832	L4 20 x W0 30 x 0 20	Undercut	
SE	405		Veg Pit	1833	L4 40 x W1 20 x D0 30	U-shaped	
SE	406		Veg Pit	1834	L0 70 x W0 50 x D0 13	U-shaped	
SE	407		Veg Pit	1835	dia 2 80 x D0 30	Irregular	
SE	408		Posthole	1836	dia 0 25 x D0 10	U-shaped	
SE	409		Posthole	1837	L0 70 x W0 55 x D0 20	Irregular	
SE	410		Posthole	1838	L0 45 x W0 40 x D0 20	U-shaped	
SE	411		Furrow	1839	L25 60 x W1 40 x D0 15	U-shaped	
SE	412		Pit	1840 1841	dia 1 20 x D0 32	U-shaped	
SE	413		Test Pit		L2 00 x W1 00 x D0 40		
SE	414		Ditch	1843	W0 4 x D0 3	U-shaped	
SE	415						
SE	416		Hedgeline	1844	W0 4-0 9 x D 0 15	Irregular	
SE	417		Culvert	1845 1846 1849	W0 35 x D0 3	Irregular	
SE	418						
SE	419						
SE	420		Ditch	1850	W1 35 x D0 65	V-shaped	
SE	421		Culvert	1851 1852 1853	W0 9 x D0 6	U-shaped	
SE	422		Ditch	1849	W1 0 x D0 4	Irregular	
SE	423		Gully	1860	L14 x W0 4m x D0 15	U-shaped	
SE	424		Veg pit	1861	L3 2 x W1 3 x D0 4	Irregular	
SE	425		Veg pit	1862	dia 1 3m x D0 15m	Irregular	
SE	426		Well	1863, 1864, 1865	L2 4 x W2 1	Unseen	
SE	427		Pit?	1866	L1 5 x W1 5 x D0 2	U-shaped	

PART 7 INVESTIGATION 17 to 19

Feature No	Investigation No	Identification	Description
1	Investigation 17, 19 (Intervention 7, 8)	Mound	Oval mound (geological), orientated NE-SW
2	Investigation 17, 19 (Intervention 7, 8)	Mound	Irregular mound, orientated N-S
3	Investigation 17, 19 (Intervention 7, 8)	Mound	Irregular mound
4	Investigation 17, 19 (Intervention 7, 8)	Linear earthwork	Linear earthwork, along E edge of intervention
5	Investigation 17, 19 (Intervention 7, 8)	Linear earthwork	Linear earthwork, orientated N-S
6	Investigation 17, 19 (Intervention 7, 8)	Hollow	N-S hollow at S end of intervention

Feature No	Investigation No	Identification	Description
7	Investigation 17, 19 (Intervention 7, 8)	Hollow	Sub-circular hollow
8	Investigation 17, 19 (Intervention 7, 8)	Hollow	Circular hollow
9	Investigation 17, 19 (Intervention 7, 8)	Hollow	Circular hollow

(INTERVENTION 8)

Feature No	Identity	Contexts	Dimensions	Profile	Dating evidence
1	Channel	1001	W3 0 x D0 20	U-shaped	natural?
2	Veg pit?	1003	W1 30 x D0 30	Irregular	
3	(Not used)	-	-	-	-
4	Sondage	1005	L2 00 x W1 00 x D0 50	-	-
5	Sondage	1008	L3 50 x W1 25 x D0 38	-	-
6	Sondage	1010, 1011, 1012	L5 20 x W1 40 x D0 65	-	-

APPENDIX B STRUCTURE INDEX

PART I INVESTIGATIONS 7 and 15

Structure No	Investigation No	Feature Nos	Identification	Description	Dating
1	Investigation 15 (Intervention 5SW)	217, 218, 226, 227, 228, 229, 230, 231, 232, 233, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 256, 257, 258, 259, 260, 261, 262, 263, 265, 266, 271, 272, 273, 274, 275 (253)	Pit alignment (with burial)	43 pits aligned NW-SE Burial (F253) in top of F251	Late Iron Age burial (C14)
2	Investigation 15 (Intervention 5SW)	77, 94, 95, 103, 109, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 134, 135, 136, 137, 138, 140, 141, 142, 143, 144, 145, 154, 155, 156, 157, 158, 160, 161, 165, 167, 168, 169, 170, 171, 172, 173, 175, 176, 177, 178, 179, 185, 186, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 201, 205, 206, 207, ?278, ?279	Pit alignment	65 pits aligned NW-SE	
3	Investigation 15 (Intervention 5SW)	264, 269, 270 (267?)	Ring ditch	uninterrupted circular ditch with an external diameter of 17 20m and internal diameter of 15 60m Urned cremation burial towards centre (F269), inhumation outside ditch (F267)	Early to mid-Bronze age (cremation), Mid- to late Bronze age inhumation (C14)
4	Investigation 15 (Intervention 5SW)	66, 67, 70, 203, 204, 208, 209, 210, 211	Pit alignment	9 pits aligned NNW-SSE	
5	Investigation 15 (Intervention 5SW)	65?, 68, 212, 213, 214, 215, 216, 219	Pit alignment	7 pits aligned NNW-SSE (parallel to S4)	
6	Investigation 15 (Intervention 5SW)	97, 101, 102, 159, 162, 163	Drying oven	Drying oven, comprising stoking pit, oven, flue, oven structure and two postholes	Roman
7	Investigation 15 (Intervention 5SW)	90, 91, 92, 93, 96, 98, 99, 100, 105, 106 (148)	Cremation group	Group of cremations, possibly the remains of a small cemetery, and potentially focussed around ring ditch (F148)	Late Bronze Age (C14)
8	Investigation 15 (Intervention 5SW)	220?, 224, 234, 254, 255	Pit alignment (solution holes?)	5 large pits aligned NNE-SSW (possibly natural)	
9	Investigation 15 (Intervention 5SW)	202, 276, 277	Well	well, with wooden frame	modern (18th to 19th century)
10	Investigation 15 (Intervention 5SW)	6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18	Pit-ditch alignment	Length of pit-ditch alignment running ESE, turning northwards before ending at edge of peat N one found to N of peat	

Structure No	Investigation No	Feature Nos	Identification	Description	Dating
11	Investigation 11 (Intervention 4)	2, 3, 4, 5, 7, 8, 11, 14. 15	Pit alignment	9 pits aligned NNE-SSW North end of pits terminates at break of slope, where ground falls away to former lake To S, pits disappear under Flask lane (possible related to S10)	
12	Investigation 7 (Trench 7)	7002, 7003, 7004, 7005, 7006, 7007, 7008, 7009, 7010, 7011, 7012, 7013, 7014, 7015, 7016, 7017, 7018, 7019, 7020, 7021, 7022, 7023 ,7024, 7025, 7026, 7027, 7028, 7029, 7030, 7031, 7032, 7033, 7034, 7035, 7036, 7050, 7095	Pit alignment	Alignment of pits running NE-SW, north end has slight return in northerly direction, possibly continues S towards North Henge	

S 8242

APPENDIX C LITHIC REPORTS
Peter Rowe

PART 1 NOSTERFIELD 1991-1996 LITHIC REPORT

1.0 INTRODUCTION

The assemblages collected from 4 fieldwork interventions in 1991, 1994, 1995 and 1996, consists of a total of 650 lithic items (Appendix 1) A breakdown of the lithic material by intervention is presented in Table 1

Table 1 Quantities of flint by intervention

Year	Quantity	Notes
1991	6	
1994	2	Natural pebbles from sieving
1995	590	All but 9 examples from excavated contexts
1996	7	1 piece unstratified

The majority of the lithics come from the 1995 season of excavation and are from contexts associated with an early to late Neolithic complex of cut features principally pits Given that the majority of the material is from the 1995 intervention this report will consider the collection as a whole and unless otherwise noted all comments relate to the 1995 collection

2.0 RAW MATERIAL

2 1 COLOUR

The raw material is relatively homogenous in colour and with the exception of 6 red/brown items consists in the main of brown-grey-black pieces often with a range of different shades within one piece The flint becomes opaque on finer flakes and chippings and is of a good quality with few flaws or fossils This homogeneity is particularly apparent from context 1096, the cut of a Neolithic pit Here 340 pieces found in a concentration towards the north end of the pit fit this range of flint colour and may be derived from the same parent source or even nodule

At least one piece from the assemblage demonstrates re-use of a previously knapped source material In this case a scraper demonstrates a highly ground and polished surface (Context 1072, the upper fill of a late Neolithic cut) (Figure 1) This surface could not have been applied to the artifact itself due to the pressure involved which would truncate a thin flake The polish is not unlike that seen on flint axes of the Neolithic period and this doubled with the use of the écaille or split pebble technique to manufacture the flake suggest that a spent flint axe was knapped to produce flakes The ecaille technique is typical of industries using small pebbles as source material (Norman 1977, 4-6) or in this case re-use of a flint axe

2 2 CORTEX

There is an extremely low incidence of any cortex on the items from the site with 516 pieces have no remaining cortex whether exterior or interior The incidence of cortex on an item rarely covers more than 25% of its surface area (12 examples in the range 25-70% surface area cover) These examples consist of larger pieces of debitage and primary/secondary flakes There are 6 examples of chips of pure cortex all of which come from context 1096

Where cortex is present it is generally cream/brown in colour and thin in section There are no examples of soft chalky cortex with the examples present having a solid matrix The cortex present, even on the few larger items, has evidence of previous removal scars so that glacial transportation of the material cannot be ascertained as no original surfaces remain

2 3 NATURAL PEBBLES

There are 6 very small natural pebbles from the collection (less than 20mm square) Two of these pieces are the examples from the 1994 sieving The natural pebbles present are not suitable for knapping due to their size and quality and are present on the site as gravel erratics

2 4 CHERT

There are 4 pieces of chert in the assemblage all of which are deliberately knapped though not further worked The cherts all vary in character and have marked differences in colour and inclusions

2 5 PATINA

Only 8 items from the collection have any patina development, 3 examples come from the 1991 intervention and 1 from the 1996 intervention Of the examples from the 1995 excavation one is unstratified with two of the remaining three pieces from context 1096 No trends in patina development can therefore be discerned amongst the assemblages

2 6 POST DEPOSITION

The material is extremely well preserved with little post depositional damage such as edge chipping, snapping or abrasion A small number of pieces have minute amounts of surface gloss consistent with movement in a sandy/dry matrix (Harbord 1996, 20) Post depositional thermal damage is only evident on once piece, this being a pot lid (S F 3, Context 5014) consistent with thermal expansion from cold to warmer conditions The pot lid refits within a corresponding crater on the surface of a flake (S F 2, Context 5014) which shows signs of pre-depositional burning

3.0 TECHNOLOGY

The flint has been classified in the first instance into its basic natural or knapped form irrespective of further working, i e scrapers based on flake blanks are included in the statistics for flakes Table 2 sets out the incidence of the varying forms at the site

Table 2 Quantities of flint by natural or knapped type

Type	Quantity per year				Total Quantity	
	91	94	95	96	Total	(%)
Blades (inc pieces of)	0	0	1	20	21	3 5
Debitage (irregular shattered pieces)	0	0	1	311	312	51 5
Flakes (inc pieces of)	6	0	4	255	265	43 8
Natural pieces (inc pot lids)	0	2	1	4	7	1 2
Total	6	2	7	590	605	100

No cores are present at the site This may suggest that cores were removed to be further worked or that the method of working left little structural evidence of the parent nodule, i e it became completely smashed The large amount of irregular debitage at the site may suggest this as set out below in Table 3

Table 3 Summary of debitage

Debitage size	Quantity	Percentage
>0mm<5mm	35	11 2
>5mm<10mm	78	25 0
>10mm<15mm	88	28 2
>15mm<20mm	60	19 2
>20mm<25mm	31	10 0
>25mm<30mm	12	3 8
>30mm<35mm	5	1 6
>35mm<50mm	3	1 0
Total	312	100

The debitage was graded by taking its maximum dimension on a grid incremented in 5mm steps The majority of the debitage falls under 25mm in maximum dimension The general small size of the waste suggests that preliminary knapping took place elsewhere

3 1 FLAKES AND BLADES

Flake production outnumbers blade production at the site in the ratio of 13 1 Blades are classified in this instance as parallel sided pieces with a length breadth ratio of greater than or equal to 2 1 Other struck pieces falling below this ratio which are flat in section are characterised as flakes The majority of the struck pieces at the site have prominent bulbs of percussion and retain a large portion of core platform indicating the use of hard hammers Approximately 10% of the assemblage is soft hammer struck and suggests that in the main the industry was driven by the production of thick flakes prepared by direct percussion with a hard hammer

Two core face trimming flakes were noted in the collection with the flakes removed across the face of the core at 90 degrees to the striking platform

In one instance the écaille technique has been used to prepare a flake (Context 1072, Figure 1) with a downward direct percussion blow with a hard hammer removing the flake The force of the blow was then carried back through the flake resting on an anvil to produce inverse ripples at its distal end

The blades at the site range in length from 15mm to 84 mm and represent many different stages in core reduction The blades are not particularly gracile and include thick examples of 3-5 mm Flakes at the site have a major range in size from two conjoining pieces from the 1991 collection at 92 x 90 x 19 mm to minuscule examples of small chipped flakes which may represent platform preparation

3 2 BURNING

Twenty eight pieces from the collection show various degrees of thermal damage by burning There does appear to be a correlation between burnt pieces and context with the 20 burnt examples originating from just 8 contexts (1004, 3 pieces, 1022, 1026, 1027, 8 pieces, 1072, 1075, 6 pieces, 1217, 6 pieces and 5014, 2 pieces which refit) However in all cases there are at least 50% more flints unburnt along with those burnt, i e there are no discrete areas which would appear to contain only burnt items It is not uncommon however for flint to remain unaltered in small hearths and fires All but two of the contexts (1004 & 5014) producing burnt flints had other evidence of burning such as reddened stones or charcoal Other than one example of a lightly burnt broken scraper (Context 1027) the burnt examples are all waste flakes and debitage

3 3 WORKED PIECES

Fifty-two pieces in the assemblage have been modified into or demonstrate use as tools The figures include pieces which have light edge damage as the integrity of the collection suggests little post deposition and excavation damage Table 4 sets out the tool types at the site

Table 4 Quantities of worked flints

Tool type	1991	1995	1996	Total quantity
Arrowhead	0	2	1	3
Miscellaneous retouch	1	3	0	4
Scraper	0	19	1	20
Serrated pieces	1	2	1	4
Utilised blade	0	5	0	5
Utilised flake	2	16	0	18
Total	4	47	3	52

Scrapers are the dominant tool type amongst the assemblage with 20 examples The scrapers at the site take a variety of forms from basic trimmed edge flakes (Figure 1) to well worked teardrop shaped end and edge scrapers (Figure 2) Scrapers are generally based upon flake blanks and usually form fairly gracile example (Figure 3) although thicker more robust examples are present (Figure 4) Of the 20 scrapers all but two are made on flakes with the other two based upon suitable large blanks of debitage (Figure 5) A characteristic thumbnail scraper was collected from the 1995 excavation from an unstratified context (Figure 6)

The scraping technology at the site appears to have been well utilised with four truncated examples or pieces of broken scrapers present One truncated example representing the distal end of the original scraper has been blunted along the broken edge to allow its reuse (Figure 7)

Retouch is used in a more ad hoc manner to create tools but this is limited amongst the assemblage and when used simply trims flakes to useful edges (Figure 8)

Retouch is used more regularly to serrate edges with examples from 1991, 1995 and 1996 One of the examples from 1995 is based upon a blade of a Borrowdale volcanic series rock and would have made an extremely robust sawing edge tool (Figure 9)

Many flakes and blades have been utilised without further working, having chipped or otherwise utilised edges This is particularly the case on pieces with thin edges (Figure 10) and those which in general could be used for cutting and slicing functions (Figure 11)

There are three arrowheads from the assemblages, two from the 1995 excavation and one from the 1996 A small arrowhead was recovered from context 1068 (Figure 12) The arrowhead is leaf butted and forms a very precise triangular point which shares close affinities with barbed and tanged examples A leaf shaped bifacially worked point was found in the fill of pit 1018 (Figure 13) This finely worked piece is made from a grey/white flint which is out of character with the principal brown/grey component of the assemblage The third example of a possible projectile point (Figure 14) comes from the 1996 excavation (S F 1) The piece is based on a triangle of honey coloured flint with bifacial working along the edges of two sides of the triangle The third side has been trimmed but not further thinned by bifacial working and may have been hafted as a chisel ended arrowhead Alternately the invasiveness of the retouch on the other edges of the piece may argue that its is an unfinished leaf shaped example

4.0 CHRONOLOGY

The flint recovered from the site came from excavated contexts dated to the Early and Late Neolithic, principally by ceramic assemblages of Grimston, Grooved and Peterborough Wares There are no diagnostic elements amongst the lithic assemblage which would suggest a date earlier than the Neolithic period The flaking style with hard hammer direct percussion would fit a date from the early Neolithic onwards

The small leaf butted arrowhead from context 1068 would correlate with an early Neolithic date as is suggested by the Grimston pottery from this feature although leaf shaped projectiles can also occur in Bronze Age contexts (Green 1983, 33)

The leaf point from pit 1018 appears to be the only item of material culture from the feature Again it is suggested that this finely worked flint would suit a date in the Neolithic period although closer affiliation with the ceramic industries cannot be tested in this case

Chisel arrowheads have been documented in association with Grimston Ware and also later Neolithic contexts but do not appear to date any later than the first half of the second millennium B C (Green 1980, 113-114)

The flake from a polished stone axe (Figure 1) would again suggest a date from the early Neolithic However as this represents the reuse of an item the piece must act as a *post quem* association The Woodlands style pottery for the context suggests a later Neolithic date

The use of a volcanic stone of the Borrowdale series, (often used for the manufacture of axes), for the formation of a saw (Figure 9) in association with Fengate and Grooved ware would suggest a late Neolithic date for context 1312, the fill of a pit

The accurate dating of scraping tools is problematic given their continuity throughout prehistory and their varied uses which means variation can be as much a function of purpose as chronology (Young 1987, 57-58) The invasiveness of the retouch on the majority of items would suggest a date later than the Mesolithic although this remains to be tested The mixture of end and end scrapers are a common component of Neolithic-Bronze Age assemblages The thumb nail scraper from an unstratified context is a common element of Early Bronze Age assemblages (Edmonds 1995, 141) although not exclusively so

5.0 CONCLUSIONS

The assemblage with its predominance of scraping tools suggests that domestic processing was carried out or is otherwise represented at the site The majority of the lithics are waste flakes and chippings characteristic of secondary knapping and trimming There are no cores suggesting that they were either removed from the site or that the knapping debris was removed from elsewhere for burial

Arrowheads are present at the site which would traditionally suggest hunting activities However given the nature of the deposition of the items, unused in pits, alternate interpretations such as purposeful deposition in a ritual context are plausible

The majority of the flint appears to be fairly homogenous in raw material characteristics Given the small size of many of the pieces and lack of cortex it is not possible to suggest whether the flint comes from a glacial origin (boulder clays/river gravels/beaches) or from a mined source

Without exception the tools at the site are concurrent with its use in the early and late Neolithic periods

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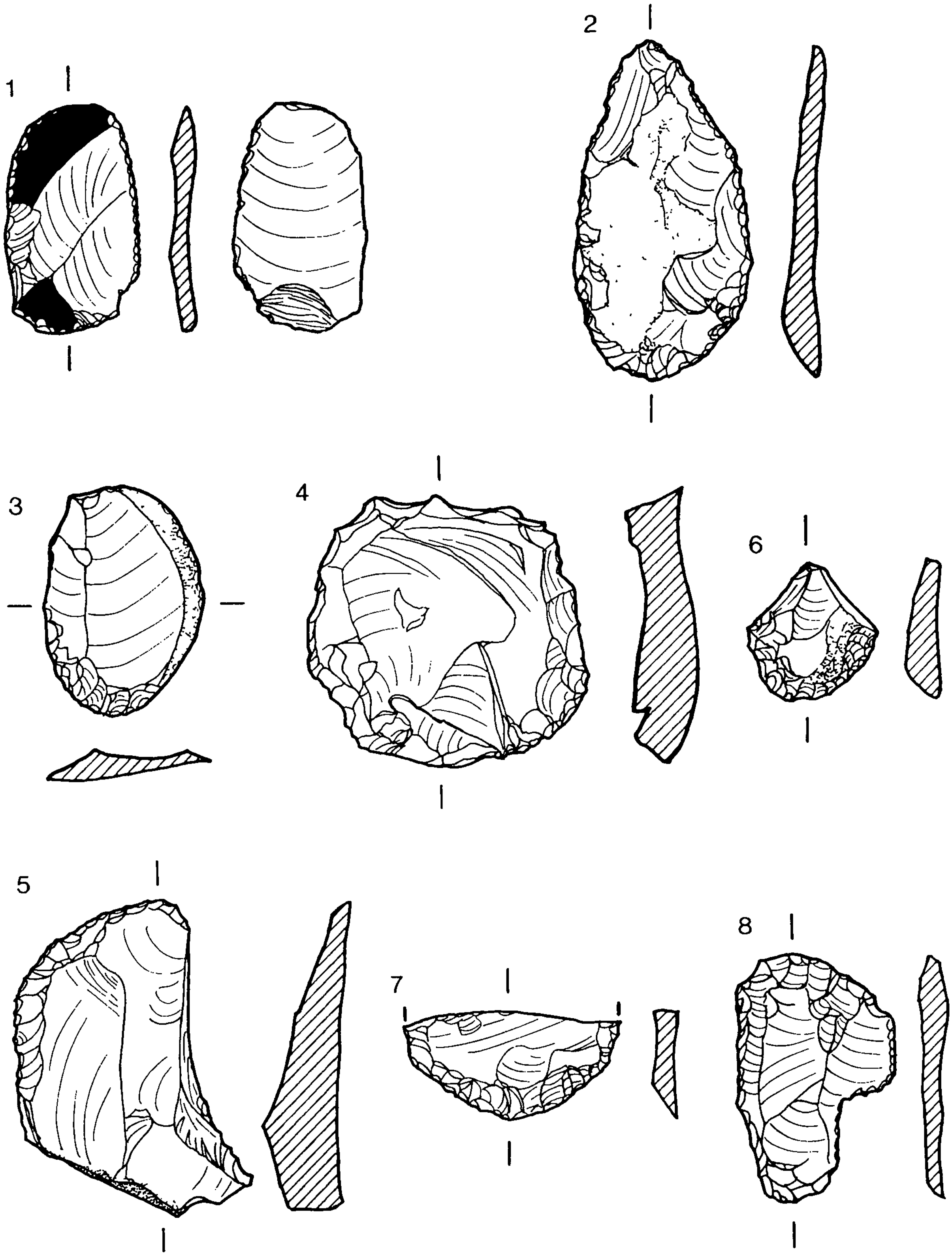
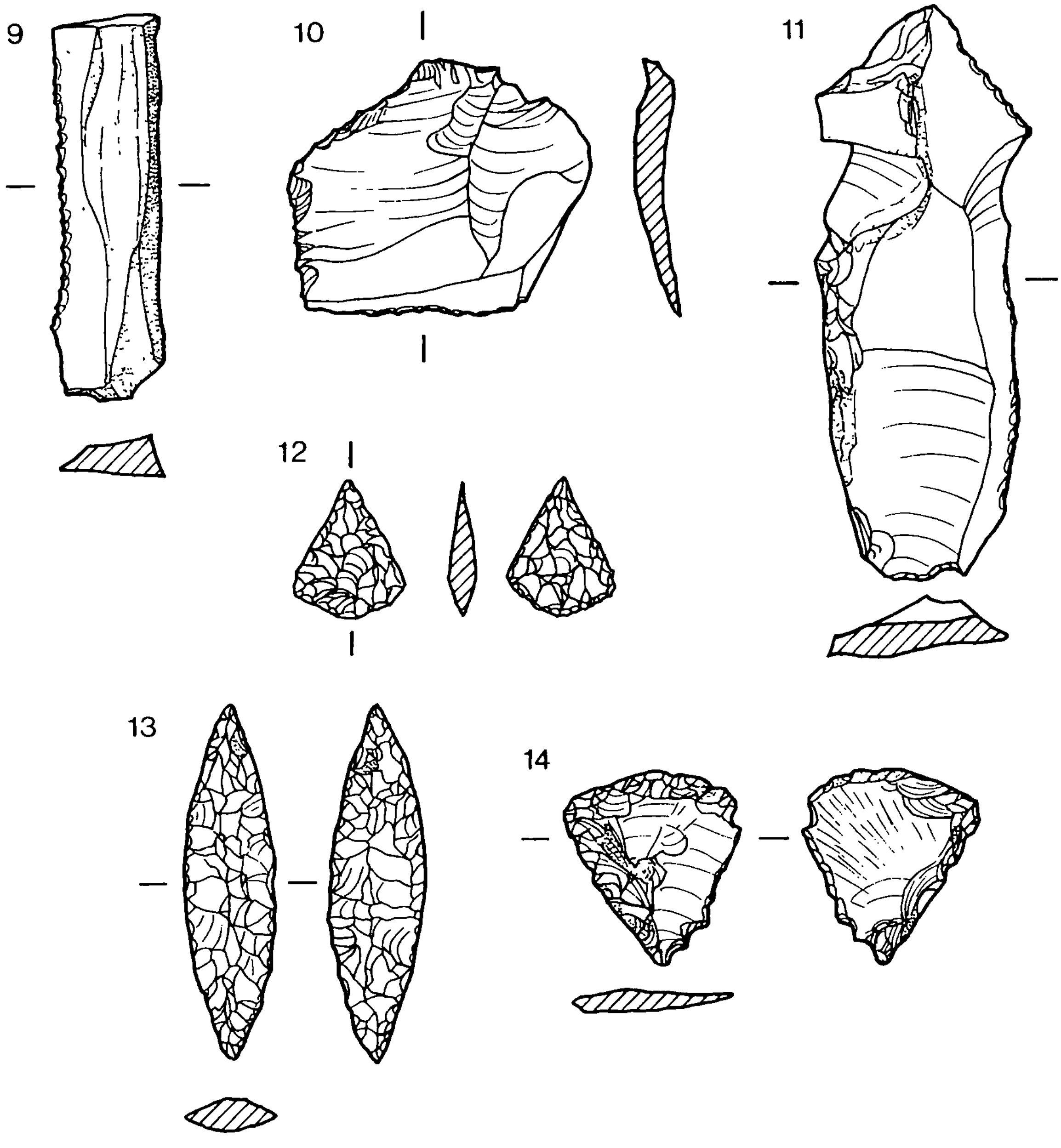


Figures 1-8 1 - edge and end scraper (C1072), 2 - edge and end scraper (C1320), 3 - edge and end scraper (C1211) 4 - edge and end scraper (C1024), 5 - scraper (C1024), 6 - thumbnail scraper (unstratified), 7 - broken scraper (C1217) 8 - retouched and trimmed flake (unstratified) (SCALE 1 1)



Figures 9 - 14 9 - Volcanic serrated blade (C1217), 10 - chipped flake (C1096), 11 - utilised blade (C1308). 12 - leaf butted arrowhead (F1069, C1068), 13 - leaf shaped point (C1046), 14 - chisel ended arrowhead (1996, SF1) (SCALE 1 1)

APPENDIX 1 LITHIC CATALOGUE

Catalogue abbreviations

SITE INFORMATION

Y	Year
Cno	The context number of the find
S.F.	The Small Find number of the item

RAW MATERIAL

F. Col.	The colour of the raw material / or ? = Unknown BL = Black BR = Brown G = Grey P = Pink
Cort.	The amount of cortex present on a piece expressed as a percentage (%)
C. Col.	The colour of the cortex where present BR = Brown CR = Cream
Patina	The colour of any patina followed by the percentage (%) of surface affected G = Grey W = White WMOT = White - mottled

TECHNOLOGY

Type	The primary form of the item irrespective of further working B = Blade BD = Blade Distal BM = Blade Mid BP = Blade Proximal D = Debitage (followed by size grading in 5 mm increments) F = Flake IB = Irregular burnt piece NAT/PEBBLE = natural pebble
Interp.	Interpretation of function of piece RET = Retouched USE = Utilised piece (may be followed by ? when unsure) Free text descriptions allowed e g SCRAPER
Work	To indicate type of working and where

AE = All edges
BAT = Battered
LE = Left edge (when viewing dorsal surface)
PF = Pressure flaked
RE = Right edge (when viewing dorsal surface)
RET = Retouch
May be followed by ? when unsure

L
B Length, breadth, width Dimensions given in millimetres (mm)
W

Bulb The knapping technique used to remove a flint
H = Hard Hammer
S = Soft Hammer
SHTD = Piece shattered from a strike elsewhere on the flint
? = undetermined
REM = removed

Burnt Indicate whether the piece is burnt with a Y(es) or (N)o

Damage Record damage as ANC(ient) or MOD(ern) Indicate which edge

Notes Free text e g CHERT

Nosterfield Lithics																
SITE INFO.			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F Col	Cort	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
91	/	1	BR-G	30	CR-BR	0	F	RET	LE RE	92	90	15	H	N	N	Refits below
91	/	1	BR-G	5	CR-BR	0	F	USE	LL RE	92	60	19	H	N	N	Refits above
91	/	1	BR-G	0	/	W 95	F	USE?	LE?	77	70	12	H	N	Y MOD	
91	/	1	BR-G	2	CR-W	0	F	/	/	51	53	10	H	N	N	
91	/	1	BR-G	5	CR	CR 95	F	/	/	60	40	8	H	N	N	Gloss
91	/	1	BR-G	5	G	G 100	F	SERRATED	LE RE	49	40	8	H	N	N	Gloss
95	602	2	BR-G	0	/	0	NP	/	/	/	/	/	/	N	N	V small np
95	1003	1	G	2	CR	/	B	SERRATED	LE RE	62	15	4	H	N	N	
95	1003	1	BR-G	0	/	0	F	RET	LE RE	36	39	12	H	N	N	
95	1003	1	BR-G	0	/	0	F	/	/	18	11	3	S	N	N	
95	1004	1	?	/	/	0	D<10	/	/	/	/	/	SH	Y	N	
95	1004	1	G	/	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1004	1	R	/	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1004	1	G	/	/	0	D<20	/	/	/	/	/	SH	Y	N	
95	1004	1	?	/	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1004	1	G	/	/	0	D<25	/	/	/	/	/	H	Y	N	
95	1004	1	G-BR	0	/	0	D<30	/	/	/	/	/	SH	N	N	

SITE INFO		RAW MATERIAL					TECHNOLOGY									
Y	CNo	Q	F Col	Cort	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1004	1	G-BR	/	/	0	D<30	/	/	/	/	/	SH	N	N	
95	1004	1	GR-W	0	/	0	F	/	/	20	20	5	H	N	N	Chert
95	1004	1	BR	30	CR	/	F	/	/	25	15	3	H	N	N	
95	1014	1	G-BR	5	W	0	F	SCRAPER	LE RE	42	36	9	H	N	N	
95	1020	1	BR	/	/	0	D<25	/	/	/	/	/	H	N	N	
95	1020	1	G	/	/	0	F	/	/	32	33	9	H	N	N	Blade scars
95	1020	1	B-BR	/	/	0	F	TOOL	EDGE	10	30	5	?	ANC	N	Butt end
95	1022	1	BR-G	5	CR-BR	0	D<15	/	/	/	/	/	SH	N	N	
95	1022	3	BR-G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1022	1	?	0	/	0	D<30	/	/	/	/	/	/	Y	N	
95	1022	1	G-BR	/	/	0	D<30	/	/	/	/	/	H	N	N	
95	1022	1	BR-B	0	/	0	D<35	/	/	/	/	/	H	N	N	
95	1022	1	BR-G	10	CR-BR	0	D<40	/	/	/	/	/	H	N	N	
95	1022	1	BR-G	10	/	0	F	USE	RE	26	18	3	S	N	N	
95	1022	1	BR-G	0	/	0	F	USE	RE	40	26	6	H	N	N	
95	1022	1	BR-G	15	CR-BR	0	F	USE	LE	50	32	10	H	N	N	
95	1022	1	BR-G	0	/	0	E	/	/	39	20	6	H	N	N	
95	1022	1	G	0	/	0	E	/	/	31	22	5	H	N	N	
95	1022	1	G	0	/	0	F	CORE TRIM	/	27	18	8	H	N	N	B scars
95	1022	1	BR-B	0	/	0	E	/	/	37	25	5	H	N	N	
95	1022	1	BR-B	0	/	0	F	USE?	RE?	22	15	4	H	N	N	
95	1022	1	BR-B	0	/	0	F	/	/	23	15	3	H	N	N	
95	1023	1	G	0	/	0	B	/	/	36	11	3	H	N	N	
95	1024	2	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1024	1	BR-B	0	/	0	D<30	/	/	/	/	/	H	N	N	Poss core?
95	1024	1	BR-B	0	/	0	D<35	/	/	/	/	/	H	N	N	
95	1024	1	G-BR	5	CR	/	D<50	SCRAPER	LE	48	50	15	H	N	N	Edge
95	1024	1	G-BR	0	/	/	F	SCRAPER	AE	45	51	13	H	N	N	End & edge
95	1024	1	B	0	/	/	F	SCRAPER	LE RE	24	36	8	H	N	N	End & edge
95	1024	1	BR-B	0	/	0	E<30	/	/	/	/	/	H	N	N	
95	1025	1	BR-B	0	/	0	D<30	/	/	/	/	/	H	N	N	
95	1026	1	BR	40	CR	0	D<25	/	/	/	/	/	SH	N	N	
95	1026	1	BR	/	/	0	D<30	/	/	/	/	/	SH	Y	N	Therm?
95	1026	1	G	/	/	0	F	/	/	32	31	7	H	N	N	
95	1027	2	G-BR	0	/	0	D<10	/	/	/			SH	N	N	
95	1027	3	?	0	/	0	D<10	/	/	/	/	/	SH	Y	N	
95	1027	4	BR-G	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1027	2	?	0	/	0	D<15	/	/	/	/	/	SH	Y	N	
95	1027	1	BR-G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1027	1	G-BR	70	CR	0	F	/	/	29	34	8	H	N	N	
95	1027	1	BR-G	0	/	0	F	/	/	24	16	4	S	N	N	
95	1027	1	BR-G	0	/	0	F	CORE TRIM	/	18	29	7	H	N	N	90 to plat
95	1027	1	BR-G	0	/	0	F	/	/	23	12	5	H	N	N	Trim prox end
95	1027	1	G	0	/	0	F	/	/	22	25	5	H	N	N	
95	1027	1	BR-G	0	/	0	F	CORE TRIM	/	22	36	7	H	N	N	90 to plat

SITE INFO		RAW MATERIAL					TECHNOLOGY									
Y	CNo	Q	F Col	Cort	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1027	1	BR-G	0	/	0	E	USE	RE	21	12	3	H	N	N	
95	1027	1	BR	0	/	/	F	SCRAPER	AE	17	26	4	H	Y	ANC	Thermal dam
95	1027	3	G-BR	0	/	0	E<10	/	/	/			S	N	N	
95	1027	4	G-BR	0	/	0	E<15	/	/	/			S	N	N	
95	1027	2	?	0	/	0	F<20	/	/	/	/	/	S	Y	N	
95	1027	1	B	0	/	0	NP	/	/	/	/	/	SH	N	N	
95	1032	1	G-BR	0	/	0	D<30	/	/	/	/	/	SH	N	N	Term dam
95	1046	1	G	0	/	/	F	POINT	AE	52	14	5	PF	N	N	Leaf biface
95	1052	1	GR-B	0	/	0	D<10	/	/	/	/	/	H	N	N	
95	1052	3	GR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1052	1	GR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1052	1	GR-B	5	CR	0	E	/	/	30	24	5	H	N	N	
95	1052	1	BR-B	0	/	0	F	USE	LE RE	34	28	5	H	N	N	
95	1052	1	BR-B	0	/	0	E	/	/	32	15	5	H	N	N	
95	1054	1	GR-B	0	/	0	F	/	/	27	19	3	SH	N	N	
95	1054	1	GR-B	10	CR	0	F	/	/	25	26	10	H	N	N	
95	1068	1	GR-B	0	/	0	B	/	/	43	11	4	H	N	N	
95	1068	1	GR-B	0	/	0	B	/	/	30	15	4	S	N	N	
95	1068	1	BR-B	/	/	0	B	/	/	15	7	2	O	N	N	
95	1068	1	GR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	Chert
95	1068	1	BL-G	0	/	0	D<30	/	/	/	/	/	H	N	N	
95	1068	1	GR-B	5	CR	0	F	/	/	26	21	5	H	N	N	
95	1068	1	BR	0	/	/	F	ARROW	AE	17	17	4	PF	N	N	
95	1072	2	BR-G	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1072	1	?	0	/	0	D<20	/	/	/	/	/	SH	Y	N	
95	1072	2	BR-G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1072	1	BR-G	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1072	1	BR-B	50	CR	0	D<35	/	/	/	/	/	SH	N	N	
95	1072	1	BR-BR	0	/	/	F	SCRAPER	LE RE	39	23	5	H	N	N	Use of anvil
95	1073	1	BR	25	BR	0	B	/	/	18	10	2	S	N	N	
95	1073	1	G-BR	/	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1073	1	G-BR	5	CR	0	F	/	/	27	25	8	H	N	N	
95	1073	1	G-BR	5	CR	0	F	/	/	15	21	4	H	N	N	
95	1073	1	BR-G	/	/	0	F	/	/	30	17	3	H	N	N	
95	1075	1	G	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1075	3	G?	0	/	0	D<15	/	/	/	/	/	?	Y	N	
95	1075	2	G?	0	/	0	D<20	/	/	/	/	/	?	Y	N	
95	1075	1	?	0	/	0	F	/	/	21	12	1	H	Y	N	
95	1075	1	G	0	/	0	F	/	/	18	16	3	H	N	N	
95	1075	1	BR-B	0	/	0	F	/	/	22	18	6	H	N	N	
95	1096	1	?	0	/	W 100	B	/	/	18	9	2	S	?	N	Pot lid
95	1096	1	BR-B	0	/	0	B	USE	LE	32	11	4	S	N	N	
95	1096	1	?	0	/	G 100	BD	/	/	17	11	2	H	POT LID	N	
95	1096	7	G-BR	0	/	0	D<05	/	/	/	/	/	H	N	N	
95	1096	28	BR-B	0	/	0	D<05	/	/	/	/	/	H	N	N	
95	1096	1	/	100	CR	0	D<10	/	/	/	/	/	H	N	N	

SITE INFO			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F Col	Curt	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1096	16	BR-B	0	/	0	D<10	/	/	/	/	/	H	N	N	
95	1096	35	BR-B	0	/	0	D<10	/	/	/	/	/	H	N	N	
95	1096	1	/	100	CR	0	D<10	/	/	/	/	/	H	N	N	
95	1096	6	BR-B	0	/	0	D<10	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1096	3	/	100	CR	0	D<15	/	/	/	/	/	H	N	N	
95	1096	14	BR-B	0	/	0	D<15	/	/	/	/	/	H	N	N	
95	1096	4	BR-B	0	/	0	D<15	/	/	/	/	/	H	N	N	
95	1096	33	BR-B	0	/	0	D<15	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1096	1	/	100	CR	0	D<20	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	D<20	NP?	/	/	/	/	H	N	N	Chert
95	1096	6	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1096	19	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1096	2	/	100	CR	0	D<25	/	/	/	/	/	H	N	N	
95	1096	2	BR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1096	1	BR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1096	2	/	100	CR	0	D<25	/	/	/	/	/	H	N	N	
95	1096	4	BR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1096	1	G	50	CR	0	D<25	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	/	D<25	/	/	/	/	/	H	N	N	Blade scars
95	1096	1	G	5	CR	0	D<30	/	/	/	/	/	H	N	N	
95	1096	2	G	50	CR	0	D<35	/	/	/	/	/	SH	N	N	
95	1096	1	G	0	/	0	F	USE	LE	36	45	8	H	N	N	Gloss
95	1096	1	B	10	CR	0	F	USE	RE	29	50	5	H	N	N	
95	1096	1	G	5	CR	0	F	/	/	45	28	5	H	N	N	
95	1096	1	G	0	/	0	F	/	/	22	20	4	H	N	N	
95	1096	1	BR-B	0	/	0	F	/	/	37	24	5	H	N	N	
95	1096	1	BR-B	0	/	0	F	/	/	38	19	6	H	N	N	
95	1096	11	BR-B	0	/	0	F<10	/	/	/	/	/	H	N	N	
95	1096	27	BR-B	0	/	0	F<10	/	/	/	/	/	H	N	N	
95	1096	5	/	100	CR	0	F<10	/	/	/	/	/	H	N	N	
95	1096	2	BR-B	0	/	0	F<10	/	/	/	/	/	H	N	N	
95	1096	13	BR-B	0	/	0	F<15	/	/	/	/	/	H	N	N	
95	1096	8	BR-B	0	/	0	F<15	/	/	/	/	/	H	N	N	
95	1096	22	BR-B	0	/	0	F<15	/	/	/	/	/	H	N	N	
95	1096	15	BR-B	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1096	1	BR-B	0	/	0	F<20	B SPALL	/	22	5	3	H	N	N	
95	1096	1	G	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1096	1	BR-B	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1096	15	BR-B	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1096	3	BR-B	0	/	0	F<25	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	F<25	/	/	/	/	/	H	N	N	
95	1096	5	BR-B	0	/	0	F<25	/	/	/	/	/	H	N	N	
95	1096	1	BR-B	0	/	0	F<30	/	/	/	/	/	H	N	N	

SITE INFO			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F Col	Cort	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1096	3	BR-B	0	/	0	F<5	/	/	/	/	/	H	N	N	
95	1096	3	G	50	CR	0	NP	/	/	/	/	/	H	N	N	
95	1097	2	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1097	1	BR-B	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1097	1	BR-B	0	/	0	D<30	/	/	/	/	/	SH	N	N	
95	1097	1	BR-B	0	/	0	F	USE	LE	20	17	3	H	N	N	
95	1097	1	BR-B	0	/	0	F	USE?	LE?	32	15	3	S	N	N	
95	1097	1	G	0	/	/	F	SCRAPER	LE RE	44	34	7	H	N	N	
95	1097	1	BR-B	0	/	0	F<15	/	/	/	/	/	S	N	N	
95	1097	1	BR-B	0	/	0	F<20	/	/	/	/	/	S	N	N	
95	1099	1	G-BR	0	/	0	D<15	/	/	/	/	/	S	N	N	
95	1103	1	G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1105	1	BR-G	10	CR-BR	0	B	USE	LE	53	22	5	H	N	N	
95	1105	1	BR-G	0	/	0	B	USE	LE	25	12	2	S	N	N	
95	1105	1	BR-G	5	CR-BR	0	F<30	/	/	/	/	/	SH	N	N	
95	1114	1	BR-G	0	/	0	B	/	/	29	12	4	H	N	N	
95	1114	1	BR-G	0	/	0	F	SCRAPER	LE RE	26	29	6	H	N	ANC	Snap
95	1114	1	BR-G	0	/	0	F	/	/	23	46	5	H	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	18	23	5	S	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	36	25	9	S	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	30	16	3	S	N	N	
95	1114	1	BR-G	0	/	0	E	/	/	24	21	4	S	N	N	
95	1114	1	BR-G	10	CR	0	F	USE	RE	50	28	6	H	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	25	22	6	H	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	45	20	3	S	N	N	
95	1114	1	BR-G	0	/	0	E	/	/	35	30	5	S	N	N	
95	1114	1	G	10	CR	/	F	SCRAPER	LE RE	40	36	11	H	N	N	End & edge
95	1114	1	G	10	CR	/	F	SCRAPER	AE	48	45	15	H	N	N	End & edge
95	1201	1	G	/	/	0	B	/	/	20	10	3	S	N	N	
95	1201	1	BR	/	/	0	B	/	/	18	9	2	H	N	N	
95	1201	1	BR-R	/	/	0	B	/	/	IS	7	3	H	N	N	
95	1201	1	BR	5	CR	0	F	/	/	15	14	5	H	N	N	
95	1201	1	BR	70	CR	0	F	/	/	28	16	4	H	N	N	
95	1201	1	BR-G	0	/	/	F	RET	LE	27	24	9	H	N	N	
95	1202	3	BR-B	0	/	0	D<15	/	/	/	/	/	H	N	N	
95	1202	3	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1202	1	BR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1211	3	BR-B	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1211	3	BR-B	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1211	2	BR-B	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1211	1	BR-B	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1211	1	BR-B	0	/	0	F	USE	RE	31	16	4	H	N	N	
95	1211	1	BR-B	0	/	0	F	/	/	26	16	3	H	N	N	
95	1211	1	BR-B	0	/	0	F	/	/	32	29	3	H	N	N	
95	1211	1	BR-B	0	/	0	F	/	/	25	26	5	H	N	N	
95	1211	1	BR-B	5	CR	/	F	SCRAPER	END	39	28	7	H	N	N	End

SITE INFO			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F Col	Corl	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1211	2	BR-B	0	/	0	F<25	/	/	/	/	/	S	N	N	
95	1217	1	BR-B	0	/	0	BD	USE	RET	18	13	5	H	N	N	
95	1217	1	BR-G	0	/	0	BM	/	/	/	/	/	SH	N	N	
95	1217	3	BR-B	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1217	1	?	0	/	0	D<10	/	/	/	/	/	SH	Y	N	
95	1217	6	BR-B	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1217	3	?	0	/	0	D<15	/	/	/	/	/	SH	Y	N	
95	1217	3	BR-B	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1217	1	?	0	/	0	D<20	/	/	/	/	/	SH	Y	N	
95	1217	4	BR-B	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1217	1	?	0	/	0	D<25	/	/	/	/	/	H	Y	N	
95	1217	1	BR-B	0	/	0	F	/	/	25	16	5	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	16	11	2	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	30	26	6	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	23	16	3	S	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	27	29	5	H	N	N	
95	1217	1	BR-B	0	/	0	F	USE	RE	33	25	6	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	30	23	7	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	25	40	7	H	N	N	Gloss
95	1217	1	BR-B	0	/	0	F	/	/	31	24	6	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	23	32	4	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	24	29	9	H	N	N	
95	1217	1	BR-B	20	CR	0	F	/	/	23	26	5	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	15	26	4	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	15	22	3	S	N	N	
95	1217	5	BR-B	0	/	0	F<15	/	/	/	/	/	H	N	N	
95	1217	2	BR-B	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1217	1	R	0	/	/	FD	SCRAPER	AE	18	36	5	H	N	N	
95	1218	1	G	/	/	W 50	D<20	/	/	/	/	/	SH	N	N	
95	1306	1	BR-G	/	/	0	B	/	/	39	14	3	S	N	N	
95	1306	2	BR-G	/	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1306	1	G	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1306	1	BR-G	/	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1306	1	BR-G	30	CR	0	D<30	/	/	/	/	/	SH	N	N	
95	1308	1	BR-G	5	W	/	B	USE	LE	84	30	10	H	N	N	
95	1308	1	BR-B	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1308	1	BR-B	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1308	1	BR-B	0	/	0	D<45	SCRAPER	LE	58	20	7	H	N	N	
95	1308	1	BR-B	0	/	0	F	/	/	20	22	4	H	N	N	
95	1308	1	BR-B	0	/	0	F	/	/	20	11	4	H	N	N	
95	1312	1	G	0	/	/	B	SERRATED	RE	57	15	5	H	N	N	Chert saw
95	1312	1	B	0	/	0	F	/	/	27	28	5	H	N	N	Chert
95	1320	1	BR-B	10	CR	0	D<20	/	/				SH	N	N	
95	1320	1	BR-B	0	/	0	F	/	/	42	25	7	H	N	N	
95	1320	1	BR	0	/	0	F	USE	LE	28	23	4	H	N	N	
95	1320	1	BR	40	CR	/	F	SCRAPER	AE	57	30	5	H	N	N	Teardrop end

SITE INFO.			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F Col	Cort	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	2003	1	G	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	U/S	2	BR-B	5	CR	/	D<25	/	/	/	/	/	SH	N	N	
95	U/S	1	BR	5	BR	/	D<25	SCRAPER	?	/	/	/	H	N	N	Part of scraper
95	U/S	1	G-BR	0	/	/	F	SCRAPER	RE	60	39	14	S	N	N	Edge
95	U/S	1	G	0	/	W 30	F	RET	LE RE	42	27	7	S	N	N	Edge
95	U/S	1	BR-R	0	/	/	F	USE	LE RE	34	21	6	H	N	N	
95	U/S	1	BR-B	0	/	/	F	/	/	16	15	2	H	N	N	
95	U/S	1	BR	0		/	F	SCRAPER	AE	30	30	9	H	N	N	End & edge
95	U/S	1	BR	0		/	F	SCRAPER	AE	25	21	11	H	N	N	End & edge
95	U/S	1	BR	0		/	F	SCRAPER	AE	24	21	8	H	N	N	End
96	5005	1	W?	0		/	D<10	/	/	/	/	/	?	N	N	
96	5014	1	G	0		/	F	/	/	14	25	4	H	N	N	
96	5014	1	R	40	CR	/	F	/	/	40	29	8	H	Y	N	Flake fits sf 2 (S f 3)
96	5014	1	R	10	CR	/	POT LID	/	/	/	/	/	NAT	Y	N	Pot lid from sf3 (S f 2)
96	5036	1	P-R	0		/	B	SERRATED	RE	45	18	5	H	N	N	
96	5036	1	BR	0		/	F	ARROW	AE	29	24	4	H	N	N	(S f 1)
96	U/S	1	BR	0		W 100	F	SCRAPER	LE	30	20	6	H	N	N	

PART 2 NOSTERFIELD 1998, LITHIC REPORT

Peter Rowe

1.0 INTRODUCTION

A small assemblage of 15 knapped flints was recovered from the 1998 season of excavation at Nosterfield The raw material type is in keeping with the more numerous samples from earlier excavations There is a further knapped flake of chert The material is again very well preserved

2.0 TECHNOLOGY

Table I below sets out the components of the assemblage by basic knapped form irrespective of further working

Table I Quantities of flint by natural or knapped type

Type	Quantity	Percentage
Blades (inc pieces of)	3	20
Debitage (irregular shattered pieces)	3	20
Flakes (inc pieces of)	9	60
Natural pieces (inc pot lids)	0	0
Total	15	100

