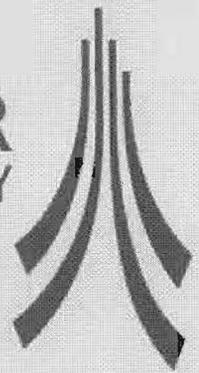


LANCASTER  
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ARCHAEOLOGICAL  
UNIT



July 1993

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# NORTH WESTERN ETHYLENE PIPELINE English Section

Archaeological Studies 1988-1993

Final Report



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Commissioned and Funded by:

Shell Chemicals UK Ltd

# North Western Ethylene Pipeline

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## Archaeological Studies

Final Report

*J K Lambert*

*with contributions by  
T M Oliver,  
N Hair and C Howard-Davis*

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**Abbreviations**

LUAU	Lancaster University Archaeological Unit
NGR	National Grid Reference
NWEP	North Western Ethylene Pipeline
NWWS	North West Wetlands Survey
OD	Ordnance Datum
OS	Ordnance Survey
PGM	Permanent Ground Marker
SAM	Scheduled Ancient Monument
SCUK	Shell Chemicals UK Ltd
SMR	Sites and Monuments Record



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## EXECUTIVE SUMMARY

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In 1988 the Lancaster University Archaeological Unit was commissioned by Shell Chemicals UK Ltd to undertake a phased archaeological assessment of the English sector of a proposed pipeline route. The North Western Ethylene Pipeline was designed to carry ethylene from Grangemouth in Scotland to the existing Shell refinery facilities at Stanlow in Cheshire.

The archaeological studies continued intermittently over a period of five years, from July 1988 to November 1991, followed by post-excavation research and analysis in 1992 and 1993. The methodology employed followed a progression from initial record searches, field walking, aerial, topographical, and geophysical survey, and trial trenching, to excavation of the most important, unavoidable sites.

Construction of the pipeline took place between May and November 1991, and archaeological monitoring was undertaken by line inspectors conducting a continuous watching brief, supported by a rapid response team, prepared to survey and excavate features disturbed by construction.

The work programme included excavations of some significance, including the crossing point of Hadrian's Wall, a post-Roman settlement at Fremington, near Penrith, and, in the Lune gorge south of Tebay, a possible medieval shieling at Powsons, and the cremation cemetery associated with the Roman fort at Low Borrowbridge. During pipeline construction, the intersections with two Roman roads were recorded; the Stanegate, south of Hadrian's Wall, and the main Ribchester to Carlisle road at Sproatgill, near Orton.

The present report describes the phased work programme and the methodology of the archaeological studies (Chapter 1), and provides an appraisal of the archaeological sites recorded (Chapter 2), and a description of those sites in relation to the topography of the pipeline route (Chapter 3). Phased accounts and discussions of the major excavations at Fremington (Chapter 4) and Low Borrowbridge (Chapter 5) are also included.

A reference section (Appendix 1 to 4) comprises a register of all archaeological sites, providing an index to the main gazetteer, together with site location plans (Figs 1 - 55), a distribution plot of sites within each county (Figs 56 - 58), details of the deposition of the project archive, and a bibliography.

The comprehensive gazetteer of 321 archaeological sites is presented in four sections, one for each of the counties traversed; Cumbria, Lancashire, Merseyside, and Cheshire.



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## ACKNOWLEDGEMENTS

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The accomplishment of such a major project is only possible with the willing cooperation and assistance of a great number of people, and I would like to thank all those who tolerated our presence, answered our questions, provided all kinds of support and specialist advice, and often made the impossible happen. Many thanks, then, to the landowners and farmers, especially Mr J Wilson and Mrs Wilson of Low Borrowbridge, Mr G Allen of Brockholes, Mr G Wilcox of Fremington, Mr Wannop of Linstock Castle Farm, Mr Thornton of Little Crimbles, Mr Newsham of Banton House Farm; the specialists consulted: John Anstee, Bob Bewley, Jim Cherry, Ken Dark, Vanessa Fell, Andrew Fitzpatrick, Helena Hamerow, Anthony Harding, Louise Hird, Jacqui Huntley, Maureen McHugh, Jacqueline McKinley, Elsa Mainman, Sue Mills, David Shotter, Chris Sparey-Green, Vivian Swan; our pilot: Brian Bateson, and staff of the Blackpool Air Centre; Nick Smith of Bechtel; SCUK executives of the NWEF project team: Alan Ryder and Mike Stanistreet, George Duxbury, chief safety officer, and John Brown, head of public affairs; SCUK surveyors: Paul Dibb, Chris Henson, Stuart Dunn, and Chris Pritchard; pipeline archaeologist: David Maynard; land agents, of Bell-Ingram: Tom Brown, Jack Buckham, and Willie Colville; the expert JCB operators: Ray Steel and Chris Birkbeck; the county archaeologists: Tom Clare, Ben Edwards, Ron Cowell, Phil Mayes, Rick Turner, and Adrian Tindall; and county SMR officers: Bette Hopkins, Peter Iles, Gail Falkingham, Norman Redhead, and Jill Collens; line inspectors: Peter McKeague and Jamie Hamilton of the Centre for Field Archaeology; geophysical surveyor: Philip Howard; the LUAU secretaries since 1988: Jane Close, Sarah Mason, Jane Hodgkinson, Jill Pollard, and Sarah Fitchett; excavation volunteers: Sue Fiddler, Marie Hale, Rachel Street, Natalie Williams, Ben Wilson, and Joy Wilson; photographer, Katharine Wratten; and, for her support and inspiration throughout, my daughter, Noël Lambert.

### Project staff

In the course of a five-year project, staffing and structural changes are inevitable. At the outset of the project, in the summer of 1988, John Williams was the Director of the Cumbria and Lancashire Archaeological Unit. A year later, he left to become the County Archaeologist for Kent, and his successor was Adrian Olivier, previously Assistant Director. The Unit also changed its name, becoming the Lancaster University Archaeological Unit. The Unit Director maintained overall responsibility for the NWEF project throughout the five years.

The initial assessment phase of the NWEF project, in 1988-89, was directed by Peter Iles, the Lancashire SMR officer, and the first phase of fieldwork was co-directed, in the spring of 1990, by Jamie Quartermaine and Janet Lambert. From May 1990 onwards the project was directed by Janet Lambert. The two seasons of trial excavations, in the summer of 1990 and the spring of 1991, were directed by Katharine Buxton, and the site directors of the major excavations in 1991 were Tove Oliver, at Fremington, and Nick Hair, at Powsons and Low Borrowbridge. The post-excavation programme was under the direction of Rachel Newman, LUAU Assistant Director, and Christine Howard-Davis, finds manager.

The success of the project owes everything to the sixty members of LUAU field and office staff involved, a number of whom fulfilled several roles at different stages. The fieldwork campaigns were long and arduous, the weather