The figures from this sample are not statistically significant given the small volume of material Both blade and flake working is evident as was noted from the earlier assemblages There is again an absence of cores suggesting that knapping took place off-site or in discrete areas of the site

2 1 FLAKES AND BLADES

Flake production outnumbers blade production by a ratio of 3 1 The majority of the pieces have large bulbs of percussion suggesting the use of hard hammers Use of softer hammer material such as antler or bone is also represented

Two pieces of blade from context 1049 were found to conjoin to form a complete example The blade is fairly robust and is broken laterally across its crest The clean nature of the break and the lack of subsequent patination mean that the break could be ancient or modem

One of the flakes from context 1005 is the only burnt example from the collection

2 2 WORKED PIECES

Four of the pieces in the collection have light edge damage or light retouching demonstrating use These are a robust blade from context 1000, the distal part of the broken blade from context 1049, and two flakes from context 1050 The limited nature of the working on the pieces suggests that they were expediently produced tools for craft activities or food preparation

A single leaf shaped arrowhead is the only example of a fully worked item in the assemblage (Figure 1) The arrowhead was recovered from context 1049 The item is bifacially worked and is both leaf shaped at the butt and the tip It is of particular interest as parts of both surfaces not removed by pressure flaking retain a blue-grey patina The artefact has evidently been knapped from a patinated flake which may have been on sue for centuries prior to its reuse for the production of the arrowhead This re-use of earlier waste material was noted amongst the previously excavated material

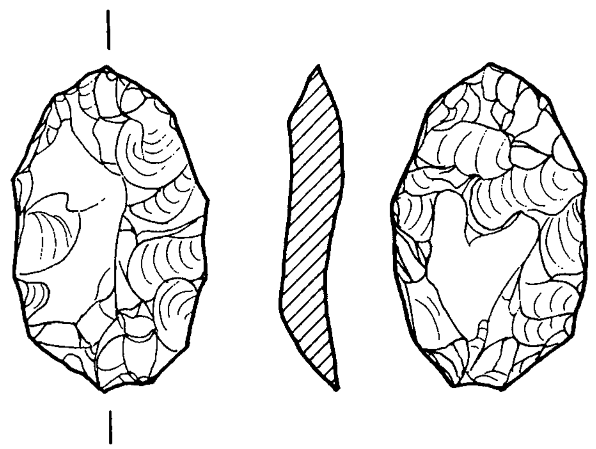


Figure I Flint arrowhead (F39 C1049) Scale 2 I

3.0 CHRONOLOGY

The present assemblage lends little to the typological dating of the site The leaf-shaped arrowhead can be dated to the earlier Neolithic period and is typical of Grimston Ware assemblages Leaf shaped projectiles are however also documented from Bronze Age contexts (Green 1984, 33) The arrowhead is based on a blank formed by an earlier flake suggesting a depth in the chronology of the site

4.0 CONCLUSION

The limited assemblage is in keeping with the larger collections recovered in previous excavations (Rowe 1998)

Bibliography

Green, H S 1984 Flint Arrowheads Typology and Interpretation *Lithics* Volume 5 , 19-39

Rowe, P 1998 Nosterfield 1991, 1994-1996 Flint Report (Unpublished report for Blaise Vyner, Heritage and Arts)

S10939

PART 3 NOSTERFIELD 1999-2003 LITHIC REPORT

Peter Rowe

1.0 INTRODUCTION

1 1 Lithic material was been recovered from five interventions at Nosterfield between 1999 and 2003 A summary of the material is presented in Table 1 1

Table 1 1 Quantities of flint by intervention

Intervention No.	Notes	Quantity
1	Mainly from excavated contexts	77
2	Surface finds from field of Intervention 1	53
4	A single natural pebble of black chert	1
5	Mainly from excavated contexts	299
6	Surface finds from fieldwalking from field of Intervention 5	18
8	Topsoil finds from evaluation trenching	6
	Total	454

1 2 This report considers lithics from Interventions 1 and 2 together as they are a fieldwalked and excavated assemblage from the same field A similar approach has been taken with Interventions 5 and 6 for the same reason The lithic item from Intervention 4 requires no further comment and the material from Intervention 8 is considered separately (see Appendices 1 to 3)

1 3 The entire assemblage has been catalogued using Microsoft Excel The full flint catalogue is available with the site archive

2.0 INTERVENTIONS 1AND 2

2 1 GENERAL CHARACTER

2 1 1 Raw material

With the exception of 6 pieces of black chert and 4 flakes of volcanic tuff all of the items are flint The flint is very homogenous in character and other than two red pieces consists of grey or light brown items often with a range of different shades within one piece The flint becomes opaque on finer flakes and is of a good quality with few flaws or fossils Very few items have any cortex When this is present it is worn from glacial or wave action and extremely thin in section

2 1 2 Post-deposition damage

The material from Intervention 1 is extremely well preserved with little post depositional damage such as edge chipping, snapping or abrasion Although the material from Intervention 2 shows few obvious signs of damage it is possible that the topsoiling of the site has caused some damage

Very few pieces amongst the collection have any patina development Only 9 items, excluding burnt pieces, have any patina development One piece (Int 2, S F 12) has become patinated in antiquity and the patina subsequently broken by further knapping

2 1 3 Burning

Eighteen pieces from the collection show various degrees of thermal damage by burning There is no correlation between burnt pieces and context i e there are no discrete areas that contain a preponderance of burnt items Other than one example of a heavily burnt thumbnail scraper (Int 2, S F 19) the burnt examples are all waste flakes and debitage

2 2 TECHNOLOGY

The flint has been classified into its basic natural or knapped form irrespective of further working, i e scrapers based on flake blanks are included in the statistics for flakes Table 2 1 sets out the incidence of the varying forms from Interventions 1 and 2

Table 2 1 Interventions 1 and 2 Quantities of flint by natural or knapped type

Type	Quantity by Intervention			Percentage by Intervention		
	1	2	Total	1	2	Total
Blades (inc pieces of)	9	9	18	12	17	14
Cores (inc pieces of)	0	1	1	0	0 7	0 7
Debitage (irregular shattered pieces & burnt waste)	25	9	34	32 5	17	26
Flakes (inc pieces ot)	43	34	77	55 5	64 3	59 3
Natural pieces (inc pot lids)	0	0	0	0	0	0
Total	77	53	130	59	41	**100**

2 2 1 Debitage

Non-burnt debitage accounts for just over a quarter of the lithics from Interventions 1 & 2 Debitage is defined here as angular chunks which are the product of knapping but served no purpose as artefacts in themselves The debitage was graded in size by taking its maximum dimension on a grid incremented in 5mm steps The results of the grading are shown in Table 2 2

Table 2 2 Interventions 1 and 2 Quantity of debitage by graded size

Debitage size	Quantity	Percentage (%)
>10mm<15mm	4	16 6
>15mm<20mm	3	12 6
>20mm<25mm	10	41 6
>25mm<30mm	2	8 3
>30mm<35mm	1	4 2
>35mm<40mm	2	8 3
>40mm<45mm	1	4 2
>45mm<50mm	0	0
>50mm<55mm	1	4 2
Total	24	100

The majority of the debitage falls under 25mm in maximum dimension although there are a small proportion of larger pieces present

2 2 2 Cores

A single core of grey/brown flint (Int 2, S F 22) was recovered during the fieldwalking exercise This is a fragment struck from a larger piece perhaps as a rejuvenation flake A core platform renewal flake is also present amongst the field walked assemblage (Int 2, S F 32) A burnt fragment from context 1166 (S F 22) may be a shattered piece from a heated core

2 2 3 Blades and Flakes

Flake production outnumbers blade production at the site in the ratio of 4 1 Blades are classified here as parallel-sided pieces with a length breadth ratio of greater than or equal to 2 1 Other struck pieces falling below this ratio which are flat in section are characterised as flakes

There is a good deal of variance within the blade assemblage The blades range in length from 9mm to 56mm and vary in thickness from 2mm to 5mm The small collection shows little in the way of further modification There are however six fragments of blades, comprising two proximal ends and four distal ends, which indicate some degree of secondary blade working

Flakes at the sue have a major range in size from a large opaque brown piece of particularly good quality flmt (Int 2, S F 36) measuring 45mm x 60mm x 8mm to smaller examples of small chipped flakes, e g a small chip 8mm x 8mm x 2mm (hit 1, context 1195) which may represent platform preparation

Whereas many of the flakes have been removed by direct percussion with a hard hammer the opposite is true of blades In all cases it appears that indirect percussion or use of soft hammers has been employed to ensure maximum control over the thickness of the finished blade

2 3 TOOLS

Thirty pieces in the assemblage have been modified to form tools The figures include pieces with light edge damage although those recovered during **Intervention** 2 should be treat with caution given their retrieval following topsoiling Table 2 3 sets out the tool types at the sue

Table 2 3 Interventions 2 and 3 Quantities of worked flints

Tool Type	Int 1	Int 2	Total Quantity
Projectile	0	1	1
Miscellaneous retouch	2	0	2
Scraper	4	5	9
Borer	1	0	1
Utilised blade	2	1	3
Utilised flake	7	7	14
Total	16	14	**30**

2 3 1 Projectile points

There is a single projectile point (Int 2, S F 16) This is a small bifacially worked point produced on a thick flake with a ridged dorsal surface which retains remnants of cortex This piece could be classified as a crude leaf arrowhead but at 10mm thick is not typical of this sort of artifact

2 3 2 Scrapers

Scrapers are the most common worked lithic artifact Scraper types are summarised in Table 2 4

Table 2 4 Interventions 1 and 2 Scraper classifications

Scraper Type	Find Nos.	Quantity
Simple retouched flakes	Int 1, S F 25, 32 and 33	3
Elongated symmetrical end and edge scrapers	Int 1, S F 32, Int 2, S F 27 and 44	3
Thumbnail/button scrapers	Int 2, S F 's 15, 19 and 55	3
Total		9

The simplest form of scraper from these interventions are struck flakes with retouch around all but the proximal end

More developed forms are also present These are based upon elongated flakes with a greater sense of symmetry applied in their manufacture One example (Int 2, S F 2) has a distal end with retouch at a 70-degree angle with much lighter retouch at the edges The proximal end is of particular interest as there is evidence of grinding producing a rounded edge around the perimeter of the striking platform This scraper class includes a robust example based on a particularly thick flake (Int 1, S F 32)

The final scraper types present are thumbnail or button scrapers based on small, thick sub-circular flakes One of these is particularly tactile with a concavity in its dorsal surface that forms a suitable cradle for the users thumb-end when held (Int 2, S F 15)

2 3 3 Utilised pieces

There are a number of pieces which have evidence of damage along the edges occasioned by light trimming or through use These are usually based on flakes (e g Int 2, S F 36) although useful cutting edges have also been utilised on suitable blades In one case the proximal end and edges of a wide flat blade (Int 1, S F 31) have been reworked with some fairly haphazard retouch

2 3 4 Miscellaneous worked pieces

A single borer or piercing tool (Int 1, S F 32) was identified amongst the assemblage This is based upon a suitably shaped spoke of debitage The end of the piece is blunted and polished through use

2 3 5 Stone axe

Four stone flakes (S F 48) from Intervention 1 refit to form an almost complete stone axehead missing only its butt end The axe has split along its length into four flakes of fairly equal thickness The axe is 89mm long in its present state, 58mm wide at its widest and 33mm thick The cutting edge has been sharpened on occasion causing a slight loss of symmetry

The raw material is a grey volcanic tuff which could be narrowed down to source, potentially Cumbria, North Wales or Scotland, by thin section analysis

It is possible that the axehead has been shattered purposefully However its fracture seems to emanate from the missing end making this interpretation uncertain There are some slightly darker patches on the surface of the axe that may be soot residue suggesting that the axe may have been heated perhaps to aid its destruction

Following deposition the surfaces of two of the flakes have taken on a dull brown patina whereas the other two flakes are unaffected The axe has a number of lines of weakness on the surface manifesting as hairline cracks meaning that care is needed in packaging and handling the item

3.0 INTERVENTIONS 5 AND 6

3 1 GENERAL CHARACTER

3 1 1 Raw material

The raw material is very similar to that from Interventions 1 and 2 It is again very homogenous with the majority of pieces being grey or light brown, often with a range of different shades within one piece There are a number of pieces of creamy cherty flint which were found in concentration in context 1277, the upper backfill of a pit Again, very few items have any cortex When this is present it is worn from glacial or wave action and extremely thin in section Chert is also present with 25 pieces of a grey-black material There are two fragments of siliceous sandstone from context 1061 (Int 5, S F s 11 and 12) which are probably natural There is a further non-flint item from context 1341 (S F 21) This is an unidentified burnt stone or ceramic that has begun to slag on one of its surfaces

3 1 2 Post-deposition damage

There are a number of pieces with modern damage This is limited to several pieces with chipped edges and two snapped pieces which are detailed in the catalogue Other then these examples there are few obvious signs of attrition following deposition

3 1 3 Burning

There are only five burnt pieces from Intervention 5 and a further 2 from Intervention 6 There is no correlation between burning and context with three of the pieces from Intervention 5 being from unstratified contexts A piece from the fieldwalked collection has being highly fired and its surface has become glazed (Int 6, S F 14)

3 2 TECHNOLOGY

The knapped character of the assemblage has been defined as in section 2 1 above
Table 3 1 sets out the incidence of the varying forms from Interventions 5 and 6

Table 3 1 Interventions 5 and 6 Quantities of flint by natural or knapped type

Type	Quantity by Intervention			Percentage by Intervention		
	5	6	Total	5	6	Total
Blades (inc pieces ot)	49	1	50	16 4	5	15 8
Cores (inc pieces of)	10	0	10	3 4	0	3 2
Debitage (irregular shattered pieces and burnt waste)	118	7	125	39 4	39 5	39 4
Flakes (inc pieces of)	113	10	123	37 8	55 5	38 8
Natural pieces (inc pot lids)	9	0	9	3	0	2 8
Total	299	18	317	100	100	100

3 2 1 Debitage

Non-burnt debitage accounts for almost 40% of the lithics from Interventions 5 and 6 The debitage was again graded in size The results of the grading are shown in Table 3 2 below

Table 3 2 Intervention 5 and 6 Quantity of debitage by graded size

Debitage size	Quantity	Percentage (%)
>10mm<15mm	50	43 5
>15mm<20mm	27	23 5
>20mm<25mm	12	10 5
>25mm<30mm	13	11
>30mm<35mm	8	7
>35mm<40mm	3	2 5
>40mm<45mm	0	0
>45mm<50mm	1	1
>50mm<55mm	1	1
Total	115	100

As with Interventions 1 and 2 the majority of the debitage falls under 25mm in maximum dimension although there are a small proportion of larger pieces present

3 2 2 Cores

Eleven cores are present from the excavated assemblage of Intervention 5 Table 3 3, below, summaries the core classification for the site

Table 3 3 Core classification

Platform type and number in brackets	Single (1)	Opposed (2)	At right angles (2)	At right angles and opposed (3)	Irregular (3)	TOTAL
Quantity	8	1	1	1	1	19

The dominant core type is single platform (e g S F 67) These are all quite small examples with a maximum face length being 49mm There is a single core with two opposed platforms (Int 5, S F 19) The incidences of cores with three platforms are less common There is one example with two opposed platforms and a third at right angles (Int 5, S F 29) There is also a more irregular core with three main platforms (Int 5, S F 52) Both of these multi-platform examples are black chert rather than flint

3 2 3 Blades and Flakes

Flake production outnumbers blade production at the site in the ratio of 2 5 1 Blades and flake classification are as defined in 2 2 3

The blade collection consists of small examples varying on average between 10mm and 40mm in length The blades range in length from 9mm to 56mm and vary in thickness from 2mm to 5mm There is good evidence for secondary blade working with twenty-two fragments of blades, comprising nine proximal ends, eight distal ends, and five mid sections Many of the blades have been modified with edge use or retouch (see 3 3 1 and 3 3 3)

Flakes at the site range in size from medium sized flakes, rarely exceeding 40mm in maximum dimension, to smaller chips which are less than 10mm wide

A mixture of hard and soft hammer percussion has been used to removed flakes from their cores However in almost all cases it appears that indirect percussion or use of soft hammers has been utilised to minimise the thickness of blades produced

3 3 TOOLS

Forty-eight pieces in the assemblage have been modified into or used as tools The figures include pieces with light edge damage, although those pieces collected during Intervention 6 should be treated with caution given their collection following topsoiling Table 3 3 sets out the tool types at the site

Table 3 3 Intervention 5 and 6 Quantities of worked flint

Tool type	Int. 5	Int. 6	Total quantity
Projectile	6	0	6
Miscellaneous retouch	3	1	4
Scraper	4	1	5
Fabricator	1	0	1
Utilised blade	9	1	10
Utilised debitage	1	1	2
Utilised flake	24	3	27
Total	48	7	55

3 3 1 Projectile points

The projectiles at the site consist of five microliths and one leaf shaped arrowhead, all from Intervention 5 The microliths are all later Mesolithic, geometric, narrow blade examples There are two scalene triangles (S F 19 and S F 30), a backed blade (S F 30) and two obliquely blunted points (S F 36, S F 38) There is a single microburin that was recovered from an unstratified context (S F 71)

A single leaf-shaped arrowhead was recovered from Intervention 5, context 1514 This is missing its tip but is otherwise in good condition The break across the tip has a fresh appearance revealing an interior colour several shades lighter than the outside suggesting a modern fracture The arrowhead is pressure flaked across the entire face on one side only

3 3 2 Scrapers

There are only a small number of scrapers given the size of the assemblage There are three small scrapers based upon squat flakes One is a simple end scraper with invasive retouch (Int 5, S F 49) This scraper shares similarities with the thumbnail examples from Intervention 2 in the invasiveness of the retouch but is not as circular These three small scrapers include a much squatter and robust example perhaps for heavier duty work (Int 5, S F 56) Finally there is a primary flake with end and edge retouch (Int 6, S F 4) although part of its left edge missing

There is a very gracile piece with a knife like edge and invasive retouch forming a scraping edge from context 1003 (Int 5, S F 1) This has been made on a large blank of high quality translucent brown flint and considerable investment has been made in it manufacture

3 3 3 Utilised pieces

There are a good number of pieces which have evidence of damage along the edges occasioned by light trimming or through use Pieces with modified edges include blades, flakes and suitable chunks of debitage (e g Int 6, S F 12) In one instance edge glossing was noted on a utilised flake (Int 5, S F 29) There is an interesting flake from context 1513 (Int 5, S F 29,) that has been modified to form a steeply retouched scraping tool

The majority of utilised pieces are for scraping or cutting functions There is however one piece of debitage with a retouched drill like end (Int 5, Context 1684)

3 3 4 Miscellaneous worked pieces

There is a single example of a fabricator amongst the assemblage (Int 5, S F 3) This large ridged blade has battered, well worn edges and one particularly abraded end The item has a smoothed, well-worn feel that gives the impression that it has had a long service

3 4 SPATIAL ANALYSIS

In terms of spatial analysis there are few apparent trends One feature (No 164, context 1277), a pit from Intervention 5, produced 125 flints, only three of which were worked The material consisted of waste flakes and debitage along with a single opposed platform core The raw material from this feature was principally a pale cream Yorkshire Wolds flint It is possible that the majority of this material was reduced from the same parent nodule The microlith from this context is a brown flint and is probably not originally associated with the knapping debris

4.0 INTERVENTION 8

4 1 GENERAL CHARACTER

A small collection of six items was recovered during trial trenching in Intervention 8 The raw material is consistent with that from the previous interventions (see above) Only one piece is burnt The assemblage consists of two blades, including one with edge use, two unmodified flakes, a piece of debitage and a microlith (Int 8, S F 3) The microluh is an obliquely blunted point of the late Mesolithic period based on a narrow blade of creamy flint

5 0 DISCUSSION

5 1 RAW MATERIAL

The raw material from all of the interventions is relatively homogenous being characterised by grey and brown flint The most likely sources are eastern coast beach flint or eroding deposits from local tills or gravels There is a smaller sample of creamy-grey pieces amongst the assemblage that demonstrate the characteristics of 'Wolds' flint The various chert samples from the site are likely to be local in origin and are typically associated with sources in the Pennines

5 2 CHRONOLOGY

The majority of the flints from the assemblages can shed little light on site chronology The bulk of the tools are simple flakes or blades with some degree of edge use These items were probably produced for a variety of activities throughout prehistory and then discarded with little ceremony

The earliest materials present are the microliths and microburin from Interventions 5 and 8 These geometric forms all date to the later Mesolithic period One of the microliths from Intervention 5, is a narrow blade, retouched on both sides It is narrow and almost rod-like suggesting a date of the very later or terminal Mesolithic The contexts from which the microliths were recovered suggest that all these finds are residual

The crude projectile point from Intervention 1 and the leaf-shaped arrowhead from Intervention 5 are both early Neolithic innovations although such projectiles can also occur in Bronze Age contexts (Green, 1984, p 33)

The fabricator from Intervention 5 fits an earlier or later Neolithic date These enigmatic tools were probably used for working materials such as leather It has also been suggested that they may have been used as 'strike-a-lights' (Edmonds, 1995, 41)

Stone axes such as that from the backfill of a small scoop in Intervention 1 became common from the onset of the Neolithic The perhaps purposeful destruction of the axe is paralleled at the Mayburgh henge near Penrith, Cumbria

Dating of scrapers is more problematic This type of tool was the mainstay of the stone tool kit for several millennia and it is difficult to assess the subtle differences between different styles in terms of chronology

The scrapers from Intervention 1 and 2 have been broken down in to three basic categories The simple edge retouched pieces could have been produced at any time during prehistory as expediency demanded This is also true of the smaller scrapers from Interventions 5 and 6 There are three scrapers from Interventions 1 and 2 based on elongated flakes with end and edge retouch These scrapers have been manufactured with a good deal of symmetry in mind This symmetry and use of end and edge retouch has been suggested as characteristic of Later Neolithic scraping tools (Edmonds, 1995, 96)

The three thumbnail or button scrapers from Intervention 2 form a class of artifact that appears in the early Bronze Age and are a common feature of Beaker associated assemblages Stray find 49 from Intervention 5 probably also fits this date

5 3 DISCUSSION

The lithic material from the current Nosterfield Interventions is consistent with exploitation of this area throughout prehistory Evidence for Mesolithic material was absent from the earlier seasons of work in the early 1990's (Rowe, 1998) The small collection of microliths along with a microburin adds a new dimension to the emerging picture of the landscape in early prehistory Other tools types at the site including a stone axe, scrapers, a fabricator and a leaf shaped arrowhead demonstrate this human presence till at least the early Bronze Age

The material present few opportunities to comment on specific activities or use of discrete parts of the sue Many of the finds are unstratified and those from Interventions 2 and 6 are from surface collections What is apparent is that there is a full suite of tool types present along with cores and debitage to suggest on site use, production and maintenance of tools

Bibiiography

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Rowe, P 1998 'Nosterfield 1991, 1994-1996 Flint Report' (Unpublished report for Blaise Vyner Heritage and Arts)

APPENDIX 1

Nosterfield Quarry 1999 Lithic catalogue Interventions 1 & 2																	
SITE INFO				RAW MATERIAL				TECHNOLOGY									
Int	F	C	SF	F Col.	Cort	C col.	Patina	Type	Interp	Work	L	B	W	Bulb	Bu	Dam	Notes
1	134	1166	22	?	0		W100	IB<25						S	Y	N	Core fragment
1	148	1206	23	?	0		W100	BD			34	15	4	?	N	N	
1	160	1170	24	?	0		W100	F	USE?	RE?	32	22	8	H	Y		Too damaged to be sure of use
1	160	1170	24	?	INT 5	CR	W100	IB<40							Y		Heavily fired
1	140	1196	27	?	0		W100	F			30	24	7	S	Y	N	Surface gloss
1		1204	29	?	0		W100	IB<40						?	Y	ANC	Pot lids
1	118	1143	31	?	0		W80	F			28	22	6	?	Y	N	
1	142	1195	32	?	0		W100	IB<40						PL	Y	N	
1	116	1141	36	?	0		W100	IB<20						SH	Y	N	
1	116	1141	36	?	0		W100	IB<35						H	Y	N	
1	117	1142	38	?	0		W100	D<25						?	N	N	
1	131	1163	39	?	0		W100	IB<25						?	Y	N	
1	141	1193	47	?	0		W100	F			20	14	2	S	N	N	
1	141	1193	47	?	0		W100	IB<45						?	Y	N	
2			13	?	0		G-P100	BD			12	11	2	S	Y	N	
2			19	?	0		0	F	SCRAPER	E&E	25	27	12	H	Y	N	Heavily fired B Age thumbnail
2			20	?	0		W100	F			10	10	2	S	Y	N	
2			26	?	20	CR	W100	IB<20						SH	Y	N	
2			56	?	0		W100	IB<20						?	Y	N	
1		1171	25	BR	0		0	BP			10	11	2	S	N	N	
1	159	1176	26	BR	0		0	F			16	17	2	S	N	N	
1		1173	30	BR	5	CR	0	E			31	20	8	H	N	N	
1	118	1143	31	BR	0		0	B	RET	PROX	56	18	5	S	N	N	Black bands in flint
1	118	1143	31	BR	0		W80	D<15						S	N	N	
1	118	1143	31	BR	0		W80	D<15						S	N	N	
1	118	1143	31	BR	5	CR	0	F			18	12	2	S	N	N	
1	118	1143	31	BR	10	CR	0	F			44	20	7	H	N	N	
1	142	1195	32	BR	10	CR	0	D<25						H	N	N	
1	142	1195	32	BR	0		0	D<40						SH	N	N	
1	142	1195	32	BR	0		0	F			23	20	4	S	N	N	
1	142	1195	32	BR	0		0	F			8	8	2	S	N	N	
1	142	1195	32	BR	50	CR ROLL	0	FP			26	36	8	H	N	N	
1		1214	34	BR	0		0	E	PF		18	16	2	S	N	N	PF platform prep
1		1214	34	BR	0		W10	F	USE	END	31	22	3	?	N	ANC	Snapped
1		1214	34	BR	20	CR	0	D<30						H	N	N	
1		1214	34	BR	10	CR	0	F			33	22	4	S	N	N	
1	152	1207	42	BR	0		0	F			20	22	6	H	N	N	

SITE INFO				RAW MATERIAL				TECHNOLOGY									
Int	F	C	SF	F. Col.	Cort	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	Dam	Notes
1	141	1193	47	BR	5	CR	0	F	USE	RE	53	45	16	H	N	N	
2			3	BR	0		0	F			18	22	6	H	N	N	Unusual striking platform
2			4	BR	0		0	F	USE?	LE	25	26	5	S	N	N	
2			5	BR	0		0	F			24	8	2	H	N	N	
2			7	BR	0		0	BD			15	11	3	S	N	N	
2			8	BR	5	CR	0	BP			16	13	4	S	N	N	Evidence of platform preparation
2			11	BR	0		0	B	USE?	RE	35	9	3	S	N	MOD	
2			12	BR	0		W40	E			26	17	4	H	N	N	Reuse - break in patina
2			15	BR	5	CR	0	F	SCRAPER	E&E	22	23	12	H	N	N	Bronze age - thumbnail
2			16	BR	30	G	0	F	PROJ POINT	PE	42	18	10	H	N	N	Poss Projectile point Small spear like tip
2			17	BR	0		0	F			16	9	2	S	N	N	
2			18	BR	0		0	E			12	27	2	S	N	MOD	Broken into 3 pieces
2			21	BR	0		0	F			37	24	5	H	N	N	Chert From bibolar core
2			23	BR	0		0	B			18	8	2	S	N	N	
2			23	BR	0		0	F			20	14	2	S	N	N	
2			24	BR	10	CR	0	F			30	35	8	H	N	N	
2			25	BR	0		0	D<25						SH	N	N	
2			27	BR	0		0	F	SCRAPER	E&E	35	15	10	H	N	N	Ground prox End Elongated flake Later neo?
2			28	BR	0		0	B			27	8	2	S	N	N	
2			29	BR	0		G50	F			20	12	5	H	Y	N	
2			30	BR	10	CR	0	F			11	8	3	S	N	N	
2			33	BR	35	CR	0	F			26	18	7	H	N	N	
2			36	BR	0		0	E	USE?	LE? RE	45	60	8	H	N	N	
2			39	BR	5	CR	0	F			15	20	4	H	N	N	
2			42	BR	0		0	F			23	12	3	S	N	N	Ground surface?
2			43	BR	0		0	F			16	11	3	S	N	N	
2			43	BR	0		0	F			16	11	3	S	N	N	
2			45	BR	5	CR	0	F	USE?	RE	20	11	3	S	N	N	
2			46	BR	50	G	0	E			20	20	3	?	N	N	
2			47	BR	5	CR	0	D<40						SH	N	N	
2			50	BR	0		0	F	USE?	LE	15	20	3	H	N	N	
2			51	BR	0		0	E			21	10	3	H	N	N	
2			52	BR	0		0	D<20						H	N	N	

SITE INFO.				RAW MATERIAL				TECHNOLOGY									
Int	F	C	SF	F Col	Corl	C col	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	Dam	Notes
2			57	BR	5	CR	0	B			25	8	3	S	N	N	
2			58	BR	5	CR	0	D<25	USE?	END				H	N	N	
2			32	BR-R	0		0	D<25	CORE TRIM					S	N	N	
1	160	1170	24	G	0		0	B			35	11	5	S	N	N	
1		1171	25	G	0		W5	F	SCRAPER	LE RE	41	25	9	?	N	N	Ad hoc scraper
1	140	1196	27	G	5	CR	0	B	USE	LE RE	46	13	5	S	N	N	
1	140	1196	27	G	0		0	D<25						?	N	N	Chert
1	140	1196	27	G	0		0	F			55	42	10	?	N	N	
1	109	1129	28	G	0		0	D<35						?	N	N	Chert
1	142	1195	32	G	5	W	0	E	SCRAPER	E & E	54	35	14	H	N	N	END & EDGE SCRAPER
1	142	1195	32	G	0		0	E	SCRAPER	RE	27	20	8	?	N	Y	BROKEN
1	142	1195	32	G	0		0	D<20	USE	END				?	N	N	POLISHED END
1	142	1195	32	G	0		0	F	USE	LE	27	35	9	S	N	N	
1	142	1195	32	G	0		0	E	USE	LE	31	19	5	S	N	N	
1	142	1195	32	G	0		0	E	USE	RE	29	19	3	S	N	N	
1	142	1195	32	G	5	W	0	F	USE	RE	41	26	6	S	N	N	
1	142	1195	32	G	0		0	B			36	14	4	S	N	N	
1	142	1195	32	G	0		0	D<15						SH	N	N	
1	142	1195	32	G	0		0	D<25						?	N	N	
1	142	1195	32	G	5	CR	0	D<25						SH	N	N	
1	142	1195	32	G	0		0	D<30						SH	N	N	
1	142	1195	32	G	0	CR	5	F			35	19	4	S	N	N	
1	115	1140	33	G	0		0	F	SCRAPER	E & E	46	36	7	S	N	N	
1	115	1140	33	G	0		0	D<20						?	N	N	
1	115	1140	33	G	5	CR	0	F			31	18	7	H	N	N	
1	115	1140	33	G	0		0	F			25	25	7	H	N	N	Hinge termination
1	161	1218	35	G	0		0	D<15						SH	N	N	
1	161	1218	35	G	0		0	D<25						H	N	N	Chert
1	161	1218	35	G	0		0	F			35	40	11	H	N	N	Chert
1	116	1141	36	G	0		0	B			9	2	1	S	N	N	Poss Burin spall/not convinced
1	116	1141	36	G	0		0	D<25						S	N	N	
1	116	1141	36	G	0		0	F			11	7	2	S	N	N	
1	116	1141	36	G	25	CR	0	E			12	8	2	S	N	N	
1	132	1164	37	G	0		0	F			26	28	6	H	N	N	
1	143	1179	40	G	0		W95	F			18	23	5	H	Y	N	
1	158	1217	41	G	0		0	FP	USE	LE	56	70	11	H	N	N	Chert
1	141	1193	48	G	0		0	E	AXE FRAG		75	46	13	SH	N	N	All axe frags
1	141	1193	48	G	0		0	F	AXE FRAG		90	54	13	SH	N	N	refit
1	141	1193	48	G	0		0	F	AXE FRAG		80	55	15	SH	N	N	

SITE INFO				RAW MATERIAL				TECHNOLOGY									
Int	F	C	SF	F Col.	Corl	C. col	Patina	Type	Interp	Work	L	B	W	Bulb	Bu	Dam	Notes
1	141	1193	48	G	0		0	F	AXE FRAG		65	45	8	SH	N	N	
2			2	G	0		0	F	USE?	RE	26	25	8	H	N	N	
2			14	G	0		W95	B			25	11	4	S	N	N	
2			22	G	5	CR	0	CORE 1			28	30	12	H	N	N	Frag From core
2			31	G	0		0	E			24	12	3	S	N	N	
2			44	G	0		0	F	SCRAPER	E&E	36	22	6	H	N	N	Crude Elongated flake Neo?
2			48	G	0		0	B			19	7	2	S	N	N	
2			49	G	0		0	FD	USE?	END	26	18	6	H	N	N	
2			53	G-BR	0		0	D<45						H	N	N	Frost damage
1	118	1143	31	GR	0		BR30	E	RET	LE	39	18	5	H	N	N	
1	118	1143	31	GR	5	CR	0	B			42	6	3	S	N	N	
1	118	1143	31	GR	0		0	F			25	26	6	H	N	N	
1	118	1143	31	GR	0		0	E			21	16	2	S	N	N	
1	118	1143	31	GR	5	W	0	E			28	22	6	H	N	N	
1	118	1143	31	GR	50	CR	0	FP			38	36	7	H	N	N	
2			55	GR	25	CR	0	F	SCRAPER	E&E	18	24	10	H	N	N	Crude thumbnail
2			1	G-W	0		0	D<55						H	N	N	
2			6	G-W	0		0	F			28	16	4	H	N	N	
2			9	G-W	0		0	E			27	30	4	H	N	N	Fossil void
2			10	G-W	0		0	E			26	28	5	H	N	N	
1	142	1195	32	R	0		0	BD	USE	RE	30	19	4	S	N	N	Notch

APPENDIX 2

Nosterfield Quarry 1999-2003 Lithic catalogue - Interventions 4, 6 & 8																		
SITE INFO					RAW MATERIAL				TECHNOLOGY									
Y	Int	ENo	CNo	SE	E Col	Cort	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Bu	Dam	Notes
99	4	13	1019	3	G-BL	0		0	D<50	NP?					?	N	N	Chert
00	6			18	BR	15	CR	W90	BD	USE?	LE?	24	11	5	?	N	Y	Snapped across patina
00	6			10	?	0		W100	D<15						SH	N	N	
00	6			5	BR	0		0	D<20	USE	LE				SH	?	ANC	Thermal damage
00	6			15	BR	5	CR	0	D<25						H	N	N	Thermal damage
00	6			2	G	40	ROLL	0	D<30						H	N	N	Chert
00	6			12	GR	0		0	D<40	RET	LE				H	N	N	
00	6			1	G	0		0	F	LEAF BLANK?	AE	25	21	3	S	N	N	
00	6			3	BR	0		0	F			30	32	10	H	N	N	
00	6			4	BR	35	ROLL	0	F	SCRAPER	E & E	28	20	6	H	N	ANC	
00	6			6	BR	0		0	E	USE?		31	22	5	S	N	N	V light edge

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	Int	ENo	CNo	SF	E Col	Cort	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Bu	Dam	Notes
																		damage
00	6			7	?	0		W100	F			15	15	3	S	N	N	
00	6			8	BR	0		W95	F	USE	LE	26	20	5	H	N	N	
00	6			9	BR	20	CR	0	F			18	15	6	H	N	N	
00	6			11	BR	5	CR	0	F			23	12	4	H	N	N	
00	6			16	BR	0		0	E			25	15	5	H	N	N	
00	6			13	BR	0		W50	IB<15						?	Y	N	
00	6			14	?	0		G100	IB<20						?	Y	N	Thermal gloss
00	6			17	BR	50	ROLE	0	PF			18	25	4	S	N	N	
03	8		1002	3	?	20	CR	W100	B			42	14	3	S	Y	N	
03	8		1002	3	G	10	CR	0	B	USE	LE	42	18	7	H	N	N	
03	8		1002	3	?	0		W100	BD	MICRO LITH	RE	22	9	3	S	N	N	
03	8A		1000	1	BE	0		0	D<35						?	N	N	Chert
03	8		1002	3	BR	15	CR	0	E			30	19	5	H	N	N	
03	8		1002	3	BR	0		0	E			43	21	6	H	N	N	

APPENDIX 3

Nosterfield Quarry 2000-2003 Lithic catalogue Intervention 5																		
SITE INFO					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort.	C. col.	Patina	Type	Interp	Work	L	B	W	Bulb	Bu	D	Notes
02	1	150	1341	21	BR-R	0		0	Not flint						N/A	?	N	Non flint - slag?
00	1	2	1003	1	BR	0		0	F	SCR	E & E	38	78	9	REM	N	N	Bronze Age
00	1	15	1023	2	BR-R	0		0	E	USE	LE	36	16	5	REM	N	MOD	Prox end snapped
00	1	15	1024	3	?	0		BR100	B	FAB	ALL	82	22	14	H	N	N	Mesolithic
00	1	15	1029	4	G	0		0	F			14	27	4	H	N	N	
00	1	15	1030	5	BR	20	CR	0	F	USE	LE RE	22	19	5	S	N	N	
00	1	26	1053	6	G	0		0	B			26	13	3	S	N	N	
02	1	72	1116	7	B	0		0	F	USE	LE RE	29	21	5	S	N	N	
02	1	72	1116	7	?	0		W100	B			24	12	2	S	N	N	
02	1	120	1179	8	BR-R	0		0	F	USE	RE	23	12	3	S	N	N	
02	1	129	1193	9	G			0	TP<110						H	N	MOD	Chert chunk
00	1	28	1055	10	BR	5	CR	0	E	RET	PROX	31	18	5	REM	N	N	Prox end modified to a point
01	1	31	1061	11	G	0		0	NP			23	13	6	?	N	N	Siliceous sandstone
01	1	31	1061	12	BR	0		0	NP - F			58	22	8	?	N	MOD	Siliceous sandstone
00	1	31	1061	13	BR	0		0	E			22	10	2	S	N	N	

SITE INFO					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort	C col	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	D	Notes
01	1	44	1074	14	B	0		0	D<40	USE	END	36	37	13	H	N	N	Black chert
02	1	131	1197	15	?	50	CR	W100	E			38	45	12	H	N	N	
02	1	131	1197	15	G	0		W90	E	USE	LE RE	25	12	5	S	N	N	
02	1	132	1199	16	BR	0		W90	B	USE	LE RE	36	12	3	S	N	N	
02	1	132	1199	16	BR	0		W90	D<20						S	N	N	
02	1	132	1199	16	G	0		0	D<20						?	N	N	
02	1	132	1199	16	BR	0		0	BP	USE	LE RE	26	14	3	S	N	N	
02	1	142	1219	17	BR	5	CR	0	F	USE	RE	26	36	6	H	N	N	
02	1	145	1226	18	G	0		0	BP	USE	LE RE	25	10	3	S	N	N	
02	2 4	164	1277	19	G-W	0		0	D<10						SH	N	N	
02	2 1	164	1277	19	G-W	0		0	D<15						SH	N	N	
02	1 2	164	1277	19	G-W	0		0	D<20						SH	N	N	
02	5	164	1277	19	G-W	0		0	D<25						SH	N	N	
02	5	164	1277	19	G-W	0		0	D<30						SH	N	N	
02	1	164	1277	19	G-W	0		0	D<35						SH	N	N	
02	1	164	1277	19	CR	0		W100	IB<10						SH	N	N	
02	1	164	1277	19	CR	0		0	E			6	6	2	S	N	N	
02	t	164	1277	19	CR	0		0	F			7	5	2	S	N	N	
02	1	164	1277	19	CR	0		0	E			6	5	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			7	6	1	S	N	N	
02	1	164	1277	19	CR	0		0	F			8	4	1	S	N	N	
02	1	164	1277	19	CR	0		0	F			19	16	6	H	N	N	
02	1	164	1277	19	G-W	0		0	F			15	24	6	H	N	N	
02	1	164	1277	19	CR	0		0	F			20	14	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			25	13	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			32	12	4	S	N	N	B scars
02	1	164	1277	19	CR	0		0	E			43	18	5	H	N	N	B scars
02	1	164	1277	19	CR	0		0	D<25						H	N	N	Chert
02	1	164	1277	19	CR	0		0	F			35	21	10	H	N	N	
02	1	164	1277	19	CR	0		0	F			17	16	3	S	N	N	Chert
02	1	164	1277	19	CR	0		0	F			6	6	S	S	N	N	
02	1	164	1277	19	CR	0		0	E			IS	11	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			30	18	2	S	N	N	
02	1	164	1277	19	CR	0		0	F	RET	LE	34	14	4	S	N	N	B scars
02	1	164	1277	19	BR	0		0	BM	MICRO LITH		16	5	2	S	N	N	Late Meso
02	1	164	1277	19	CR	0		0	D			15	25	4	S	N	N	
02	1	164	1277	19	CR	0		0	BD			12	6	2	S	N	MOD	Chipped
02	1	164	1277	19	G-B	0		0	B			IS	8	2	S	N	N	

SITE INFO					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort	C col	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	D	Notes
02	1	164	1277	19	CR	0		0	F			30	12	3	H	N	N	
02	1	164	1277	19	CR	0		0	F			22	12	4	H	N	N	
02	1	164	1277	19	CR	0		0	F			35	20	6	H	N	N	
02	1	164	1277	19	CR	0		0	B			12	5	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			16	8	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			18	6	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			11	14	2	H	N	N	
02	1	164	1277	19	CR	0		0	BD			20	12	4	S	N	N	
02	1	164	1277	19	CR	0		0	CORE 2			56	32	35	S	N	N	
02	1	164	1277	19	CR	0		0	F			20	8	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			17	6	4	H	N	N	
02	1	164	1277	19	CR	0		0	F			24	16	7	S	N	N	
02	1	164	1277	19	CR	0		0	F			34	22	8	H	N	N	
02	1	164	1277	19	CR	0		0	F			16	9	4	S	N	N	
02	1	164	1277	19	CR	0		0	F			14	17	6	H	N	N	
02	1	164	1277	19	CR	0		0	F			11	12	3	H	N	N	
02	1	164	1277	19	CR	0		0	F			30	20	7	H	N	N	
02	1	164	1277	19	CR	0		0	F			10	6	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			16	15	5	S	N	N	
02	1	164	1277	19	CR	0		0	F			12	13	4	H	N	N	B scars
02	1	164	1277	19	CR	0		0	F			21	20	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			32	10	5	H	N	N	
02	1	164	1277	19	CR	0		0	B			10	6	2	S	N	N	
02	1	164	1277	19	G	0		0	BD			12	9	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			14	29	4	S	N	N	
02	1	164	1277	19	CR	0		0	F			20	12	2	S	N	N	
02	1	164	1277	19	CR	0		0	F	USF	LF	25	20	8	H	N	N	
02	1	164	1277	19	CR	0		0	F			15	11	3	S	N	N	B scars
02	1	164	1277	19	CR	0		0	BP			10	9	2	H	N	ANC	
02	1	164	1277	19	CR	0		0	F			17	12	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			22	16	8	H	N	N	
02	1	164	1277	19	CR	0		0	F			17	8	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			12	8	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			10	16	1	S	N	N	
02	1	189	1338	20	G	0		0	F	USF	LF	24	12	2	S	N	N	
02	1	150	1341	21	?	0		G100	IB<20						H	N	N	
02	1	150	1341	21	?	0		W100	NP<50						N/A	N	N	
02	1	150	1343	22	BR	0		W50	D<25						SH	N	N	
02	1	190	1376	23	G	0		W50	NP<15						N/A	N	N	
02	1	190	1376	23	BR	50	G	0	D<20						?	N	N	
02	1	205	1391	24	G	0		W100	NP<30						N/A	N	N	SF 24 conjoin
02	1	205	1391	24	G	0		W100	NP<35						N/A	N	N	SF 24 conjoin
02	1	219	1504	25	G	0		0	F			27	21	10	H	N	N	

SITE INFO					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort	C col	Patina	Type	Interp	Work	L	B	W	Bulb	Bu	D	Notes
02	1	220	1506	26	G	0		0	F			29	20	8	H	N	N	Chert B scars
02	1	220	1506	26	B	0		0	F			14	15	2	H	N	N	Chert B scars
02	1	220	1508	27	?	0		W100	D<35						SH	N	N	
02	1	220	1508	27	G	0		0	F			16	18	3	S	N	N	
02	1	222	1510	28	?	0		W100	F			22	10	2	S	N	N	
02	1	222	1510	28	B	0		0	F			28	14	4	H	N	N	Chert
02	1		1513	29	?	0		W100	D<20						SH	N	N	
02	2		1513	29	G	25	CR	W90	D<35						SH	N	N	
02	1		1513	29	G	0		0	CORE 1						SH	N	N	
02	1		1513	29	G	0		0	CORE 1			25	37	20	S	N	N	
02	1		1513	29	B	0		0	CORE 3			25	27	22	S	N	N	Chert
02	1		1513	29	G	0		0	F	RET	END	26	16	8	H	N	N	
02	1		1513	29	G	0		0	F	USE	RE	39	19	7	H	N	N	
02	1		1513	29	G	0		W80	E			25	35	12	H	N	N	
02	1		1513	29	BR	0		0	F	USE	LE RE	21	36	8	H	N	N	
02	1		1513	29	B	0		0	F			26	10	3	S	N	N	Chert Circular fossil
02	1		1513	29	G	0		W90	F	USE	LE RE	34	16	5	H	N	N	
02	1		1513	29	G	0		0	F	USE	RE	24	16	4	S	N	N	Point
02	1		1513	29	G	0		0	F	USE	LE	35	18	4	H	N	N	Edge gloss
02	1		1513	29	G	5	CR	0	B	USE	LE RE	34	8	2	S	N	N	
02	1	224	1514	30	?	0		W100	IB<30						SH	N	N	
02	1	224	1514	30	B	0		0	D<50						SH	N	N	Chert
02	3	224	1514	30	G	0		W50	D<20						SH	N	N	
02	1	224	1514	30	B	0		0	F			34	12	4	H	N	N	Chert
02	1	224	1514	30	B	0		0	F			11	12	2	S	N	N	
02	1	224	1514	30	G	0		0	E			19	14	3	S	N	N	
02	1	224	1514	30	G	0		0	E	LEAF ARROW		30	20	4	S	N	ANC	Neo Broken Tip
02	1	224	1514	30	G	0		0	F			45	20	6	H	N	MOD	
02	1	224	1514	30	?	0		W100	F	USE	LE RE	30	13	4	H	N	N	
02	1	224	1514	30	G	0		W90	BM	MICROLITH		15	5	2	S	N	N	Meso
02	1	224	1514	30	G	0		0	BM	MICROLITH		18	5	2	S	N	N	Meso
02	1	320	1515	31	B	0		0	D<25						H	N	N	Chert
02	1		1526	32	B	0		0	D<35						H	N	N	Chert
02	1	224	1527	33	?	0		W100	B			32	9	3	S	N	N	
02	1	224	1527	33	?	0		W100	F			15	9	4	S	N	N	
02	1	224	1527	33	?	0		W100	E			20	11	5	S	N	N	

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort	C col	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	D	Notes
02	1	224	1527	33	?	0		W100	E			15	13	4	S	N	N	
02	1	224	1527	33	?	0		W100	B			19	10	3	S	N	MOD	
02	1	234	1545	34	G	0		W80	D<15						SH	N	N	
02	1	234	1545	34	B	0		0	D<35						SH	N	N	Chert
02	1	234	1545	34	BR	50	CR	0	BP			5	9	2	S	N	N	
02	1	234	1545	34	G-BR	0		0	F			43	26	10	H	N	N	Chert
02	1	234	1545	34	G-BR	0		0	F			34	23	12	H	N	N	Chert
02	1	234	1545	34	G	0		0	BP			12	8	2	S	N	N	
02	1	234	1545	34	G	0		0	B			26	11	4	S	N	N	Chert
02	1	234	1546	35	CR	100	CR	0	F			34	18	6	H	N	N	
02	1	234	1546	35	B	0		0	F			26	15	3	S	N	N	Chert
02	1	239	1557	36	G	0		0	B	MICRO LITH	LE	26	7	3	S	N	N	Meso
02	1	240	1560	37	BR	0		0	F			20	12	4	S	N	N	
02	1	242	1565	38	G	0		0	B	MICRO LITH		21	5	2	S	N	N	Meso
02	1	244	1576	39	G	0		0	D<20						SH	N	N	
02	1	244	1576	39	?	0		G100	B<15						SH	N	N	
02	1	244	1576	39	BR	0		0	BD			13	11	2	S	N	N	
02	1	245	1582	40	G	0		0	D<20						SH	N	N	
02	1	245	1582	40	BR	0		0	B			11	6	1	S	N	N	
02	1	245	1580	41	?	0		W100	D<20						SH	N	N	
02	1	245	1580	41	G	0		W80	D<35						H	N	N	
02	1	245	1580	41	?	30	CR	W100	F	USE	RE	20	17	5	H	N	N	
02	1	245	1580	41	G	0		0	F	USE	LE	26	21	5	H	N	N	
02	1	245	1580	41	G	0		0	E	USE	RE	16	17	4	H	N	N	
02	1	245	1580	41	G	0		W95	F			8	8	2	S	N	N	
02	1	245	1580	41	G	0		W95	BP			12	11	2	S	N	N	Refits with below
02	1	245	1580	41	G	0		W95	BM			8	10	2	S	N	N	Refits with above
02	1	260	1629	42	?	0		W100	F			24	12	4	S	N	N	
02	1	263	1637	43	G	0		0	B			31	9	3	S	N	N	
02	1	265	1639	44	?	0		W100	BD			22	11	3	S	N	N	
02	1	264	1644	45	G	10	G	W90	D<25						H	N	N	
02	1	264	1644	45	G	0		W95	D<30						H	N	N	
02	1	130	1996	46	BR	5	BR	0	F			16	13	6	H	N	N	
02	1			47	G	10	CR	0	CORE I			40	22	18	S	N	N	
02	1			47	G	10	ROLL	0	D<20						?	N	N	
02	1			48	BR	0		W20	F			26	18	6	H	N	N	Reuse patina cut by scars
02	1			49	G	5	CR	0	F	SCRAPER	E & E	21	25	8	H	N	N	
02	1			50	G	0		0	BD	USE	END	22	15	4	S	N	N	
02	1			51	G	0		0	CORE I			40	30	20	H	N	N	

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort.	C. col	Patina	Type	Interp	Work	L	B	W	Bulb	Bu	D	Notes
02	1			52	B	0		0	CORE 3			38	30	22	S	N	N	Chert
02	1			53	G	15	CR	W95	CORE 1			40	32	25	S	N	N	
02	1			54	G	0		0	B			40	11	4	S	N	MOD	
02	1			54	G	0		0	B			20	8	2	S	N	N	
02	1			55	G	0		0	D<30						H	N	N	
02	1			56	BR	10	CR	0	F	SCRAPER	E & E	28	27	15	SP	N	N	
02	1			57	G	0		W80	B			32	13	6	H	N	MOD	
02	1			58	?	0		W100	F	USE	LE	27	20	4	S	N	N	
02	1			59	BR	0		W80	D<15						SH	N	N	
02	1			60	BR	0		0	E	USE	LE RE	18	12	3	S	N	N	
02	1			61	G	0		0	B			29	10	7	S	N	N	
02	1			62	G	0		0	B	USE	LE	26	9	4	H	N	N	
02	1			63	G	30	CR	0	D<55						SH	N	N	
02	1			64	BR	0		0	F			15	7	2	S	N	N	
02	1			65	BR	0		0	F	USE	RE	21	22	5	S	N	N	
02	1			66	?	0		W100	B			19	6	2	S	N	N	
02	1			67	BR-GR	0		0	CORE 1			42	35	22	S	N	N	Chert
02	1			68	?	0		W100	F			42	32	7	S	N	MOD	
02	1			69	G	25	CR	W80	D<30						SH	N	N	
02	1			70	?	5	CR	W100	D<30						SH	N	N	
02	1			70	G	0		0	E	USE	LE RE	26	48	8	H	N	N	
02	1			70	BR	10	CR	0	CORE 1			44	30	17	S	N	N	
02	1			70	B	0		0	E			25	13	5	H	N	N	Chert
02	1			71	B	0		0	D<15						SH	N	N	Chert
02	2			71	?	0		W100	D<20						H	N	N	
02	1			71	?	0		W100	D<25						H	N	N	
02	2			71	?	0		W100	D<30						H	N	MOD	
02	1			71	?	0		W100	BD			13	8	2	S	N	N	
02	1			71	BR	0		W95	F			12	8	2	S	N	N	
02	1			71	?	0		W100	F			11	11	2	S	N	N	
02	1			71	BR	0		W80	F			22	13	4	S	N	N	
02	1			71	BR	0		0	F	USE	LE	26	14	5	H	N	N	
02	1			71	BR	0		0	B	USE	LE RE END	24	11	3	S	N	N	
02	1			71	?	0		W100	F	MICRO BURIN	RE	15	10	4	S	N	N	Meso Poss microburin
02	1			71	?	0		W100	BP			15	10	2	S	N	N	
02	1			71	?	0		W100	CORE 1			49	30	20	S	N	N	
02	1			72	G	15	CR	W90	F			18	15	5	H	N	N	

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort	C. col	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	D	Notes
02	1			72	G	0		W90	B			32	12	4	S	N	N	
02	1			72	?	0		W100	BP			10	12	3	S	N	N	
02	1			72	G	0		W90	BP			26	16	5	S	N	N	
02	1			72	G	0		0	B	USE	LE RE	22	8	3	S	N	N	
02	1			73	BR	0		0	D<30						SH	N	N	
02	1			73	?	0		W100	F	USE	LE RE	25	36	6	S	N	N	
02	1			73	?	0		G100	BM			12	10	3	S	N	MOD	Refits with below
02	1			73	?	0		G100	BD			8	10	3	S	N	MOD	Refits with above
02	1			139	BR	0		0	NP<5						N/A	N	N	
02	1			140	G	0		W90	F			24	19	3	H	N	N	
02	1			141	G	0		W90	D<20						SH	N	N	
03	1	278	1666	201	?	0		G100	IB<20						SH	N	N	Chert
03	1	278	1666	201	BR	0		0	F			29	36	8	H	N	N	Chert
03	1	304	1721	210	?	0		W100	NP<20						N/A	N	N	
03	1	306 B	1709	211	BR	0		0	F	USE	RE	24	20	6	S	N	N	
03	1	306 A	1697	212	BR	0		0	B			34	12	5	S	N	MOD	Edge chips
03	1	295	1604	500	BR	10	CR	0	F			42	16	3	S	N	N	
03	1	295	1604	500	BR	24	CR	0	D<35	USE	END	41	10	8	SH	N	N	Awl/borer
03	1	295	1604	500	BR	30	CR	0	F			30	15	4	S	N	N	
02	1	234	1545	34	?	0		G100	F			22	20	8	H	Y	N	
02	1			54	?	0		W100	B	?	?	35	13	2	S	Y	N	
02	1			71	?	0		0	IB<15						?	Y	N	
02	2			71	?	0		0	IB<20						?	Y	N	
02	1			71	?	0		G100	B	USE	LE RE	22	8	5	S	Y	N	

APPENDIX D CERAMIC REPORTS

Blaise Vyner

PART 1 NEOLITHIC POTTERY FROM NOSTERFIELD

1.0 INTRODUCTION

The assemblage appears to span the Neolithic period and comprises Grimston, Peterborough and Grooved wares The majority of the sherds are small and preclude the reconstruction of complete vessels A number of fabrics is present, but since these are very similar in content individual differences are most likely to reflect the individualities of particular vessels rather than significant differences in chronology or source Fabric difference between particular vessels, however, may well be functionally and/or symbolically significant

2.0 TREATMENT

In the fabric descriptions supplied hyphenated colours indicate the variation in colour expected from poorly controlled firing conditions, the first colour being that most in evidence Grit sizes are expressed as small (>3mm) and medium (4-6mm), large (6-9mm), and very large (<10mm) Distinctive particles smaller than 0 02mm are described as dust No thin section analysis has been done and identification has been using a 10× lens

While the desirability of more detailed presentation of prehistoric ceramics in terms of form and function (Cleal 1992, 302-3) is recognised, the fragmentary nature of many assemblages, not least this one, often precludes the application of these approaches in that rim diameter, vessel height and volume are not usually knowable In the catalogue entries square brackets denote a pit or other feature number, while standard brackets denote their fill number

Sherds have been assigned to individual fabric types, and where possible, individual vessels have been identified Diagnostic sherds have been illustrated and this material is separately packed in boxes marked 'D' in green All the material has been re-packed following examination and identification by fabric and vessel The pottery has been assessed for conservation needs and all significant sherds in friable or otherwise weak fabrics have been consolidated The laboratory record cards are included with the pottery and conserved pottery is stored in boxes marked 'C' in red The drawn material is also that which is most appropriate for display

3.0 POTTERY FABRICS

Although the pottery from Nosterfield spans a considerable period of the Neolithic, with a number of chronologically and stylistically distinct elements, there are considerable similarities in fabric Virtually all the material contains the same suite of filler grits, although proportions vary from vessel to vessel A distinctive feature of the fabrics is a considerable number of cavities from which an angular grit has leached The cavities vary in size from very small through to large, in the latter instance the surviving fabric is considerably weakened through the loss of the grits combined with low original firing temperatures Geological examination reveals traces with the characteristics of gypsum, which is suggested to have been the original grit

Angular fragments of grey-white 'cherty limestone' - effectively chert - are another major constituent of the pottery fabrics, with mica and quartz forming a smaller element Smaller rounded quartz sands may have been present in the clay matrix, rather than being deliberately added Fragments of carbon-rich mudstone are occasionally present, while there also appear to be occasional fragments of re-used 'grog', or previously fired clay

Variations of the fabric have been noted and allow the sub-divisions described below, but these show relatively little variation in basic constituents between Grimston style of the earlier Neolithic, and the later Peterborough Fengate and Grooved Ware Significantly, sherds of the only Peterborough Mortlake style vessel from the site are in a variant fabric (Pe4), distinguished by the presence of igneous grits and fragments of feldspar

It may be significant, in terms of activity at the site and in the neighbourhood, that the constituents of the main suite of fabrics are all available within a radius of between 16 and 19 km of Nosterfield, although, of course, they could have come from further afield Grits for the granite tempered Mortlake style vessel, if not the vessel itself, derive from the Pennine uplands to the west of the site

Taking into account the post-depositional degeneration of the pottery a high level of potting skill is evident throughout In general the finished vessels are better made than pottery of the middle Bronze Age and Iron Age from the region Of particular note are some sherds of Grooved Ware in Woodlands style, where a fine clay body has been burnished before firing

Table I Distribution of pottery by feature

Feature	Fill	Vessel no.	Type	Weight
1004		24	GW1	25
		12	GW6	50
		13	GW2	40
	1001	22	GW2	10
	1002	14	GW8	80
		12	GW6	50
	1003	21	GW5	35
1009	1022	25	GW2	130
	1023	31	GW3	30
1010	1024	15?	GW3	90
			GW3	35
	1025		GW4	10
1011	1026		GW3	90
	1027	15	GW3	370
		16	GW4	5
1012	1020		GW3	15
1013	1201		GW3	35
1015		15	GW3	60
1016	1203		GW2	10
1017	1202	17	GW5	230
		18	GW4	5
1054		14	GW8	30
		20	GW6	25
1063	1064		?Pe	20
1069	1068	1	Grimston	10
		4	Grimston	100
1074	1072	17	GW5	25
		26	GW2	5

Feature	Fill	Vessel no.	Type	Weight
	1073	27	GW7	5
		28	GW2	5
1076	1075	2	Grimston	15
		3	Grimston	50
		31	GW3	25
1090			GW3	45
1096			GW6	10
1097		?13	GW2	35
1099			GW2	5
1101			GW2	10
1105		23	GW2	50
1113		29	GW9	20
1114		30	GW1	25
1216	1217	19	GW8	105
	1218		GW3	10
1307	1306	5	Fengate	480
		6	Fengate	695
		7	Fengate	1440
		8	Fengate	220
1309	1308		GW3	15
1311	1310		GW3	15
1313	1312	9	Fengate	25
		10	Fengate	x
1321	1320	15	GW3	10
		11	Mortlake	115

GRIMSTON STYLE

The pattern of distribution of Neolithic activity and associated pottery in Yorkshire has, perhaps more than any other period of the past, remained unchanged over many years Newbigin's map (1937, pl 18) has continued fairly accurately to represent the known distribution of earlier Neolithic pottery The pottery assemblage from Nosterfield, on the north bank of the Ure, taken in conjunction with that recently excavated from Marton-le-Moor, between the rivers Nidd and Swale, some 18km to the south (Manby 1996, Tavener 1996), is therefore important, the more so since it derives from the Vale of Mowbray, an area where significant sites have until now not been joined by ceramic assemblages

FORM AND FABRIC

Sherds from four Grimston style vessels were found in two pits, 1069 and 1076 The fabric is of the same general type as the majority of the vessel fabrics found at Nosterfield, characterised by numerous small to medium-sized cavities from leached grits, with variable amounts of small chert fragments and some quartz sands Vessel 2 is unusual in having been fired oxidised orange-brown on both internal and external surfaces With the exception of one bag-shaped vessel (vessel 4), the vessel profile was not recoverable, although the raised cordon on one vessel (vessel 1) might well have followed a carination

The quantity of Grimston style pottery from Nosterfield is not sufficient to allow much discussion Vessel forms appear to be plain bowls, although no substantial profile is recoverable Rims are plain and everted, and the assemblage lacks the sharp everted and rolled forms seen at Marton-le-Moor Vessel walls are thin, between 5 and 8mm, and comparable with those from the finer series of vessels from Marton-le-Moor (Manby 1996) There appear to be similarities, too, between the fabric of the Nosterfield pottery and that of the finer vessels from Marton-le-Moor, although the latter assemblage is marked by sandstone and Pennine grit fillers (ibid)

CONTEXT AND ASSOCIATIONS

The Grimston style pottery from Nosterfield derives from the fill of two pits only, 1069 and 1076 Only a small amount of the lithic material from the site is chronologically diagnostic (Rowe 1998), of the contexts which contained Grimston style pottery, the fill of pit 1069, context 1068, produced a leaf-shaped arrowhead and a few flint flakes The small amount of material does not encourage extended discussion, although it should be noted that the presence of carinated pottery here and at Marton-le-Moor (Manby 1996) extends the distribution of carinated Grimston bowls to sites, suggested to have been restricted to mortuary sites (Herne 1988, 19) to sites which do not have an overt mortuary function

CHRONOLOGY

In the absence of any radiocarbon dates to provide an absolute chronology for the Nosterfield pottery comparison has to be made with other sites within the region Again, the Marton-le-Moor site is useful in that a date has been obtained for the thin-walled (Series 1) Neolithic vessels which compare with those from Nosterfield This is calibrated to 3900 - 3800 BC (OXA-5581), somewhat earlier than the series from Street House cairn, which varies from 3120±50 (BM2061N) to 2770±50 cal BC (BM1969N) and relates to activity which is probably contemporary with the deposition of the pottery (Manby 1996, Vyner 1988, 199)

In east Yorkshire and its region it would seem that the Grimston style bowl, either carinated or bag-shaped, is current during the first half of the fourth millennium BC On the evidence from Marton-le-Moor and the more distant Scottish site of Balfarg (Cowie 1993, 65-75), heavier vessels with coarser fabrics and applied lugs are in use, alongside the finer vessels, by the mid-fourth millennium It is not currently clear how long either type remained current, although Manby suggests that relatively soon after this time the Series 1 vessels go out of use, while ultimately the Series 2 vessels develop into Towthorpe Ware (Manby 1996) The absence of thick-walled vessels from Nosterfield may therefore be chronologically significant, perhaps indicating a reduction of activity in the area around the mid-fourth millennium cal BC

PETERBOROUGH WARES

Fragments of an estimated six Peterborough Ware vessels are present in the assemblage, the majority of the material deriving from parts of two vessels in the fill of a pit, 1307 The vessels are characterised by thick walls and large grits, probably a necessary manufacturing and firing corollary

FORM AND FABRIC

Pe1 Thick walled, chert grits, fine clay matrix with quartz dust Vessels 5, 6, 10

Pe2 Thick walled, numerous cavities of all sizes, coarse clay matrix with quartz dust Vessels 7, 8

Pe3 As above, with few or no cavities Vessel 9

Pe4 Thick walled, coarse fabric with small to medium quartz, feldspar and mica fragments and medium to large and very large (13 by 9 by 9mm) angular granite grits Wall thickness typically 17mm Vessel 11

Most of the Peterborough Ware is in the Fengate style two vessels, with a single flake from a probable third, vessel 10, have straight sides with T-shaped rims and well-executed incised decoration Two vessels have more obvious collars, one roughly formed with external incised decoration, another represented by a single sherd which has external incised decoration and a series of U-shaped incised grooves on the interior

A single vessel, 11, with dumb-bell impressions, probably from the use of bird or other bone, appears to belong to the Mortlake style The vessel contains igneous grits which could have been obtained locally from a glacial deposition

As with the Grimston style pottery, the assemblage has some parallels with somewhat larger assemblage of pottery from Marton-le-Moor, but these tend to be in terms of decorative traits rather than vessel form The T-shaped rim of the well-crafted Nosterfield vessels 5 and 6 is noted as absent from the Marton-le-Moor assemblage (Manby 1996), but does find some similarities in the assemblage from Carnaby Top Site 19 on the Yorkshire Wolds (Manby 1975, fig 13, 5), and in the less well finished material from Sawdon Moor, on the south slope of the North Yorkshire Moors (Manby 1995, 42-3) The absence of sherds with overt Rudston characteristics contrasts with pottery in the somewhat larger Peterborough Ware assemblage recently recovered from the site at Catterick Racecourse, on the River Swale, 19km to the north (Vyner 1996), where it was apparently associated with mortuary activities However, the relatively few assemblages available for study, even within the wider region, make it difficult to know whether variation in construction and decoration should be ascribed to chronology, function, or cultural association

Impressed cord decoration is hardly seen at Nosterfield, although there are some poorly defined indentations which may have been formed by this method Fingernail impressions are commonly found, but the overwhelming use of incised decoration using stick, bone, or flint is notable

Table 2 Decorative motifs on Nosterfield Peterborough ware

<table>
<tr><th>vessel</th><th>fabric</th><th>incised</th><th>impressed</th><th>fingernail</th><th>style</th><th>no. of contexts</th></tr>
<tr><td>5</td><td>1</td><td><</td><td></td><td>/</td><td>F</td><td>1</td></tr>
<tr><td>6</td><td>1</td><td><</td><td>|</td><td></td><td>F</td><td>1</td></tr>
<tr><td>7</td><td>2</td><td>\</td><td></td><td>|</td><td>F</td><td>1</td></tr>
<tr><td>8</td><td>2</td><td></td><td></td><td>|<</td><td>F</td><td>1</td></tr>
<tr><td>9</td><td>3</td><td><((</td><td></td><td></td><td>F</td><td>1</td></tr>
<tr><td>10</td><td>1</td><td>></td><td></td><td></td><td>P</td><td>1</td></tr>
<tr><td>11</td><td>4</td><td></td><td>|</td><td></td><td>M</td><td>2</td></tr>
</table>

CONTEXTS AND ASSOCIATIONS

Peterborough Ware occurs in the fill of three pits, 1307, 1313, and 1321 Peterborough ware in Fengate style was not associated with any other styles of pottery, but the fill of pit 1321, containing the Mortlake style sherd, also contained a sherd of Grooved Ware which is probably part of vessel 15 Again, the lithic associations are unhelpful so far as chronology is concerned Of the principal context producing Peterborough pottery, pit 1307 produced only flakes, while a saw in volcanic Borrowdale stone was present in the fill of pit 1313 (Rowe 1998)

CHRONOLOGY

Again, the Marton-le-Moor site has produced a range of radiocarbon dates relevant to the Nosterfield assemblage Since they are derived from carbonised hazelnuts they may be somewhat older than the associated potsherds, but the range through the second part of the fourth millennium cal BC is a potential indication of the currency of this material (Manby 1996), as well as a further confirmation of the likely contemporaneity of Mortlake and Fengate styles (Gibson 1995, 30)

GROOVED WARES

The assemblage of Grooved Ware from Nosterfield contains vessels in Woodlands and Durrington Walls style The total weight of Grooved Ware from Nosterfield is 1580gm While it is a smaller assemblage than those recently recovered from Marton-le-Moor (3044gm) or Roecliffe (2899gm), with which regional comparison is best made (Manby 1996), it is particularly important because the continuing archaeological investigation of Nosterfield and the nearby henges offers the potential for viewing the assemblage within the broader context

The Grooved Ware vessels from Nosterfield, as from other Yorkshire sites, were recovered from pits and are for the most part represented by only small numbers of sherds, and on occasion by only one or two (Table 3) The minimum number of vessels represented is nine in Woodlands style and 12 in Durrington Walls style, with total weights respectively of 300g and 1280g The higher weight of the Durrington Walls style pottery reflecting the slightly coarser fabric as well as the greater number of vessels The predominance of Durrington Walls style Grooved Ware at this site is typical of the relative distributions of Grooved Ware styles in northern England (Manby forthcoming)

Table 3 Relative quantities of Grooved Wares at Nosterfield

	Woodlands style		Durrington walls style	
vessel	sherds	weight	sherds	weight
12			11	105gm
13			10	70gm
14			15	110gm
15			25	530gm
16			1	5gm
17			14	255gm
18			1	5gm
19			7	105gm
20			5	25gm
21			5	35gm
22			2	10gm
23			4	50gm
24	4	25gm		
25	35	130gm		
26	1	5gm		
27	1	5gm		
28	1	5gm		
29	5	25gm		
30	3	25gm		
31	4	55gm		
TOTAL	59	300gm	95	1280gm

FORM AND FABRIC

GW1 Thin walled, numerous cavities from small leached grits (and medium for vessel 4), very similar to Grimston Contains occasional traces of 'grog' Vessels 4, 12, 24

GW2 Medium walled, small to medium chert grits, small to medium cavities with remnant white material which is probably gypsum, mica dust in fabric, which can be very fine Vessels 13, 16, 18, 25, 28

GW3 Thick walled, numerous small to medium chert grits, some small cavities, quartz dust in the clay matrix Vessels 15, 23, 31

GW4 As GW2, but with no obvious cavities Vessel 16

GW5 Thick-walled, numerous small, medium and large cavities create a friable fabric, a few obvious irregularly shaped small white grits probably gypsum, some small clear quartz grains Vessel 17

GW6 Thin-walled version of GW5 Vessels 20, 30

GW7 Fine smooth fabric with quartz and pink rose quartz sands, and perhaps some grog Vessel 27

GW8 As GW2, but with small white grits, perhaps gypsum Vessels 14, 19

GW9 As GW3, but with medium wall thickness Vessel 22

Table 4 Nosterfield Grooved Ware correlation of fabric and style

GW Fabric	Durrington Walls	Woodlands
1		24
2	13, 22, 23	25, 26, 28, 29
3	15	
4	16, 18	
5	17	
6	12, 20	30
7		27
8	14, 19	

The Grooved Ware is typical of the Woodlands and Durrington Walls styles (Table 3) The Woodlands style (Wainwright and Longworth 1971, 238-40) is generally found in small assemblages widely if thinly distributed between Orkney and Wessex The Nosterfield vessels are all fragmentary and in general do not allow the original form of the vessels to be reconstructed As usual with the Woodlands style, internal decoration is confined to the rims External moulded cordons are relatively common and there appears to be a direct correlation between quality of the vessel fabrics and the extent and intricacy of decoration Vessels 20 and 27 have particularly fine fabrics, the former has notching on alternate cordons as seen at Marton-le-Moor (Manby 1996) and on Yorkshire Wold sites at Garnaby Top Site 12 and Flamborough Hartondale (Manby 1974) The undulating cordon with linking motif on vessel 20 is reminiscent of Marton-le-Moor Gw22 (Manby 1996), while vessel 28 has an applied decorative pellet on the rim interior in the style also seen on that site

Vessels in the Durrington Walls style (Wainwright and Longworth 1071, 240-42) are again largely fragmentary Vessels generally have thicker walls and a somewhat coarser fabric than those in Woodlands style They include some without evident decoration Raised cordons and patterns of incised lines are the most common decorational traits seen at Nosterfield, the assemblage is generally similar to that from Roecliffe (Manby 1996)

CONTEXT AND ASSOCIATIONS

Grooved Ware occurred in conjunction with other pottery styles in only one instance, pit 1321, which also contained a Peterborough Mortlake sherd Grooved Ware in both Durrington walls style and Woodlands style occurred in only two contexts, pits 1004 and 1054 Other contexts appear to contain either Durrington Walls style or Woodlands style pottery Taken with the fact that some vessels, especially Woodlands style pottery, were represented by single or only a few sherds, this suggests that selective deposition was taking place Beyond noting the characteristic presence of scrapers in association with Grooved Ware, the lithic assemblage is not enlightening

CHRONOLOGY

Nosterfield provides no internal dating evidence for the Grooved Ware assemblage on the evidence from Marton-le-Moor and Roecliffe, North Yorkshire, and other sites, Woodlands style material is suggested to belong to the latter part of the fourth millennium cal BC, while Durrington walls style may have a somewhat later currency, in the first half of the third millennium (Manby 1996)

GENERAL DISCUSSION

The Nosterfield pottery assemblage derives from a series of shallow pits located some 1km north-east of the northernmost of the Thornborough henges In general terms the features are similar to those at other sites in the region that produce Neolithic pottery assemblages, and there is little to suggest that the presence of the nearby henge has a significant influence on the nature of the assemblage Unlike the major henges of Wessex, which have produced distinctive concentrations of Grooved Ware, excavations at Yorkshire henges have been notably poor in finds of any kind, especially pottery Thus limited excavations at the Thornborough henges in 1952 retrieved only a single Neolithic-type sherd from above the cursus (Thomas 1955, 437) and excavations in the ditch terminal of the southern henge in 1996 revealed no pottery at all At Ferrybridge, a henge adjacent to the River Aire some 60km to the south, the assemblage comprised only a few sherds of Grimston style pottery, probable Towthorpe Ware, and Peterborough Ware (Vyner 1997) It cannot therefore be said that Yorkshire henges produce distinctive pottery assemblages, Grooved Ware or otherwise, indeed, on current evidence it would seem that they do not

On the other hand it cannot safely be assumed that the known Yorkshire Grooved Ware assemblages derive from occupation sites, since the majority of assemblages derive from pit groups and only at Hartendale, Flamborough, is there an association with a putative structure (Manby 1974, 70) However, at Willington, Derbyshire, a group of structures interpreted as houses was associated with an assemblage of Grooved Ware (Wheeler 1979) A number of sites on the Wolds comprise pits, generally of the same scale as those found at Nosterfield, which Manby has suggested are evidence for occupation in an area where attrition of the surface chalk has removed shallower features and hearths (Manby 1975, 47-8) An assemblage with Clacton style Grooved Ware characteristics appears to have been associated with activity preceding the construction of an early Bronze Age burial mound at Green Howe, North Deighton, and could conceivably have been related to earlier ritual activity (Manby 1971) At Low Caythorpe, East Riding, Peterborough Ware was retrieved from two of 14 pits in a boundary alignment, and thus may have been associated with ritual rather than domestic activity Grooved Ware was also recovered from a group of six pits (1020), at least three of which appear to have been contemporary (Abramson 1996, 6-9) Unfortunately at Caythorpe as elsewhere, the extent and associations of the pit group are unclear

Table 5 Relative proportions of pottery by weight, minimum number of vessels and sherd count Sherd count includes all sherds over around 150mm², recently divided pieces are counted as one

	minimum number of vessels	sherd count	number of contexts	weight
Grimston style	4	17	2	200gm
Peterborough wares	6	62	4	1780gm
Grooved ware Durrington Walls	7	97	12	1305gm
Grooved ware Woodlands	5	58	9	275gm

All the pottery from Nosterfield derives from pits of varying size and depth, but seldom greater than 1m across or 0 80m deep The two pits containing Grimston style pottery are slightly smaller than the average, but there seems little to distinguish them from pits containing Peterborough Ware and Grooved Ware

There is little mixing of pottery types between pits, suggesting that they were not open for any length of time, a suggestion supported by the generally unabraded state of the sherds Pit 1069 contained Grooved Ware and Peterborough Fengate pottery, but Peterborough Ware was only associated with Grooved Ware in one instance, pit 1321, where a Mortlake sherd was present with Grooved ware of probable Durrington Walls style

An extensive area has been excavated at Nosterfield and the spatial distribution of pits containing pottery is of some interest Not all the excavated pits contained pottery, of 76 pits on the excavation plan, 28 contained pottery Spatially there seems little to distinguish pits that contain pottery from those that do not It is noticeable, however, that the two pits containing Grimston style pottery, pit 1069 and pit 1076, are situated close to the southern end of the excavated area Pits containing Peterborough Ware are also relatively restricted in their distribution, pit 1069 (again) and 1321 being at the southern end of the site and pit 1307 at its centre

The pits containing Grimston and Peterborough pottery are all relatively marginal to the pits which contain Grooved Ware Pit 1307 is especially notable in being located at the centre of the excavated area in a largely 'empty' area Activity associated with the deposition of Grimston pottery seems to have been concentrated at the southern end of the site, while that associated with Peterborough pottery was extended into the central part of the excavated area

Activity connected with the deposition of Grooved Ware appears to have intensified but polarised to north and south within the excavated area The central space, some 70m wide, was occupied by only a few features, the most significant ceramically being pit 1307, which appears not to have bad any other distinguishing features

While it is quite possible that chronologically distinct areas of Nosterfield site remain to be investigated, on the present evidence there is nothing to indicate continuous activity from the period of deposition of Grimston style pottery through to more concentrated activity involving the use of Fengate, Mortlake and Grooved Ware Whether the absence of Beaker pottery from Nosterfield is chronologically or functionally significant has yet to be established

With very few exceptions the Nosterfield pottery is manufactured using clays and grits which could have been obtained within a 16 to 19km radius of the site and therefore might have been made very locally That very local manufacture is at least a possibility is suggested by the fact that Grooved Ware from Low Caythorpe, Humberside, contained fillers obtainable within 2km of the site (Manby 1996a, 44)

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APPENDIX 1 CATALOGUE OF POTTERY

Vessel 1

Jar with plain everted rim, mid-grey surfaces and fabric, numerous small and medium chert grits, and cavities from which small and medium grits have leached, wall thickness 9mm A single plain rim sherd and a small body sherd with a pinched raised cordon, similar in profile to a vessel from North Carnaby Temple Site 11 (Manby 1975, fig 3, 17) Grimston style Wt 10g [1069] (1068)

Vessel 2

Jar, external and internal surfaces and fabric buff-brown, small to medium angular cavities from leached out grits, a few small to medium chert grits Wall thickness 7mm No evident decoration Grimston style Wt 15g [1076] (1075)

Vessel 3

Jar, external and internal surfaces dark terracotta-brown to dark grey, cavities where small grits have leached out, the fabric otherwise smooth and somewhat laminated Wall thickness 6mm Simple plain everted rim, no evident decoration, striations on the lower interior are probably from manufacture Grimston style Wt 50g [1076] (1075)

Vessel 4

Jar, surfaces and fabric dark grey varying to orange-grey Numerous cavities from small and medium leached grits, occasional small chert grits and some quartz sands present Wall thickness usually 5mm, but extending to 10mm at the rim A large plain rim and shoulder sherd shows this to be a plain vessel with a bag-shaped profile Grimston style Wt 100g [1069] (1068)

Vessel 5

Jar, surfaces orange-brown, fabric similarly orange-brown Fine well-made smooth fabric with mica dust and some very small chert grits The chief characteristic is the presence of numerous cavities left by the solution of medium, large and very large grits - some up to 10 by 5 by 6mm - with a few smaller cavities Typical wall thickness 12mm, base thickness 20mm Pc1 Fragments of the rim survive (20%) with a similar proportion of body sherds and the base

Decoration comprises filled triangles of incised lines on the rim surface, the rim upper surface has a chevron of impressed short strokes, below which is a concentric band of oblique strokes above double concentric lines The rim external surface edge has a single row of near vertical fingernail impressions The vessel body has been wholly covered with at least seven rows of fingernail impressions Peterborough Fengate style Wt 480g [1307] (1306)

Vessel 6

Jar, external surfaces brown-orange, internal surface varying from brown-orange to dark grey, fabric orange-brown to dark grey Clay matrix similar to that of vessel 5, but less fine Cavities remain from the solution of small to medium angular grits Numerous medium to large angular chert grits Typical wall thickness 16mm Pc1

The rim upper surface is decorated with filled triangles, the design made up with short impressions The rim interior has three concentric rows of short impressions above two impressed concentric lines The rim external edge has a single row of diagonal varying to vertical fingernail impressions The jar body has a seemingly haphazard covering of short vertical impressions - perhaps made with one or more unevenly edged wood or bone implements The vessel decoration and style is very similar to that of the more finely made vessel 5 Peterborough Fengate style Wt 695g [1307] (1306)

Vessel 7

Jar, external surface varying from dark reddish-brown to grey-brown, internal surface dark grey, fabric varying from between the surface colours The clay matrix seems similar to that of vessels 5 and 6, with mica dust and cavities from the solution of small, medium and large grits Wall thickness 14mm Pe2 The vessel has been poorly fired, resulting in much spalling and disintegration There are a few medium to large angular chert grits and a few medium siltstone flakes

The rim comprises a large collar which has two rows of impressed scores, or perhaps incisions, a single sherd with finger nail impressions suggests that the motifs alternated Traces of indentation on the rim bead may represent a row of very short impressions The body has been covered with what appears to be fingernail scoops set about 10mm apart Peterborough Fengate style Wt 440g [1307] (1306)

Vessel **8** (not drawn)
Jar, fragment with external surface mid-brown, interior surface dark grey and dark grey fabric, the clay matrix similar to vessels 5 and 6, though less well made Grits comprise medium and large angular chert fragments, with a few very small to large cavities from former grits Typical wall thickness 14mm Pe2 The single rim fragment seems to be a wodge of reddish clay from which the neighbouring material has spalled The rim fragment has a chevron of fingernail impressions on its only surviving, upper, surface The vessel body is covered with closely spaced rows of fingernail impressions Peterborough Fengate style Wt 125g [1307] (1306)

There are additionally, unattributable sherds from vessels 7 and **8**, total wt 220g [1307] (1306)

Vessel 9
Jar, external and internal surfaces and fabric dark grey The clay matrix has quartz dust and contains mixed small limestone grits Wall thickness 13mm Pe3 A rim fragment has internal decoration comprising concentric curved grooves, the exterior has oblique short deep incisions along the rim top, below that a chevron of longer incisions The body has further rows of incisions Peterborough Fengate style Wt 25g [1313] (1312)

Vessel 10 (not drawn)
Flake of rim interior, surfaces brown-grey, dark grey fabric, mixed small quartz and limestone grits Pe1 Traces of incised chevron decoration Peterborough Fengate ware Wt n/a [1313] (1312)

Vessel 11
Jar, external surface dark brown-dark grey, internal surface and fabric dark grey Coarse fabric with small to medium quartz, feldspar and mica fragments and medium to large and very large (13 by 9 by 9mm) angular igneous grits - suggested to be either a microgranite or quartz dolerite, the latter perhaps more likely Wall thickness typically 17mm Pe4 Body decoration comprises apparently haphazard dumb-bell-shaped impressions, perhaps made with a bone, the interior has striations probably caused during forming the unyielding fabric Peterborough Mortlake ware Wt 115g [1321] (1320)

This context also contained a few sherds of Grooved Ware, perhaps part of vessel 15 Wt 25g

Vessel 12
Group of sherds with surfaces and core orange, numerous angular chert grits, some decaying, and cavities from lost small to large grits, wall thickness 9mm GW6 Decoration comprises grooved lines, including part of a filled lozenge Although the fabric is similar to vessel 24, both decoration and firing is different Grooved Ware, Durrington Walls style Wt 50g [1004]

Additional 50g in [1002]

Vessel 13
Jar, represented by three sherds, external surface grey-brown, internal surface dark grey, fabric dark grey Numerous small and medium igneous grits and cavities from leached out small to medium grits Wall thickness 9mm GW2 Decorated with

grooved horizontal and converging lines Grooved Ware, Durrington Walls style Wt 40g [1004]

Vessel 14

Jar, external and internal surfaces grey-brown, fabric dark grey with small to medium igneous grits, quartz dust in the clay matrix, which has only sparse very small cavities Wall thickness 6mm GW8 Plain rim with no sign of decoration on the surviving sherds Grooved Ware, Durrington Walls style Wt 50g [1004] (1002)

Vessel 15

Jar, external surface varying from dark grey to brown-orange and orange, internal surface dark grey, fabric varying from dark grey to orange Numerous small and medium quartz sands, some igneous sands and small cavities from the leaching of grits Wall thickness 11mm GW3 The plain rim has horizontal and vertical raised cordons creating an open panel effect The one visible junction has an impression Carbonised accretions on the interior wall Grooved Ware, Durrington Walls style Wt 370g [1011] (1027)

A single body sherd in the same fabric, and probably from the same vessel, has traces of a raised cordon The context also contained Peterborough material A single sherd of vessel 15 also occurs in [1321] (1320) Wt 10g

Vessel 16

Jar rim represented by a single rim sherd, external surface brown-grey, internal surface dark grey, fabric dark grey-brown Smooth fabric with no obvious grits Wall thickness 8mm GW4 Decoration on the rim interior comprises shallow horizontal or converging cord impressed lines, on the outside there are broad but indistinct impressions which may have been formed with cord Grooved Ware, Durrington Walls style Wt <5g [1011] (1027)

Vessel 17 (not drawn)

Jar, external surfaces dark grey, internal surface and fabric dark grey Numerous small, medium and large angular cavities, a few small irregular ?gypsum fragments remain Wall thickness 14mm GW5 A single sherd has traces of a raised vertical cordon, while another has traces of a grooved line, presumed to be evidence of a filled panel Grooved Ware, Durrington Walls style Wt 230g [1017] (1202)

Base sherds and other fragments, external surface brown-orange, internal surface dark grey, fabric colour varying between the two, cavities from numerous missing grits, a few remaining possible gypsum fragments May be part of vessel 17 Wt 25g [1074] (1072)

Vessel 18

Single small sherd, external surface and fabric brown-orange, internal surface spalled, fine fabric GW4 Decorated with a raised cordon which has a neat impressed cord decoration on its centre surface Grooved Ware, Durrington Walls style Wt <5g [1017] (1202)

Vessel 19

Jar, external surface varying from dark brown to orange-brown, internal surface dark grey, fabric variably grey-orange Numerous small and medium cavities from leached grits, a few small possible gypsum fragments remain Wall thickness 11mm GW8 Simple plain rim with no decoration on the surviving body sherds Carbonised accretions on the interior of the rim and base Grooved Ware, Durrington Walls style Wt 105g [1216] (1217)

Vessel 20

Rim fragments, surfaces and fabric dark grey, small cavities from leached out grits, a few small probable gypsum grits remaining Wall thickness 6mm GW6 The thin rim has a neat internal bevel, and its exterior has a series of concentric grooves Body sherds have raised cordons, including a junction between horizontal and vertical cordons which has two impressed grooves Grooved Ware, Durrington Walls style Wt 60g [1054]

Vessel 21 (not drawn)
Body sherds with dark grey surfaces and fabric, numerous small, medium and large cavities from leached out grits, wall thickness 10mm GW5 Three sherds have incised grooves, one with deep, perhaps fingernail, impressions Grooved Ware, Durrington Walls style Wt 35g [1004] (1003)

Vessel 22 (not drawn)
Two sherds, external surface brown-terracotta, internal surface dark grey-terracotta, fabric dark grey Clay matrix has quartz dust and small to medium chert fragments, wall thickness 7mm GW2 One sherd has a fragment of decoration comprising short (4mm) diagonal impressions Grooved Ware, Durrington Walls style Wt 10g [1004[(1001)

Vessel 23
Group of sherds, exterior surface orange-brown, interior varying from brown to orange, mixed small, medium and large angular chert grits, small to medium cavities, and quartz sands, fabric probably GW3 One sherd has traces of a filled triangle of short impressions, seemingly not made with cord, but perhaps using wood or bone Grooved Ware, Durrington Walls style Wt 50g [1105]

Vessel 24
Jar, a few sherds with external and internal surfaces brown-grey, fabric dark grey A honeycomb of cavities remains from the leaching of numerous small to large grits Wall thickness 8mm GW1 Plain upright rim, traces of external converging raised plain cordons Grooved Ware, Woodlands style Wt 25g [1004]

Vessel 25
Jar, external surface brown-dark grey, internal surface dark grey, fabric varying between the two colours A few small to medium igneous grits and some very small quartz sands, wall thickness typically 9mm GW2 The vessel has been poorly fired and most of the body sherds have lost their internal surface Plain rim with no decoration A single body sherd has traces of two converging raised cordons, while a lower wall sherd has traces of impressed possible fingernail decoration Grooved Ware, Woodlands style Wt 130g [1009] (1022)

Vessel 26
Rim fragment, external surface brown-grey, internal surface dark grey, fabric varying between the two colours Fabric matrix has some quartz dust, small to medium mudstone and shale grits GW2 Plain interior, but variable fabric thickness suggests an external horizontal cordon below the narrow rim Grooved Ware, Woodlands style Wt <5g [1074] (1072)

Vessel 27
Rim, surfaces buff-brown, fabric dark grey, cavities where small and medium angular grits have leached out, a few small to medium shale grits remain Wall thickness 8mm GW7 The rim interior has a groove just below the top, the exterior has four raised cordons, with alternating impressed decoration Grooved Ware, Woodlands style Wt <5g [1074] (1073)

Vessel 28
Rim sherds External surface reddish brown, fabric brown-terracotta, internal surface mostly spalled GW2 Internal surface has an applied piece with four short vertical ridges, the exterior has a horizontal groove below which are three converging raised cordons, the middle one plain, the flanking ones with short vertical impressions Below the cordons are traces of diagonal grooves Grooved Ware, Woodlands style Wt <5g [1074] (1073)

Vessel 29 (not drawn)
Jar, external surface mid-brown, internal surface dark grey, fabric varying between the two colours Wall thickness 6mm

GW9 Grooved Ware, Woodlands style Wt 20g [1113]

Vessel 30

Jar, external surface brown-grey, internal surface and fabric dark grey The clay matrix has quartz dust and small to medium cavities from leached grits Wall thickness 8mm GW6 The rim fragment has two concentric internal grooves, the rim exterior has two grooves, below which is a plain rib and a further pair of grooves Tiny fragments have traces of a raised cordon and converging raised cordon, while one body sherd has impressions made by a spatula or similar implement Grooved Ware, Woodlands style Wt 25g [1114]

Vessel 31 (not drawn)

Jar, surfaces and fabric dark brown-dark grey, small to medium igneous grits, a few small to medium cavities from vanished grits Wall thickness 12mm GW3 One sherd has traces of converging raised cordons, another has a few irregular indentations, but most of the pieces are fragmentary Grooved Ware, Woodlands style Wt 30g [1009] (1023)

Part of a base may be from the same vessel Wt 25g [1076] (1075)

Group of sherds, 6+frags, one fragment may have part of a raised cordon GW3, perhaps part of vessel 15 Wt 90g [1010] (1024)

Few sherds, 2+frags, GW4 Wt 10g [1010] (1025)

Group of sherds, 4+frags, GW3 Wt 35g [1010] (1024)

Single small rim sherd, damaged, GW3 Wt 5g [1011] (1026)

Sherds, 2-frags, GW3 F6 Wt 15g [1012] (1020)

Sherds, 2, GW3, one with shallow grooves Wt 35g [1013[(1201)

Sherds, 2, GW3, one with raised plain cordon on exterior and carbonised accretion on interior Appears to be part of vessel 15 Wt 60g [1015]

Sherd, GW2 Wt 10g [1016] (1203)

Rounded lump of ?Peterborough Ware, Pe2, or perhaps simply a piece of baked clay Wt 20g Similar fired clay pellets were present in pit containing Grooved ware at Marton-le-Moor, North Yorkshire (Manby 1996) [1063] (1064)

Group of sherds, 5+frags, GW3 Wt 45g [1090]

Fragments of GW6 Wt 10g [1096]

Group of 7 sherds +frags, GW2, from a plain-rimmed jar, perhaps vessel 13 Wt 35g [1097]

Sherd +frags, GW2 Wt 5g [1099]

Single abraded sherd, GW2 Wt 10g [1101]

Sherd +frags, GW3 Wt 10g [1216] (1218)

Sherds, 3+frags, GW3 Wt 15g [1309] (1308)

Sherds, 2, GW3 Wt 15g [1310] (1311)

POTTERY FROM EXCAVATIONS IN 1996

A group of small sherds and fragments from a vessel of which little indication of form or decoration survives External surface dark brown/dark grey, the interior spalled away, fabric dark grey Traces of narrow impressed, probably twisted cord, decoration Fabric probably Pe1, an identification supported to some extent by the decoration Wt >10g NON96 2 5014

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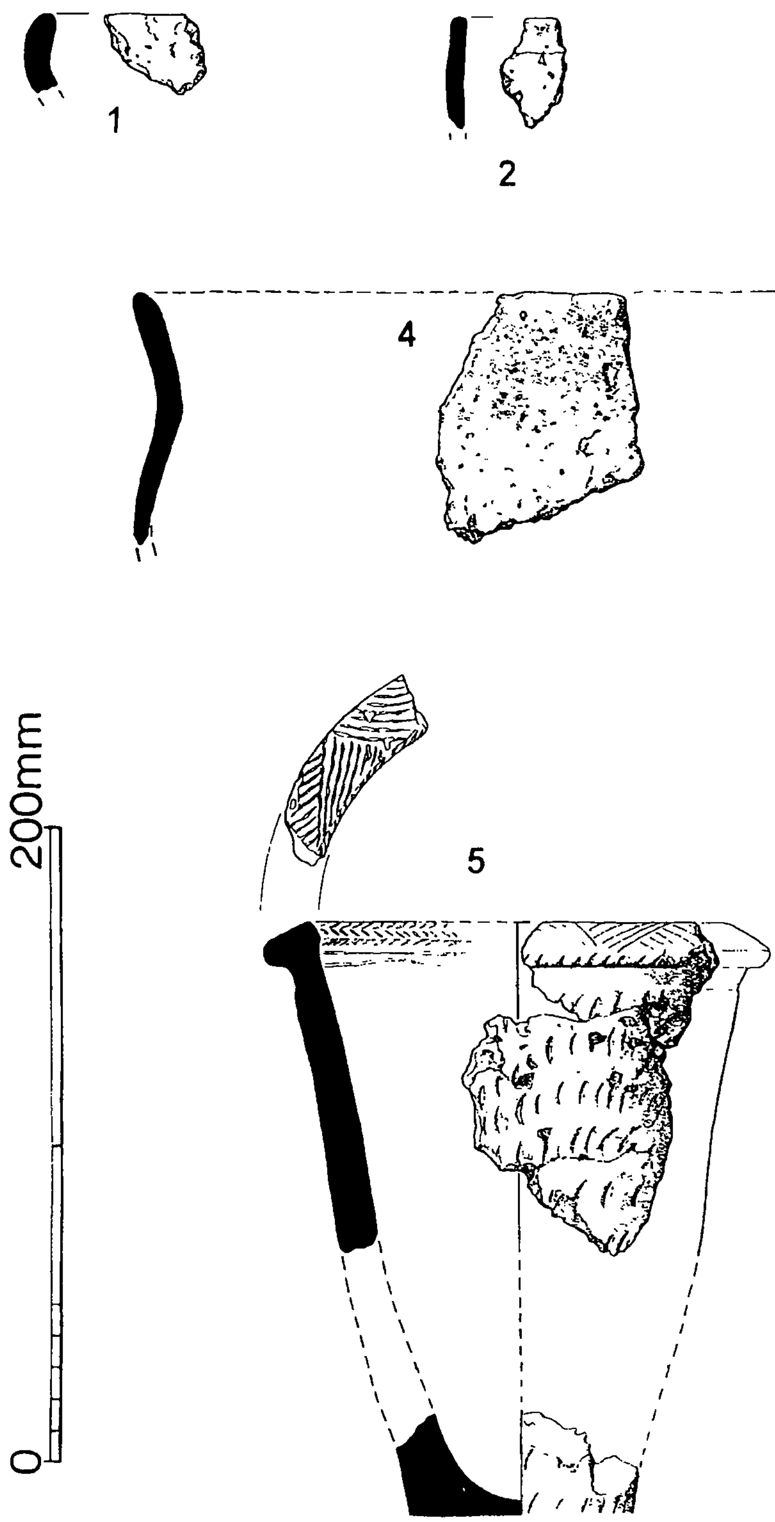

Figure 1 Nosterfield pottery 1 - 4 Grimston ware, 5 - Peterborough ware, Fengate style

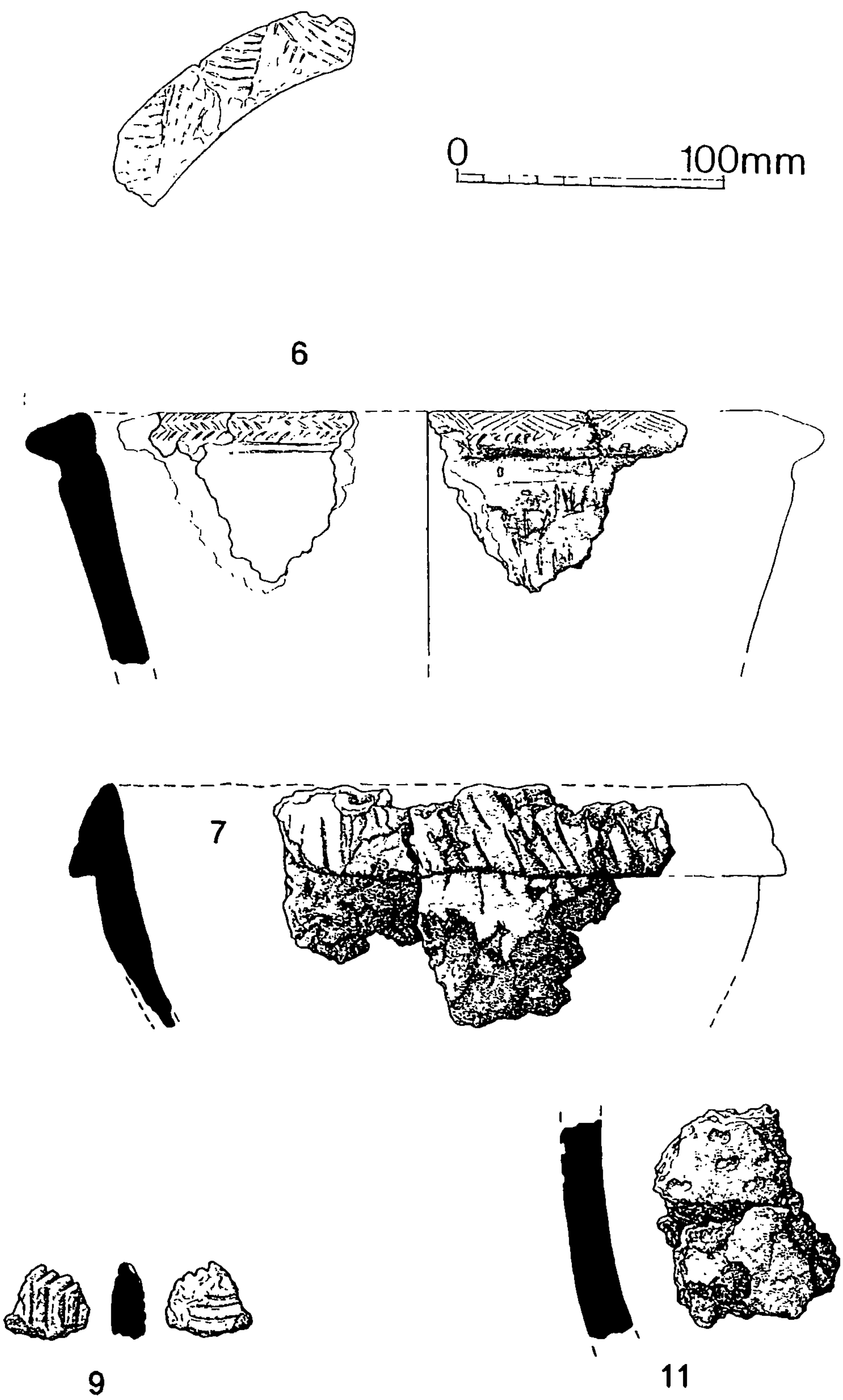

Figure 2 Nosterfield pottery 6 - 9, Peterborough ware, Fengate style, 11 - Peterborough ware, Mortlake style

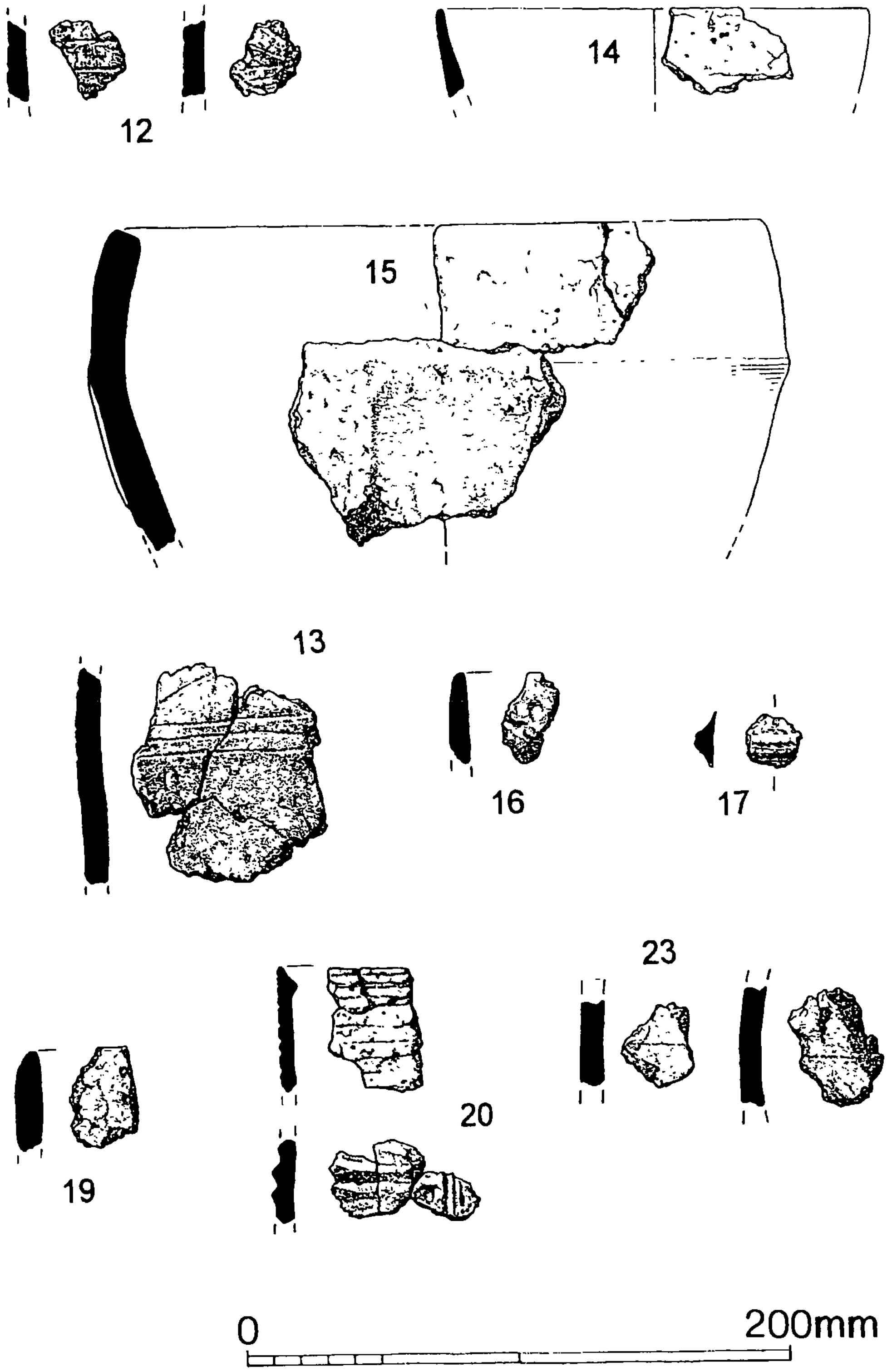

Figure 3 Nosterfield pottery 12 - 23, Grooved ware, Durrington Walls style

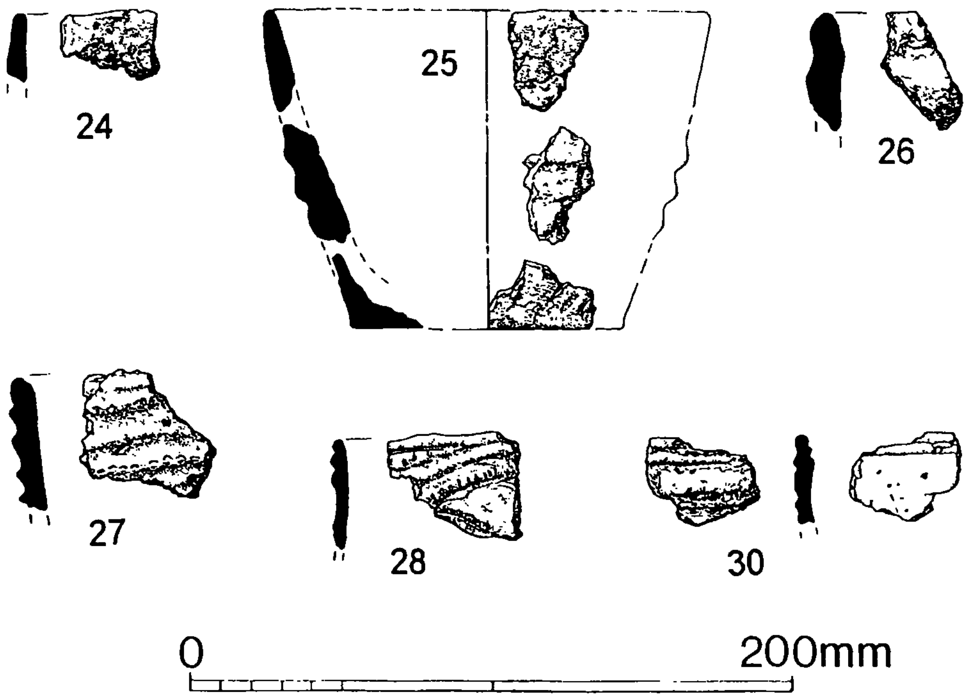

Figure 4 Nosterfield pottery 24 - 30, Grooved ware, Woodlands style

PART 2 EARLY PREHISTORIC POTTERY FROM NOSTERFIELD 1998

Blaise Vyner

1 0 INTRODUCTION

Prehistoric pottery was retrieved from two contexts, C1005 and C1007 The material derives from two distinct chronological horizons, C1005 producing early to middle Neolithic pottery, context C1007 producing pottery of later Neolithic and early Bronze Age style

2.0 TREATMENT

In the fabric descriptions supplied hyphenated colours indicate the variation in colour expected from poorly controlled firing conditions, the first colour being that most in evidence Grit sizes are expressed as small (>3mm) and medium (3-6mm) Distinctive particles smaller than 0 02mm are described as dust The later Neolithic and early Bronze Age sherds were washed in order to clarify the detail of fabric and decoration, but in view of the friable nature of the early Neolithic pottery only a few sherds of this material were washed No thin section analysis has been done and identification has been using a 10x lens Given the limited representation of a small number of vessels with widely varying chronologies quantification by weight has not been considered helpful, instead the minimum number of vessels has been suggested on the basis of fabric, form, and decoration where present None of the pottery has been the subject of conservation

3.0 THE POTTERY

3 1 GRIMSTON WARE

All the pottery from context C1005 comprises sherds from Grimston style bowls, or, in all likelihood, a single bowl The external surface is mid-brown in colour, the internal surface is dark grey and the fabric also dark grey The surfaces have numerous small angular cavities from which grits have leached, the remaining grits comprise only a few grains of mica and rare sub-rounded quartz grains Wall thickness varies from 4 to 6 mm A total of 17 sherds over 10^2 mm in size is present, together with a few smaller fragments, all plain body sherds The total sherd weight is 100 gm, representing probably less than 10% of a single vessel

In contrast to the Grimston Ware previously reported upon from Nosterfield, this pottery does not have the white residues of limestone/chert, suggesting that the leached grits may have been a purer calcite

3 2 LATER NEOLITHIC OR EARLY BRONZE AGE POTTERY

Context C1007 produced a total of eight sherds representing vessels in several late Neolithic or early Bronze Age traditions

Peterborough Ware Single body sherd from a jar, buff-brown external surface, dark grey internal surface, dark grey core, with numerous small and medium angular quartz grits, the clay matrix containing angular quartz grains Wall thickness variable, typically 9 mm Decorated with two rows of fingernail impressions A second sherd in a similar fabric has occasional impressions from the end of a small (2 mm diameter) stick or the like

Grooved Ware (probable) Four small fragments, probably from different vessels, but all in a similar fabric, have orange brown external surfaces and dark grey internal surfaces and fabrics Small to medium angular calcite grits, while a few grains of quartz are present and, in one sherd, a few chert grits Wall thicknesses vary from 7 to 8 mm No decoration is evident In the absence of diagnostic features it is difficult to assign these few sherds to any particular style, but their wall thickness is similar to that of the Grooved Ware vessels previously excavated at Nosterfield (Vyner 1998)

Beaker Two sherds from the same vessel, one of the sherds noticeably more abraded than the other External surface reddish-brown, internal surface and fabric dark grey, the fine sandy fabric has grains of mica, small limestone grits and medium sized pieces of grog Wall thickness 8mm Decoration comprises a zone of short diagonal impressions flanked above and below by a single comb-impressed line Above that are two converging lines of comb impressions

4.0 COMMENTARY

It may be noted that while the Grimston Ware fabric has numerous calcitic grits which had leached out leaving the usual 'corky' appearance, calcitic grits in the Grooved Ware had not dissolved, reflecting either a shorter period of deposition, different context characteristics, or a combination of both factors

Although very small, this assemblage is interesting in two respects Firstly, the earlier Neolithic Grimston Ware and the later Peterborough Ware and probable Grooved Ware closely reflect the pottery previously found in earlier excavations at Nosterfield Secondly, the Beaker sherds add a further, and chronologically slightly later, dimension to that assemblage, underlining still further the similarities between the Nosterfield pottery assemblage and that from Marton-le-Moor, between the rivers Nidd and Swale, some 18km to the south, where Grimston Ware, Peterborough Ware and Grooved Ware was also joined by a small amount of Beaker (Manby 1996) Beyond this, the regional context for this material has been presented in the earlier report on pottery from Nosterfield

References

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PART 3 POTTERY FROM ARCHAEOLOGICAL EXCAVATIONS AND WATCHING BRIEFS AT NOSTERFIELD 1999-2002 –

Blaise Vyner

1.0 INTRODUCTION

Excavations and watching briefs undertaken at Nosterfield over the period 1999-2002 have recovered a relatively large assemblage of prehistoric pottery which augments the material found during previous work (Vyner 1999) The present assemblage confirms an intensity of activity during the later Neolithic and indicates continued use of the area during the middle Bronze Age Pottery of the earlier Bronze Age, which has been recovered from the area in small quantities during previous archaeological work, is not present in this assemblage

2.0 TREATMENT

In the fabric descriptions provided hyphenated colours indicate the variation in colour expected from poorly controlled firing conditions, the first colour being that most in evidence Grit sizes are expressed as small (<3 mm) and medium (3-6 mm), and large (6-9 mm) Distinctive particles smaller than 0 02 mm are described as dust As a general guide, grit quantities have been described in relation to the estimated average number of pieces visible per 100 mm square occasional (1 or less), few (2), many (3 to 4) and numerous (5 or more) Sherd weights have been rounded to the nearest 5g No thin section analysis has been done and identification has been made using a 100× microscope Quantification excludes fragments with a total surface area of less than around 100^2 mm

3.0 CERAMIC RANGE AND CHRONOLOGY

The majority of the pottery belongs to the later Neolithic period, with a small quantity which may be assigned to the middle Bronze Age

3 1 NEOLITHIC POTTERY

Nosterfield is one of a growing number of locations in the northern part of the Vale of York where the surviving earthwork monuments have been joined by pits and other cut features which have produced assemblages of Neolithic pottery (Manby 1999, 57) Grooved Ware from locations along the Ure at the southern end of the Vale of Mowbray, at Nosterfield and Marton-le-Moor, have now been joined by finds of Woodlands style from the Scorton area in the Swale valley to the north of Catterick (T Manby pers comm)

A small proportion of the pottery comprises thin-walled (walls between 6 and 7 mm thick) vessels with plain near-upright or everted rims The limited number of sherds and their small size precludes certainty, but it appears that this material is undecorated This pottery belongs to the Grimston Ware tradition, which extends from the earlier Neolithic Better known from a scatter of sites in eastern Yorkshire (Manby 1975), Grimston Ware style pottery has been recovered from previous excavations at Nosterfield Grimston Ware carinated bowls are in use from the beginning of the fourth millennium BC, although they may have been restricted to ceremonial functions (Manby et al 2003, 47), only later being adopted for domestic use There is no evidence that any of the vessels from Nosterfield is carinated, and it may be that these vessels are relatively late in the Grimston Ware tradition and that their currency overlapped with that of the Grooved Ware

The greater part of this assemblage comprises later Neolithic Grooved Ware pottery, a notable feature of previously excavated assemblages from Nosterfield (Vyner 1999) This style of pottery has been the subject of recent review (Manby 1999) and there is at present little that can be added to that discussion The assemblage contains mostly small sherds which preclude the reconstruction of vessel profiles and the recovery of the complete decorative patterns It is therefore difficult to assign the pottery to the Grooved Ware component styles - Clacton, Woodlands or Durrington Walls - always assuming that the region has not developed its own variants The range of decoration present here is dominated by incised undulating lines and horizontal furrowed cordons, although some infilled grooved panels are also visible, together with raised plastic cordons - although whether horizontal or vertical is unclear Grooved lines are not a diagnostic feature, but the absence of whipped cord decoration argues against the presence of any quantity of Durrington Walls style pottery, while the absence of point decoration suggests that Clacton style material is also not a significant presence The conclusion is that this material belongs mostly to the Woodlands style or a variant of that, as is clearly indicated by a rim sherd with Woodlands style plastic decoration (C1036 F16)

There is currently no internal dating information for any of the pottery, however, Manby has pointed out the early range of dates for Grooved Ware from Marton-le-Moor, which extends from 3200 BC to 2800 BC (Manby 1999, 68)

A small amount of Peterborough Ware is also present in the assemblage This material derives principally from two contexts (C1180 F136 sf12 and C1214 sf2) The sherds are all small and damaged and there is little that may be said beyond noting their presence Pottery of this kind is only sparsely distributed across lowland Yorkshire, and its relative absence is emphasised by the recovery of Grooved Ware in increasing quantities

3 2 BRONZE AGE POTTERY

A small component of the assemblage comprises fragments of barrel-shaped and open jars, many without diagnostic features A common characteristic is an association with small quantities of cremated bone, and there are some similarities with vessels which are generally assigned to the middle Bronze Age, between 1550 and 1150 cal BC (Manby et al 2003, 64-65)

4.0 DISTRIBUTION OF CERAMICS ON SITE

The Neolithic pottery all derives from the fill of pits and other cuts which appear to be non-structural This provenance is typical for domestic assemblages of Neolithic date within the region (Manby *et al* 2003, 47), and at present is interpreted as an indicator of settlement activity with a domestic bias within which ritual was no doubt strongly embedded

A small assemblage of pottery of apparent middle Bronze Age date derives from a series of pits which may represent the remains of a cremation cemetery, these features are loosely associated with a small ring ditch (F148) which may have surrounded a small burial mound, perhaps the original focus for the burial activity

5.0 NOS99 INTERVENTION 1

C1140 **F115 SF8**

At least seven Grooved Ware vessels are represented by rim sherds, but since all the rims bear incised decoration, and a quantity of body sherds have raised plastic decoration, it is likely that the actual number of vessels represented is greater - perhaps twelve Body sherds suggest that incised decoration comprised mostly sets of two or three undulating lines, although the presence of filled lattices is indicated on a fragment of wall base Furrowed cordons seem also to have been employed in undulating sets of two, three or four, with no evidence for knots or other applied decoration on the sherds present The rim sherds are all small, none being larger than 40x35mm, and no significant profiles of vessels can be reconstructed

Vessel surface colours range from brown-purple through to orange-brown, suggesting poorly controlled firing to a relatively low temperature Vessel fabrics are all similar, having contained variable quantities of angular grits which have leached out leaving a friable matrix Other grits appear to have been incorporated by accident rather than design, and comprise occasional mudstone and quartz grits

1 Vessel 1

Jar, plain interior, wall thickness 11 mm, incised grooves on the rim exterior Grooved Ware

2 Vessel 2

Jar, wall thickness 9 mm, plain interior with raised bevel, two incised grooves around the exterior Grooved Ware

3 Vessel 3

Jar, wall thickness 8 mm, plain rim with raised cordon on interior, two shallow incised grooves around the exterior Grooved Ware

4 Vessel 4

Jar, wall thickness 10 mm, deep groove on rim upper edge, two deep incised grooves undulating around the exterior Grooved Ware

5 Vessel 5

Jar, wall thickness 7 mm, raised bevel on rim interior, shallow groove around the exterior Grooved Ware

6 Vessel 6

Jar, similar to vessel 5, but with a plain interior surface Grooved Ware

7 Vessel 7

Jar, wall thickness 9 mm, interior rim edge bevelled, deep incised groove around the exterior Grooved Ware

C1141 F116 SF5

Also from this context two undiagnostic sherds and two pieces of ceramic which may derive from a hearth

8 Jar, exterior surface buff-terracotta, interior surface buff, fabric dark grey, cavities from which occasional large and medium-sized, and numerous small, angular gypsum grits have leached, occasional small milky quartz and mudstone grits, wall thickness 12 mm, incised grooves apparently set in groups of four undulating lines Grooved Ware

C1142 F117 SF15

9 Jar, rim sherd (1 sherd plus fragment) in fabric similar to a vessel in **F336** (A), and thus perhaps Grimston Ware tradition

C1143 F118 SF10

10 Jar, body sherds (2 sherds plus fragments), re-brown surfaces, dark grey core, many mixed medium and occasional large mudstone grits, typical wall thickness 7 mm, external surface abraded but a furrowed cordon is visible Grooved Ware

C1148 SF6

55 Jar, brown-grey exterior surface, dark grey interior surface, dark grey fabric, cavities from which numerous small and medium-sized, and a few large, calcareous grits have leached, occasional small rounded milky quartz sands, typical wall thickness 10 mm Sharply everted plain rim with a rounded edge, no visible decoration on the sherds present Neolithic, but uncertain style and date

C1163 F131 SF3

Four vessels are represented in the assemblage from this context, all Grooved Ware

11 Jar, globular form, surfaces brown-grey, fabric dark grey, hard smooth fabric with a few mixed small and medium-sized quartz and mudstone grits, wall thickness 7 mm (18 sherds plus fragments), plain inverted rim Neolithic, uncertain style

12 Jar, brown-grey exterior surface, dark grey interior surface and fabric, many small and a few medium-sized cavities from which calcitic grits have leached, wall thickness 9 mm (1 sherd), on the exterior a series of incised undulating grooves similar to vessel 1 in F142 Grooved Ware

13 Jar, terracotta-brown surfaces, dark grey fabric, occasional angular medium-sized mudstone grits, wall thickness 7 mm (1 sherd), slightly everted rim with small external bead Perhaps Grimston Ware

14 Jar, exterior and interior surfaces dark grey, fabric dark grey with numerous small quartzitic grits and a few angular quartz sands (5 sherds plus fragments), everted rim with small external bead Perhaps Grimston Ware

C1166 F134 SF17

15 Ceramic fragments (6 sherds), perhaps not a vessel, buff-orange surfaces and fabric, fine sandy fabric with occasional cavities from which variously sized calcareous grits have leached, wall thickness variable from 4 to 7 mm, indeterminate shape, but perhaps a plaque

C1167 SF21

16 Jar, small sherd (1 sherd) from a medium-walled vessel

C1173 SF19

17 Jar, fragment of a thin-walled vessel

C1176 F159 SF18

18 Ceramic fragments

C1179 F143 SF7

19 Jar, sherd (1 sherd) with exterior and interior surfaces dark grey, fabric dark grey, numerous small and a few medium-sized cavities from which calcareous grits have leached, some remaining decayed gypsum fragments, typical wall thickness 7 mm, long flared everted rim with variably formed small external bead, no decoration present Grimston Ware tradition

20 Jar, (30 sherds plus fragments) brown-grey exterior surface, dark grey interior surface, dark grey fabric, numerous small and occasional medium-sized milky quartz and quartzitic grits, occasional small mica chunks, typical wall thickness 8 mm, everted plain rim Grimston Ware tradition

C1180 F136 SF12

Sherds from two Peterborough Ware vessels are present from this context

21 Jar, buff-brown exterior surface, dark grey interior surface, dark grey fabric with many medium-sized and large angular quartzitic grits, typical wall thickness 12 mm (5 sherds plus fragments), decorated with rows of indistinct sub-rectangular impressions Peterborough Ware

22 Jar, exterior surface dark grey, interior surface dark brown, fabric dark grey, many small and medium-sized angular mudstone grits, typical wall thickness variable between 6 and 10 mm (9 sherds plus fragments), short everted rim with a row of indentations following the outer edges of the rim surface, a shoulder sherd has rows of diagonally-set

impressions perhaps made with bird bone Peterborough Ware

C1193 F141 SF9

23 Jar, a few sherds (3 sherds plus fragments) from a vessel similar to or the same as vessel 2 in **C1194** Peterborough Ware

C1194 F139 SF4 (vessel 1)

57 Jar, orange-brown exterior surface, grey-orange interior surface, dark grey fabric, cavities from which numerous small and medium and large calcareous grits have leached - the cavities are fewer and shallower on the interior surface, typical wall thickness 8 mm Plain everted rim, no visible decoration on the sherds present Grimston Ware

C1194 F139 SF4 (vessel 2)

58 Jar, brown exterior surface, dark grey interior surface, dark grey fabric, cavities from which numerous small and medium and a few large calcareous grits have leached - the cavities are fewer on the exterior surface, typical wall thickness 10 mm Plain everted rim, burnished exterior surface, no visible decoration on the sherds present Probably Grimston Ware

C1194 F139 SF4 (vessel 3)

59 Jar, dark grey exterior surface, dark grey interior surface, dark grey fabric, cavities from which numerous small and medium and a few large calcareous grits have leached - the cavities are fewer on the exterior surface, typical wall thickness 11 mm Plain everted rim, burnished exterior surface, no visible decoration on the sherds present Grimston Ware

C1195 F142 SF1

Eight Grooved Ware vessels are represented, mostly by single rim sherds, while the context contains a range of damaged body sherds not readily attributable to any specific vessel (51 sherds plus fragments) Fabrics are all similar, with many small and a few medium-sized cavities from which gypsum grits have leached, other grits comprise occasional small quartz and milky quartz fragments and occasional small and medium-sized mudstone fragments, there is mica dust in the clay matrix

24 Vessel 1

Jar, grey-brown interior and exterior surfaces, fabric grey-brown, wall thickness 10 mm, plain upright rim with incised cordon on the exterior Grooved Ware

25 Vessel 2

Jar, similar colours to vessel 1, wall thickness 10 mm, upright rim with a furrowed cordon on the interior, three furrowed cordons around the exterior Grooved Ware

26 Vessel 3

Jar, similar colours to vessel 1, thin-walled vessel with typical wall thickness 5 mm (2 sherds), upright rim with intersecting lattice of grooves on the exterior Grooved Ware

27 Vessel 4

Jar, similar colours to vessel 1, wall thickness 11 mm, upright rim with two furrowed cordons, furrowed cordon on rim exterior Grooved Ware

28 Vessel 5

Jar, similar colours to vessel 1, wall thickness 9 mm, traces of a furrowed cordon on the rim interior, two deeply furrowed cordons on rim exterior Grooved Ware

29 Vessel 6

Jar, exterior surface brown-terracotta, interior surface mid-brown, fabric dark grey-brown, wall thickness 10 mm, rim has internal raised bevel, rim exterior has four horizontal grooves Grooved Ware

30 Vessel 7

Jar, pink-orange surfaces and fabric, wall thickness 9 mm, raised bead on outer edge of rim Grooved Ware

31 Vessel 8

Jar, brown-orange exterior surface, grey-orange interior surface, dark grey fabric, friable fabric with many cavities, wall thickness typically 12 mm, raised cordon on rim interior Grooved Ware

C1196 F140 SF11

32 Jar, a few abraded sherds (4 sherds plus fragments) of formerly calcite-gritted ware, similar to vessel 1 in C1194 Grooved Ware

C1202 F153 SF13

33 Ceramic fragments

C1203 F154 SF14

34 Jar, small sherds (3 sherds) from a medium-walled jar, similar to vessel in F142 Grooved Ware

C1203 F154 SF14

35 Jar, sherd (1 sherd) with groove, similar to vessel from F142 Grooved Ware

C1204 F155 SF20

36 Jar, sherd (1 sherd plus fragment) from medium-walled vessel similar to vessel in F142, grooved decoration Grooved Ware

C1214 SF2

This context contains small amounts of pottery from what appear to be three vessels, all Peterborough Ware

37 Vessel 1

Jar, dark grey exterior surface, brown-grey interior surface, dark grey fabric with occasional small and medium-sized cavities, occasional small angular milky quartz grits, a row of diagonal slashes on the interior of the rim, herring bone slashes along the rim upper surfaces, external rolled bead

38 Vessel 2

Jar, dark brown exterior, dark grey interior, dark grey fabric, dense fabric with occasional mixed small sands, the exterior has a horizontal raised cordon with a row of deep finger-nail impressions to either side Eight sherds plus fragments may belong to this vessel - or partly to another, since all but one is plain

39 Vessel 3

Jar, grey-orange exterior, dark grey interior, dark grey fabric with numerous large and medium-sized angular milky quartz grits (4 sherds), the interior of one sherd has two 'maggot' impressions made using thick cord

C1217 F158 SF16

40 Jar, sherds (2 sherds) from a thin-walled vessel, similar to sherds in C1214

6.0 INTERVENTION 2 (walkover of Intervention 1 area)

This small assemblage contains little diagnostic material apart from a sherd of Peterborough Ware (SF54) The remaining material, however, also appears to belong to the Neolithic period, with a few pieces from thin-walled (6-7 mm) plain bowls with quartz grits (SF 34, 38 and 59) in the tradition of Grimston Ware, fragments of slightly thicker-walled (9 mm) vessel with mudstone grits (SF 40 and 41), and pieces of more substantial (average wall thickness 10 mm) soft-fired fabric which may be Grooved Ware (SF 35 and 37) Similar material was recovered in larger quantities from excavated contexts in this area

SF34

41 Jar (3 sherds), dark grey fabric, numerous small and medium-sized angular milky quartz grits, mica dust in the clay matrix A thin-walled vessel Grimston Ware style

SF35

42 Jar, (2 sherds plus fragments) from a similar vessel to SF37 below Traces of impressed decoration, perhaps made with a comb Grooved Ware

SF37

43 Sherds from a thick-walled vessel, exterior surface brown-orange, soft dark grey fabric and interior surface, a few small mudstone grits, no trace of decoration Probably Grooved Ware

SF38

44 Ceramic fragment from a thin-walled vessel, mid-grey fabric with occasional small angular milky quartz grits Grimston Ware style

SF40

45 Ceramic fragment from a medium-walled vessel, surfaces brow-red, mid-grey fabric with numerous mixed angular mudstone grits Probably Grooved Ware

SF41

46 Ceramic scrap, similar fabric to SF40 Probably Grooved Ware

SF54

47 Body sherd, medium-walled vessel, exterior surface brown-grey, interior surface brown, fabric dark grey, occasional angular quartz grits, occasional cavities from which small calcareous grits have leached, occasional medium-sized pieces of mudstone Part of a single row of indistinct rectangular impressions - made perhaps using a reed - is visible Peterborough Ware

SF59

48 Plain rim and fragments of a thin-walled vessel, dark grey surfaces and fabric, numerous small milky and clear quartz and other sands, occasional small mica plates Grimston Ware style

7.0 INTERVENTION 5

Conservation of the fabric prior to examination of the pottery from this intervention makes identification difficult

C1135 F91

49 Urn. barrel-shaped, exterior surface buff-brown, interior surface buff-grey, fabric mid-grey, many medium-sized angular cavities from which gypsum grits have leached. occasional small and medium-sized angular pieces of grog or ceramic Plain. slightly everted, rim with a single shallow line of cord impression below the outer edge This vessel has some similarity with an open dish from Rudston Wold (Manby 1980, 324, fig 8 2) Middle Bronze Age

C1036 F16

50 Jar, sherds and fragments probably from the same vessel, exterior surface mid-brown, interior surface terracotta, fabric dark grey, occasional small quartz grits and occasional medium-sized mudstone fragments, the rim sherd has indentation - perhaps finger-nail - in the rim upper and a cordon with applied knots surface above a raised horizontal cordon A body sherd has raised bosses or the beginnings of a cordon This is a Grooved Ware vessel in Woodlands style (Manby 1999, 60-64) >From a pit close to a pit alignment, but not necessarily associated with the alignment

C1136 F92

51 Urn, fragments of the lower part of a vessel only, exterior surface grey-buff, interior surface dark grey, fabric dark grey, occasional small and medium-sized cavitied from which calcitic grits have leached - with a few surviving, many mixed small and medium-sized grits, mudstone grits Traces of an indentation at the base of the wall probably reflect manufacture rather than decoration Middle Bronze Age

C1137 F93

52 Urn. fragment of base, buff-brown external surface, dark grey interior surface and fabric Numerous angular mixed grits which are perhaps chert or a mineralised vein rock Base diameter around 180 mm, no other detail present Probably middle Bronze Age

C1140 F96

53 Urn(s), fragments from the lower part of what appears to be two distinct vessels, one of which has been placed within the other The outer vessel has buff-mid-brown exterior and interior surfaces, with a dark grey fabric, conservation has made it difficult t identify grits, but there appears to be numerous medium-sized mudstone grits The vessel has been poorly fired and a narrow segment of the lower wall. some 110 mm wide, survives This vessel appears to have been charged with a deposit of cremated bone, of unknown quantity, before the second vessel was placed within it

54 The second vessel is very similar in colour and construction, except that parts of its outer surface have been fired to a dull red colour Although it might at first appear that the fragments represent just one vessel which has collapsed, the presence of fragments with base angle resting upon the remains of the cremation suggest that this cannot be the case, and that a second vessel was placed within a first It is thought that the complete base which is present belongs to the second vessel Probably middle Bronze Age

C1157 F106

56 Urn, bucket-shaped vessel, exterior and interior surfaces dark brown, the vessel is complete and had been the subject of conservation prior to examination, hence detail of the fabric is not clear, although it appears to be tempered with quartz and other sands and occasional angular medium-sized mudstone grits Height 110 mm, base diameter 115 mm, rim diameter 160 mm, typical wall thickness 15 mm The vessel is undecorated and appears to have been slab rather than coil constructed This vessel would appear to belong to the middle Bronze Age, to which a few bucket-shaped vessels from North Yorkshire may be assigned (Manby 1980, 317-19) Similar to a vessel from Stanghow Moor, Cleveland (Manby 1980. fig 5 12, Atkinson 1863)

C1755 F336 (A)

60 Jar, (12 plus fragments) exterior surface brown-grey, interior surface dark grey, fabric dark grey, numerous small angular milky quartz grits, typical wall thickness 8 mm, no rim form or decoration present Perhaps Grimston Ware tradition

C1755 F336 (B)

61 Jar, sherds (18 plus fragments) from a soft fired vessel, exterior surface mid-brown, interior surface dark grey, fabric grey-brown, numerous small and medium sized milky and clear quartz and quartzitic grits, occasional small and medium-sized water-rolled silt pebbles, the grits are most visible in the fabric and interior surface, wall thickness variable between 9 and 11 mm - there may be sherds from two vessels here, no visible decoration Neolithic, uncertain style

C1240 F82 SF130

62 Single sherd of plain pottery, fine sandy fabric Date and style uncertain

C1263 F102 SF133

63 Two fired clay fragments from a hearth or oven

C1137 F93

64 A few fragments (>5 mm) of ceramic, unidentified **F93 C1137 SF177** Associated with middle **B**ronze Age pottery and probably of that chronological horizon

PIT ALIGNMENT F145-F190

C1202 F135 SF129

65 Two sherds plain pottery

C1206 F137 SF135

66 Two fragments of thick-walled pottery or ceramic, unidentifiable

C1219 F141 SF134

67 Fragments, unidentifiable

C1256 F156 SF132

68 Fragments, unidentifiable

C1288 F169 SF136

69 Ceramic scrap, perhaps a deformed sherd but more likely to be from the base of a hearth or oven

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S10941

PART 4 POTTERY FROM NOSTERFIELD 1999

Blaise Vyner

Intervention 4 F8 C1011

Single run sherd of Torksey or Torksey-type Ware The known production source is the Lincolnshire town, although other kilns may have existed Found in urban assemblages from York, and in east Yorkshire, this fabric does not appear to be widely distributed in assemblages from North Yorkshire Datebale to the 10th to 11th century

S10942

PART 5 ASSESSMENT OF THE ROMAN AND LATER POTTERY FROM NOSTERFIELD

Barbara Precious and Alan Vince

One hundred and sixty-five sherds of pottery, representing no more than 128 vessels and weighing 1 860kg from a watching brief at Nosterfield Quarry, North Yorkshire, carried out by Field Archaeology Specialists were submitted for identification and assessment

The pottery consists of a group of Romano-British date and a small number of medieval and later sherds The Roman material is moderately abraded but includes several groups of sherds from the same vessel (sherd families) It is likely that the occupation which gave rise to this debris was situated on or close to the site By contrast, the medieval and later sherds are smaller, more abraded and include no cross-fitting sherds It is likely that these came onto the site with manure and that the settlement they originated in could be some distance from the site, although two small sherds (one broken into three post-burial) were recovered from occupation features - a well and a pit/kiln complex (Features 202 and 102 respectively)

1.0 DESCRIPTION

ROMAN

The Roman pottery fabrics were recorded according to the system employed at York (Table 1 1993, 1997)

One hundred and forty-seven sherds of Romano-British pottery were recovered from the excavations Ninety-five of these were greywares of various sorts (a number of which appear to have been made at York, Eboracum wares) but there were also sherds of amphora, mortaria and samian ware In total, 22 sherds were imported, 15 came from other British provinces, 7 were of York origin and the remaining 103 were of unknown but probably northern origin

Table 1

cname	Narrow cname	Imported	Regional industries	Unknown British?	York	Total
AP25	Amphorae	10				10
B0	Grey B			5		5
B0?	Grey B			5		5
B1	BB1		14			14
B2	BB2		1			1
B6	BB2			68		68
EL?	Ebor				3	3
G0	Grey			13		13
G1?	Grey				1	1
M0	Mortaria			6		6
M3-6?	Mortaria				2	2
M14	Mortaria		1			1
O0	Misc Oxid			4		4
P0	'White'			2		2
S1?	SGS	1				1
S2?	LMDV samian	1				1

ename	Narrow ename	Imported	Regional industries	Unknown British?	York	Total
S3	CGS	7				7
S3?	CGS	3				3
W1	Ebor white				1	1
Total		22	15	103	7	147

Although a number of the imported sherds did come from sherd families, there were still 15 separate vessels represented and so this high non-local and imported pottery frequency cannot be explained as being an accident of recovery

The amphora sherds are all of Dressel 20 type (AP25) This type was produced in southwest Spain and used mainly for the transportation of olive oil

The black burnished wares include unidentified examples (B0), Dorset Black-Burnished ware (BB1, York B1), and Black-Burnished ware 2 (BB2, York B2 and B6) B2 is the wheelthrown BB2 fabric produced in Essex and Kent

Only one standard Ebor ware (E1) was tentatively identified but two of the mortaria sherds (M3-6?) and one white-slipped vessel (W1?) were found This suggests that the site relied on other, more local, sources for its coarse cooking pottery but still acquired finer vessels from York

Fourteen sherds of unidentified greyware (G0) and one sherd of a local greyware of a type found at York (G1) was tentatively identified

Six unidentified sherds of mortaria were recovered (M0) These should be submitted to a specialist (Kay Hartley) for identification if the material is to be published

There were four sherds of miscellaneous oxidized wares (O0) and two sherds of whiteware (P0)

The samian wares include one example of a South Gaulish samian (S1) form Dr18/31, one extremely abraded sherd, possibly from the Les Matres de Veyre factory, 7 positively-identified sherds of a Central Gaulish samian ware decorated form Dr37 and 3 possible examples, one from a dish and two from a form Dr18/31 vessel The samian ware should also be examined by a specialist should the material be published

The range of vessel forms present (Table 2) indicates a wide range of functions, using in food preparation and storage (amphora, jars and mortaria) and serving (Flagons, Samian ware, dishes and beakers) The latter vessels are mainly imported and the former mainly local although examples of regionally imported jars are present There is, however, an absence of bowls, which are normally a common element in Roman pottery assemblages throughout the Roman occupation

Table 2

FORM	Broad class	Imported	Regional industries	Unknown British?	York
18/31	Samian	1			
37	Samian	6			
AP25	Amphora	5			
D	Dishes	1	1		

FORM	Broad class	Imported	Regional industries	Unknown British?	York
DF	Dishes			1	
F	Flagons			1	
J	Jars			8	2
JC	Jars		3	59	
K	Beakers				1
M	Mortaria			4	

The Roman pottery indicates a settlement in which food was prepared and served in the Roman manner and this probably indicates that the users were Romanised natives or perhaps members of the administration Whether there was a difference in pottery supply or use between these two groups would require further research

The date of the occupation is broadly-speaking late 1st to early 3nd century but there are only 19 sherds which come from contexts which do not also contain early 2nd-century or later wares These contexts are 1084, 1138, 1199, 1239, 1298, 1349, 1365, 1554, 1698 and 1995 Only one of these contexts produced more than a single sherd (1239) and it is very likely that these contexts too date to the early to mid 2nd century but contained assemblages which are too small to contain the diagnostic, datable types

A single sherd of Les Matres de Veyre samian ware was found This factory was in operation c 100-120 AD but its products may have continued to be stockpiled and sold much later The Central Gaulish samian ware dates to 120 AD or later and is present in several contexts A number of contexts contain either BB1 or other burnished wares, assumed to be influenced by the fashion for BB1 and therefore of similar starting date These wares first appear in northern England in the Hadrianic period In total, the following contexts produced pottery dating to the 2nd century or later 1122, 1128, 1133, 1139, 1148, 1149, 1309, 1367, 1399, 1513 and 1715

The latest datable type present is a sherd of Mancetter/Hartshill mortaria, a wall-sided mortaria of early 3rd century date There are no sherds of Dales ware, Calcite-tempered wares, Nene Valley colour-coated wares, Crambeck wares or any other types which might be expected if occupation continued into the later 3rd and 4th centuries

MEDIEVAL

Eleven sherds of medieval pottery were found All are small and abraded They include sherds of wheelthrown gritty wares, tempered with fragments of Millstone Grit sandstone and its constituents, North Yorkshire whiteware, either from the Brandsby kilns or other industries using the white-firing clays which outcrop around the borders of the North Yorkshire Moors, a possible sherd of Tees Valley ware, produced somewhere on the south side of the Tees valley, and a sherd of Humber ware, made from a silty clay somewhere in the Humber wetlands It is unlikely that any of these sherds are earlier than *c* 1150 whilst most are likely to be high or late medieval (i e later 13th to 15th centuries)

POST-MEDIEVAL

Three sherds of post-medieval pottery were found One of these, an untempered red earthenware, might be a fragment of tile rather than pottery (PMX) Another is a lead-glazed red earthenware with a white internal slip, of the type produced in northeast England in the 18th and 19th centuries (SUND) The third is a sherd of Reversed Cistercian ware This type was a minor product of industries such as that at Wrenthorpe where small cups decorated with applied brown clay and covered internally and externally with a thick lead glaze were produced alongside the standard Cistercian ware types, which have a red-firing body and are decorated with white applied slip The type is of 16th to early 17th-century date

ASSESSMENT

The Roman pottery comes from a settlement of early 2nd to 3rd century date which may have its origins in the later 1st century, although this is doubtful The range of wares and forms present suggests that the users cooked and served their food in a Roman manner and there is little evidence for the use of handmade 'native' wares (apart from a sherd from context 1391) It is possible that occupation was present on the site before this date but that the occupants continued to use the same pottery types as they had in the Iron Age The mould-makers stamp on the samian ware bowl is comparatively rare and the sherd should be sent to Ms B Dickinson, who is compiling a National Corpus of samian stamps The unidentified mortaria and the decorated samian ware, however, only require specialist identification if the collection is to be published since they might aid closer dating and provide more information on pottery supply

The medieval and later pottery from the site is small and abraded and seems to span a long period of tune with no apparent chronological concentrations This is consistent with the pottery coming onto the site with manure and six of the sherds were found in the backfill of furrows, including the Reversed Cistercian ware sherd

Context	Period	Nosh	NoV	Weight	cname	Broad cname	Broad source	Narrow cname	Form	Description
1001	LMED	1	1	10	HUM				JUG/JAR	GLAZED, BH JOHN
1001	MED				ZDATE					POSTRO
1074	MED	1	1	5	NORTHERN GRITTY				JUG	BS GLAZED
1074	MED				ZDATE					POSTRO
1084	EROM				ZDATE					CP1B-2
1084	EROM	1	1	2	EI?	EBOR	York	Ebor	K	BS, INDENTED
1122	ROM				ZDATE					CP1B-2
1122	ROM				ZDATE					CP2A-2B
1122	ROM				ZZZ					SAM FAB AS REST 37
1122	ROM				ZZZ					SHOW MORT K HARTLEY
1122	ROM	3	2	222	AP25	AMPH	Imported	Amphorae	AP25	BSS, EEAB
1122	ROM	2	1	23	B6	BURNISHED	Unknown British?	BB2	DGI	RIM GIRTH BASAL BS
1122	ROM	1	1	31	M0	MORTARIA	Unknown British?	Mortaria	M	BS, WHT FAB MIX OZITE TRITS
1122	ROM	1	1	103	M0	MORTARIA	Unknown British?	Mortaria	ME	RIM UPPER WALL, Q? TRITS, AS
1122	ROM	1	1	18	M0	MORTARIA	Unknown British?	Mortaria	ME	RIM,Q? TRITS,AS
1122	ROM	1	1	2	O0	OXID	Unknown British?	Misc Oxid		FRAG
1122	ROM	1	1	19	S3	SAMIAN	Imported	CGS	37	BS OVOLO
1122	ROM	1	1	12	S3	SAMIAN	Imported	CGS	37	BS SAME FAB, DIFF OVOLO
1122	ROM	2	1	9	S3?	SAMIAN	Imported	CGS	18/31?	RIMS UPPER WALL
1122	ROM	1	1	5	S3	SAMIAN	Imported	CGS	D	BS
1128	ROM				ZDATE					CP2A-2B
1128					ZZZ					SAM FAB AS REST 37
1128	ROM	1	1	22	AP25	AMPH	Imported	Amphorae	AP25	BS

Context	Period	Nosh	NoV	Weight	cname	Broad cname	Broad source	Narrow cname	Form	Description
1128	ROM	1	1		S3	SAMIAN	Imported	CGS	37	BS, BODY NAME STAMP
1133	ROM				ZDATE					CP2A-2B
1133	ROM				ZZZ					SAM FAB AS REST 37
1133	ROM	3	1	13	AP25	AMPH	Imported	Amphorae	AP25	BSS FRAGS
1133	ROM	1	1	2	EI?	EBOR	York	Ebor	J or K	BS
1133	ROM	1	1	2	S2?	SAMIAN	Imported	LMDV samian		FRAGS SURFS NR LOST
1133	ROM	1	1	15	S3	SAMIAN	Imported	CGS	37	BS OVOLO
1138	EROM				ZDATE					CP1B-2
1138	EROM				ZDATE					CP2
1138	EROM	1	1	40	G0	GREY	Unknown British?	Grey	DF	RIM LWR WALL, SOOT/TAR EXT
1138	EROM	1	1	6	G0	GREY	Unknown British?	Grey	J	BASE CF GI YORK, THIN
1138	EROM	2	2	9	G0	GREY	Unknown British?	Grey	J	BS CF GI YORK, THIN
1138	EROM	1	1	42	G0	GREY	Unknown British?	Grey	J	BS LARGE JAR, CF GI YORK
1139	ROM				ZDATE					CP2A-2B
1139	ROM				ZZZ					SAM FAB AS REST 37
1139	ROM				ZZZ					SHOW MORT K HARTLEY
1139	ROM	2	1	6	B0	BURNISHED	Unknown British?	Grey B	JC	BSS
1139	ROM	4	1	22	B1	BURNISHED	Regional Industries	BB1	DFL	RIM BSS BURNT OXID
1139	ROM	7	1	31	B1	BURNISHED	Regional Industries	BB1	JC	RIM BSS
1139	ROM	1	1	4	B2	BURNISHED	Regional Industries	BB2	D	BS
1139	ROM	1	1	16	M0	MORTARIA	Unknown British?	Mortaria	M	BS, WHT FAB MIX QZITE TRITS
1139	ROM	1	1	15	S3	SAMIAN	Imported	CGS	37	BS OVOLO
1139	STONE	1	1	1	STONE					FLAKE, WORKED?
1147	MED	1	1	2	NORTHERN GRITTY				JAR	ID?
1147	MED				ZDATE					POSTRO
1148	ROM				ZDATE					CP2A-2B
1148	ROM				ZZZ					SAM FAB AS REST 37
1148	ROM				ZZZ					SHOW MORT K HARTLEY
1148	ROM	1	1	3	B6	BURNISHED	Unknown British?	BB2	JC	RIM FRAG
1148	ROM	11	1	122	B6	BURNISHED	Unknown British?	BB2	JC	RIMS BSS
1148	ROM	1	1	18	M0	MORTARIA	Unknown British?	Mortaria	M	BS MIX R Q TRITS

Context	Period	Nosh	NoV	Weight	cname	Broad cname	Broad source	Narrow cname	Form	Description
1148	ROM	2	1	7	S3	SAMIAN	Imported	COS	37	RIMS SAME FAB AS REST 37S AS
1149	ROM				ZDATE					CP2-3
1149	ROM				ZZZ					FLOT RES, CREMATION
1149	ROM	2	1	18	B0	BURNISHED	Unknown British?	Grey B	DD?	BASES
1199	LIA/EROM				ZDATE					PREH?-RO
1199	LIA/EROM	1	1	3	G0	GREY	Unknown British?	Grey	J	BASE FINE SILTY, EIGHT WEIGHT
1199	LIA/EROM	1	1	1	O0	OXID	Unknown British?	Misc Oxid		FLAKE, TILE?
1199	STONE	1	1	12	STONE?					FRAG PUMICE?, POSS PREH POT
1239	EROM				ZDATE					CP1B-2
1239	EROM				ZZZ					SHOW MORT K HARTLEY
1239	EROM	1	1	91	M0	MORTARIA	Unknown British?	Mortaria	M	BASE, QUARTZITE TRITS
1239	EROM	1	1	25	M3-6?	MORTARIA	York	Mortaria	ME	RIM, EBOR? SAME FAB AS REST
1239	EROM	1	1	11	O0	OXID	Unknown British?	Misc Oxid	F	BS DK GREY CORE FRIABLE
1245	MED	1	1	4	NORTHERN GRITTY				JUG	BS ROULLTTED/COMB
1245	MED				ZDATE					POSTRO
1298	EROM				ZDATE					CP1-2
1298	EROM				ZZZ					DR20 ONLY
1298	EROM	3	1	177	AP25	AMPH	Imported	Amphorae	AP25	BSS FRAG, EFAB
1309	ROM				ZDATE					CP2
1309	ROM	2	1	2	B1	BURNISHED	Regional Industries	BB1	JC	BSS FRAG, EFAB
1341	PMED	1	1	5	SUND				BOWL	WHITE SLIPPED INT, MOTTLED BROWN GLAZE, LATE 18TH/19TH
1341	PMED				ZDATE					POSTRO
1349	EROM				ZDATE					CP1B-2
1349	EROM				ZZZ					SHOW K HARTLEY
1349	EROM	1	1	111	M3-6?	MORTARIA	York	Mortaria	ME	SPOUT, EBOR? SAME FAB AS
1365	EROM				ZDATE					CP1B-2B
1365	EROM	1	1	20	E1?	EBOR	York	Ebor	J	BASE FAB ID EBOR, PROB CP1
1367	ROM		1		ZDATE					CP2A
1367	ROM				ZZZ					SMASHED VESSEL

Context	Period	Nosh	NoV	Weight	cname	Broad cname	Broad source	Narrow cname	Form	Description
1367	ROM	54	54	252	B6	BURNISHED	Unknown British?	BB2	JC	RIMS BSS, EXT ABRADED
1367	ROM	1	1	11	G0	GREY	Unknown British?	Grey	J	BS CF G1 YORK, THIN
1391	LIA/ER OM				ZDATE					I AGE - CP1
1391	LIA/ER OM	1	1	5	G0	GREY	Unknown British?	Grey	B or D	BS SMOOTH INT
1391	LIA/ER OM	2	1	25	G0	GREY	Unknown British?	Grey	J	BSS HANDMADE
1399	LIA/ER OM				ZDATE					CP2A-B
1399	ROM	1	1	34	B0	BURNISHED	Unknown British?	Grey B	JC	BS SURFS LOST
1399	ROM	5	1	26	B0?	BURNISHED	Unknown British?	Grey B	JC	BSS SURFS LOST
1399	ROM	1	1	23	G0	GREY	Unknown British?	Grey	DG1	RIM LWR WALL, SOOT/TAR EXT
1399	ROM	2	1	12	G0	GREY	Unknown British?	Grey	J	BSS
1513	ROM				ZDATE					CP2
1513	ROM	1	1	6	B1	BURNISHED	Regional Industries	BB1	JC	BS, SHLDR
1554	EROM				ZDATE					CP1B-2A
1554	EROM				ZZZ					SAM ONLY
1554	EROM	1	1	10	S1?	SAMIAN	Imported	SGS	18/31	RIM BASE
1641	LIA/ER OM	1	1	3	FCLAY					FRAG QUARTZITE
1641	LIA/ER OM				ZDATE					PREHIST?
1670	MED	3	1	0	MEDLOC				JUG	
1691	MED	3	1	0	MEDLOC				JUG	
1694	MED	1	1	0	MEDLOC				JUG	
1698	EROM				ZDATE					XP2+
1698	EROM	1	1	8	G1?	GREY	York	Grey	J	BS SHLDR GROOVE CF EBOR
1705	ROM	1	1	30	M14		Regional Industries	Mancetter Hartshill	MW	RIM GIRTH, BLK TRITS
1715	ROM				ZDATE					CP1-2
1715	ROM				ZDATE					CP2
1715	ROM				ZZZZ					FAB EBORISH, W1
1715	ROM	2	1	1	P0	'WHITE'	Unknown British?	'White'	K	BSS
1715	ROM	1	1	33	w1?	EBOR	York	Ebor white	E1	BASE, WHT SLIP UNDER BASE
1725	MED	1	1	0	TVW?				JUG	
1725	PMED	1	1	0	REVERS ED CSTN				CUP	APPLIED BROWN CIRCULAR PAD

Context	Period	Nosh	NoV	Weight	ename	Broad ename	Broad source	Narrow ename	Form	Description
1764	MED	1	1	0	MEDLOC				JUG	SLIGHTLY SAGGING BASE, INTERMITTENT THUMBING
1995	EROM				ZDATE					CP2+
1995	EROM	1	1	10	O0	OXID	Unknown British?	Misc Oxid	J or K	BS FINE SILTY FAB NOT EBOR
US	MED	1	1	27	NYMM				JUG PLAIN BASE	US
PMED	1	1	23	PMX					?	MIGHT BE A FLAT ROOF TILE OR BASE OF A LARGE JAR?" FABRIC LOOKS POST MED

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APPENDIX E ENVIRONMENTAL REPORTS

PART I. NOSTERFIELD, NR RIPON THE CHARRED PLANT REMAINS

J P Huntley, University of Durham

1.0 INTRODUCTION

Archaeological work was undertaken by Tom Gledhill for Mike Griffiths Associates on a potential gravel extraction site near to the Dishforth henges in North Yorkshire (centred upon NGR SE3573) Several series of pits were uncovered These ranged considerably in depth and extent and Neolithic pottery was recovered from some of them This consisted of mostly Fengate ware but with some early Grimston ware and later Durington Walls sherds In general the upper fills were the ones containing charcoal and finds whilst the lower fills were mostly sterile The excavator suggested that this represents deliberate backfilling with later subsidence and settling allowing slumping which was itself either filled deliberately or by material blowing around. There was, apparently, no evidence for the primary function of the features

Bulk samples were taken and three have been processed in order to evaluate the potential in terms of determinmg the nature of the features

2.0 THE SAMPLES

Three bulk samples (each approximately 10 litres) were processed using manual flotation with flots and residues retained upon 500μ mesh After drying the flots were sorted for their plant remains and the residues scanned for biological and artefactual material

The samples produced moderate sized flots (50-100ml) of silty charcoal fragments and a few modern roots The charcoal was mainly from large trees although was in small pieces only No twiggy material was recorded Oak was clearly present but the majority was from diffuse-porous species such as alder, hazel or birch No heather fragments were recorded Context 1217 (sample 22) produced a fragment of barley grain, a fragment of either apple or pear fruit and 2 fragments of hazelnut shell Context 1007 (sample 4) produced 1 hazelnut fragment and context 1306 (sample 15) 1 fragment of cereal grain, probably barley, 1 fragment of apple/pear pip and 6 fragments of hazelnut

These remains are typical of Neolithic deposits in Britain and closely parallel the results from the excavations at the nearby Marton-le-Moor site (Huntley 1995) Indeed, the two sites are sufficiently close to suggest that they may represent a single, large and possibly disparate usage site, one dares not say settlement since no evidence for housing has yet been recovered Of the 84 samples from Marton-le-Moor only 11% contained cereals/fruit (other than nut shell) and of these only 2 samples contained any quantity of cereals It is therefore important to at least process and scan as much material from as many contexts as possible in order to find the relatively few which have statistically significant amounts of material present It is therefore recommended thai the remaining 20 (ish) samples from Nosterfield are processed Given that there are spatial patterns in the pits, or pit groups, it may be that areas of 'more' activity can be determined This was certainly the case at Marton-le-Moor This would provide more evidence to target a better defined research programme since it seems likely that the gravel extraction will expand, due to continuing Al improvements

This part of North Yorkshire clearly has evidence for substantial Neolithic activity witness the numerous henges and standing stones within even 5km of this site Equally, cereal usage is high, albeit in a limited number of contexts What is needed is evidence for the settlements that, surely, must have been associated with all of this activity By extensive sampling programmes the nature of cereal waste and weed assemblages should provide an indication of whether these cereals were, indeed, locally grown or whether the grains were brought in with people who, perhaps, used tentage of some sort for short-term, temporary settlement only

References

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PART 2. REPORT ON THE SEDIMENT STRATIGRAPHIES OF THREE SHAFTS FROM NOSTERFIELD

Deborah J. Long and Richard Tipping. Department of Environmental Science. University of Stirling

Summary of Findings

Detailed semi-quantitative sediment-stratigraphic data are presented for three deep (2 5-2 8m) shafts closely grouped at Nosterfield sand-and-gravel quarry

The morphological and sedimentological data support the archaeological interpretation of these shafts as anthropogenic in origin

The sediments and infilling processes are complex and different between each of the shafts, allowing a relative sequence for the formation and infilling of the shafts to be suggested

Two of the shafts (F44 and F45) clearly contained standing water, probably during use The shafts are assumed to have served as water-sources The third shaft (F46) has no evidence for standing water, but is thought to have ceased to function very soon after its excavation

Sediments at critical depths for defining (i) the ages of formation and (ii) close to the end of sediment infilling are organic-rich and should be able to define the time-span covered by the deposits

INTRODUCTION

Three features (F44 - F46 inclusive) in the Nosterfield (NON 98) sand and gravel quarry were sampled on the 25th September 1998. This report describes the subsequent laboratory analyses, which focused on detailed semi-quantitative sediment-stratigraphic description in order to define the possible modes of formation of these features and the processes of sediment infilling Features F44, F45 and F46 were identified during excavation as probably of anthropogenic origin, and sediment-stratigraphic description was designed to explore this possibility An anthropogenic origin is confirmed as most likely, and the complex processes of sediment infilling are seen as resulting from a combination of recutting, probably whilst the shafts were in use, and post-use sediment accumulation

We present a suggested relative chrono-sequence for the formation and infilling of these features derived from these descriptions The report also defines the depths of critical sediment samples recommended for AMS 14 C dating, and details the significance of these assays in characterising the dates of sediment infilling

In addition a sediment description of a 25 0cm monolith taken from the marl/peat boundary within the lacustrine deposit adjacent to F44-F46 is presented Radiocarbon dating of the peat immediately above this sedimentological boundary is recommended, which will allow us to establish the age of terrestrialisation of the former lake and its relation to F44-F46

METHODS

The three features discussed in this report had been partially excavated prior to the sampling described here on September 25th 1998 Attempts to section the sediment fills, prevented by a high groundwater-table, made sampling with corers a little difficult Nevertheless, all cores taken can be related to site and Ordnance Datum, levelled by Electronic Distance Measurer

The sediment fills at and below the groundwater table were sampled using a 1 0m long, 6 0cm internal diameter Russian peat-corer, samples placed in clean plastic guttering, labelled and wrapped in plastic Monolith tins of 50.0cm length had already been sampled in the overlying sediment fills, these were returned with the cores to Stirling University for sediment description

Cores and monolith tins are stored in a refrigerator at 40C to prevent fungal growth Sediments were cleaned in the laboratory, and sediment-stratigraphic descriptions carried out according to the conventions of Troels Smith (1 955) This is a semi-quantitative objective descriptive method designed to produce a full, consistent and universally applicable appraisal of discrete sediment units (deposit elements)

Troels-Smith descriptions are presented in Tables 1-5 In the text simpler but less precise descriptions of the sediments are used

Colours of sediments were described using Munsell Color Charts on moist sediment under artificial light

SEDIMENT STRATIGRAPHIES

The three features are described and interpreted in numerical order Observations made during archaeological excavation on feature morphology prior to sediment sampling are incorporated Sediment stratigraphies are described from base up, e g in the order of deposition

F44

F44 is the easternmost of the group of three features, closest to the former lake margin Cut into the underlying gravel, F44 had a near-circular planform c 3m in diameter, the uppermost fill lying at 39 50m) A shallow basin-like feature rapidly changes below c 50cm to a steep- or vertical-sided shaft a little less than 3m wide

The uppermost loamy inorganic fills (8055 and 8054) contain considerable quantities of modern pottery and are interpreted by the excavator as fills to level the depressions Below these recent loamy fills is context 8056, described by the archaeologist as a pure peat This and the underlying context 8057 were sampled by 50 Ocm monolith tin, and two overlapping Russian core samples in lower sediments, at the centre of the shaft The lowermost Russian sample probably reached gravel but a 15 Ocm nose-cone prevents sampling of these basal sediments The total depth of fill recorded in samples is 241 Ocm (Table 1), the base of the fill is probably 15.Ocm lower or at an altitude of 36 53m OD

The basal fill (241-229cm) is an unstratified organic-rich clay with sand grains and common small rounded stones Coarse components probably derive from the sides of the shaft, but the intimate mix of clay and amorphous organic matter suggests deposition and mixing in water An abrupt boundary to overlying clay occurs at 229cm Nearly a metre of completely minerogenic, structureless clays (although varying in particle-size from clay to silty clay) were deposited to 138cm A well-humified peat at 191-195cm (Table 1) is clearly a discrete lens with a sharp boundary within the clay Small rounded stones are rare The clay is almost certainly a product of settling-out in standing water During this period the stability imposed by a high groundwater table and equal pore-water pressure within the gravel and shaft may have prevented slumping of the shaft sides Despite the abundance of minerogenic sediment in the shaft it is likely that the adjacent contemporary ground surface was vegetated because the sediment fill is largely limited to the clay-sized fraction of 'soil' Sediment was probably sorted before deposition, possibly by a complete vegetation cover

An organic-rich clay deposited between 138-134cm is oxidised, and is overlain by a similarly iron-rich sandy gravel (134-127cm) The gravel is very probably a collapse feature from the shaft sides, oxidised above the contemporaneous water level, and the underlying peaty clay may also be derived by shaft-edge collapse Overlying these slumped sediments are a series of well-humified peats and well-defined clay lenses with sharp boundaries between 127 and 11Ocm, suggestive of intermittent though probably rapid infilling or of fluctuating water levels within the shaft the peats probably formed on the wet surface of former sediments and are *in situ*, the clays may have sedimented out in ponds on the peat surfaces or be derived from slope-wash, representing single small-scale erosion events

Above this is a thick well-humified structureless peat (110-72cm), probably that identified in excavation as context 8057, and a wood-rich peat between 72 and 60cm, it is not clear if these wood fragments are *in situ* Finally, extending to context 8056 is an *in situ* peat of varying humification in which sedge remains (Cyperaceae), including *Phragmites*, are seen in poorly humified parts These less decayed peats are felted, retaining the original sub-horizontal structure This peat accumulated with no slumping or recognisable slope-wash activity However, the uppermost 10 or so cm are severely disturbed by recent earthworm activity

F45

F45 is cut into gravel, the surface at around 39 50m OD The feature is more neatly circular than F44, 2 2m wide and with little evidence for the surface horizons to be wider than the shaft Archaeological excavation to around 60cm showed a sequence of shallow loamy and stony fills at the surface in the centre of the shaft (contexts 8066 and 8065) to 20cm depth, containing modern pottery These are interpreted as fills to level the surface as at F44 Beneath these recent inorganic fills are a series of peat deposits (contexts 8067, 8068) sampled in the centre of the shaft by 50 0cm monolith tin and two overlapping Russian cores The total depth of fill sampled is 281 0cm, as at F44 the Russian core probably grounded on underlying gravel but could not sample it, and the base of the shaft is estimated to reach 36 99m OD

The basal sediment sequence (281-189cm) is an organic-rich clay with discrete thin pure clay bands It is comparable to the basal sequence at F44 and probably represents mixing of mineral material with *in situ* amorphous organic matter in standing water However, well-humified peats are also present and *Phragmites* stems are preserved, and if *in situ*, which is most likely, these peats formed in short periods when the water level was lowered Wood fragments occur at 257-260cm, and may be inwashed Small rounded stones are present, but in general there is little evidence for shaft-collapse or major erosional events Between 227-221 cm a structureless silty clay was deposited in standing water, probably quite rapidly and suppressing organic matter production, but coarse particles were not inwashed The silty clay is oxidised, probably indicating its derivation from a soil surface

Above 189cm is 23cm of structureless and highly humified *in situ* peat formed under stable conditions, but above 166cm peat formation is interrupted by the deposition of discrete clay lenses These clay bands probably represent the sorting of eroded soils by a complete vegetation cover and the washing into the shaft of only the finest particles, they may represent individual storm events and the setting-out of sediment following temporary flooding of the shaft Recorded in excavation are a series of sandy silt slumps in the surface horizons (context 8069), predating peat infilling the top of the shaft, these may relate to this period of soil inwashing

These intermittent but probably rapidly deposited sediment fills continue to 119cm, when minerogenic sediment inwashing ceases and structureless well-humified *in situ* peats accumulate. As at F44 the humification state of this final pure organic fill varies, and less decayed parts contain *Phragmites* (Cyperaceae) stems, preserved in growth position (i e vertically) above 50cm

F46

The surface of this feature lies at 39 93m OD, furthest from the lake margin This is a distinctive funnel-shaped feature, over 4m wide at the surface, with a steep edge to the shaft at the east, a more bowl-shaped slope at the west The shaft commences about 70cm below the present surface, and is assumed to be steep or vertical The top of the funnel was excavated and seen to be infilled with context 8059, a crumbly dark brown loam rich in modern debitage, and context 8060, a discrete layer of pebbles and gravel extending across the depression These contexts are interpreted as deliberate fills above the shaft, although the absence of artefacts in context 8060 is problematic in this regard.

Beneath these in section is an organic-rich loam (context 8061) that grades into the underlying black peat of context 8062. These contexts were sampled by 50.0cm monolith tin in the centre of the shaft, and two overlapping Russian cores obtained deeper sediments. With the assistance of a JCB bucket the otherwise intractably stiff sediments were sampled and the Russian corer was able to demonstrate coarse gravels beneath the shaft fill. Samples were obtained to a depth of 250.0cm but the contact between gravel and basal fill is at 223.0cm or 36.92m OD.

The fill is very uniform, and comprises 215.0cm of highly organic, well-humified *in situ* peat with rare herbaceous and woody remains visible. Accumulation appears to have been continuous. There is no evidence for mineral components and the diffuse contacts between peat units suggest undisturbed accumulation without wall collapse or minerogenic infilling. Minerogenic sediment is virtually absent until the admixed loam of context 8061, above 8.0cm depth. Seen to be lining the sides of the shaft in excavation are sandy silts (context 8064), but these inwashed or slumped deposits predate all the peat infill of this shaft.

MARL/PEAT BOUNDARY (FIND NO. 14)

The altitude of this sequence is at 39.23m OD, not significantly different to the ground surfaces at F44-F46. The monolith tin was sampled through *in situ* lacustrine and fen deposits where undisturbed sediments are closest to F44, around 75m away to the north-east. Marls are recorded from very close (within 15m) to F46, however. The proximity of open-water sediments to the shafts leads to questions concerning their contemporaneity, to be resolved through ^{14}C dating (below).

The horizontally colour-laminated marl is clearly an *in situ* lacustrine deposit rich in calcium carbonate. A well-defined transitional unit to the overlying peat is indicated by thin laminae and bands of alternately deposited marl and organic matter, before a well-humified structureless terrestrial peat replaces lacustrine sediment.

DISCUSSION

(1) Probable Mode of Formation of F44-F46

The steep sides to these features are indicative of deliberate cuts into the gravel substrate. The abrupt boundary between gravel and well-humified peat at F46 also indicates that this is not a natural feature: these shafts are clearly anthropogenic in origin. It is not known whether the shafts were dug to their maximum depth at one time or in a more piecemeal fashion because the shafts could not be half-sectioned. It can be suggested that re-cutting or emptying of the sediment fill occurred during use in one shaft, F44 (below).

The sediments demonstrate that two shafts, F44 and F45, at one time contained standing water. This cannot be demonstrated for F46 although it is argued that this is because this shaft, dug last, became redundant through a drop in groundwater level before water-lain sediments could form. It is likely that all three shafts were intended to contain water. However, whether these were wells intended for human consumption of water is uncertain: the amount of clay sedimented out in F44 in particular indicates that the water in the shafts was at least periodically very muddy; further analyses will be required to define water quality from, for example, particle-size and diatom analyses.

The three shafts are cut to approximately the same altitude: F44 = 36.53m OD, F45 = 36.99m OD, F46 = 36.92m OD. These differences in altitude are not considered significant. At their fullest depths these shafts were probably dug to reach a groundwater table at roughly the same depth. However, current data cannot establish the original groundwater level: pollen and aquatic macro-plant analyses will help here. Sedimentological data indicate that during infilling the groundwater table varied, with some clay-rich fills probably indicating standing water, and well-humified peats suggesting drier conditions, although many of these sediment fills may not relate to use of the shafts (below)

The observation that all the shafts were cut to broadly the same depth does not necessarily imply that the shafts were dug at the same time because groundwater levels may have remained stable for long periods However, the close grouping of these shafts suggests that one was visible or known when others were sunk Equally, this close grouping might imply that not all shafts functioned at the same time, and that some shafts went into disuse before others

(2) The Relative Chronology of Sediment Inkling

Non-contemporaneous use of the shafts is suggested by the very different stratigraphies of the sediment fills at each shaft These major contrasts are interpreted here as representing different modes of sediment formation occurring at different times This relative chronology is speculative and makes assumptions that are currently untestable

F44 and F45 have comparable sediment infills at the base of the two shafts Depositional conditions were of standing water where *in situ* organic matter, amorphous but perhaps derived from micro-faunal and floral components in addition to plant growth, was intimately mixed with clays being washed into the shafts by storm events and soil erosion around the shafts, small-scale slumping of shaft edges also occurred Initial depositional conditions were comparable between these features which might suggest contemporaneous use of the shafts In F45 this sequence of intermixed clays, organic matter and peat continues until replacement by *in situ* peat, and there is no indication that deposition was interrupted The simplest interpretation is that F45 simply filled with water-lain sediments before these were replaced by peats

At F44 this basal sequence is truncated The abrupt boundary between the basal units and overlying clays is interpreted as the result of recutting, or an attempt to empty out the sediments accumulating in the shaft The purely minerogenic clays and silty clays within F44 are not seen at F45 F45 was seemingly not re-cut, no attempt at rejuvenating the function of the shaft is indicated So although F44 and F45 may initially have been dug at the same time, F45 was not cleaned out, and may have been abandoned before F44

The clays of F44 are water-lain sediments, deposited when minerogenic input was much greater than at any time during the infilling of F45. This is a second reason for suspecting that F45 was infilled before F44 The source of these large thicknesses of clays in F45 is not presently clear The sediments are assumed to derive by slopewash from gravelly soils, but sediment-sorting through the trapping of coarse particles by a complete vegetation cover, even of grasses, would seem necessary to explain the very fine particles being deposited in this shaft The abundance of clays suggests that soil erosion, by wind, perhaps, as much as by water, was much more prevalent than during the infilling of F45 Reasons for this could relate to an intensification of settlement or land-uses around the shafts, closer proximity of these activities to the shafts, or to climate change to increasing storminess or lower groundwater tables Evidence is recorded for only one episode of re-cutting at F44, and eventually peat accumulated in the shaft.

The peat sequences in the upper parts of F44 and F45 are interpreted as representing post-use phases of sediment infilling, it is difficult to see these shafts functioning as sources of water when the sediment indicates only moist terrestrial conditions

F46 is astonishingly different in its absence of water-lain sediments The basal fill of this shaft is a well-humified peat which at F44 and F45 is interpreted as an indicator of abandonment It is difficult to see this peat as anything other than a post-use indicator here also The absence of water-lain sediments may be interpreted in several ways

- the function of this shaft was different to F44 and F45, but morphologically these three shafts are strikingly similar,
- water-lain sediments formed during use were removed by a re-cutting episode, after which the groundwater table fell rendering the shaft non-functional,
- similar but simpler, groundwater fell after initial excavation but before the shaft could contain water

Given that both F44 and F45 clearly contained water at some time, either of the latter two explanations for the sequence at F46 would most reasonably imply that F46 was dug later than the other two shafts, close in time to abandonment of the features.

(3) Relation of F44-F46 to the Lake Sediments

Discussion of the role of groundwater fluctuations in the use and abandonment of these shafts necessitates evaluation of the lacustrine sediments only tens of metres to their east and north A marl lake certainly existed at some time in the Holocene period, and this was replaced by terrestrial peat It is assumed here that if the shafts were dug to seek water, the lake had by then ceased to exist This is not demonstrable from existing stratigraphic relations but can be established by ^{14}C dating

RADIOCARBON DATING

Radiocarbon dating is necessary to establish

a) the ages of the three shafts F44-F46,
b) the duration of their infilling,
c) possibly differences in the periods of use of the three shafts and
d) the temporal relation between the lacustrine sediment sequence and those in the shafts

Objectives (a), (b) and (d) are readily attainable Objective (c) is less clear-cut the sequence of use and sediment infilling within F44-F46 is a relative one, and all of these changes may have occurred over time periods too short to be resolved by ^{14}C dating

The sequences in these shaft sediments have a very high potential for resolution by ^{14}C dating The sequence is complex, and in time it may prove necessary (and will be easily achievable) to define for each of the shafts the following changes

(1) a *terminus post quem* age for initial excavation of each shaft,
(2) a *terminus ante quem* age for re-cutting in F45,
(3) the ages of homogeneous peat-formation, possibly indicating the disuse of each shaft-,
(4) palaeo-hydrological and palaeo-ecological changes,
(5) the ages of cessation of peat-growth at the tops of the shafts

Such a dating programme is ambitious, and here it is recognised that the fundamental concern at present is to bracket the time periods represented by the shaft deposits (Points (1) and (5))

TERMINUS POST QUEM AGES FOR INITIAL EXCAVATION OF EACH SHAFT

In situ organic sediments are recorded from the basal sediments of each of the shafts In F44 and F45 these are pond-sediments with organic contents estimated to between 10-20% (F44) and >75% (F45). In these deposits there is a possibility of some organic matter being reworked from surface soils by shaft-edge collapse, but this is thought to be negligible In F46 the basal fill is a highly organic (*c* 80-90%) *in situ* peat

AGE/S OF CESSATION OF PEAT-GROWTH AT THE TOPS OF EACH SHAFT

The topmost peats within the monolith tins have evidence of drying, probably through 19th century drainage and bioturbation

However, below c 20cm from the top of each sequence the peat is moist, with good plant preservation and no evidence of bioturbation Assays from these localities will provide very secure age-estimates close to the age of cessation of peat infilling

THE AGE OF THE MARL/PEAT BOUNDARY

A ^{14}C assay is also requested on the terrestrial peat immediately above the marl described in Find no 14, providing a *terminus post quem* date for the terrestrialisation of the former lake Identification of the precise depth within the peat would be defined after laboratory analyses for loss-on-ignition, $CaCo_3$ content and pH to avoid the possibility of hard-water contamination

DATING

AMS ^{14}C techniques will need to be employed because of the paucity of available sediment 'Beta Analytic Inc', Miami, Florida can process the results in between 14 and 50 days of receipt of samples. Currently seven assays would be required

CONCLUDING REMARKS

It should be stressed that the interpretations derived from these sediment-stratigraphic data are not conclusive and that the reconstruction attempted here is only one possible sequence of events However, this reconstruction is supported by the limited evidence available to date and provides a testable model for future work AMS ^{14}C radiocarbon dating of six assays from tops and bottoms of the shafts is feasible and would place these sediment infills into a broad temporal context

The potential of the deposits described in this report is very great in enabling a detailed temporal reconstruction of landscape change Depending on the broad age-ranges established from this recommended dating programme and their relevance to existing archaeological finds in the region, further analyses might be encouraged These would include further ^{14}C dating to refine the sequence further (above), together with sedimentological analyses to define more precisely the depositional mechanisms, and palaeoecological analyses (pollen, diatoms, plant macro-remains) to define the local vegetation and land-use history, water depths and water quality at times during sediment infilling

References

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Table 1 Detailed sediment stratigraphy of F44

Site	Sediment depth(cm) unit	Sediment (m OD) unit depth	Sediment unit	Troels-Smith description	Colour	Notes
F44 m	38686	39 1	Well-humified peat	Strf 0, humo 4, Sh4, Ga+, Gs+, Gg (maj)+, Dl+, Dh+, Tl+,Th+	7 5YR2 5/1	
	38704	38 98	Cyperaceae peat	Strf 0,lim sup 0, humo 4, Sh2, Dl+, Dh1, Tl+, Th1	7 5YR2 5/1	Felted peat
	19-28	38 89	Well-humified peat .	Strf 0, lim sup 0, humo 4, Sh4, Ga+, Gs+, Gg (maj)+, Dl+, Dh+, Tl+,Th+	7 5YR2 5/1	
	28-32	38 85	Well-humified peat	Strf 0, lim sup 1, humo 4, Sh4, As+, Dl+, Dh+, Tl+, Th+	7 5YR 3/1	
	32-49	38 68	Well-humified peat	Strf 0, lim sup 0, humo 4, Sh4, Dl+, Dh+, Tl+, Th+, (Phrag)	7 5YR2 5/1	

Site	Sediment depth(cm) unit	Sediment (m OD) unit depth	Sediment unit	Troels-Smith description	Colour	Notes
F44 ci	49-56	38 61	Cyperaceae peat	Strf 0, hm sup 0, humo 2, Sh1, Dh3, Dl+, Th+, (Phrag)	2 5YR2 5/3	
	56-60	38 57	Missing	Missing		
	60-72	38 45	Wood peat	Strf 0, humo 2, Dh2, Tl2, Th+, Sh+	7 5YR2 5/2	Large root present
	72-110 5	38 06	Well-humified peat	Strf 0, hm sup 1, humo 3, Sh3, Dh1, Dl+, Dg+, Th+, (Phrag)	7 5YR 2 5/1	
	110 5-111	38 06	Clay	Strf 2, lm sup 4, As4, Ag+, Dh+, (mica)	10YR 4/2	
	111-112 5	38 04	Well-humified peat	Strf 0, hm sup 4, humo 4, Sh4, Dh+, Th+	7 5YR2 5/1	
	112 5-113 5	38 03	Clay	Strf 1, lm sup 4, humo 4, As4, Ag+, Sh+, (mica)	10YR 3/2	
	113 5-127	37 9	Well-humified peat	Strf 0, hm sup 4, humo 3, Sh4, Dl+, Dh+, Th+	7 5YR2 5/2	
F44 cii	127-134	37 83	Sandy gravel	Strf 0, hm sup 1, Gs4, Ga+, Gg(Maj)+, Gg(min)+	10YR 4/4	Oxidation
	134-138	37 76	Peat with clay	Strf 0, lm sup 0, humo 4, Sh2, As1, Gs1, Ga+, Th+	10YR 4/4 &7 5YR 2 5/1	Oxidation in mineral component
	138-145	37 72	Clay	Strf 0, hm sup 0, humo 4, As3, Sh1, Ga+, Th+	10YR 4/2 &7 5YR 2 5/1	
	145-1 50	37 6	Clay	Strf 0, lm sup 0, humo 4, As3, Sh1, Ga+, Gs+, Gg(maj)+, Gg(min)+	10YR 3/2	
	150-191	37 19	Clay	Strf 0, lm sup 0, humo 4, As2, Ga1, Sh1, Gg(maj)+, Cg(min)+, Dl+,Th+	10YR3/1	
F44 ciii	191-195	37 15	Well-humified peat	Strf 0, hm sup 4, humo 4, Sh4, Dl+, Dh+, Th+	7 5YR2 5/1	Discrete Sh inclusions
	195-199	36 98	Silty clay	Strf 0, hm sup 1, As3, Ag1, Ga+	2 5Y 4/2	
	199-216	36 96	Clay	Strf 0, hm sup 1, As4	2 5Y 4/2	
	216-218	36 94	Silty clay	Strf 0, lm sup 1, As3, Ag1, Ga+	2 5Y4/2	
	218-220	36 91	Clay	Strf 0, hm sup 1, As4	2 5Y 4/2	
	220-223	36 85	Silty clay	Strf 0, lm sup 1, As2, Ag1, Ga1, Gg(min)+	2 5Y4/2	
	223-229	36 81	Clay	Strf 0, lm sup 1, As4	2 5Y4/2	
	229-234	36 75	Clay with peat	Strf 0, lm sup 1, humo 4, As3, Sh1, Ag+, Ga+,Gg(maj)+, Gg(min)+,Dl+, Th+	2 5Y 2 5/1	Quartz
	234-239	36 71	Clay	Strf 0, hm sup 1, As4	2 5Y 4/2	Clay inclusion
	239-241	36 68	Clay with peat	Strf 0, lm sup 1, humo 4, As3, Sh1, Ag+, Ga+, Gg(maj)+, Gg(min)+,Dl+, Th+	2 5Y 2 5/1	Quartz

Table 2 Detailed sediment stratigraphy of F45

Site	Sediment depth (cm) unit	Sediment (m OD) unit depth	Sediment unit	Troels-Smith description	Colour	Notes
F45 mi	37999	39 32	Well-humified peat	Strf 0, humo 4, Sh4, Dl+, Dh+, Th+, Gg(min)+	2 5YR 2 5/1	
	14-50	39 18	Cyperaceae peat	Strf 0, lm sup 0, humo 3, Sh3, Dh1, Dl+, (Phrag, mica)	5YR 2 5/1	Vertically bedded phrag
F45 ci	50-60	38 82	Missing	Missing		

Site	Sediment depth (cm) unit	Sediment (m OD) unit depth	Sediment unit	Troels-Smith description	Colour	Notes
	60-100 5	38 72	Well-humified peat	Strf 0, humo 4, Sh3, Dh1, Ag+, Ga+, Gg(min)+, Dl+, Th+ (Phrag)(rhizopod)	7 5YR 2 5/1	
	100 5-115	38 32	Wood peat	Strf 0, humo 3, Sh2, Dl2, Dh+, Th+	7 5YR 2 5/1	
	115-119	38 17	Missing	Missing		
	119-129	38 03	Well-humified peat	Strf 0, humo 3, Sh4, As+, Dl+, Dh+, Th+	7 5YR 2 5/1 &7 5YR4/4	
F45 cii	129-166*	38 12	Peat with clay	Strf 1, hm sup 0, humo 4, Sh2, As1, Ag1, Ga+, Dl+, Dh+, Th+	10YR4/1 & 7 5YR 2 5/2	Table 2
	166-189	37 75	Well-humified peat	Strf 0, lm sup 0, humo 4, Sh4, Ag+, Gg(min)+, Dh+, Th+	7 5YR 2 5/1	
	189-221	37 52	Peat with clay	Strf 0, lm sup 0, humo 4, Sh2, As2, Ga+, Gs+, Gg(maj)+, Dl+, Dh+, Th+	7 5YR 2 5/1 & 10YR 4/6	Discontinuous lenses
F45 ciii	221-227	37 2	Silty clay	Strf O, lm sup 3,As3, Ag1, Ga+, Gg(maj)+, Dl+,(mica)	10YR 4/2	Oxidation
	227-281*	37 14	Well-humified peat with clay bands	Strf 0, lm sup 1, humo 4, Sh4, As+, Ag+, Ga+, Gg(min)+, Cg(maj)+,Dl+, Dh+ (Phrag)	7 5YR 3/1	Wood piece 257-260cm Table2

Table 3 Detailed sediment stratigraphy of F46

Site	Sediment depth (cm) unit	Sediment (mOD) unit depth	Sediment unit	Troels-Smith description	Colour	Notes
F46 mi	38564	39 21	Peat with clay	Strf 0, humo 4, As2, Sh2, Gg(min)+,Dh+,Th+	7 5YR 3/1	Table 4
	8-50	39 13	Well-humified peat	Strf 0, lm sup 0, humo 4, Sh4, Dl+, Dh+, Tl+	2 5YR 2 5/1	
F46 ci	50-150*	38 71	Well-humified peat	Strf 0, humo 4, Sh4, Dl+, Dh+, Tl+, Th+	7 5YR 2 5/1	Table 4
F46 cii	150-196	37 71	Well-humified peat	Strf 0, humo 4, Sh4, Dl+, Dll+	10YR 2/1	
	196-209	37 25	Missing	Missing		
	209-221 5	37 12	Well-humified peat	Strf 0, humo 4, Sh4, Dl+, Dh+	10YR 2/1	
	221 5-223	36 92	Fine gravel	Strf 0, lm sup 1, Gg(min)3, Gg(maj)1, Ga+, Gs+		Mixed geologies
	223-242	36 73	Coarse gravel	Strf 0, lm sup 0, Gg(maj)3, Cg(min)1, Ga+, Gs+		Mixed geologies
	242-250	36 65	Coarse gravel	Strf 0, lm sup 0, Gg(min)3, Gg(maj)1, Ga1, Gs+		Mixed geologies

Table 4 Additional stratigraphic details at F44, F45 and F46

Site	Sediment unit depth (cm)	Sediment unit depth (mOD)	Sediment unit/ feature	Troels-Smith description
F44	2		Contamination	Modem contamination
	4 and 10		Earthworms	
F45	129-133		Peat	Strf 0, lm sup 1, humo 4, Sh4, As+, Ga+, Dl+, Dh+, Th+
	133-136		Clay inclusion	Strf 0, hm sup 1, As2, Sh2, Ag+, Ga+, Gg(maj)+, Dl+, Dh+,Th+
	143-143 5		Clay inclusion	As above
	145 5-145 5		Clay inclusion	As above
	147-147 5		Clay inclusion	As above

Site	Sediment unit depth (cm)	Sediment unit depth (mOD)	Sediment unit/ feature	Troels-Smith description
	149-153		Clay inclusion	As above
	156-156 5		Clay inclusion	As above
	158-160		Clay inclusion	As above
F45	38600		Discontinuous clay bands	Strf 0, lm sup 0, As4, Ag+, Ga+, Gg(min)+, Gg(maj)+, (mica & quartz) Oxidation
	268-268 5			
	275-279			
F46	15-16		Root?	
	36		Wood piece	
	44		Hazelnut fragment	
F46	7		Clay inclusion	Strf 0, lm sup 0, As3, Ag+, Ga1, Gg(min)+
	7-11		Mineral inwash	Strf 0, lim sup 0, Ga4, As+, Ag+, Gg(min)+
	11		Wood piece	
	16		Wood piece	
	34		Wood piece	
	54		Wood piece	
Find 14	22-24		Dh inclusion	Discrete inclusion with oxidation
	17-24		Earthworm burrow	8 mm wide burrow, lined with Th, Dh, Sh

Table 5 detailed sediment stratigraphy of F46

Site ref	Sediment unit depth (cm)	Sediment unit depth (mOD)	Sediment unit	Troels-Smith description	Colour	notes
Find 14	38625	39 23	Well-humified peat	Strf 0, humo 4, Sh4, Dh+, Th+, Gg(min)+	7 5YR 2 5/1	
	38695	39 13	Transition	Strf 4, hm sup 0, humo 4, Lc3, Sh, Dl+,Th+	7 5YR2 5/1, 10YR 4/2	
	38700	39 11	Marl	Strf 4, lim sup 0, Lc4, Dl+, Dh+, Th+, Sh+	10YR 4/2 & 10YR 6/4	
	15-25	39 08	Marl	Stfr 2, hm sup 0, Lc4, Dh+, Th+, Sh+	2 5YR 7/3	Dh inclusion

Figure 1 Nosterfield F44

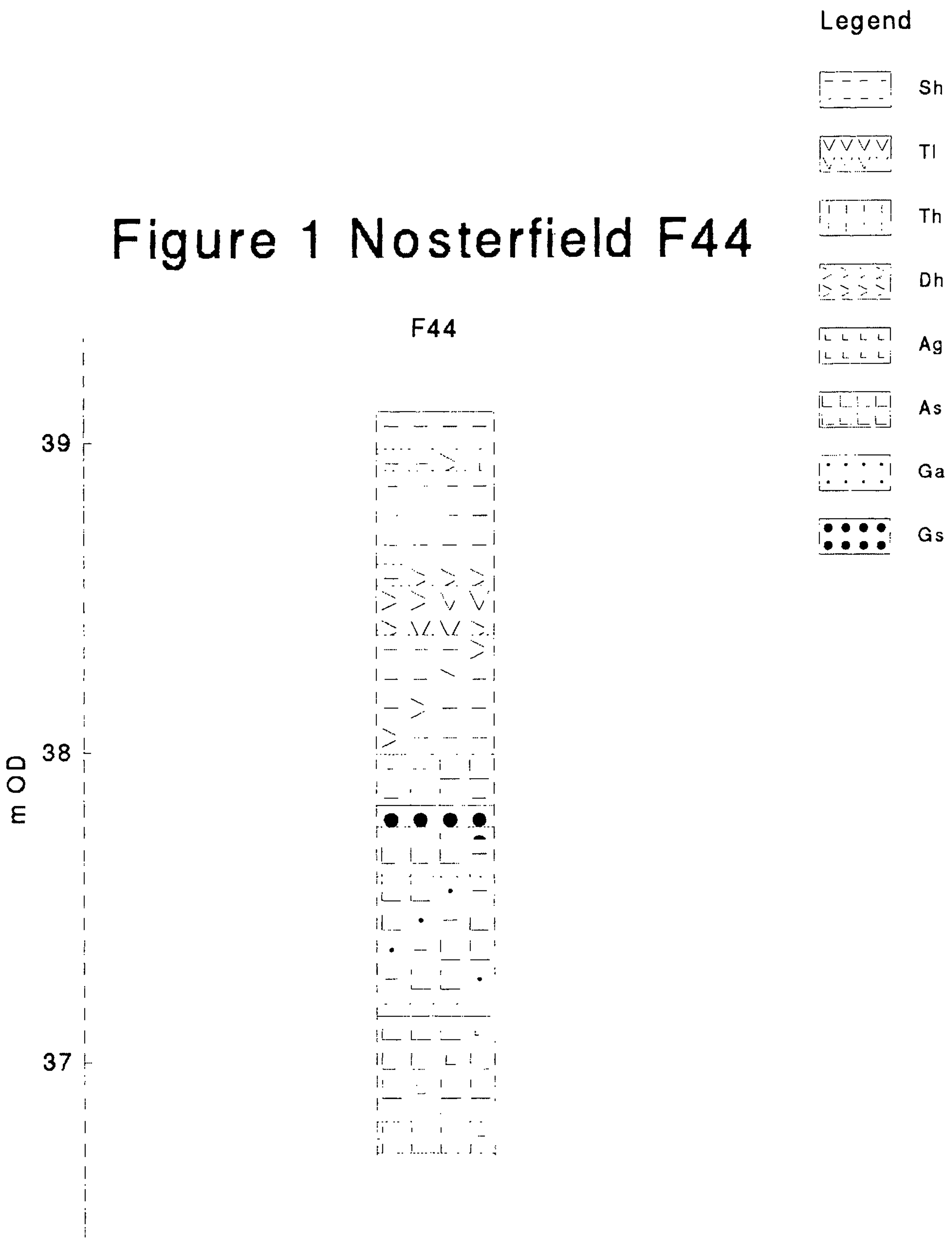


Figure 2 Nosterfield F45

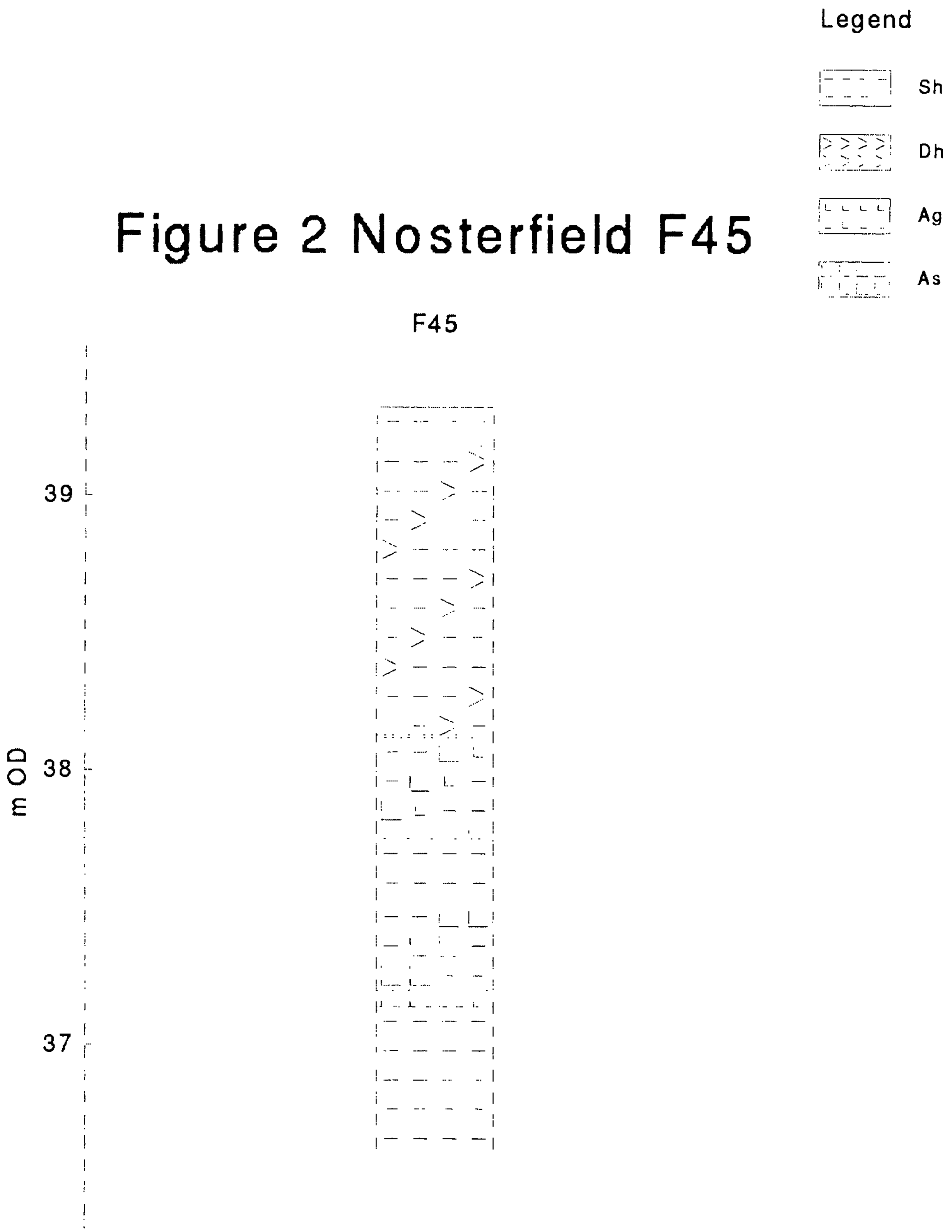
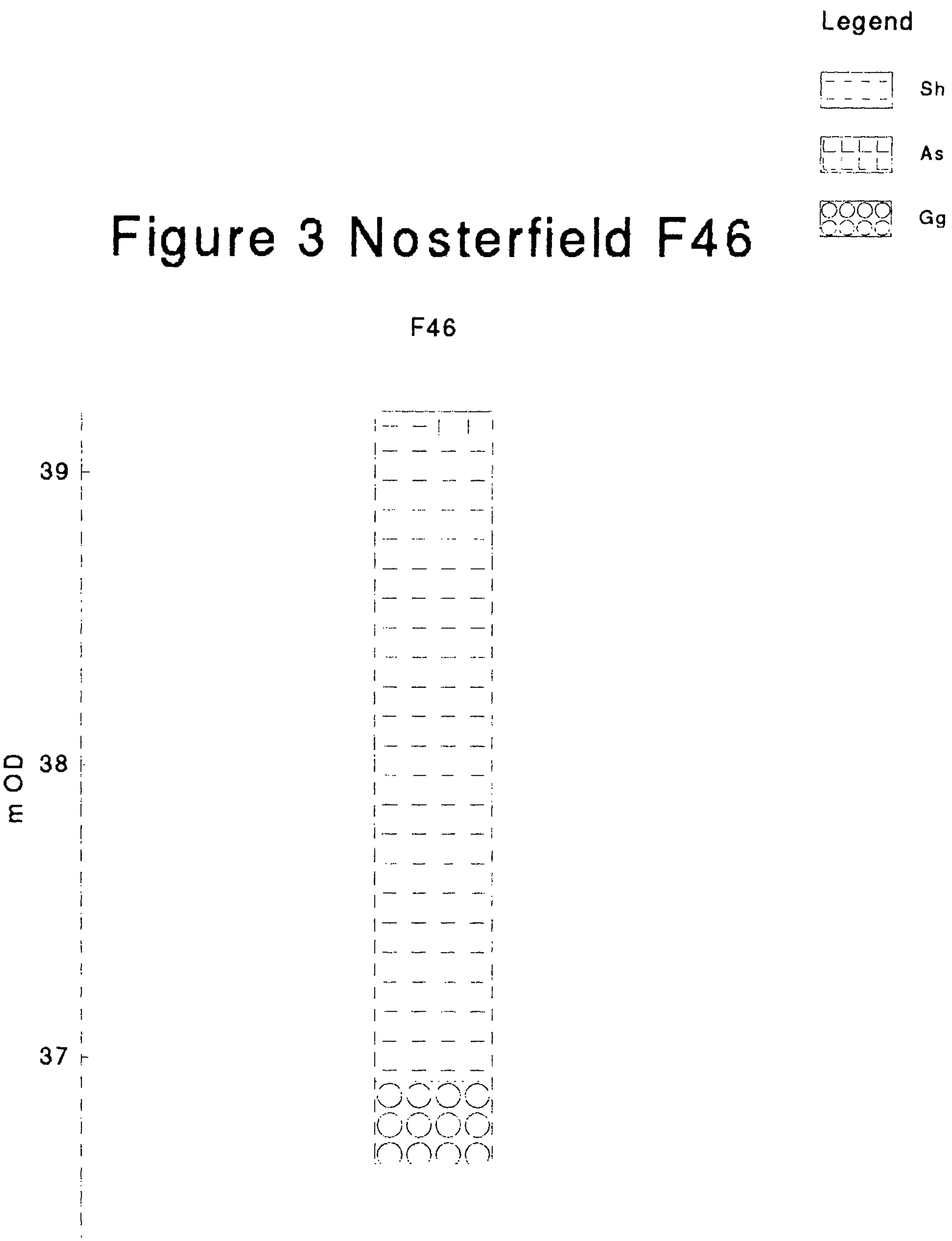


Figure 3 Nosterfield F46



PART 3 REPORT ON COMPLETION OF C14 DATING FOR SEDIMENTS FROM F44-F46 AND FIND 14

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S10944

Summary

- The results of C14 dating from the bases and 'tops' of F44, F45, F46 and Find 14 are presented
- F44, F45 and F46 began receiving organic sediment at separate times in the Devensian Lateglacial and in the early Holocene
- The C14 assay from Find 14 shows the lake to have been replaced at the dated site in the early Holocene
- There are no grounds for rejecting the C14 assays, although there is potential for 'hard water' error making the C14 assays 'old'
- A test of the C14 assays through biostratigraphic correlation is recommended as an immediate measure
- If correct, the C14 assays suggest that F44 - F46 are natural features caused through collapse of subterranean structures, and they are not now seen as anthropogenic features
- C14 assays from the highest points in the stratigraphies of F44 - 46 show that stratigraphic integrity is maintained until the later prehistoric period
- The small sizes of these features and their longevity provide an exceptional and exceedingly rare opportunity for fine-detailed, spatially precise reconstructions of Holocene environmental change that can be linked securely to the archaeological record at Nosterfield

1.0 INTRODUCTION

On 30th April 2000 the case for and up-to-date costs of commercial C14 dating of seven sediment samples from F44-46 and Find 14 were presented Samples for C14 dating were submitted to Beta Analytic Inc (Florida) on the 17th May 2000 This report will (a) present the results of these assays, received on July 5th 2000, (b) discuss the significance of the assays for interpretation of the sequence, (c) evaluate the significance of these sediments in relation to archaeological and palaeo-environmental records, (d) recommend additional analyses that should be undertaken following this construction of chronologies and (e) advise on costs for this

2.0 C14 SAMPLES

Sediments from the monoliths and cores from F44, 45 and 46 had previously been identified (Long and Tipping 1998) as sufficiently organic for C14 dating The samples were submitted were

F44	Core III	239-240 0cm
	Monolith 1	0 0-1 0cm
F45	Core III	280 0-281 0cm
	Monolith 1	0.0-1.0cm
F46	Core II	219 0-220 0cm
	Monolith 1	8 0-9 0cm

The sediment sequence from Find 14, a 25 0cm monolith sample, had to be analysed further to define (a) organic content and (b) carbonate content Data are not presented here, but this work defined a depth within the tin of 9 0cm (39 1 5m OD) when organic content by loss-on-ignition rose over 4 0cm from 10% to 73% and carbonate content, also by loss-on-ignition (Tipping 30th April 2000) fell from 53% to 3% This is regarded as a reliable indicator of the transition from calcareous marl to peat, and a 1 0cm slice at 9 0-10 0cm was submitted for C14 dating

3.0 C14 ASSAYS AND INTERPRETATIONS

The assays reported by Beta Analytic Inc are given in Table 1 Samples were assayed by standard AMS treatment

C14 assays from the basal organic sediments at F44, 45 and 46 all indicate that the predominantly organic sediment infills of these features began to accumulate in the Devensian Laterglacial or early Holocene There is no correlation between feature depth and age F44 seemingly began to receive sediment at the end of the Lateglacial Interstadial (Beta-143455), F45 at the end of the Loch Lomond (Youger Dryas) Stadial (Beta-143456) and F46 within the early Holocene (143457) There is no evidence available to question these assays, although uncertainties arise over sources of carbonate within the sediment introducing 'hard water error' The sites lie on Magnesian limestone at depth, and the gravels surrounding the features contain Carboniferous limestone clasts Pre-treatment by two acid washes (Beta Analytic Inc pers comm) removes free carbonate but cannot isolate carbonate preserved within plant fragments which would induce 'ageing' errors The only guides currently available are the a^{13}C contents of assays, and these do not indicate contamination Tests of the C14 dating results using palynological data are suggested below, but there is currently no reason to reject these assays

There is no stratigraphic significance to the series of dates on the highest organic sediments in each feature The tops of the features have undergone weathering, pedogenesis and mineralisation These assays measure the ages of the youngest peats that have remained unaltered by soil-formation, and this can be expected to be dependent on original peat thicknesses within the features and differential processes of ancient and recent truncation and drainage These assays do not measure the ages at which peat-infilling ceased this cannot be known There is no pattern to the C14 ages but one is not expected F44 loses stratigraphic 'integrity' in sediments younger than the late Bronze Age (Beta-143453), F45 in sediments younger than the mid-late Iron Age, F46 has no reliable stratigraphy after the early Bronze Age Again there are at present no grounds for rejecting these assays

The single assay from Find 14 dates the earliest occurrence of terrestrial (fen) peat over lake sediment (marl) This contact is sedimentologically conformable with alternating bands of marl and peat The peat is of early Holocene age (Beta-143458)

Table 1

Feature	Depth	Altitude	Sediment	Wet wt. (g)	Lab no.	C14 age±1σ	$\delta^{13}C$	Calib age BC*
F44	239-240 0cm	36 66mOD	Peat	1 87	Beta-143455	11140 ± 60	-26 2	11005-10960
	0 0-1 3cm	39 10mOD	Organic clay	2 92	Beta-143453	3110 ± 30	-28 2	1405-1260
F45	280.0-281.0cm	37 52mOD	Organic silt	2 36	Beta-143456	10180 ± 60	-26 2	10370-9605
	0 0-1 0cm	39 32mOD	Peat	1 92	Beta-143452	2330 ± 40	-29 0	395-200
F46	219 0-220 0cm	36 88mOD	Peat	1 05	Beta-143457	8900 ± 50	-27.4	8220-7780
	8 0-9 0cm	39 13mOD	Peat	1 66	Beta-143454	3930 ± 40	-28 1	2470-2210
Find 14	9.0-10 0cm	39 15mOD	Peat	1 68	Beta-143458	9380 ± 50	-28 4	8705-8440

*calibration INTCAL98 (Stuiver 1998)

3 1 TEST OF THE C14 ASSAYS

A test of the veracity of the C14 dates is recommended as an urgent measure For this the sediments infilling F45 will be pollen-analysed rapidly ('skeletal' counts of 150 total land pollen) at 4.0cm intervals between 281 0cm and 200 0cm (20 subsamples). The base of this sequence is C14 dated to the earliest Holocene The lowermost sediments should, then, contain a clearly identifiable pollen sequence depicting the postglacial migration of tree taxa from before 10000 and 7000 C14 BP (Birks 1989) Regional biostratigraphic correlations will confirm or refute the C14 dating of the base of this sequence

4.0 INTERPRETATION OF THE FEATURES

The features are distinctive in their circularity and their high depth diameter ratios The features are presumed also to have near-vertical sides, although this was not demonstrated from excavation or probing The shapes of the features allowed the suggestion that these were anthropogenic features, and on a gravel substrate, that they may have been wells

This interpretation is rejected here Although not conclusive in itself, the ages of the basal sediments infilling the features suggests an anthropogenic origin to be unlikely. They can still be of anthropogenic (Late Upper Palaeolithic and early Mesolithic) origin, but their antiquity and variation in age of formation probably preclude this The 'deliberate' cuts in the gravels argued for in the November 1998 report must be challenged, and it is likely that the major product of collapse was the wide funnel-shaped entrances to the shafts, which were considered late in the sequence in earlier interpretations

The features are probably natural features within the already-formed fluvioglacial gravels bordering the River Ure Their origin is thought to lie as small collapse features within the gravels as a result of cavern-collapse in underlying limestones. This interpretation can explain the circularity of the features, and their close concentration may reflect the collapse over time of one large cavern The interpretation does not wholly explain the depth and narrowness of the shafts but these may be determined by the nature of the collapse beneath There appears to be no discernible environmental trigger for the collapse The C14 dates show that collapse occurred over *c* 3000 cal years in a range of climatic conditions There are insufficient data to argue more than that the timing of separate collapses is governed by chance Alternative explanations of origin are rejected on morphological or geomorphological grounds The features are not periglacial in origin, nor can they be scours induced by flowing water

Collapse is assumed to be followed closely in time by sediment accumulation Sediment fills recorded in the report of November 1998 (Long and Tipping) are quite variable, though all indicate deposition in water-lain (pond) or waterlogged (peat) environments Rates of sediment accumulation must have been highly variable, and no attempt is made here to interpolate ages between the basal and top C14 dates in the fills The sequences may indeed, over this long a period, contain depositional hiatuses

However, the C14 dates allow some appreciation of the variations in sediment fills In F44 between 229-138cm is a structureless minerogenic clay which may now be seen as a product of deposition within the Younger Dryas Stadial (11000-10000 C14 BP) Such minerogenic sediments are absent at both F45 and F46 which formed at the beginning of and within the Holocene and were infilled with much more organic sediment

The lake adjacent to the features was 'terrestrialised' in the early Holocene. Although this C14 date correlates with evidence elsewhere in NW Europe for a marked phase of aridity and lake-level fall (Tipping 1996), little can be said with confidence on this from a single assay. No further work is recommended at this site since the lacustrine history is not relevant to the archaeological record

5.0 POTENTIAL OF THE SEQUENCES FOR PALAEOENVIRONMENTAL AND ARCHAEOLOGICAL RECORDS

If the test of the C14 dates (above) confirms the antiquity of the basal assays, as is anticipated, then the features have received organic sediments for a very considerable period Although hiatuses are perhaps likely they are not detectable from current measures, and broadly these features contain sediments from before the earliest Mesolithic to, at F45, the late Iron Age This changes the potential of these features for archaeological and palaeoenvironmental interpretation, from their being seen as single-period records to near-complete prehistoric sequences, but it does not reduce their significance

The infills of these features represent quite exceptional sediment records of landscape change and human activity which can be defined through the use of palaeoecological techniques The most important aspect of these features for such interpretations is, curiously, their small diameter The shafts are <3m across What makes these sites exceptional requires a diversion to state-of-the-art concerns in the key palaeoecological technique, pollen analysis (palynology) Of over-riding importance in current work is the need to define landscape change at spatial scales relevant to human populations Most pollen diagrams do not do this because the size and type of pollen site (large lakes or large peat-bogs) mean that pollen originates from very large, vague and unspecified sources kilometres away The current failure to establish close links between vegetation change, human impacts and archaeological records is partly because the sizes of landscapes we each measure are different Pollen analysts have learnt to refine the spatial resolution (pollen source area) of sites such that, in simple terms, basin diameter provides a good estimate of the scale of landscape being depicted the smaller the pollen site, the smaller the area depicted

The Nosterfield features will in wooded conditions have received pollen from 50-70m around the features To be able to state this using empirical models indicates the power that this control provides At sites like these we can operate at a scale where human beings become part of the landscape Woodland disturbance, the use of fire, clearance, settlement and agriculture all become tangible and linked to archaeological records and chronologies Scales of activity can be defined, and the ecological consequences of human activities explored Such sites are exceptionally rare and this cannot be stressed enough.

This spatial precision was always the real palaeoecological value of the sites, but we had not appreciated the huge timespan covered by the deposits Given continuity of sediment accumulation, it is possible to understand the Neolithic finds at Nosterfield, as we hoped, but also now to define earlier, Mesolithic, impacts and later prehistoric developments

In the next section different approaches to environmental reconstruction are briefly reviewed and recommended Here I review the needs to analyse all three sediment fills. The three features at Nosterfield cover essentially the same time-span, and all the features reflect the same small pollen source area There is no advantage to analysing the three sediment fills The choice of site is determined by (a) the interests of the investigation (b) timespan covered by the sediments and (c) complexity and information content of the sediments F44 contains Devensian Lateglacial sediments Although interesting in themselves, the concern of the work is to explore environmental changes related to the archeological record from the area, which is entirely of Holocene age, and so analysis of F44 is not recommended F45 represents the longest sequence of sediments, reaching to the mid-late Iron Age before the stratigraphy is disrupted, much younger and more complete than F46 Palaeoecologists often seek the simplest sediment sequences to provide undisturbed contexts, but the most interesting work comes from complex sequences which link ecological, geomorphic, hydrological and archaeological change F45 provides the best context for this. F45 is recommended for full analysis

5 1 PALAEOENVIRONMENTAL ANALYSES RECOMMENDED ON THE FILL OF F45

281 0cm of sediment spans the time from the earliest Holocene to the late Iron Age The sediments were initially formed in standing water with clays and bands of amorphous organic matter Later peats are on occasions interbedded with standing-water clays (Long & Tipping 30th November 1998), and there is clearly a complex relation between the water-table, peat growth and sediment inwashing The following analyses are seen as cost-effective yet comprehensive approaches to the integration of palaeo-environmental data Costs are considered in the next and final section
X-ray analysis of the cores X-ray analysis has become an important non-destructive technique for defining the complexity

of macro- and micro-scale sediment stratigraphies These are often not visible The complexity of the sequence at F45 suggests that much subtlety will emerge from X-ray analysis, and this is indispensable to defining the changes in depositional environments, defining the subsampling positions of palaeoecological samples and their interpretation

X-ray analysis will be undertaken at the purpose-built facility at the British Geological Survey in Edinburgh The tune taken is 3 0 days for preparation of samples and photography Materials are charged at £90 00 per exposure, and the three cores and one monolith may require three exposures at different settings to obtain maximal clarity

Image analysis of X-ray photographs X-ray exposures can be further interpreted by quantitative measures of the light-dark contrasts on X-ray plates by computer-driven image analysis The University of Stirling has this facility Quantification of X-ray patterns should define similar deposits and depositional conditions, and refine sedimentological interpretations This application is novel and experimental, but is rapid and non-destructive 2 0 days are allotted to this with equipment/consumable costs waived

Magnetic Susceptibility contrasts between mineral and organic sediments are further defined by differences in ferromagnetic iron minerals, and this is measured by volumetric magnetic susceptibility on intact cores (the technique is non-destructive) on a Bartington Instruments MS meter 1 0 day is needed

Further work on magnetic properties can refine source areas for inwashed sediment (topsoils, subsoils, substrates, imported (e g non-local) material) if volumetric measurements suggest sensitivity in the signal This work will use the mineral residues after loss-on-ignition, so is destructive This will require 5 0 days work at the Chemistry Department, University of Edinburgh, with equipment/consumable costs waived

Sediment Properties by Loss-on-Ignition the first destructive technique will be the definition of (a) water content by oven-drying at 1050C for 8 hours, (b) organic contents by loss-of-ignition after furnacing at 5500C for 4 hours and (c) carbonate content by further furnacing at 9500C for 2 hours on 2 0cm thick subsamples (140 samples) These are needed to characterise depositional environments The techniques are routine and will be performed by technical staff over 5 0 days

Geochemical Analyses Inwashed sediments are derived from the immediate surroundings of the site and will retain evidence of the rates of soil development and deterioration. Standard laboratory X-ray diffraction analyses of Ca, Al, K and Fe will be obtained on mineral bands to define these Mound 40 analyses may be needed, undertaken by technical staff

Pollen Analyses pollen analyses to understand vegetation change, woodland disturbance, clearance and agricultural practices need not be defended, but pollen data on aquatic and wetland taxa will also define the presence-absence of standing water and water-depth Measures of pollen concentrations allows insights into rates of sediment accumulation too subtle to be defined by further C14 dating (below) Associated analyses of pollen preservation can identify water-table fluctuations and periods when the shaft dried out Analyses of microscopic charcoal provide extraordinary insights into fire regimes within undisturbed and anthropogenically altered landscapes Counts of sulphide spherules produced in anoxic environments allow an understanding of water-quality and depth

These separate and independent analyses come as a package, all are extracted from the same microscope slides The delicate sediment slices sampled for pollen analysis (<0.5cm thick slices) mean that decisions of temporal resolution have to be made, broadly, how often do you subsample the time-sequence - at decadal intervals or at coarser levels? This of course affects the tune, labour and costs This estimate is difficult because it presupposes the patterns to emerge from the analyses Natural woodland dynamics need to be examined at time-intervals of 150-200 years; post-Mesolithic activities are perhaps best analysed at 50-75 year intervals (e g. 1-3 human generations) in order to establish settlement continuity/change. Mesolithic signals can, however, be missed at this temporal resolution

These estimates have determined the estimates of numbers of subsamples Between the basal sediments (10200 cal BC) and around 4000 cal BP (to be defined by further C14 dating, below) analyses will be at 200-year intervals, or around 30 subsamples Between *c* 4000 cal BP and *c* 300 cal BC the temporal resolution will increase to *c* 75 year intervals, requiring around 50 subsamples

Pollen analyses will be to 500 total land pollen, and will include taxonomic recording to the highest resolvable level, measurements of pollen concentration, preservation, microscopic charcoal and sulphide spherules The *c* 80 subsamples have to be processed which will take 20 0 days, and consumables costs are £80 in total Analyses will take 80 0 days and will require analysis at post-doctoral level

C14 Dating two C14 dates will not suffice to describe the chronology of these complex sediments, and eight further analyses are costed through Beta Analytic Inc

Report Preparation the preparation of a report will combine and synthesise all the physical, geochemical and palaeoecological analyses described above, and will incorporate archaeological data from Nosterfield and the surrounding area following consultations The writing of the report will take 10 0 days

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S10945

PART 4 PALAEOECOLOGY OF NOSTERFIELD CORE F45

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1.0 INTRODUCTION

Pollen and radiocarbon analyses have been completed on a core, F45, supplied by Dr Debbie Long and Dr Richard Tipping which they recovered from a small sediment-filled hollow threatened by quarrying operations at Nosterfield, North Yorkshire They obtained radiocarbon dates on the base and top of the sediments of 10,180 ± 60 BP and 2330 ± 40 BP respectively In this new study, samples for pollen analysis were prepared throughout the core to the base at 280cm, but pollen was not preserved below 136cm The diagram has pollen counts at four centimetre intervals from 136cm to 4cm below the ground surface.

2.0 STRATIGRAPHY OF THE CORE

Based upon field descriptions by Dr Tipping and upon laboratory description of the core during sub-sampling, the stratigraphy recorded at Nosterfield F45 was as follows

Depth (cm)	Description
0 - 14	Well humified peat with small amounts of herbaceous *detritus*, wood fragments, *turfa* (peat comprising decomposed roots and stems of herbaceous plants) and small stones
14 - 50	Humified peat with Cyperaceae (sedges) and vertical *Phragmites* (reed) stems
50 - 100	Well humified amorphous and *detritus* peat with some wood fragments, small stones, silt and sand
100 - 119	Humified peat with wood fragments and some *detritus* and turfa
119 - 129	Well humified peat with some clay, *detritus*, wood fragments and *turfa*
129 - 166	Humified peat with clay lenses and some silt, sand, wood fragments, *detritus* and *turfa*
166 - 189	Well humified peat with some *detritus*, *turfa*, wood fragments and small stones
189 - 221	Peat with clay and some stones, sand, *detritus*, *turfa* and wood fragments
221 - 227	Silty clay with sand and stones
227 - 281	Well humified peat with clay bands, wood fragments, detrital *Phragmites* stems, sand and stones Wood fragments at 257-260cm

The stratigraphic units indicate several phases of deposition under contrasting hydrological conditions The organic sediments described as peat contain high proportions of detrital organic material which probably indicate some standing water within the hollow, or at least a very wet sediment surface However the consistent presence of *turfa*, peat composed of plant roots and stems, within the sediment column suggests that any water covering the sediment was never very deep and that it probably fluctuated in depth. Minerogenic sediments ranging in size from clay to gravel occur at intervals in the deposit and represent periods of flooding of varying intensity and the inwash of soil material, which may have included much organic detritus

3.0 POLLEN ANALYSIS

The results of the pollen analyses are shown as Figure 1 Despite the calcareous nature of the site catchment, pollen was generally well preserved in the upper part of the core A count of 300 land pollen grains was made at each level, plus aquatic pollen and spores Below 136cm pollen was not preserved It is likely that a dry phase and water table fall in the mid to late Holocene caused drying and oxidation of the sediments The vegetation history for the lower part of the profile, shown by radiocarbon to have begun at the start of the Holocene, has therefore not been preserved From 136cm upwards, however, there is a full pollen record from which to reconstruct vegetation history The pollen diagram is sub-divided into nine phases which are characterised by the degree of influence of woodland disturbance Phases a, b, c and d represent periods during which disturbance pressure on the vegetation was low Phases 1, 2, 3, 4 and 5 represent periods with higher levels of disturbance activity

Phase a (136 and 132cm) is characterised by low *Ulmus* (elm) pollen frequencies which suggests a post elm-decline, later Holocene, date after *c* 5000BP for this part of the profile There are low levels of grassland weeds like *Plantago lanceolata* (ribwort plantain) and *Taraxacum* (dandelion)-type but most non-tree pollen are from wetland types like Cyperaceae (sedges) which are probably associated with the very local wetland The local landscape seems to have been relatively well wooded with a substantial cover of trees including *Alnus* (alder), *Betula* (birch), *Pin us* (pine) and *Quercus* (oak), and shrubs including *Corylus* (hazel)

Disturbance phase 1 (128 and 124cm) records some human activity close to the sue as cereal-type pollen grains occur together with some cultivation type weeds like *Artemisia* (mugwort), Chenopodiaceae (fat hen family) and Cruciferae (charlock family) Several other open ground herbs also appear in the pollen record, including a peak of *Plantago lanceolata*, while *Betula*, and initially *Corylus*, frequencies fall A phase of arable farming, either at low intensity or not closely adjacent to the site, seems to be reflected here as other tree taxa are unaffected

During phase b (120, 116, 112, 108 and 104cm) *Betula* and *Corylus* percentages are restored and woodland cover re-established There are no indications of renewed disturbance, although the continuing presence of weed types *Plantago lanceolata* and Chenopodiaceae suggests that some open areas remained around the site

Disturbance phase 2 (100 and 96cm) records renewed agricultural activity with cereal-type pollen again recorded Slight reductions occur in the frequencies of *Alnus* and *Corylus* but there are no real peaks in weed type pollen except *Taraxacum-type* No major reduction of woodland cover occurred during this limited phase of cultivation

During phase c (92, 88, 84, 80 and 76cm) there are no indications of disturbance of the woodland cover Several open ground herbs are present as before, but all in very low percentages Some grassland areas persisted within the open woodland community Herbs such as *Mentha* (mint)-type and *Filipendula* (meadowsweet) will have been associated with the wetter areas on the site

Disturbance phase 3 (72 and 68cm) is a major phase of woodland reduction with *Betula*, *Pinus*, *Quercus* and *Corylus* percentages all falling sharply Cereal-type pollen is recorded and peaks occur in the frequencies of several weeds of open ground, mainly *Plantago lanceolata* and *Taraxacum-type* Extremely high frequencies of *Pteridium* (bracken) spores occur and point to a real removal of tree cover around the site Cyperaceae percentages are also greatly increased and clearance may have encouraged increased land drainage onto the site and increased mire surface wetness and sedge growth

During phase d (64, 60, 56 and 52cm) woodland dominance is restored and non-tree pollen frequencies are reduced to very low values. Full regeneration of tree cover occurred after the previous phase of agricultural activity and clearance The previously unimportant woody taxa *Tilia* (lime) and *Salix* (willow) also increase at this time Herbaceous pollen is at the lowest percentages in the diagram

Disturbance phase 4 (48, 44 and 40cm) includes the decline of most tree types, although indicators 6f agriculture are not significantly increased There are no cereal-type grains to indicate cultivation and the pasture or grassland herbs are reduced, *Plantago lanceolata* even ceasing to be recorded at one level Tree curve declines are gradual, with first *Betula* then *Pinus*, *Tilia* and *Alnus* falling in turn Cyperaceae and *Pteridium* gradually increase through the phase As well as the Cyperaceae rise, increases in *Sphagnum* moss spores and *Botryococcus* alga suggest increased wetness In the absence of indicators of agricultural clearance, climatic change may have been responsible for the tree decline Hydrological changes on the mire surface itself may have increased the pollen representation of wetland plants, mainly Cyperaceae, and so suppressed tree pollen values further

Disturbance phase 5 (36, 32, 28, 24, 20, 16, 12, 8 and 4cm) begins with a continuation of the reduction of woody taxa as *Corylus*, the only remaining tree or shrub type in high frequencies, falls sharply The reintroduction of cereal-type pollen and major increases in the curves for *Plantago lanceolata* and *Taraxacum-type* suggest that renewed human agriculture was the cause of this increased clearance *Pteridium* frequencies are also greatly increased and sustained Although cereal-type pollen is not present in most levels in the phase, a much greater range of weeds of open ground occurs throughout, including *Plantago major-media* (great and hoary plantains) and *Polygonum aviculare* (knotgrass) which suggest cultivation Rising Cyperaceae and *Typha angustifolia* (lesser reedmace) curves indicate that the trend to increased wetness continued

4.0 CHRONOLOGY

In addition to the two dates provided by Dr Tipping, nine AMS radiocarbon dates were funded by English Heritage These eleven dates provide a chronology for the vegetation history and the ten dates on the upper profile are shown on Figure 1 To avoid hard water effects from the calcareous substrate dating was only conducted on macrofossils from terrestrial plants These were not present at all levels and while dates are placed as close as possible to important pollen horizons in some cases, disturbance phase 3 for example, direct correspondence was not possible The very low *Ulmus* frequencies at 136cm and the presence of cereal-type pollen just above this suggested that all of the countable levels are post Elm Decline (*c* 5000 BP) in age This has been confirmed by the AMS datings at 140 and 125cm which show the early part of the pollen profile to have formed around 4000 BP Although there is a small reversal in these two dates they show disturbance phase 1 to be late Neolithic to early Bronze Age in date The date on phase 1 itself was 11,675 ± 50 BP and so clearly in error by several thousand years The material for this date, charred wood, must have been reworked

The end of disturbance phase 2 also has dates of around 4000 BP Very rapid deposition may have occurred in this part of the profile unless the dates, which are on wood or bark, are all on reworked material of similar age The radiocarbon dates from 42cm upwards are in sequence between *c* 2400 BP and *c* 2200 BP, except for the surface date which is slightly inverted The reason for this similarity is not clear, unless very rapid deposition occurred The dates do, however, support the age of the pollen changes in phase 4 as corresponding with the major mid-third millennium BP climatic deterioration which caused greatly increased wetness and mire growth across north west Europe The dates also show the agricultural activity and dominance of open habitat vegetation in phase 5 to be of Iron Age date By interpolation the major but temporary clearance episode of phase 3 is likely to have been of Bronze Age date, before *c* 3000 BP

5.0 CONCLUSION

The early and mid-Holocene pollen record at Nosterfield F45 has not survived, but there is a record of vegetation history from the late Neolithic to the late Iron Age which includes five phases of woodland recession One of these, in the Iron Age, appears to have been climatically instigated The other four contain pollen records of agricultural activity which indicate that human land-use was instrumental in the opening and then removal of woodland

Acknowledgments

This research was completed with the support of a grant from English Heritage under the Aggregate Levy Sustainability Fund, with the radiocarbon dates provided by Dr Alex Bayliss of the English Heritage Scientific Dating Section Thanks to Mike Griffiths and Dr Richard Tipping for arranging access to the sediment samples studied here Mairead Rutherford assisted in the field

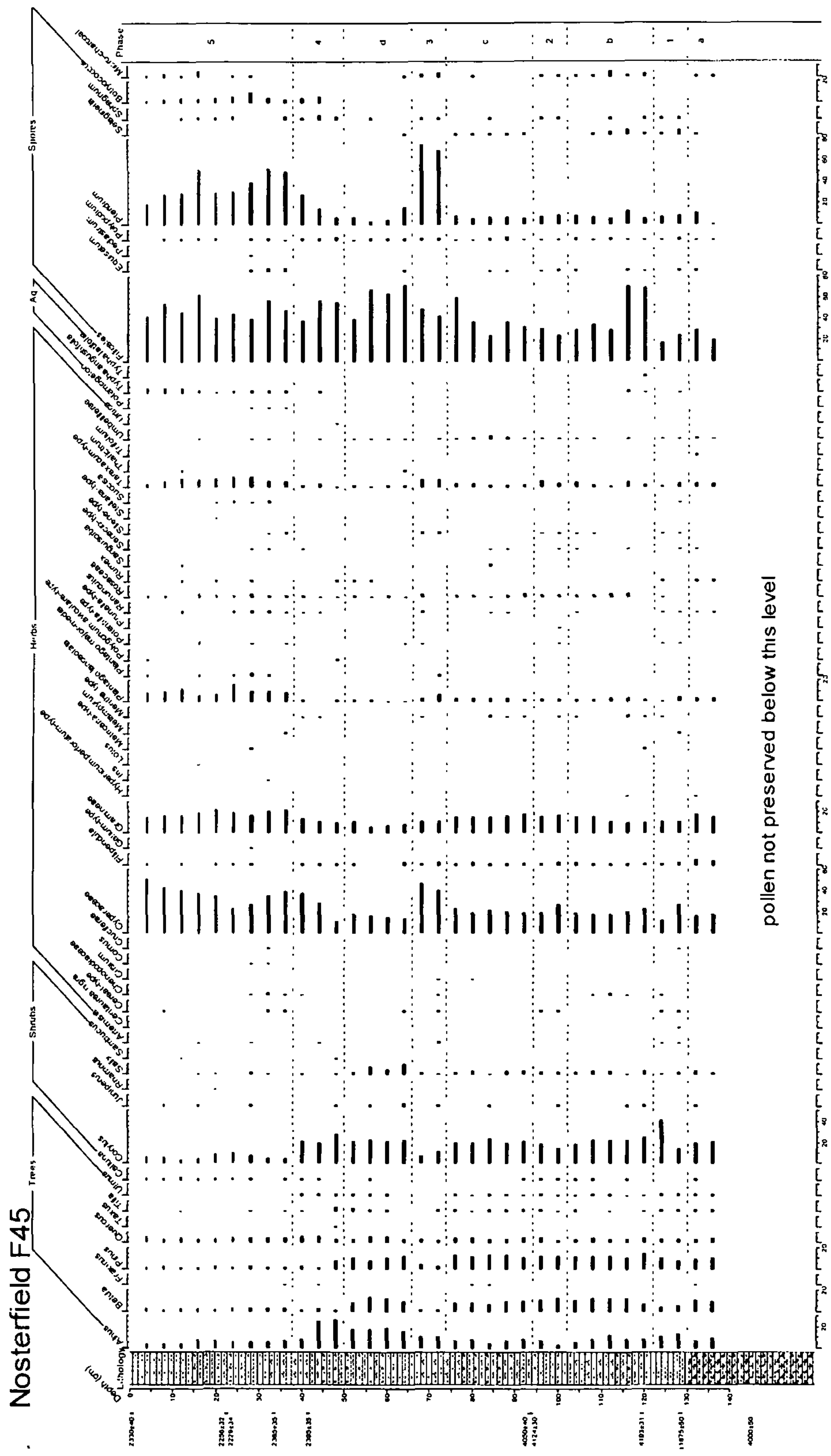
Nosterfield F45
Trees
Shrubs
Herbs
Aq
Spores
Depth (cm)
Lithology
Phase
Alnus
Betula
Fraxinus
Pinus
Quercus
Taxus
Tilia
Ulmus
Calluna
Corylus
Juniperus
Rhamnus
Salix
Sambucus
Artemisia
Centaurea nigra
Cereal-type
Chenopodiaceae
Cirsium
Cornus
Cruciferae
Cyperaceae
Filipendula
Galium-type
Gramineae
Hypericum perforatum-type
Iris
Lotus
Melampyrum
Mentha type
Plantago lanceolata
Plantago major-media
Polygonum aviculare-type
Potentilla-type
Ranunculus
Rosaceae
Rumex
Sanguisorba
Succisa
Taraxacum-type
Thalictrum
Trifolium
Umbelliferae
Urtica
Potamogeton
Typha angustifolia
Typha latifolia
Filicales
Equisetum
Polypodium
Pteridium
Selaginella
Sphagnum
Botryococcus
Micro-charcoal
pollen not preserved below this level

Figure 1

S10946

PART 5 PALYNOLOGY OF NOSTERFIELD THE FLASKS - CORE 69

Dr Jim Innes, Department of Geography, University of Durham

1.0 DESCRIPTION

A two metre core from this site contains a limnic mud overlying a silty clay containing mollusc shells Above the limnic mud is about sixty-five centimetres of grey silty clay and then a surface organic unit of almost ninety centimetres of humified peat, of which the upper half is oxidized and crumbly, and unsuitable for palynology or radiocarbon dating The tree and shrub pollen assemblage of the limnic mud comprises mainly birch with some willow and juniper, while the non-tree pollen is dominated by sedges with lesser grass percentages and some wetland herbs like *Filipendula* (meadowsweet) There are low percentages of micro-charcoal

Birch percentages are much reduced in the overlying silty clay, with sedge frequencies abundant at over 60% of total pollen Willow and grass pollen remain significant Herbs tolerant of severe cold and disturbed soils increase in representation, such as *Artemisia*, *Helianthemum*, *Thalictrum* and *Rumex* The more thermophilous *Filipendula* increases near the upper part of the clay Open water conditions are shown by *Pediastrum* algae, with abundant pollen of aquatic taxa *Typha angustifolia* and *T latifolia* near the end of the unit Micro-charcoal frequencies are generally high

Near the base of the surface peat unit there is a rise in birch pollen percentages to almost 50% of land pollen, replacing the high percentages of sedges and grasses Aquatic pollen frequencies fall sharply Hazel percentages start to rise slowly and pollen of deciduous trees like oak and elm become consistently recorded The juniper pollen curve ends at about 65cm At 50cm depth, before the peat becomes oxidized, hazel rises to high values of over 50%, with birch declining and sedges reduced almost to nothing Herb pollen, including wetland types, fade from the record There is little micro-charcoal

2.0 INTERPRETATION

The stratigraphy of a limnic unit separated from a surface peat sequence by a thick layer suggests deposition during the Late Glacial period, with Late Glacial Interstadial organic lake muds laid down under temperate climate and covered by inorganic inwash clays under severe cold conditions of the Late Glacial (Loch Lomond) Stadial, before deposition of peats under renewed temperate, Holocene climate The pollen data support this, with open birch and willow woods established in the two organic units, but a sedge-tundra of open herbaceous vegetation dominant m the intervening cold phase Climatic amelioration at the end of this phase allowed increased biological productivity in the wetland and terrestrial plant succession at the start of the Holocene and the transition to a wooded landscape Juniper scrub was shaded out by birch woods, which were in turn replaced by hazel, creating a closed canopy ground cover, a succession typical of early Holocene woodland vegetation history in this region (Innes 2002, Innes and Blackford 2003) The record is truncated above this point This Late Glacial and early Holocene record at the Flasks core 69 profile is comparable to others in the area from Dishforth Bog (Giles 1992), Bingley Bog (Keen *et al* 1988) and Tadcaster (Bartley 1962)

Five levels are proposed for radiocarbon dating Date 1 at *c* 55cm would provide an age for the rise of hazel pollen frequencies, a nationally significant biostratigraphic zone boundary Further pollen levels will locate this event more closely Date 2 at *c* 65cm would date the final decline of juniper pollen Date 3 at *c* 83cm would date the early Holocene rise in birch pollen and the establishment of Holocene woodland Date 4 at *c* 154cm would date the end of temperate Interstadial conditions in the Late Glacial Date 5 at *c* 184cm would date the onset of that Late Glacial temperate event Further pollen counts are needed to locate these levels exactly

3.0 SUMMARY

Flasks core 69 provides a vegetation history through Late Glacial and early Holocene period up to the expansion of hazel woodland, broadly dated elsewhere to about 9000BP Five dates on pollen zone boundaries and stratigraphic boundaries are proposed

S10947

PART 6 PALYNOLOGY OF NOSTERFIELD THE FLASKS - SHAKE HOLE 1

Mairead Rutherford, Department of Geography, University of Durham

SUMMARY

Pollen analysis of a 5m core describes a landscape dominated by mixed deciduous woodland from 5m to 85cm A dramatic change in landscape appearance occurs between 85cm and 65cm and from 65cm to the top of the section the landscape is dominated by sedges and grasses with virtual disappearance of woodland The entire sequence is probably of post-Elm Decline age, although values for Elm are quite high between 500-240cm *Plantago lanceolota* is present sporadically from the base of the diagram but consistently and in higher numbers from 180cm Cereal pollen is recorded sporadically from 150cm

DESCRIPTION

Mixed deciduous tree pollen types recorded include birch, oak, pine, lime, alder and elm These taxa, in addition to hazel, are consistently present in relatively uniform numbers from 500cm to approximately 250cm

Values for some tree pollen record an expansion between 230cm and 85cm (alder) and 260cm to 200cm (birch) Pine values show a little peak between 290cm and 250cm Values for elm decline above 240cm and lime disappears above 110cm

A dramatic close to the woodland vegetation is seen above the interval 85cm-65cm, with virtual disappearance of alder, lime and elm with very low counts for birch, oak and pine Hazel follows the same pattern

The other main component of this diagram is that of sedges and grasses Sedges are consistently present in relatively large numbers, grasses too are present consistently but expand from 170cm and above Sedges, and, to a lesser extent, grasses, replace the woodland vegetation which disappears between 85cm – 65cm

A range of shrub and herb taxa are also recorded Among these is the consistent presence of *P lanceolota*, taken as an indicator of grassland communities and associated with *Rumex* and occasional cereal pollen suggests possible low scale pastoral activity in woodland clearings The taxon is present sporadically from the base of the diagram but consistently and in higher numbers from 180cm Additional herb taxa include *Taraxacum*, Umbelliferae, *Rumex*, *Mentha*, Chenopodiaceae as well as a range of Caryophyllaceae and various Compositae Cereal pollen is present, although in low numbers It first appears at 150cm

Freshwater indicator taxa include the aquatic flora *Menyanthes*, *Potamageton*, *Equisetum* and *Typha* These taxa are sporadically present throughout the diagram but most consistently within the upper part of the core, from approximately 155cm Charophyte oogonia have been recorded through the core and are especially common between 220cm and 205cm

There is no microscopic charcoal recorded through the core

INTERPRETATION

The sediments have accumulated in the shake-hole as a result of collapse caused by dissolution of the underlying Magnesian Limestone The accumulated 5m of sediment show a constantly wet environment supported by sedges, grasses, aquatic flora, charophytes and green algae These taxa suggest development of a shallow pool, which was constantly infilled with sediment and pollen from nearby sources Carophytes (stoneworts) and green algae may have lived on the surface of the pond

Pollen from the surrounding area shows a dominant mixed woodland environment Clearances within the woodland for agricultural use may be interpreted from the presence of open grassland taxa such as *P lanceolota* and *Rumex* spp

The dramatic change in vegetation seen towards the top of the diagram with the virtual disappearance of woodland suggests active woodland clearance rather than climatic-induced change If the climate becomes much wetter (which is likely), trees with a preference for wet landscapes would continue to flourish (alder) The record from this shake-hole indicates widespread clearance of the woodland

The precise age of the sequence contained within the shake-hole is difficult to estimate without use of radiocarbon dating Analogy with sites in Yorkshire and in the North York Moors suggests a possible correlation with a transition from Bronze Age to Iron Age and continuing up to the post-Roman period At Bole Ings (Dinnin and Brayshay 1994) forest clearance in surrounding landscape and increased wetness occurs during the upper Bronze Age period During the Iron Age, drastic woodland clearance with increased flooding and arable and pastoral activity is identified

The lowlands of northeast England first experienced major forest clearance during the Bronze Age (Bartley *et al* 1976) Climatic deterioration from the early Iron Age onwards encouraged development of marshland and bogland and this may have had a detrimental impact on woodland communities However, the pollen diagrams such as that from Fen Bogs (Atherden 1976) show a massive woodland clearance during this tune (in spite of increased wetness) and this has been attributed to human activity (Simmons *et al* 1993) Extensive deforestation in Britain also took place during Roman times and also during the Medieval period

The sequence of events at the Nosterfield shake-hole site will only be clarified by a suite of radiocarbon dates

APPENDIX F WYAS ARCHAEOLOGICAL REPORTS

PART 1 ARCHAEOLOGICAL WATCHING BRIEF

Contents

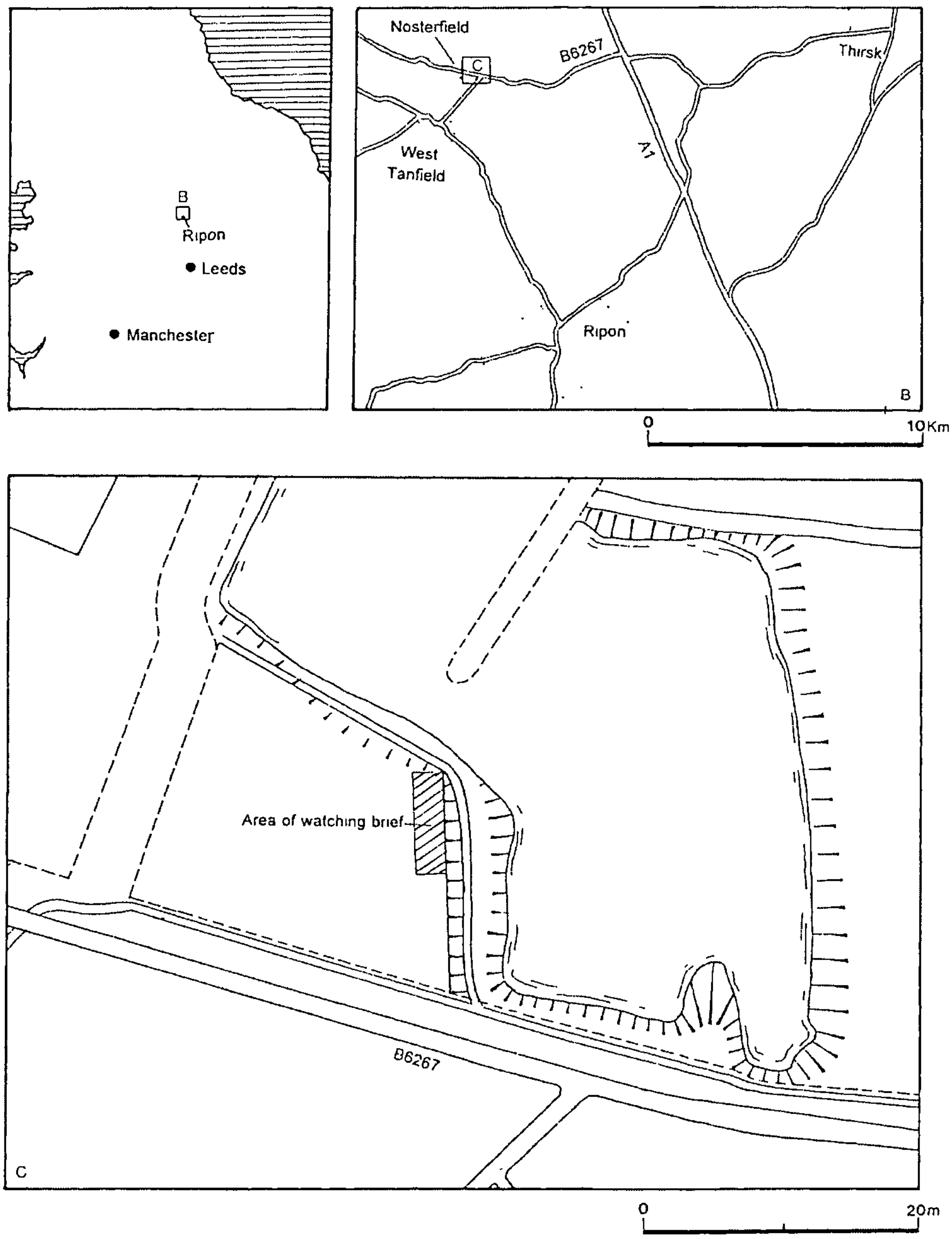

Figure 1 · Location of Nosterfield Quarry, North Yorkshire

1.0 SUMMARY

Objectives
To identify any archaeological remains exposed during topsoil and subsoil stripping

Methodology
Close archaeological supervision was maintained during topsoil and subsoil stripping All spoil was inspected for artefacts and a full written, drawn and photographic record was made of any archaeological features

Results
No archaeological features or artifacts were identified or recovered

2.0 INTRODUCTION

Archaeological Services WYAS were commissioned to carry out an archaeological watching brief on the 29th January 1997 on an area within the Nosterfield Quarry The investigation was designed to identify and record any archaeological features in advance of the proposed quarrying

3.0 ARCHAEOLOGICAL BACKGROUND

Nosterfield Quarry is approximately quarter of a mile north of the northern most henge of the 'Thomborough Complex', one of the most important prehistoric ritual landscapes in Britain Previous work in the area has uncovered a number of pits dating from the Neolithic period The area adjacent and to the west of the subject area produced artefacts of a Neolithic date

4.0 METHODOLOGY

An area 60m by 7m was stripped of soil down to the natural gravel The operation was carried out using a tracked backactor mechanical excavator under direct archaeological supervision The topsoil was stripped and scanned for artefacts Subsequently the subsoil was removed in a series of controlled spits until the natural geological strata of sandy gravel was reached This surface was then inspected for negative features A photographic record was made of this process

5.0 RESULTS

The dark brown stony topsoil was inspected for artefacts but contained none The brownish grey stony subsoil was also inspected with the same result There were no features cut into the natural yellowish orange gravel This area of the site would appear to be devoid of any identifiable archaeological activity.

Acknowledgements

Project manager	Mr C Moloney
Field work	Mr C S Hum
Report	Mr C S Hum
Graphics	Miss E Carter

59189

PART 2 GRADIOMETER SURVEY

Alistair Webb

CONTENTS

1.0 Summary

Objectives
To gather sufficient information to establish the location and extent of any archaeological features (particularly pits) within the proposal area, and, where possible, to characterise the archaeology located in this way

Method
To achieve these objectives a detailed gradiometer survey was carried out over a 1 hectare area using a Geoscan FM36 fluxgate gradiometer

Results and Conclusions
The gradiometer survey identified three responses which it was thought could be caused by pits as well as an area of enhanced magnetic response A negative linear anomaly was also identified This is probably caused by a plastic service pipe

2..0 INTRODUCTION AND ARCHAEOLOGICAL BACKGROUND

2.1 Archaeological Services (WYAS) was commissioned by Mike Griffiths and Associates, Consulting Archaeologists, to carry out a gradiometer survey on a 1ha site at Nosterfield Gravel Quarry, operated by RMC/Tilcon Ltd , in advance of the projected expansion of the extraction area

2 2 The quarry lies about 1km east of Nosterfield to the north of the B6267 in a particularly rich archaeological landscape Three aligned henge earthworks lie immediately south of the quarry, south and west of the village of Thomborough, and there are numerous other tumuli in the immediate vicinity indicating the importance of the area in prehistory Within the quarry site itself previous excavations revealed a prehistoric pit alignment which it was thought might continue into the current application area

2 3 The aim of the survey was twofold, firstly to see if gradiometry was an appropriate evaluation technique on gravel geology and secondly to see whether discrete archaeological features, such as pits, could be identified

2 4 At the tune of survey, March 18th 1997, the site was under short grass

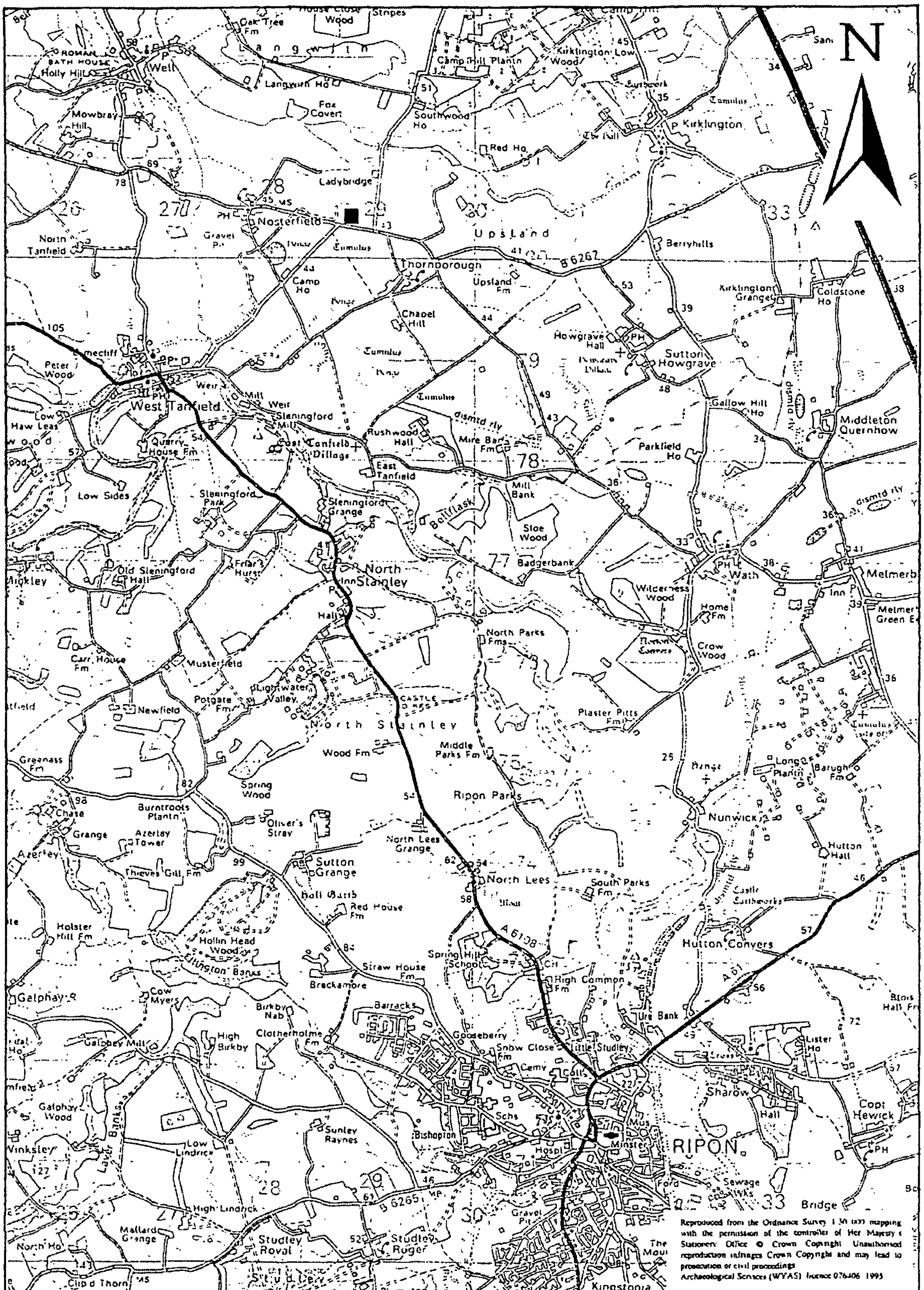

Fig. 1 Site location

3.0 RESULTS AND DISCUSSION

3 1 THE PRESENTATION OF THE RESULTS

3 1 1 The gradiometer data is presented as a greyscale plot overlain on a 1 1250 plot of the site survey in Figure 2 and in dot density and X-Y trace formats at a scale of 1 500 in Figures 3 and 4 The data is interpreted in Figure 5

3 2 THE GRADIOMETER SURVEY (Figures 3 AND 4)

3 2 1 The most obvious anomalies in the magnetic data are the isolated positive/negative (dipolar) responses which are common across the whole site These responses are caused by ferrous material on the ground surface and in the topsoil They are not normally archaeologically significant

3 2 2 Three isolated responses have been identified which it is thought could reflect discrete features such as pits These anomalies differ from "iron spikes" in that the response is positive, not dipolar, and is often seen on more than one traverse ("iron spikes" are generally only detected on one traverse) The positive response is due to the fill of the feature having a higher magnetic susceptibility than the surrounding topsoil

3 2 3 A more general area of enhanced susceptibility has also been detected This probably reflects an area of burning

3 2 4 One negative, curvi-linear, anomaly has been detected at the far eastern edge of the site This is probably due to a plastic service pipe

4.0 CONCLUSION

4 1 The gradiometer survey has shown that both discrete and linear features can be detected on a gravel substrate

4 2 The isolated positive anomalies could be pit features

The results and subsequent interpretation of geophysical surveys should not be treated as an absolute representation of the underlying archaeology It is normally only possible to prove the archaeological nature of anomalies through intrusive means such as by trial excavation

Acknowledgements

Project Management	A Webb BA
Geophysical Survey	J Nicholls BA MSc
Report	A Webb BA
Graphics	H Boyd HND

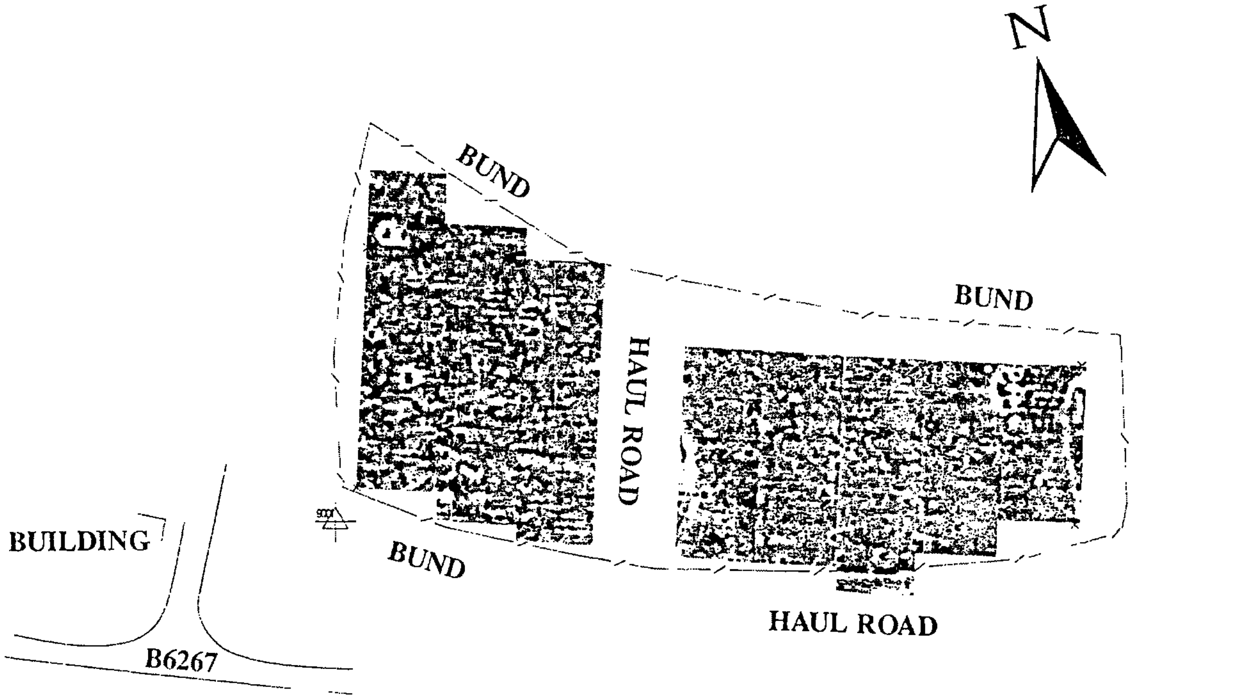

Fig. 2 Site location showing gradiometer data

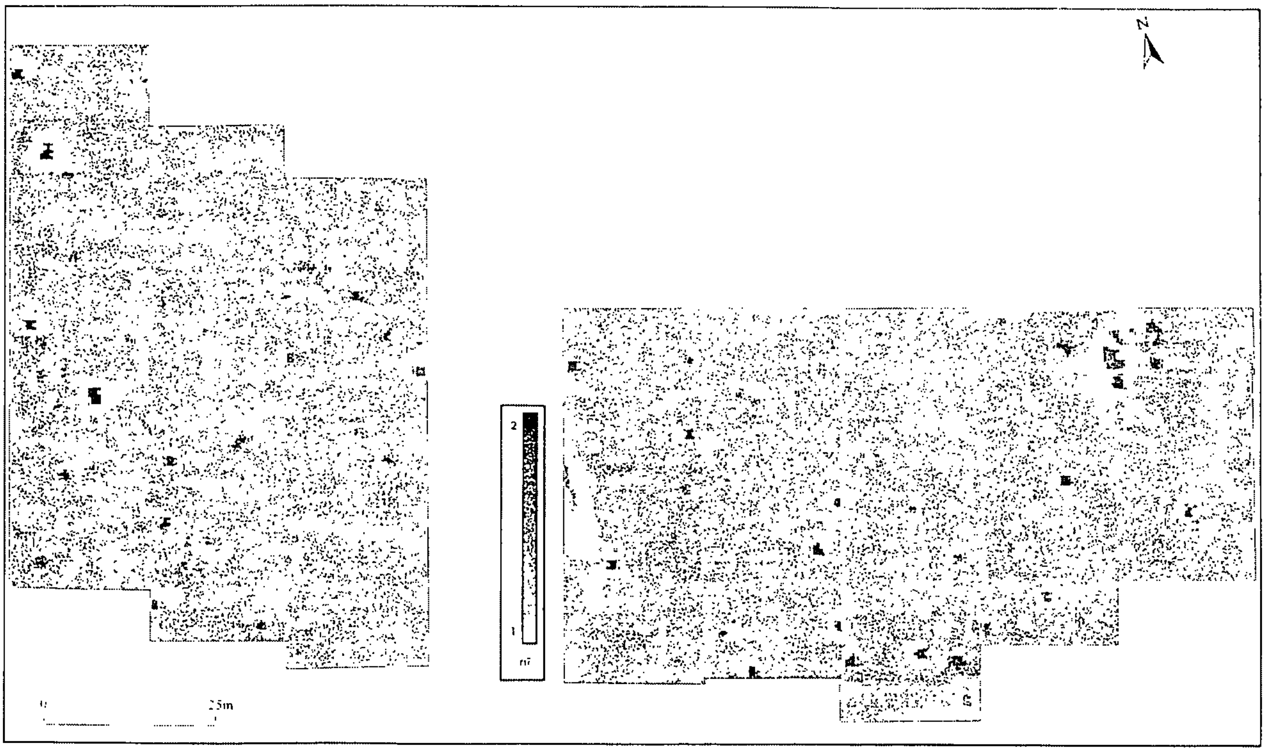

Fig 3 Dot density plot of the gradiometer data

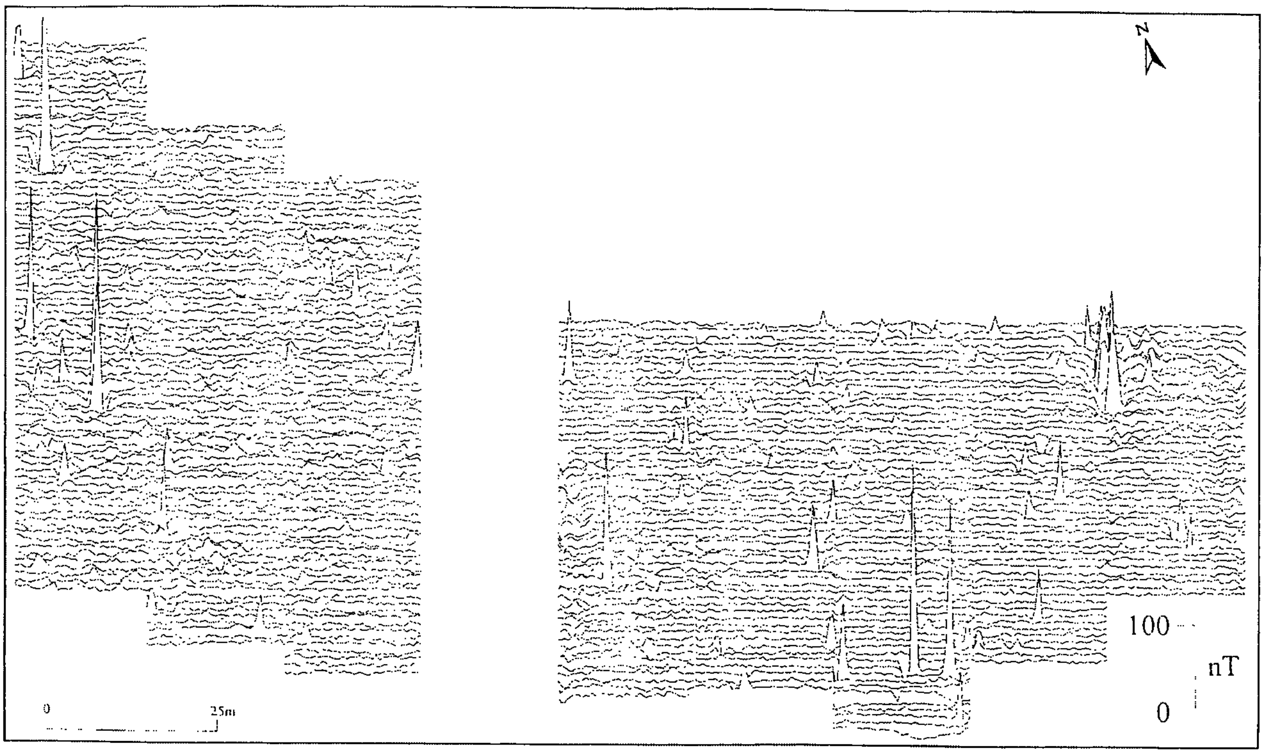

Fig. 4 X-Y trace plot of the gradiometer data

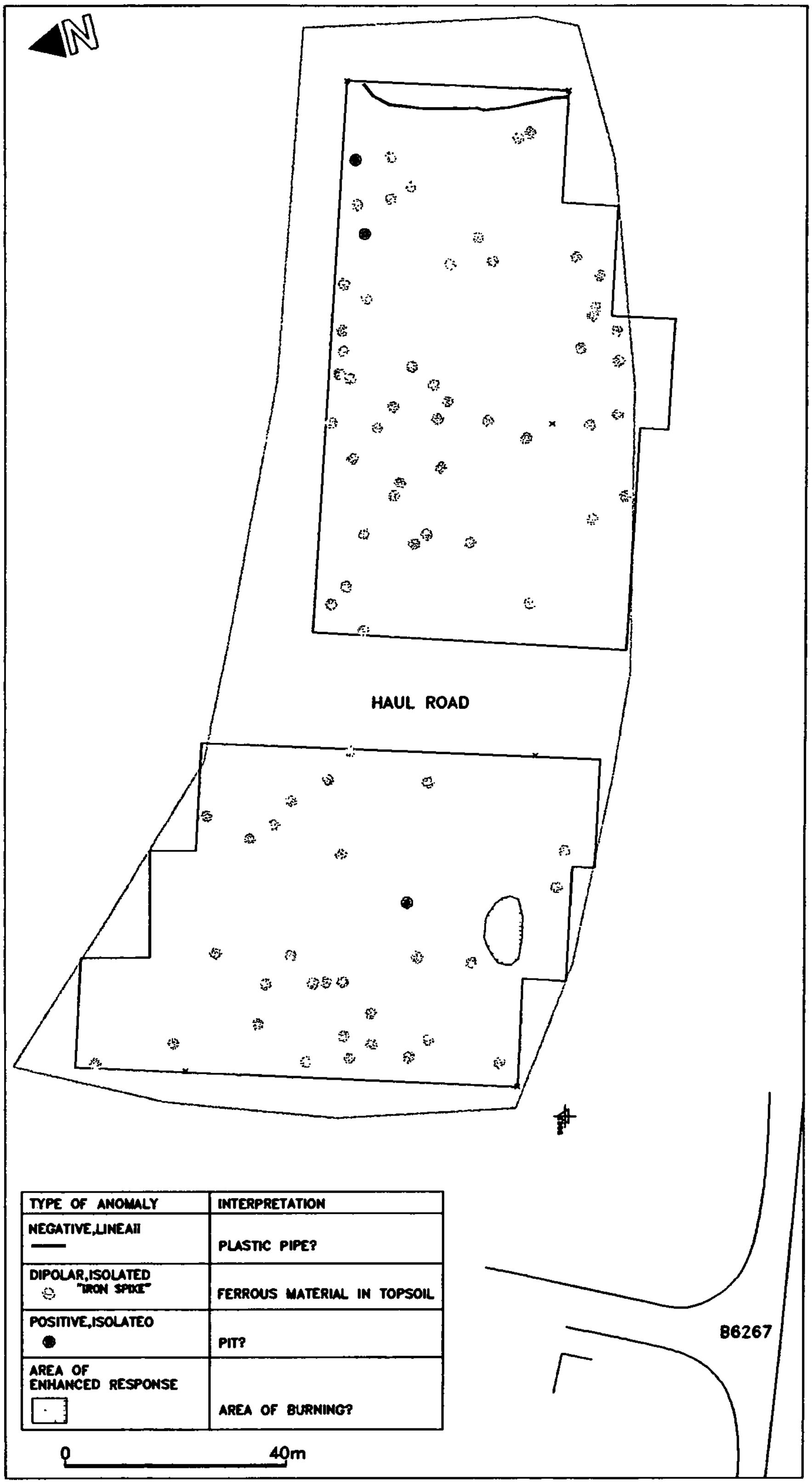

Fig.5 Interpretation of gradiometer data

APPENDIX 1 GRADIOMETER SURVEY TECHNICAL INEORMATION & METHODS

1.0 TECHNICAL INFORMATION

1 1 Iron makes up about 6% of the Earth's crust mostly dispersed through soils, clays and rocks as chemical compounds which are weakly magnetic Human activities can redistribute these compounds and change (enhance) others into more magnetic forms These anthropegenic processes result in small localised anomalies in the Earth's magnetic field which are detectable by a gradiometer

1 2 In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of the topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses This is primarily because there is a tendency for magnetic (iron minerals) to concentrate in the topsoil thereby making it more magnetic than the subsoil or bedrock Linear features cut into the subsoil or solid geology, e g ditches, that have silted up or been backfilled with topsoil will produce a positive magnetic response relative to the background soil levels Discrete features such as pits can also be detected Less magnetic material such as masonry or plastic service pipes which intrude into the topsoil will give a negative magnetic response relative to the general background level

1 3 The magnetic susceptibility of the soil can also be enhanced significantly by heating This can lead to the detection of features such as hearths or kilns

1 4 The highest responses are usually due to iron objects in the topsoil These produce a response characterised by a rapid change from positive to negative readings (iron "spikes")

1 5 The types of response mentioned above can be divided into the five main categories which are described below

1 Iron Spikes (Dipolar Anomalies)
These responses are referred to as dipolar and are caused by buried iron objects Little emphasis is usually given to such responses as iron objects of recent origin are common on agricultural sites

2 Rapid, strong variations in magnetic response
Also referred to as areas of magnetic disturbance these can be due to a number of different types of feature They are usually associated with burnt material such as industrial waste or other strongly magnetic material It is not always easy to determine their date of origin without supporting information

3. Positive, linear responses
The strength of these responses varies depending on the underlying geology They are commonly caused by ancient ditches or by more recent field drains.

4 Isolated positive responses
These exhibit a magnitude of between 2nT and 300nT and, dependent on the strength of their response, can be due to pits, hearths, ovens or kilns They can also be due to natural features on certain geologies It is, therefore, very difficult to establish an anthropogenic origin without an intrusive means of examining the features

5 Negative linear anomalies
These are normally very faint and are commonly caused by features such as plastic water pipes which are much less magnetic than the surrounding soils and geology. They too can be caused by natural features on some geologies

2.0 METHODOLOGY

2 1 There are two methods of using the fluxgate gradiometer The first of these is referred to as *scanning* and requires the operator to visually identify anomalous responses on the instrument display whilst covering the site in widely spaced traverses, typically 10m - 15m The instrument logger is not used and there is therefore no data collection This method is used as a means of selecting areas for detailed survey when only a percentage sample of the whole site is to be surveyed Scanning can also be used to map out the full extent of features located during a sample detailed survey

2 2 The second method is termed *detailed survey* and this employs the use of a sample trigger to automatically take readings at predetermined points, typically at 0 5m intervals, on zig-zag traverses usually 1m apart These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation This method was employed during the survey

2 3 A Geoscan FM36 fluxgate gradiometer and ST1 sample trigger was used to take readings at 0 5m intervals on zig-zag traverses 1m apart within grids measuring 20m by 20m, 800 readings therefore being taken within each 20m grid square In-house software (Geocon Version 9) was used to interpolate the "missing" line of data so that 1600 readings in total were obtained for each complete grid

S109448

APPENDIX G ZOOARCHAEOLOGICAL REPORT

PART I ASSESSMENT OF HAND-COLLECTED ZOOARCHAEOLOGICAL REMAINS FROM NOSTERFIELD

Stephen Rowland, Field Archaeology Specialists Ltd

Summary

An archaeological watching brief was undertaken by Field Archaeology Specialists (FAS) Ltd, on behalf of Mike Griffiths Associates for Tarmac Northern Ltd at Nosterfield quarry, North Yorkshire The watching brief encountered multi-period archaeology dating from the late Neolithic to the 19th century A small vertebrate assemblage of 362 fragmenls was recovered by hand-collection and flotation

Assessmenl of this material indicated that only a very small proportion of these remains (28 fragments) could be identified to taxon, most of which comprised of more durable elements such as loose teeth The range of identified taxa was limited, comprising of horse, pig, cattle, Pleistocene deer and human

1.0 INTRODUCTION

This document reports on the zooarchaeological assessment of approximately 40 litres of animal bone recovered by hand-collection and flotation from an archaeological watching brief undertaken by Field Archaeology Specialists Ltd (FAS) between 1998 and 2003 at Nosterfield Quarry, North Yorkshire A total of 28 contexts from 23 features contained vertebrate remains, these features comprising of pit alignments, ditches, a drying oven, a pit, a posthole, a swallow hole, a drain and a cremation burial

1 1 AIMS AND OBJECTIVES

The aim of the zooarchaeological study was to assess the potential of faunal material for providing information about ritual, social, economic, husbandry and butchery practices at the site

1 2 METHODOLOGY

Zooarchaeological remains were recorded using Microsoft Access 2002, with subjective and semi-quantitative notes made on the state of preservation ('excellent', 'good', 'fair' or 'poor'), angularity ('spiky', 'quite spiky', 'rounded' or 'baltered') and colour, as well as the degree of fragmentation and the proportions of butchery, burning, gnawing and fresh breakages as expressed in percentage ranges Data was imported into Microsoft Excel 2002 for the purposes of preparing figures and tables.

Identifications were made using the FAS and University of York Palaeoecology reference collections and recording followed the Environmental Archaeology Unit (EAU) protocol for recording animal bones (Dobney, Jaques and Johnstone 1999) which, to increase speed of analysis and to maximise the potential of the most informative elements, advocates the recording of a specific suite of 'A bones' using the bone zones of Dobney and Reilly (1988) In addition, to aid determination of the final epiphyseal fusion stage, vertebrae were also recorded to species if more than 50% of the vertebral body (Zone 1) was present The remaining elements were not identified to taxon, regardless of completeness Instead, along with less complete elements, these were identified to anatomic element where possible, and recorded generally as medium mammal 2 (dog, cat or rabbit sized), medium mammal 1 (caprovid, pig and small deer sized), large mammal (cow, horse and large deer sized) or unidentified

Mammal bones were recorded as 'juvenile' if the epiphysis was unfused and if the epiphysis or metaphysis was spongy with billowing growth surfaces If the bone was particularly small, then it was described as 'neonatal', although bones described thus could derive from animals several months old

2.0 ASSESSMENT

2 1 BONE FROM PIT ALIGNMENTS

There were eight contexts from eight aligned pits - F103 C1149, F123 C1184, F125 Cbf, F145 C1226, F155 C1250, F156 C1256, F190 C1376 and F262 C1635 Bone was generally described as in a fair or poor state of preservation, and fragments tended to be 'battered' in appearance Bones were pale in colour, either fawn or beige, with those from F103, C1149 being white and calcined Fragmentation was high, with the majority or all of the bones from most contexts measuring less than 5cm across and none over 20cm There was no evidence for butchery or for carnivore gnawing and the only burning was observed in the F103 where all fragments were calcined A very small number of bones were identified to taxa, including an isolated cow tooth and a fragmentary male horse mandible from F156, C1256 and two calcined pig phalanges from F103 The remaining 204 fragments were dominated by medium mammal (184 fragments) the majority of which came from F203 Fragments of medium and large mammal were generally of more durable long bone shaft

2 2 BONE FROM DITCHES

Ten contexts from four ditch features - F15, F44, F82 and F132 contained bone Most bone was in a fair state of preservation with 'rounded' edges, although two of the five contexts from F15 contained bone in good condition, while that from F44, C1074 was poor and 'battered' and F132, C1189 was poor and 'rounded' Bones from two contexts from F15 were in a good and 'spiky' condition Colouration was again pale, either beige or fawn and fragmentation, similar to bone from pit alignments, was high No butchery or gnawing was observed, and the only burning was a calcined human ulna fragment from F82, C1242 The only identified domesticate was horse, with one or two isolated molars (totalling 15 fragments) present in all but two contexts - F82, C1242 and F132, C1199 More or less complete mandibles with measurable molars were recovered from F15, C1030 and C1041, while F132, C1233 contained left and right mandibles with measurable tooth rows along with a tibia and a possible radius

2 3 BONE FROM BOUNDARY PITS

Several pits were interpreted as the extension of a prehistoric ditched boundary Three of these, F8, F9 and F10 contained a total of 14 fragments of animal bone, all identified as large mammal and generally comprising long bone shaft with single fragments of humerus and radius remaining distinctive The bones tended to be in a fair state of preservation, rounded, and were fawn in colour Fragmentation was moderate to high and there was no evidence of burning, gnawing or butchery

2.4 F4 POSTHOLE

A poorly preserved cow tooth was recovered from C1015

2 5 F13 SWALLOW HOLE

F13 was initially interpreted as a pit, but subsequently identified as a natural peat-filled swallow hole Two backfills contained bone. C1020 a piece of large mammal tibia and C1022, a very large deer mandible This mandible is extremely dense and appears to be partly fossilised It is possible that the mandible of that of elk, or megaloceros, both taxa that had not been extant in Britain since the Pleistocene (Terry O'Connor pers comm) The overall preservation of the bones was fair but rounded and they had been stained dark brown by their peaty environment

2 6 F72 DRAIN

C1116 contained eight rounded bones in a fair state of preservation These included six pig teeth five incisors and a female canine, a bird shaft fragment and a piece of medium mammal skull

2 7 F91 CREMATION PIT

A single fragment of calcined medium mammal bone was recovered through flotation from C1135

2.8 F101 OVEN CHAMBER

F101 was identified as the chamber of a drying oven of Roman date Two contexts, C1146 and C1380 yielded a poorly preserved medium mammal rib and two large mammal shaft fragments, described as either battered or rounded and either beige or white in colour There was no evidence of burning on the bones that might indicate that they had been *in situ*, as a fuel source for example, when the oven was in use

3.0 DISCUSSION

Overall, there is little that can be said about the animal bones from Nosterfield beyond tantalising inferences there are too few fragments and too little in the way of dating evidence While each of the main domesticates are represented, there are insufficient bones from which to establish any idea of animal husbandry or local economic practices In addition, it is clear that from the survival of the more robust elements such as teeth and long bone shaft fragments, their poor state of preservation and their roundedness, that intense taphonomic processes have acted upon the bones, and the assemblage that was recovered is likely to be very different from that which was originally deposited The bones would certainly suggest that rubbish dumping, and by inference human occupation, took place in the area of the excavated features

One aspect of interest may be the relatively high numbers of horse bones The concentration of head elements may not be significant since other parts of the body were found, in general they are less likely to survive However, the discovery of F316, a quadruple horse burial during more recent work at Nosterfield, for which analogous features have been found at other Iron Age sites such as Blueburton (Mike Griffiths pers comm.), would suggest that horses played an important role in ritual activity. Horses also made an appearance in a large pit of probable ritual importance dated to the 3rd century AD at Site 25 on the Silk-Willoughby-Staythorpe gas pipeline in Nottinghamshire Here, the basal deposit contained the skulls of a horse and a cow and a pair of dog mandibles, while the upper fills contained a large number of horse bones deriving from at least two individuals (FAS 2003) When the material from Nosterfield is combined with the evidence of two square ditched features, thought to be barrows of Iron Age date, it seems likely that a certain degree of ritual activity was carried out at the site during that period Indeed, it can be argued that horse remains were quite closely associated with these square barrows. F316 was cut about six metres from F304 and in direct alignment with it, while the only artefact accompanying male burial F335 (placed into the west ditch of barrow F320), was a horse molar found between his legs It is possible then that horses may have been deposited into features for ritual reasons, or perhaps even that their skulls were displayed The presence of a cremated human ulna fragment in F82, C1242 is not particularly out of place given the widespread occurrence of human body parts in Iron Age features from a wide range of sites

Ritual activity is also likely to be associated with the pit alignments F103 contained material that might suggest that it derived from ritual activity In this case, there were 170 small fragments of calcined bone, two of which could be recognised as pig phalanges one of which was unfused The rest of the fragments could be identified only as medium mammal, but included fragments of skull and long bone It is possible that this deposit represents some sort of burnt offering

4.0 POTENTIAL FOR FURTHER ANALYSIS

At present, the assemblage from Nosterfield is a little too small and poorly preserved to warrant much in the way of detailed further analysis However, should more refined dating be acheived for some of the features containing horse remains, then it may be worth making an archive of horse tooth measurements

5.0 RECOMMENDATIONS

It is recommended that the horse bones from Nosterfield should be fully measured and recorded only once a tighter chronology has been established and within the context of a specific research question A full identification of the large deer mandible is also desirable The rest of the material should be retained so that it can be combined with further material from the watching brief whereupon it may be necessary to reassess its potential

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Table 1 Summary of context and preservation information from Nosterfield

Key Int=Intervention, Type=feature type, Pres=preservation (f=fair, p=poor, g=good), Ang=angularity (s=spiky, q=quite spiky, r=rounded, b=battered), Col= colour (be=beige, g=ginger, f=fawn, db=dark brown, w=white) The following expressed in percentages where n=none, 0=o-10%, 1=10-20%, 2=20-50% and 5=50%-, 0-5cm = fragments between 0 and 5cm across, 5-20cm = fragments between 5 and 20cm across, 20cm+ = fragments over 20cm across, Butch=butchery, Gnaw= gnawing, Burn=Burning

Int	Feature	Context	Type	Pres	Ang	Col	0-5cm	5-20cm	20cm+	Butch	Gnaw	Burn	Fresh Breaks	Total Frags
5	4	1015	post hole	p	s	be	5	n	n	n	n	n	5	1
5	8	1009	boundary pit	g	q	g	n	5	n	n	n	n	n	1
5	9	1010	boundary pit	f	r	f	2	5	n	n	n	n	5	8
5	10	1011	boundary pit	f	r	f	5	2	n	n	n	n	5	5
4	13	1020	pit	f	r	db	n	5	n	n	n	n	5	1
4	13	1022	pit	g	r	db	n	n	5	n	n	n	n	1
5	15	1022	ditch	f	r	be	n	5	n	n	n	n	n	1
5	15	1023	ditch	f	r	f	2	5	n	n	n	n	5	3
5	15	1025	ditch	f	r	be	n	5	n	n	n	n	n	1
5	15	1028	ditch	g	s	f	5	n	n	n	n	n	5	1
5	15	1030	ditch	g	q	f	5	2	n	n	n	n	2	22
5	15	1041	ditch	f	r	be	5	2	n	n	n	n	5	14
5	44	1074	ditch	p	r	be	5	n	n	n	n	n	5	1
5	72	1116	drain	f	r	be	5	n	n	n	n	n	2	8
5	82	1242	ditch	f	r	w	5	n	n	n	n	5	n	1
5	91	1135	cremation pit	f	r	w	5	n	n	n	n	5	n	1
5	101	1146	oven chamber	p	b	be	5	n	n	n	n	n	5	1
5	101	1380	oven chamber	p	r	w	5	n	n	n	n	n	5	2
5	103	1149	aligned pit	f	r	w	5	n	n	n	n	5	n	170
5	123	1184	aligned pit	p	b	be	5	n	n	n	n	n	5	8
5	125	bf	aligned pit	f	b	f	5	2	n	n	n	n	n	8
5	132	1199	ditch	p	b	be	5	n	n	n	n	n	f	9
5	132	1233	ditch	f	b	f	5	2	0	n	n	n	5	64
5	145	1226	aligned pit	f	b	f	n	5	n	n	n	n	5	6
5	155	1250	aligned pit	f	b	f	n	5	n	n	n	n	1	1
5	156	1256	aligned pit	p	b	f	5	n	n	n	n	n	5	4
5	190	1376	aligned pit	p	b	be	5	n	n	n	n	n	5	10
5	262	1635	aligned pit	f	b	be	5	n	n	n	n	n	5	9

Table 2 Summary of fragment count by taxon according to feature type from Nosterfield

Taxon		Aligned pit	Boundary pit	Cremation pit	Pit	Ditch	Drain	Oven chamber	Post hole	Grand Total
horse	*Equus* f domestic	1				15				16
deer	*Cervus* sp				1					1
pig	*Sus* f domestic	2					6			8
cow	*Bos* f domestic	1							1	2

Taxon	Aligned pit	Boundary pit	Cremation pit	Pit	Ditch	Drain	Oven chamber	Post hole	Grand Total
human *Homo sapiens*					1				**1**
large mammal	20	14		1	54		2		**91**
medium mammal I	186		1		13	1	1		**202**
bird						1			**1**
unidentified	6				34				**40**
Grand Total	**216**	**14**	**1**	**2**	**117**	**8**	**3**	**1**	**362**

Table 3 Summary of analysable bones from Nosterfield

Taxon		Measureable	Mandibles	Teeth	New Born	Juvenile	Unfused	Fragments	Weight
horse	*Equus* f domestic	7	2	1	0	0	0	16	985
deer	*Cervus* sp	0	1	0	0	0	0	1	406
pig	*Sus* f domestic	0	0	1	0	0	1	8	21
cow	*Bos* f domestic	0	0	0	0	0	0	2	18
human	*Homo sapiens*	0	0	0	0	0	0	1	4
large mammal		0	0	0	0	0	0	91	639
medium mammal I		0	0	0	0	0	0	202	73
bird		0	0	0	0	0	0	1	0.5
unidentified		0	0	0	0	0	0	40	18
Total		7	3	**2**	0	0	**1**	362	**2164.5**

APPENDIX H SCIENTIFIC DATING OF ARCHAEOLOGICAL FEATURES

PART 1. RADIOCARBON DATING OF HUMAN BONE

Scottish Universities Environmental Research Centre (SUERC)

SUMMARY OF RADIOCARBON DATING CERTIFICATES

Feature No	Context No	Laboratory code	Material	$\delta^{13}C$ relative to VPDB	Radiocarbon age BP	Radiocarbon age BC/AD
91	1135	SUERC-3776 (GU-12280)	Cremated bone Human	-22 9%	3085 ± 35	1135 ± 35 BC
92	1136	SUERC-3777 (GU-12281)	Cremated bone Human	-22 0%	3210 ± 35	1170 ± 35 BC
96	1140	SUERC-3781 (GU-12285)	Cremated bone Human	-22 2%	3050 ± 40	1100 ± 35 BC
106	1157	SUERC-3782 (GU-12286)	Cremated bone Human	-20 5%	3000 ± 35	1050 ± 35 BC
253	1617	SUERC-3778 (GU-12282)	Bone Human	-20 8%	1910 ± 35	AD 40 ± 35
267	1642	SUERC-3779 (GU-12283)	Bone Human	-21 1%	3190 ± 40	1240 ± 40 BC
269	1647	SUERC-3786 (GU-12287)	Cremated bone Human	-23 0%	3555 ± 35	1605 ± 35 BC
335	1754	SUERC-3780 (GU-12284)	Bone Human left femur	-20 5%	2085 ± 35	135 ± 35BC

PART 2. RADIOCARBON DATING CERTIFICATE F216, C1482

Scottish Universities Environmental Research Centre (SUERC)

Laboratory Code.	AA-51419 (GU-10384)
Submitter:	Andrew Copp Field Archaeology Specialists Ltd University of York King's Manor York YO1 7EP
Site reference:	Nosterfield sand and gravel quarry, North Yorkshire
Sample reference:	F216 C1482 G
Material:	Sediment Acid wash only
Delta ^{13}C rel. **PDB**:	-26 0‰
Radiocarbon Age BP:	6625 ± 60

N.B. 1 The above C14 age is quoted in conventional years **BP** (before 1950AD) The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error

2 The calibrated age rages are determined from the University of Oxford Radiocarbon Accelerator Unit calibration programme (OxCal3)

3 Samples with an AA coding are measured at the University of Arizona AMS facility and should be quoted as such in any reports within the scientific literature Any questions directed to SURRC should also quote the GU coding that is given in parentheses after the AA code

Conventional age and calibration age ranges calculated by	R Anderson	Date 26-11-02
Checked and signed off by.	P Naysmith	Date 26-11-02

PART 3 ARCHAEOMAGNETIC ANALYSIS OF F159

GeoQuest Associates

Summary

A total of 13 samples of fired stone and 1 of fired clay were removed from F159 for the purpose of archaeomagnetic analysis and dating Specimens were oriented in situ using the button method, combined with spirit levels and a sun compass Demagnetisation tests showed that the magnetisation in the material is highly stable The mean archaeomagnetic vector in the samples was compared with the UK Master Curve to suggest that last firing occurred in the date range 100-170A D

MAGNETIC DATING REPORT

SITE NAME:	Nosterfield Tarmac Quarry	**LOCATION:**	Nosterfield, N. Yorks
SITE CODE:	N0S02	**COORDINATES:**	54 2°N 1 6°W
SAMPLING DATE:	10/6/02	**SITE CONTACT:**	Annette Roe
CONTEXT:	F159 Fired stone & clay	**FEATURE TYPE:**	Roman(?) kiln/dryer

SITE/CONTEXT DESCRIPTION

Feature was discovered during a watching brief by Field Archaeology Specialists during topsoil stripping of a proposed extension to the Tarmac aggregate quarry at Nosterfield It comprises a kiln or corn drying oven, about 1 2m long by about 0 8m across, constructed of stone mortared with fired clay A disuse fill which dished into the feature contained sherds of probable Roman date, thus providing *a terminus ante quem* for the feature.

ANALYTICAL METHODS

Sampling via button method with orientation by sun compass Archaeomagnetic remanence measured using a Molspin fluxgate spinner magnetometer and stability assessed using stepwise, alternating field demagnetisation Secondary components of magnetisation removed by partial demagnetisation. Mean of selected vectors computed (with unit weights) and corrected to Meriden Comparison then made to the UK Master Curve to obtain a last firing date Further details of technical methods are contained in the Appendix

RESULTS

SAMPLE	J	D	I	A.F.	D	I	Comment
NOS1	209 7	356 4	55 8	2 5	352 6	56.3	Stone
NOS2	48 1	11 6	690	25	12.7	68 3	Stone
NOS3	145.3	349 2	61 6	2 5	347 9	62 6	Stone
NOS4	82 6	353 3	67 5	2 5	358 3	67.0	Stone
NOS5	123 0	353 2	79 0	2 5	354.7	80.2	Stone
NOS6	77 6	350 0	61 3	2 5	350 4	60 3	Stone
NOS7	247.3	8 0	66 5	2.5	6 0	66 1	Stone
NOS8	1 8	348 3	60 3	2 5	346 7	63 6	Stone
NOS9	34 5	12 2	711	2 5	10 9	69 9	Stone
NOS10	25 1	20 0	76 3	2 5	16 3	74 1	Clay
NOS11	63.1	15 2	67 1	2 5	15 5	67 1	Stone

SAMPLE	J	D	I	A.F.	D	I	Comment
NOS12	84 9	354 1	672	2 5	351 4	66 9	Stone
NOS13	58 5	356 9	602	2 5	356 8	61 4	Stone
NOS14	129 5	354 8	629	2 5	335 3	62 8	Stone
MEAN K=110 7 Alpha95=3 8 c s c =2 1					357 0	66 6	
MERIDIEN					357 1	65 3	

KEY D=declination, I=inclination, J=intensity in units of $mAm^{-1}x10^{-3}$ A F =peak alternating demagnetising field in milliTesla K=precision parameter, c s c =circular standard error, alpha95=semi-angle of the 95% cone of confidence

ESTIMATED DATE RANGE FOR LAST FIRING:100 A.D. – 170 A.D.

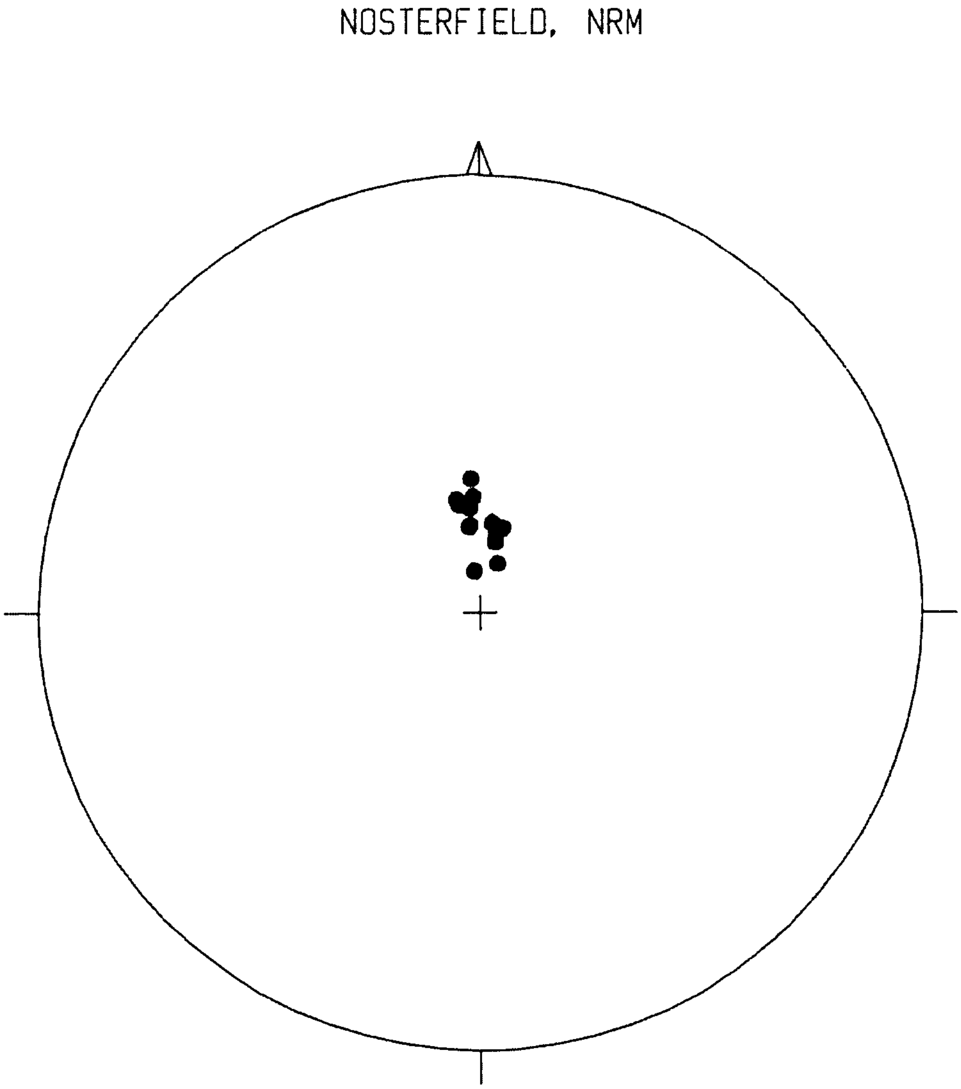

Figure 1 Directions of natural remanent magnetisation in samples from F159 at Nosterfield, shown on an equal area stereogram In this representation, declination increases clockwise while inclination increases from zero at the equator to 90° at the centre of the projection

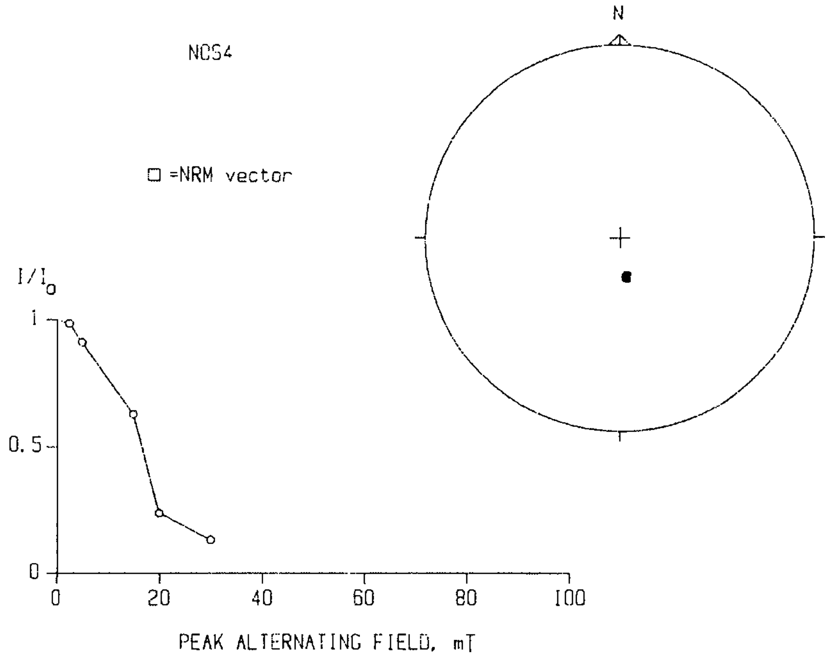

Figure 2 Changes in the direction and intensity of remanent magnetisation in pilot sample N0S4 during stepwise demagnetisation in alternating magnetic fields

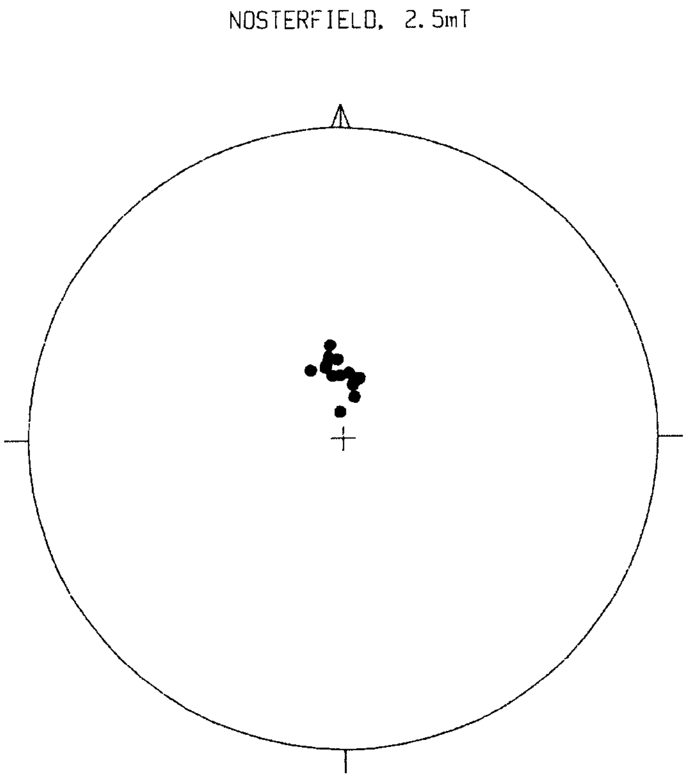

Figure 3 Directions of natural remanent magnetisation in samples from F159 after partial demagnetisation in an alternating field of 2 5mT

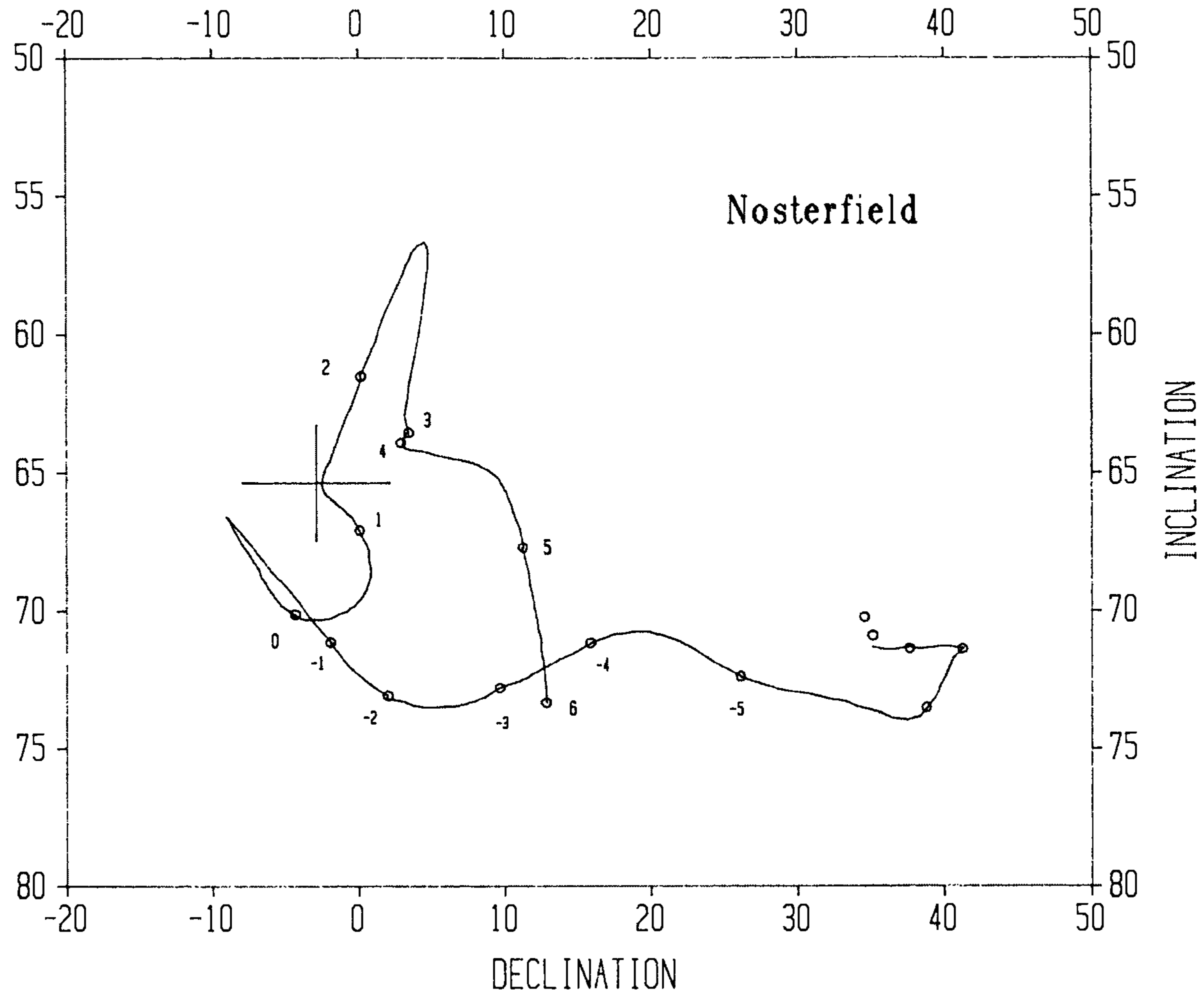

Figure 4 Comparison between the mean archaeomagnetic vector in the feature with the UK Master Curve 1000 B C to 600 A D Numbers refer to the date in centuries The error bar is based on the circular standard deviation given in Table 1

APPENDIX 1 Principles of Magnetic Dating

Magnetic dating is based on comparing the remanent magnetisation in an archaeological structure with a calibrated reference curve for the geomagnetic secular variation Two distinct methods have evolved The *intensity* technique relies on obtaining estimates of the past strength of the Earth's magnetic field while *directional* magnetic dating uses archaeomagnetic measurements to derive the orientation of the geomagnetic vector in antiquity Intensity dating can only be applied to fired materials which have acquired a thermoremanent magnetisation upon cooling from high temperatures (>600°C) while the directional method enables the age of a broader range of archaeological materials to be determined For example, sediments and soils may have acquired a dateable 'detrital remanence' if magnetic grains had been aligned by the ambient field during deposition The growth of magnetic minerals during diagenesis or as a result of manufacturing processes can also give rise to a magnetisation which may enable materials such as iron-rich mortars, for example, to be dated However hearths, kilns and other fired structures are the most common features selected for magnetic dating primarily because their thermoremanence is generally strong, stable and sufficiently homogeneous that the ancient field can be determined with sufficient precision from a small set of specimens An analysis of dated archaeomagnetic directions, largely from fired structures, together with lake sediment and observatory records has enabled a master curve for the UK region to be synthesised for the period 2000 B C to the present (Clark, Tarling and Noel 1988)

For directional magnetic dating it is essential to obtain specimens of undisturbed archaeological material whose orientation with respect to a geographic coordinate frame is known A number of sampling strategies have evolved, enabling specimens to be recovered from a range of archaeological materials with orientations being recorded relative to topographic features, the direction of the sun, magnetic or geographic north For this feature the miniaturised 'button method', illustrated overleaf, was employed Clark *et al.* 1988) Modern archaeomagnetic magnetometers are sufficiently sensitive that only small volumes of material (~1 ml) are required for an accurate remanence measurement (Molyneux 1971) This has the advantage of reducing the impact of sampling on archaeological features - of particular significance if they are scheduled for conservation and display For dating, all archaeomagnetic vectors are transposed to Meriden, the reference location for the UK Master Curve (Noel and Batt 1990)

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PART 4 RADIO-CARBON DATING OF A HORSE FEMUR FROM F316, C1732
Scottish Universities Environmental Research Centre (SUERC)

RADIO-CARBON DATING CERTIFICATE

Laboratory Code:	SUERC-2974 (GU-11688C)
Submitter:	Cecily Spall Field Archaeology Specialists University of York King's Manor York YO1 7EP
Site reference:	NOSTERFIELD QUARRY
Sample reference:	NOS'03 F316 C1732
Material:	Bone (horse femur)
$\delta^{13}C$ relative to **VPDB**:	-22 2‰
Radiocarbon Age **BP**:	**2000 ± 35** [AD 50 ± 35]

N.B.

1. The above 14C age is quoted in conventional years **BP** (before 1950 AD) The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard, and the random machine error
2. The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal3).
3. Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and shoul be quoted as such in any reports within the scientific literature Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code

Conventional age and calibration age ranges calculated by	BRIAN T	13/08/2004
Checked and signed off by	GORDON COOK	13/08/2004

APPENDIX I OSTEOLOGICAL REPORTS

510949

Osteological analysis was undertaken by Field Archaeology Specialists in 1999 and 2003 on cremated and unburnt bone assemblages from three phases of watching brief at Nosterfield Quarry, North Yorkshire (SE 7661 0886) on behalf of Mike Griffiths and Associates for Tarmac North Ltd (Part 1) Subsequently, York Osteoarchaeology was commissioned to examine one skeleton excavated in December 2003 (Part 2)

PART 1 OSTEOLOGICAL ANALYSIS

Summary

Nineteen assemblages of cremated bone were the subject of osteological analysis, which identified that eight of these were non-human and were subsequently omitted from the analysis Ten of the cremations were part of a small scattered cemetery, which is provisionally dated to the Middle Bronze Age The cemetery contained both urned and unurned burials, some of which contained grave foods in the form of animal bone The group included individuals of all ages, suggesting that the cemetery may have served a small community or family

Another assemblage of cremated bone, as well as two inhumations were recovered from a discrete area The assemblage included the cremated remains of an adult female, who might have been interred in a box, located within the perimeter of a large ring ditch Two unusual inhumations were found in pits close to the ring ditch Both graves only contained long bones arranged beside one another, with a skull placed on top These burials probably represent secondary interments, following exposure of the body with subsequent loss of some bone to animal attack, the surviving bones were then collected and placed in pits The burials contained a mature adult female buried in an isolated pit, and a female middle adult who had been placed in a pit of a pit-alignment that cut the ring ditch

Acknowledgements

Field Archaeology Specialists Ltd would like to thank Dr Matthew Collins for his advice on the excarnated skeletons FAS would also like to thank Karen Barker for the excavation of the skeletal remains contained in the urns

1.0 INTRODUCTION

Human remains were uncovered during three phases of watching brief at Nosterfield Quarry, North Yorkshire (SE 7661 0886) These comprised a small cremation cemetery assemblage and two inhumations excavated in 2002 (Intervention 5), as well as four deposits of calcined bone excavated in 1999 (Intervention 1) by Field Archaeology Specialists Ltd Three further assemblages of calcined remains were excavated in 1997 by Mike Griffiths and Associates In September 2003, osteological analysis was carried out on the calcined and inhumed remains from all three phases of excavation

Two inhumed skeletons (C1617 and C1642) had been interred near the perimeter of a large ring ditch (F264) in Intervention 5 The skeletons were found in unusual positions, only some of the long bones, the skulls and a small number of bone fragments representing the trunk were recovered from these burials The position of the long bones laid out beside one another, with the skull placed on top of the bones, as well as the apparent lack of some skeletal elements, implies that the individuals must have been skeletonised prior to burial. A cremation burial (F269) was found in a square cut within the area enclosed by the ring ditch and may have been associated with the inhumations

A small cremation cemetery was discovered in the central part of Intervention 5 and contained ten burials, which were dispersed around a small ring ditch Four of the burials had been interred in urns and two of these may represent a double burial (F92 and F93), although their relationship was not clear upon excavation Dating evidence from four urns and pottery sherds recovered from the cremation cemetery date these burials to the Middle Bronze Age (approximately 1300 BC), while all other deposits are undated

The remaining assemblages of calcined bone derived from scattered pits and scoops

1 1 AIMS AND OBJECTIVES

Initially, the assessment aimed to identify whether all calcined bone recovered from the site was human The skeletal assessment then aimed to determine age, sex and stature, as well as any pathological conditions from which the individuals may have suffered Information was also sought regarding the cremation techniques and the unusual funerary ritual of the two inhumed individuals

1 2 METHODOLOGY

The inhumed skeletons were analysed in detail, assessing the preservation and completeness of each skeleton, as well as determining the age, sex and stature of the individuals and any pathological conditions.

The cremated bone was first analysed to determine whether it was human or non-human The human bone was subsequently sieved through a stack of sieves, with 10mm, 5mm and 2mm mesh sizes The bone recovered from each sieve was weighed and sorted into identifiable and non-identifiable bone The identifiable bone was divided into five categories skull, axial (excluding the skull), upper limb, lower limb, long bone (unidentifiable as to the limb) All identifiable groups of bone were weighed and bagged separately

Bone colour, fragmentation, preservation and rate of cracking and warping resulting from the burning were recorded in order to obtain information on cremation processes and subsequent funerary rituals

2.0 OSTEOLOGICAL ANALYSIS

Osteological analysis is concerned with the determination of the demographic profile of the assemblage based on the assessment of sex, age and stature, as well as measurements and non-metric traits This information is essential in order to determine the prevalence of disease types and age-related changes It is also crucial for identifying gender dimorphism in occupation, lifestyle and diet, as well as the role of different age groups in society

2 1 PRESERVATION

All calcined bone assemblages recovered from Intervention 1, as well as those excavated in 1997, were found to be non-human Additionally, the uppermost backfill of pit F103 from Intervention 5 contained calcined bone, which was non-human (Table 1) The eight assemblages of animal bone have been omitted from this report Ten burials originating from the cremation cemetery and a single cremation burial as well as two inhumations are discussed here

Table 1 Summary of the assemblage preservation

Area	Context	Feature	Feature type	Human/ Animal	Inclusions	Bone State	Preservation	Age	Sex	Weight (g)
1997	1075	-	-	animal	-	white	poor	-	-	68 1
1997	1306	-	-	animal	-	white	poor	-	-	0.5
1997	7081	-	-	animal	-	white	good	-	-	1 2

Area	Context	Feature	Feature type	Human/ Animal	Inclusions	Bone State	Preservation	Age	Sex	Weight (g)
1	1174	116	pit	animal	-	white	poor	-	-	1
1	1186	125	scoop	animal	-	white	moderate	-	-	122
1	1200	134	pit	animal	-	white	moderate	-	-	14
1	1195	142	scoop	animal	-	white	poor	-	-	0 7
5	1134	90	burial	human	charcoal	white	poor	-	-	0 6
5	1135	91	burial	human	charcoal, pottery, hoof	white	good	3813 9	-	104 4
5	1136	92	burial	human	urned	white	good	13+	-	90 4
5	1137	93	burial	human	urned	white	moderate	-	-	1 7
5	1140	96	burial	human	urned, animal bone	white	good	36+	?male	1301 7
5	1143	98	burial	human	charcoal, pottery	white/blue/black	moderate	16–	-	5 4
5	1144	99	burial	human	charcoal	white/brown	poor	-	-	0 3
5	1145	100	burial	human	charcoal	white	very poor	-	-	1 3
5	1149	103	pit	animal	-	white/blue	moderate	-	-	37 7
5	1156	105	burial	human	charcoal	white/blue	moderate	-	-	73 8
5	1157	106	burial	human	urned, charcoal	white/blue	excellent	16+	-	216 8
5	1617	253	inhumation	human	-	unburnt	very poor	26-45	female	-
5	1642	267	inhumation	human	-	unburnt	very poor	46+	?female	-
5	1647	269	burial	human	charcoal	white	good	16+	female	206 2

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition Preservation of human skeletal remains is assessed subjectively, depending upon the severity of bone surface erosion and post-mortem breaks, but disregarding completeness

Preservation was assessed using a grading system of five categories very poor, poor, moderate, good and excellent Excellent preservation implied no bone surface erosion and very few or no breaks, whereas very poor preservation indicated complete or almost complete loss of the bone surface due to erosion and severe fragmentation

Preservation varied considerably throughout the bone assemblages (see Table 1) The severity of erosion and fragmentation depended to a large extent on the degree of disturbance by ploughing, which is estimated to have truncated the features by around 0 30m The use of chemicals in agricultural activities and leaching from rain water may have exacerbated degradation Few of the cremation burial pits survived as more than 2cm of the base of the burial pit The degree of truncation of the features was illustrated by some of the cremation vessels, where little more than the base had remained intact, with the exception of the urn in F106, which was inverted and had remained intact Nevertheless, the presence of the urns had protected the bones from the effects of leaching and erosion This was illustrated most effectively in burial F106, which contained bone fragments up to 70mm long and showed no evidence for erosion. Cremated bone recovered from outside the cremation vessel on the other hand, was fragmentary and had suffered from severe erosion The extent of the truncation had therefore not only caused significant bone loss, but also considerable deterioration to the surviving bone

The inhumation burials were also truncated. resulting in loss of parts of the skulls, which were uppermost in the burial pits These unburnt bones were extremely porous, and disintegrated upon removal from the grave Erosion had destroyed the bone surface entirely Furthermore, none of the spongy parts of the bone, such as the vertebrae or long bone joints were preserved It is possible that the bones had already been weakened as a result of exposure before burial, which would have allowed weathering of the bone, as well as the possibility of fungal, mammal and bacterial attack.

The fragment size of cremated bone is frequently attributed to post-cremation processes This is because skeletal elements retrieved from modern crematoria tend to be comparatively large before being ground down for scattering or deposition in urns However, bone is also prone to fragmentation if it is moved while still hot (McKinley 1994, 340) and it may be this process which contributed to the fragmentation of the cremated bone from Nosterfield Quarry It is probable that truncation affected bone degradation, which is illustrated by the comparative difference in skeletal fragment size from urned burials F96 and F106 Burial F96 contained the greatest quantity of bone in the best preserved, though truncated vessel Nevertheless, the bone fragment size from this burial was considerably smaller than the size of fragments from F106, an inverted burial that had survived intact

Bone fragment size varied between and within the eleven cremation burials However, the majority of bone recovered derived from the 5mm sieve (Table 2) Bone smaller than 5mm was often not separated from the fine gravel residue, and therefore constitutes only a small proportion of the total assemblages In 55% of burials, one third or more of the assemblages constituted bone fragments larger than 10mm These were mostly assemblages which contained a more substantial proportion of bone However, only in two burials (18%) was the majority of bone larger than 10mm The majority (64%) of assemblages contained bone fragments that were between 5 and 9mm in size Two burials which had suffered from particularly severe truncation and contained less than 4g of human bone contained bone fragments which were retained predominantly in the 2mm sieve

Table 2 Summary of cremated bone fragment size

Feature No	10mm (g)	10mm (%)	5mm (g)	5mm (%)	2mm (g)	2mm (%)	Residue (g)	Total human (g)
90	0	0	0 6	100	0	0	162 1	0 6
91	28 7	27 5	65 9	63	9 8	9 5	1225	104 4
92	35 3	39	45 2	50	9 9	11	0	90 4
93	0	0	1 7	100	0	0	0	1 7
96	583 2	45	432 7	33	285 8	22	83 8	1301 7
98	1 4	26	4	74	0	0	321.3	5 4
99	0	0	0 3	100	0	0	235 9	0 3
100	0	0	0	0	1 3	100	394 4	1 3
105	3 2	0	1 4	44	1 8	56	73 8	3 2
106	132 2	61	73 7	34	10 9	5	0	216 8
269	72.3	35	124 9	61	9	4	960 7	206 2

The quantity of cremated bone per burial varied considerably from 0 7g to 1301 7g (see Table 1), with an overall mean weight of 175 6g The quantity of bone retrieved from the burials weighed considerably less than that produced by modern crematoria, which tends to range from 1001 5g to 2422.5g with an average of 1625.9g (McKinley 1993) Wahl (1982, 25) found that archaeologically recovered remains of cremated adults tend to weigh (between 250g and 2500g), as a result of the commonly practised custom of selecting only some of the cremated bone from the pyre for inclusion in the burial, thereby representing a symbolic, or token, interment In a study of Bronze Age cremation burials, McKinley (1997) also observed that the entire cremated remains were rarely, if ever, interred in the burial Most burials from Nosterfield Quarry produced less than 10% of the quantity of bone expected to remain following burning, and only burial F96 contained the amount of bone similar to the quantity expected to survive cremation The only intact cremation burial (F96) only contained 216 8g of cremated bone, which supports the idea of a token interment Nevertheless, it is improbable that the small quantity of bone in some of these burials was solely the result of post-cremation selection, but is probably also influenced by the severe truncation of the burials.

The cremated bone from Nosterfield was very well burnt, causing the complete loss of the organic portion and producing a white colour throughout most assemblages One assemblage (F99) also contained brown bone elements (see Table 1) Brown colouration of cremated bone is generally associated with haemoglobin, or soil discolouration (Correia 1997, 276) Some of the bone fragments from burials F98, F105 and F106 exhibited a bluish hue, which occurs when the organic components of the bone are pyrolised According to McKinley (1989), the body requires a minimum temperature of 500 degrees Celsius over seven to eight hours to achieve complete calcination of the bone

Despite the fragmentation of bone elements, it was possible to identify skeletal elements in all cremated bone assemblages that weighed more than 1 5g In three burials containing between 0 3g to 1 3g of bone, it was not possible to identify any bone elements (Table 3) In 55% of burials the majority of bone fragments could be identified In all cases, the majority of identifiable bones were long bone shaft fragments or cranial fragments However, other skeletal elements were also recovered from the burials, particularly vertebral articular facets and rib shaft fragments Furthermore, burial F269 contained a number of intact finger bones (phalanges), including most of the bones in the finger tips Large bone fragments, such as parts of the femoral shafts, the ear bone (petrous temporals) and parts of the lower jaw also survived well and were noted in a number of burials

Table 3 Summary of identifiable elements in the cremation burials

Feature No	Skull (g)	Skull (%)	Axial (g)	Axial (%)	U i. (g)	U L (%)	L L (g)	L L (%)	Ul L B (g)	Ul L B (%)	Total ID (g)	Total ID (%)	Total Ul D (g)	Total Ul D (%)
90	0	0	0	0	0	0	0	0	0	0	0	0	0 6	100
91	51 4	54	8 5	9	1 4	1	2 6	3	31.1	33	95	91	9 4	9
92	17 2	24	3	4	6	11	22 3	31	21 4	30	71 9	80	18 5	20
93	0 3	18	0	0	0	0	0	0	1 4	82	1 7	100	0	0
96	148 7	22	55	8	15 8	2	108 2	16	358 9	52	686 7	53	615	47
98	0 9	20	0	0	0	0	0	0	3 8	80	4 7	87	0 7	13
99	0	0	0	0	0	0	0	0	0	0	0	0	0 3	100
100	0	0	0	0	0	0	0	0	0	0	0	0	1 3	100
105	0	0	0	0	0	0	0	0	1 4	100	1 4	44	1 8	56
106	32 6	17	21 5	11	29	15	27 3	14	83	43	193 6	89	23 2	11
269	59	37	13 8	8 5	12 2	7 5	6 5	4	69 6	43	161 1	78	45 1	22

UL - upper limb, LL - lower limb, UlL - long bone (unidentified as to upper or lower limb), ID - identifiable bone, UID - unidentifiable bone

Four of the burials were excavated in spits which varied in size between 20mm to 50mm in an attempt to ascertain, whether the bone was distributed in a deliberate order, or whether it had been placed into the urn with no regard for skeletal element Spit excavation showed that in the urned burials, the majority of bone was located in the upper part of the vessel, suggesting that water may have percolated through the burial, causing the base of the vessel to act like a silt trap, depositing smaller fragments of bone and silt at the base of the vessel, while the larger fragments remained in the upper parts of the urn In the unurned burials on the other hand, the central of three spits contained the largest quantity of bone, implying that the lack of a vessel allowed more even distribution of the bone in within the cut However, the complete lack of the upper parts, and often the majority of the burials means that this is merely a hypothesis Excavation of the burials in spits did not determine any pattern of deliberate bone deposition in the burials

Upon excavation of the matrix in one of the vessels (F106), it was noted that this included a number of air pockets, which are not uncommon and may point to the fact that organic material had been included within the vessel, which has subsequently deteriorated (McKinley 1997, 142)

Two of the burials (F91, F98), which were severely truncated, contained a small number of pottery fragments It is possible that these burials had been interred in urns, or that pottery had been provided as grave goods All of the unurned burials and one of the urned burials included a small amount of charcoal, suggesting the inclusion of some pyre material with the skeletal remains According to McKinley (1997, 137) it is not unusual for pyre debris to be included in Bronze Age burials However, pyre debris appears to have been deliberately omitted from the remaining urned burials

Inclusions of animal bone were found in two burials burial F91 contained a fragment of hoof, while burial F96 included one fragment of unidentified animal long bone Both bone fragments were burnt and had probably been placed on the pyre with the deceased as a pyre good, to be selected later for inclusion in the grave

2 2 MINIMUM NUMBER OF INDIVIDUALS

A count of the 'minimum number of individuals' (MNI) recovered from a cemetery is carried out as standard procedure during osteological assessments of inhumations in order to establish how many individuals were represented by the articulated and disarticulated human bones (without taking the archaeologically defined graves into account) The MNI is calculated by counting all long bone ends, as well as other larger skeletal elements, such as the hip joints and cranial elements It is not possible to calculate the MNI for cremation burials, because only a token selection of bone from the pyre tends to be buried Double burials can be identified only if skeletal elements are duplicated, or if skeletons of different ages are represented in one burial In this instance, no double burials were identified

Although archaeologically, two distinct inhumation burials were identified, it is possible in this instance, that the burials did not represent discrete individuals, but may have contained an amalgamation of different individuals' bones However, the complete lack of long bone ends did not allow the determination of an MNI Neither was it possible to suggest, whether the shape and size of the bones in each grave were uniform and would have belonged to one person However, it was possible to suggest that none of the bone elements in either grave were represented by more than their usual number, suggesting that each grave contained only one individual

2 3 ASSESSMENT OF AGE

The determination of age relies on the development and degeneration of bones and teeth Different stages of development and degeneration have been mapped using data gathered from individuals of known age (Cox 2000) Methods used to determine age rely on the preservation of the dentition and hips and are most precise when used to assess the developing skeleton, due to the fact that the growth of bones and teeth follows a relatively predictable course up to the age of twenty-five However, the degeneration of the skeleton, which is assessed according to the severity of wear on the teeth, hips and ribs, depends on the sex, occupation, lifestyle and health of the individual analysed The effect of wear on the teeth and bones tends to vary increasingly with advancing age, as a result, age cannot be reliably determined beyond 46 years

Age was divided into a number of categories, including foetus (up to 40 weeks *in utero*), neonate (around the tune of birth), infant (following birth to 1 year), juvenile (1-12 years), adolescent (13-17 years), young adult (18-25 years), young middle adult (26-35 years), old middle adult (36-45 years) and mature adult (46+years) Age was determined using standard ageing techniques, specified by Buikstra and Ubelaker (1994) and Scheuer and Black (2000)

Because none of the criteria normally used for age determination were represented in any of the burials, it was not possible to estimate age in three of the cremated individuals This meant that age determination was based on less reliable criteria The dental development of F91 suggested that this individual was aged between two to six years, whereas F92 was over the age of thirteen Age estimation was based on bone robusticity in burials F98 and F106, which suggested that these individuals were adolescents or adults Possibly the oldest cremated individual was F96, who, based on the dental development and the presence of degenerative joint disease, was older than 36 years of age This implies that the cremation cemetery held individuals of all ages and suggests that it may have represented a communal or family burial plot

The cremated individual (F269) interred in the vicinity of the inhumations was at least sixteen years old, but no more than 25 years of age, based on the dental development, cranial suture fusion and fusion of the finger bone joints

The extremely fragmentary and eroded state of preservation of the inhumed skeletons allowed only tentative age assessment This was based solely on dental wear, which is not an accurate ageing characteristic The limited dental wear on the molars of F253 initially suggested an age of 26 to 35 years However, the anterior teeth of this individual were severely worn, indicating that this individual may have been older A wider age bracket, between 26 and 45 years has therefore been suggested for this individual Similarly, the dental wear of skeleton C1642 varied considerably, with severe wear on one side of the jaws, and moderate wear on the other However, such uneven wear may occur, when corresponding teeth on the upper or lower jaw have been lost ante-mortem, and it is therefore probable, that the more severe wear represents the individual's age, which is thought to be older than 46 years

2 4 SEX DETERMINATION

Sex determination is a vital part of the analysis of human remains, because of the likelihood that different sexes followed different lifestyles as a result of varying occupations, child bearing, or other activities which may have affected their health

Sex assessment relies on the presence of the skull and pelvis, the morphology of which are sexually dimorphic, as described by Mays (2000) It was possible to estimate sex in two cremated individuals, F96, who was a probable male, and F269, who is thought to have been female. None of the other cremated assemblages contained skeletal elements which were sexually dimorphic

The mastoid process (bone behind the ear) from inhumation, C1617 suggested that this individual was a female, a diagnosis, which was supported by the gracile nature of this skeleton The sex of the second inhumed individual could not be established with certainty However, based on the gracile nature of the bones, it was thought that this individual may have been female Sex could be assessed in two of the cremated individuals, while the individual from burial F269 was female, the largest burial (F96) contained a male It is interesting to note that the two inhumed individuals, as well as the cremation associated with ring ditch F264, were female

2 5 METRIC ANALYSIS

Cremated bone shrinks at an inconsistent rate (up to 15%) during the cremation process and it was therefore not possible to measure the bone from these cremation burials The fragmented nature of the inhumed individuals did also not allow any metrical analysis

2 7 NON-METRIC TRAITS

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are thought to suggest diversity and familial affiliation between skeletons (Saunders 1989) Each skeleton and cremated bone assemblage was examined for thirty cranial and thirty post-cranial non-metric traits selected from the osteological literature (Buikstra and Ubelaker 1994, Finnegan 1978, Berry and Berry 1967). Non-metric traits were not identified in the cremated or inhumed individuals

3.0 PATHOLOGICAL ANALYSIS

The analysis of skeletal and dental manifestations of disease can provide a vital insight into the health and diet of past populations, as well as their living conditions and occupations. However, only one individual (F96) exhibited skeletal manifestations of disease.

Joint disease is commonly observed in populations of all periods, especially in those where older individuals are well represented. Degenerative joint disease (DJD) is caused by a number of factors, including increasing age, mechanical factors, hereditary predisposition and endocrine stress. Different factors can affect different joints; Jurmain (1980, 1991) observed that DJD in the elbow and knee was more likely to be caused by functional stress, whereas the hip and shoulder were more likely to degenerate as a result of increasing age. DJD is expressed as additional bone formation around the joint margins (osteophytes), or through pitting of the joint surface. Evidence for DJD was observed in the spine of F96. Two vertebral articular facets were found to exhibit evidence for DJD: one of the facets showed pitting on the joint surface, while the second facet showed manifestations of joint disease in the form of additional lipped new bone formation (osteophytes) at the margin of the join (Plate 1).

Plate 1 F96, two vertebral facets with DJD in the form of porosity (left) and osteophytes (right)

Spinal joint disease is very common in most populations from archaeological contexts, because of stress exerted on the spine as a result of bipedalism. The intervertebral discs are the 'shock absorbers' of the spine, but these can degenerate as a result of gradual desiccation, which then causes transmission of the stress from the vertebral discs to the articular facets and ligaments (Hirsh 1983, 123). Spinal osteophytes form in response to the constant stress that is placed on the spine as a result of human posture (Roberts and Manchester 1995, 106). Increasing stress or activity can therefore lead to increased size and prevalence of osteophytes (*ibid*). The degree of joint disease is therefore graded from mild to severe. The severity of both the porosity and osteophytes suggests that this individual suffered from a moderate expression of the condition.

The small quantity of cremated bone recovered from Nosterfield Quarry, as well as the considerable fragmentation and erosion of the bone from both cremation burials and inhumations may explain the lack of further pathological manifestations from the site.

4.0 DENTAL HEALTH

Analysis of the teeth from archaeological populations provides vital clues about health, diet and oral hygiene, as well as information about environmental and congenital conditions. Tooth crown and root fragments were recovered from burials F91, F92, F96 and F269. Unfortunately, little information could be gained from these teeth, because they were shattered into tiny fragments during the cremation process.

Few teeth survived in the graves of the two inhumed females, and even fewer remained in the jaw bones. As a result, it was not possible to determine, which of the teeth had been lost ante-mortem or post-mortem.

Thirteen teeth (of a maximum number of 32) were recovered from grave F253, but two of the teeth (a mandibular molar and premolar ante-mortem) had been lost ante-mortem (Appendix 1). This individual had not suffered from any cavities or dental plaque concretions (calculus) adhering to the teeth, although it is possible, that the latter may have been lost as a result of post-depositional processes. It was, however, possible to determine that this individual had suffered from considerable periodontitis, which is an inflammatory disease affecting the soft tissues and bone surrounding the teeth. Periodontitis results in the resorption of the alveolar bone, which can lead to loosening of and eventual loss of the teeth and may have been responsible for the ante-mortem tooth loss of two teeth

Neither of the jaw bones survived in the mature adult female (C1642). This individual had sixteen surviving teeth, which were all mandibular, with the exception of a maxillary canine and premolar. Four of the teeth exhibited thin or patchy deposits of concreted dental plaque. Additionally, the individual suffered from a moderately sized dental cavity on the right mandibular wisdom tooth.

Dental wear tends to be more common and severe in archaeological populations than in modern society, being caused by a much coarser diet based upon contemporary corn grinding techniques. Severity of the dental wear was assessed using a chart developed by Smith (1984). Each tooth was scored using a grading system ranging from 1 (no wear) to 8 (severe attrition of the whole tooth crown).

Wear was slightly less severe in the younger individual, and ranged from two to six, with the least wear on the wisdom teeth (which are the last teeth to erupt and are therefore least likely to exhibit attrition). The wear of the mature adult (C1642) ranged in severity from moderate to severe, with the worst wear on the left mandibular molars.

The dental health of the two inhumed females suggests that these women practised relatively poor dental hygiene, leading to inflammation of the gums, tooth loss, cavities and plaque concretions.

5.0 DISCUSSION AND SUMMARY

Nineteen deposits of calcined bone were recovered from Nosterfield Quarry between 1997 and 2002, eight of which contained solely non-human bone. Ten human cremation burials were found in the wider vicinity of a small ring ditch (F148). Four of these burials had been interred in urns and it is possible that two further burials, which contained fragments of pottery, had also been urned. Alternatively, sherds of pottery may have been included as grave goods in these cases. Evidence for possible grave goods was found in two burials in the form of single animal bone inclusions. Both bones were calcined, and had probably been placed on the pyre together with the deceased. Charcoal was found in all unurned and one of the urned burials, and may have been a deliberate inclusion in the burials, or may have been accidentally raked up from the pyre together with the human remains. It is possible that one of the burials (F106) also contained organic material, which had since deteriorated, but had left air pockets in the soil matrix in the urn.

The group included one possible double burial (F92 and F93), characterised by two urns in a poorly defined cut. Notably, the less truncated urn contained considerably less bone than the more severely disturbed vessel. This may suggest that one of the urns was an accessory vessel, or that the smaller quantity of bone may simply relate to differential bone deposition within the urn. Osteological analysis was not able to define, whether the bone derived from the same, or from different individuals and the tiny quantity of bone in F93 (1.7g) did not permit any conclusions regarding funerary ritual.

Age determination was difficult in most cases, because of the lack of skeletal ageing characteristics in the burials. Nevertheless, it was possible to determine that the cemetery group included individuals of all ages, with an under-representation of children. Notably, even the single burial of a young child contained pottery, suggesting that archaeologically visible evidence for burial ritual was not affected by age. It was only possible to determine sex in one individual (F96) who was male, thus comparisons with funerary ritual and gender could not be made.

No pyre sites were observed during excavations at Nosterfield. Although Bronze Age pyre sites have been found in the vicinity of a number of cremation cemeteries, they tend to have been constructed on the ground surface (McKinley 1997, 132). In experimental case studies, heat effects of surface pyres penetrated no more than 0.10m below the surface (McKinley 1997, 134) and may therefore have been subject to the severe truncation of the site. Additionally, pyre sites were often cleared soon after use, so that little charcoal ash and cremated bone may remain *in situ* to identify the feature (*ibid*). A number of features containing charcoal and evidence of *in situ* burning have been located at Nosterfield Quarry and although none of these contained human bone, it is possible that they represent cremation pyres

Two inhumations and a further cremation burial were found in the vicinity of a much larger ring ditch (F264), which was situated 292m to the southwest of ring ditch F148 One of the inhumations was found in the upper part of the backfill of a pit in one of the pit-alignments The skeletal remains of a middle-aged female had been interred in the pit after this had silted up, suggesting that the burial was secondary to its original use The same alignment cut the ring ditch F264, implying that it is later in date

The second inhumation of an elderly female was located immediately to the southeast of the ring ditch in a sub-oval pit The inhumation burials were both thought to be secondary interments, following skeletonisation of the body Only some bone elements, which included predominantly skulls and long bones, had been placed in an orderly, but not anatomical manner in the pits The evidence suggests that the bodies had been left exposed and underwent normal processes of decomposition, as well as defleshing and attack as carrion, which may explain the lack of some of the bones Any surviving bones were finally collected and interred in burial pits Alternatively, it is possible that the bodies were defieshed deliberately and only token samples placed in the pits

A cremation burial was found in a square cut within ring ditch F264, on the southern side of its centre The burial had been severely truncated, and contained 200g of human bone, as well as a small quantity of charcoal This individual was also a female adult, but her age could not be determined more accurately It is possible, that the burial had been interred in a square container, which may explain the shape of the grave cut Its location within the ring ditch suggests that this burial may have been associated with the ring ditch

Although there is no evidence to suggest that the inhumations were contemporary, this is assumed on the basis of the similarity in bone deposition and their vicinity to ring ditch F264, despite the distinct nature of the burial features However, the burials may not be contemporary with the ring ditch itself, and the cutting of the ring ditch by two of the pits implies that there was at least some time lapse between the excavation of the ditch and that of the pits Furthermore, their relationship with the cremation burial has not been identified Although cremation burials and inhumations do occur contemporaneously at other sites in Yorkshire, particularly the Wolds (Woodward 2000, 23), it is equally possible that the burial features are several generations apart

Prehistoric burials are frequently associated with liminal spaces, such as boundaries In this case, at least one of the inhumations is directly associated with a boundary, through its interment in one of the pits from the pit alignment Similarly, the smaller ring ditch is cut by a ditch which encloses a large part of the excavated site The small cremation cemetery in this part of the site appears to be spread alongside the ditch, rather than distributed around the ring ditch, which may suggest a further boundary association. However, until the features have been subject to absolute dating, it is not possible to determine, which of these features may be contemporary with the cemetery and any attempts of interpreting these must be regarded as tentative

6.0 RECOMMENDATIONS

Until targeted absolute dating has been carried out of the inhumations and some of the cremation burials, interpretations of the funerary treatment are mere speculation Once their date is known, focussed research on mortuary behaviour of the period can be carried out, with the aim of identifying parallels for the funerary treatment of the individuals interred at Nosterfield Quarry Dating may also contribute further information regarding the prehistoric land use and character of the landscape

Furthermore, histological analysis of the inhumed skeletons may be able to prove scientifically, whether these individuals had been exposed prior to burial or had been deliberately defleshed This will provide a further insight into the beliefs of the people interred at Nosterfield

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APPENDIX A OSTEOLOGICAL AND PALAEOPATHOLOGICAL CATALOGUE

Skeleton number	F253
Preservation	Very poor
Completeness	15%, parts of the skull, shoulders, lower arms, legs, hands, vertebrae and ribs
Age	26-45, middle adult
Sex	female
Stature	-
Non-metric traits	-
Pathology	-
Dental health	parts of mandible present, moderate periodontitis; 13/32 teeth, considerable wear, two teeth lost am

	Right dentition								Left dentition							
Present	-	p	-	p	p	p	p	-	-	-	p	p	p	-	-	p
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	4	-	6	5	5	5	-	-	-	4	5	-	-	-	2
Maxilla	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Mandible	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Present	-	-	am	am	-	p	-	p	-	p	-	-	p	-	p	-
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	-	-	-	-	4	-	3	-	4	-	-	5	-	-	-

Skeleton number	F253
Preservation	very poor
Completeness	18%. parts of the skull, left humerus, lower arms, femora, tibiae, fibulae and pelvis
Age	46+, mature adult
Sex	female
Stature	-
Non-metric traits	-
Pathology	-
Dental health	parts of mandible present, 16/32 teeth, moderate to considerable wear, calculus on 5/16 teeth, moderate root resorption

	Right dentition								Left dentition							
Present	-	-	-	p	-	-	-	-	-	-	p	-	-	-	-	-
Calculus	-	-	-	Sa	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	-	-	5	-	-	-	-	-	-	4	-	-	-	-	-
Maxilla	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Mandible	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Present	p	p	-	p	p	p	p	p	p	p	p	p	p	-	p	p

Calculus	-	-	-	-	-	Fm	-	Fa	-	Fa	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	Mb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	4	4	-	4	5	4	4	5	5	4	4	5	4	-	7	7

KEY:

Present - Tooth presence; am - ante-mortem tooth loss, pm - post-mortem tooth loss, p - tooth present, - - jaw not present

Caries - Calculus, F - flecks of calculus, S - slight calculus, M - moderate calculus, H - heavy calculus, a - all surfaces, b - buccal surface, d - distal surface, m - mesial surface, l - lingual surface, o - occlusal surface

DEH - dental enamel hypoplasia, l - lines, g - grooves, p - pits

Caries - caries, s - small lesions, m - moderate lesions, l - large lesions

Wear - dental wear, numbers from 1-8 - slight to severe wear

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PART 2 NOSTERFIELD QUARRY, NORTH YORKSHIRE

Malm Holst, York Osteoarchaeology Ltd

Summary

In January 2004, York Osteoarchaeology Ltd was commissioned by Field Archaeology Specialists Ltd to carry out an osteological assessment of one human skeleton recovered during a watching brief at Nosterfield Quarry, North Yorkshire (NGR SE 7661 0886)

The skeleton had been interred in the partially backfilled ditch of a square barrow, provisionally dated to the Middle Iron Age The barrow was part of a prehistoric landscape of ritual significance, which includes henge monuments, pit alignments, a cremation cemetery and further barrows

Osteological analysis revealed that the skeleton was that of a man in his late thirties to mid forties The bones of the arms, thighs and neck exhibited evidence for muscular strain indicative of their use in occupational activities The man had also suffered from inflammation of the left leg, although this was healing at the time of his death Two successive fractures of the left forearm would have caused disability of the left arm, which resulted in the subsequent greater use of the right arm in order to compensate It is probable that these fractures were defence or work-related injuries

Acknowledgements

York Osteoarchaeology Ltd would like to thank Field Archaeology Specialists Ltd for their help and support during this project

1.0 INTRODUCTION

In January 2004 York Osteoarchaeology Ltd was commissioned by Field Archaeology Specialists Ltd to carry out an osteological assessment of one skeleton excavated in December 2003 during a watching brief at Nosterfield Quarry, North Yorkshire (NGR SE 7661 0886)

The skeleton (C1754) had been interred in a supine semi-flexed position in an oval pit (F335) cut into the partly backfilled ditch of a square barrow (F320) The individual had suffered slight damage to the left knee and right foot when the barrow ditch was re-cut at a later date The skeleton was orientated NNE to SSW and the skull leant on both hands, which were positioned under the left side of the face, as if asleep One horse tooth was recovered from between the legs of the skeleton and this may represent a grave good, or may have accidentally found its way into the grave, when the barrow ditch was re-cut. The burial has been tentatively dated to the mid Iron Age on the basis of its style

1.1 AIMS AND OBJECTIVES

The skeletal assessment aimed to determine age, sex and stature, as well as to record any pathological conditions from which the individual may have suffered Additionally, an attempt was made to identify the possible reasons for the unusual position of the arms of this individual

1.2 METHODOLOGY

The skeleton was analysed in detail, assessing the preservation and completeness, as well as determining the age, sex and stature of the individual (Appendix 1) All pathological conditions were recorded and described

2.0 OSTEOLOGICAL ANALYSIS

Osteological analysis is concerned with the determination of the demographic profile of the assemblage based on the assessment of sex, age and stature, as well as measurements and non-metric traits This information is essential in order to determine the prevalence of disease types and age-related changes It is also crucial for identifying gender dimorphism in occupation, lifestyle and diet, as well as roles of different age groups in society

2 1 PRESERVATION

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition Preservation of human remains is assessed subjectively, depending on the severity of bone surface erosion and post-mortem breaks, but disregarding completeness

Preservation was assessed using a grading system of five categories very poor, poor, moderate, good and excellent Excellent preservation implied no bone erosion and very few or no post-depositional breaks, whereas very poor preservation indicated complete or almost complete loss of the bone surface due to erosion and severe fragmentation

The skeleton was moderately well-preserved, due to extensive bone loss of the spongy bones of the joints and spine, and the cranium was fragmented, but complete Additionally, many of the bones had suffered a moderate degree of fragmentation and erosion, some of which may have been caused when the skeleton was disturbed during re-cutting of the barrow ditch Loss of the spongy bones meant that the skeleton was 70% complete

2 2 MINIMUM NUMBER OF INDIVIDUALS

A count of the 'minimum number of individuals' (MNI) recovered from a cemetery is carried out as standard procedure during osteological assessments of inhumations in order to establish how many individuals were represented by the articulated and disarticulated human bones (without taking the archaeologically defined graves into account) The MNI is calculated by counting all long bone ends, as well as other larger skeletal elements, such as the hip joints and cranial elements The largest number of these is then taken as the MNI The MNI is likely to be lower than the actual number of skeletons which would have been interred on the site, but represents the minimum number of individuals which can be scientifically proven to be present

As expected, the count of major bone elements provided a MNI of one individual

2 3 ASSESSMENT OF AGE

The determination of age relies on the development and degeneration of bones and teeth Different stages of development and degeneration have been mapped using data gathered from individuals of known age (Cox 2000) Methods used to determine age rely on the preservation of the dentition and hips They are most precise when used to assess the developing skeleton, due to the fact that the growth of bones and teeth follows a relatively predictable course up to the age of twenty-five However, the degeneration of the skeleton, which is assessed according to the severity of wear on the teeth, hips and ribs, depends not only on the age, but also on the sex, occupation, lifestyle and health of the individual analysed The effect of wear on the teeth and bones tends to vary increasingly with advancing age, as a result, age cannot be reliably determined macroscopically beyond forty-six years

Age was divided into a number of categories, including foetus (up to 40 weeks *in utero*), neonate (around the time of birth), infant (following birth to 1 year), juvenile (1-12 years), adolescent (13-17 years), young adult (18-25 years), young middle adult (26-35 years), old middle adult (36-45 years) and mature adult (46+ years) Age was determined using standard ageing techniques, specified by Buikstra and Ubelaker (1994) and Scheuer and Black (2000)

The poor preservation of the hips meant that the age determination was based on less accurate criteria The dental wear, long bone fusion, grade of cranial suture closure and degeneration of a tiny surviving fragment of hip joint (auricular surface) suggested that this individual was an old middle adult, aged between 36 and 45 years

2 4 SEX DETERMINATION

Sex determination is a vital part of the analysis of human remains, because of the likelihood that different sexes followed different lifestyles as a result of varying occupations, childbearing, or other activities, which may have affected their health Sex assessment relies on the presence of the skull and pelvis, the morphology of which are sexually dimorphic, as described by Mays (2000)

Sex determination relied solely on the cranial morphology, which consistently suggested that this individual was male

2 5 METRIC ANALYSIS

Stature can only be established if at least one complete and fully fused long bone is present In this instance, none of the long bones were intact, which meant that stature could not be established Leg measurements were obtained from the femora and tibiae and were used to calculate robusticity indices From front to back, the right femoral shaft was broad and flat, while the left femoral shaft was more rounded The *platycnemic* index (robusticity index) of the tibiae was calculated in order to establish the degree of tibial shaft flatness The tibiae of skeleton C1754 were of average shape

Craniometric measurements could not be taken because the skull was extremely fragmented As a result, the skull shape could not be established However, it was possible to establish through the survival of the nasal part of the face that this individual had a very prominent nose

2 6 NON-METRIC TRAITS

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are thought to suggest diversity and familial affiliation between skeletons (Saunders 1989) The origins of non-metric traits have been extensively discussed in the osteological literature and it is now thought that while most non-metric traits have genetic origins, some can be produced by factors such as mechanical stress (Kennedy 1989) or environment (Turkel 1978)

A total of thirty cranial and thirty post-cranial non-metric traits were selected from the osteological literature (Buikstra and Ubelaker 1994, Finnegan 1978, Berry and Berry 1967) and the skeleton was scanned for these traits Two cranial traits were recorded, including a *mastoid foramen extrasutural* and a *precondylar tubercle* Both traits are thought to have genetic origins The skeleton was also found to have *hypotrochanteric fossae* on both femora, as well as a third trochanter on the left femur These traits have been attributed to mechanical stress, in particular to the main bottom muscle, *gluteus maximus*, and may therefore be activity-related

3.0 PATHOLOGICAL ANALYSIS

Pathological conditions can manifest themselves on the skeleton during life, especially when these are chronic or the result of trauma to the bone The bone elements to which muscles attach can also provide information on muscle trauma and excessive use of muscles

3 1 DEGENERATIVE JOINT DISEASE

Degenerative joint disease (DJD) is caused by a number of factors, including hereditary predisposition, increasing age, endocrine stress and mechanical strain Occupational stress often affects the joint itself, whilst age may induce marginal changes These marginal changes (*osteophytes*) are characterised by additional bone formation, whereas pitting affects the actual joint surface
Evidence for DJD was observed in the spine of this man, in the form of mild pitting on the vertebral body surfaces of the cervical (neck) vertebrae It is not uncommon for individuals in the 36 to 45 year age group to suffer from mild manifestations of joint disease

3 2 INFECTION

Evidence for non-specific infection was very common before the introduction of antibiotics and is frequently observed in populations derived from archaeological contexts Inflammatory lesions on human bones can be indicative of infectious diseases, such as leprosy and syphilis, or of non-specific infection, such as varicose veins, leg ulcers or trauma to the shins However, skeletal lesions are only produced if the infection is chronic and long-standing (Roberts and Manchester 1995, 125)

Evidence for infection was observed in the form of superficial (*periosteal*) inflammatory lesions on the left tibia of Skeleton C1754 Any manifestations present on the right tibia would have been eroded The nature of the lesions suggests that the inflammation was receding

3 3 TRAUMA

Occasionally, it is possible to infer soft tissue trauma from the bones, in the form of muscular or ligamentous trauma This is expressed trough the formation of bony processes (*enthesopathies*) at ligament attachments Additionally, it is possible to observe cortical defects at the site of muscle attachments, which are the result of constant micro-trauma and are usually activity-related (Hawkey and Merbs 1995, 334) Cortical bone excavations were noted at a number of muscle attachments of Skeleton C1754, including *brachialis* at the ulnar tuberosities, which is a muscle that flexes the forearm The skeleton also showed evidence for muscular strain to *gluteus maximus*, the main muscle of the bottom (discussed above). The muscle extends and laterally rotates the hip joint and extends the trunk Evidence for an *enthesopathy* was noted at the back of the skull, where the *trapezius* muscle attaches to the occipital bone The muscle also attaches to the shoulders and to the spine in the form of a large trapezoid, and is responsible for elevating, adducting and depressing the shoulders This muscle is easily strained, which may have been the cause for the *enthesopathy*

The most dramatic skeletal manifestation of pathology was observed at the left ulna This bone had suffered a fracture at the lower third of the shaft The fracture had moved from the supero-lateral part of the shaft obliquely to the infero-medial side The fracture was well-healed, but had mal-united, causing overlapping of the two broken bone ends by 19 9mm This would have caused considerable shortening of the bone

The bone had been fractured a second tune, from the same origin of the first fracture, but moving at a lesser angle medially (Plate 1) It is thus probable that the bone was fractured twice at the same site, but the overlapped part of the bone had been too strong to re-fracture, causing the fracture path to move superiorly to the initial fracture site Notably, the second fracture is not united, and the two bone ends have formed a false joint with an irregular, pitted surface It is assumed that the rotational stress placed on the forearm prevented union of the two fractured bone ends

Although the proximal and distal joints of the radius were missing, it cannot be ruled out that the bone was completely unaffected Remarkably, the radius shaft was not fractured and the injury may have affected only the ulna

Alternatively, it is possible that this fracture was a so-called 'Monteggia fracture', which results in dislocation of the radial head (at the elbow joint) and fracture of the ulnar shaft, although the fracture site tends to be closer to the elbow.

Plate 1 Fracture of left ulna

It is certain that this injury would have hindered extensive use of the left forearm and it was therefore not surprising to note well-developed muscle attachments at the right humerus and right hand. It is possible that the initial injury was a parry injury, caused when the forearm is raised in front of the face or chest for protection against an attacker or advancing object. However, it is unusual for the bone to be broken twice at the same site, which may suggest that this was caused during a habitual activity. Alternatively, the second fracture may have been deliberately induced, with the aim of reducing the shortening of the ulna.

4.0 DENTAL HEALTH

Analysis of the teeth of archaeological populations can provide vital clues about health, diet and oral hygiene, as well as information about environmental and congenital conditions.

Despite the poor survival of the upper jaw (maxilla), 27 of 32 teeth of this individual survived. The upper left second incisor and all four lower incisors were absent. The jaw bone holding these teeth was eroded and it was therefore not possible to determine whether the teeth had been lost ante-mortem or post-mortem. However, considering the lack of dental pathology, it is more likely that the teeth had been lost post-mortem. Loss of the anterior teeth in the burial environment is not uncommon, because the teeth are single-rooted and easily slip out of the jaw once the surrounding soft tissues have decayed.

Dental wear tends to be more common and severe in archaeological populations than in modern society, being caused by a much coarser diet based upon contemporary corn grinding techniques. Severity of the dental wear was assessed using a chart developed by Smith (1984). Each tooth was scored using a grading system ranging from 1 (no wear) to 8 (severe attrition of the whole tooth crown). The individual exhibited moderate to severe wear, which was consistent with his age.

Because of the lack of calculus deposits on the teeth, periodontal disease was slight and caused only mild resorption of the bone surrounding the teeth. The good dental health of this individual suggests that he was practising unusually good dental hygiene.

5.0 MORTUARY BEHAVIOUR

The skeleton was interred in a ritually significant landscape, dating form the Neolithic to the late Iron Age. Nearby are the three Thornborough Henge Monuments, several pit alignments, a Bronze Age cremation cemetery, inhumations and round and square barrows The burial was found in the ditch of a small square barrow A second square barrow was located approximately 155m to the southwest of the burial, which may have been associated with a quadruple horse burial, 5m outside its perimeter

The inhumation burials excavated at Nosterfleld Quarry have so far proved most unusual The two earlier burials represented secondary interments, following exposure of the body with subsequent loss of some bones and later burial of all surviving bones While the burial of skeleton C1754 was not as remarkable, the position of his arms on the right side of the chest, with the hands positioned under the left cheek is very uncommon

6.0 DISCUSSION AND SUMMARY

The osteological analysis of a single skeleton from Nosterfleld Quarry has provided a small glimpse into the life of this person The skeleton was a male who had survived into his late thirties to mid forties Poor skeletal preservation meant that it was not possible to establish his stature or obtain much evidence for facial characteristics, with the exception of the presence of a prominent nose.

This man enjoyed general good health, particularly of the teeth He had, however, suffered from the effects of repetitive muscular injury to the arms and thighs, suggesting that he had carried out activities involving regular use of these muscles Evidence for functional strain on the neck was noted in the form of muscular trauma, as well as mild degenerative joint disease on the vertebrae of the neck

It is possible that trauma to the shins, an infectious disease or simply varicose veins were responsible for the development of inflammation on the left tibial shaft The inflammation was receding, suggesting that it had begun to heal before the individual died. Inflammatory lesions to the shins are frequently observed in skeletons from all periods, but are usually more common in those populations from densely occupied urban areas

Most notable, however, were two fractures of the left forearm, which may have been the result of a defence or work-related injury The first fracture, which may have been associated with a dislocation of the radius at the elbow, resulted in considerable overlapping of the broken bone ends and must have caused considerable discomfort, as well as disabling the forearm Whether the arm was fractured through another accident, or whether the second fracture was the result of an attempt to reduce the bone overlap could not be determined Nevertheless, it is certain that the second fracture caused more discomfort as a result of the non-union of the broken bone ends. This resulted in greater use of the right arm, which was observed in the form of pronounced muscle attachments on the right upper arm and hand

It could not be established, whether this injury was the reason for the unusual positioning of the arms of this man , which were placed on the left side of the chest, with his hands under the left side of his face, as if asleep It is notable that this burial was disturbed during re-cutting of the barrow ditch, because this implies that those who worked on the ditch were not aware of the presence of the burial, or alternatively, that they were not afraid to disturb the burial of this man

The presence of the horse tooth in the inhumation burial may suggest a tentative link with the quadruple horse burial near the larger barrow nearby However, radiocarbon dating and further analysis of the archaeological evidence would be required to confirm any relationship between the burials

7.0 RECOMMENDATIONS

It is recommended that the skeleton is subject to absolute dating, with the aim of establishing, whether this individual dates to the same period as the horse burial and inhumations previously excavated at Nosterfield Quarry This may in turn aid the interpretation of the prehistoric landscape in which this man had been interred

Once their date is known, focussed research on the mortuary rituals observed at Nosterfield Quarry could be considered, with the aim of establishing parallels for the funerary behaviour observed in the immediate locality of the site, and further afield

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APPENDIX 1 OSTEOLOGICAL AND PALAEOPATHOLOGICAL CATALOGUE

Skeleton number	C1754
Preservation	moderate
Completeness	70%, the majority of the skull, long bones and hands are present
Age	36-45, old middle adult
Sex	male
Stature	-
Non-metric traits	mastoid forarem *extrasutural* (right), *precondylar* tubercle, *hypotrochanteric fossae* (bilateral), third trochanter (left)
Pathology	bone excavations for *brachialis* at ulnae, bone excavations for *gluteus maximus* at femora, *enthesopathy* for *trapezius* at occipital, double fracture of distal third of shaft of left ulna, well-healed with ma-union and overlap at first fracture, non-union at second fracture
Dental health	27/32 teeth present, 5 teeth lost pm, slight peridontal disease, moderate to severe wear

	Right dentition								Left dentition							
Present	p	p	p	p	p	p	p	p	p	-	p	p	p	p	p	p
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	4	6	8	7	6	6	7	7	7	-	6	6	7	8	6	4
Maxilla	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Mandible	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Present	p	p	p	p	p	p	-	-	-	-	p	p	p	p	p	p
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	4	5	7	5	5	6	-	-	-	-	7	5	5	6	5	4

KEY:

Present - Tooth presence, am - ante-mortem tooth loss, pm - post-mortem tooth loss, p - tooth present, - - jaw not present

Caries - Calculus, F - flecks of calculus, S - slight calculus, M - moderate calculus, H - heavy calculus, a - all surfaces, b - buccal surface, d - distal surface, m - mesial surface, l - lingual surface, o - occlusal surface

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Caries - caries, s - small lesions, m - moderate lesions, l - large lesions

Wear - dental wear, numbers from 1-8 - slight to severe wear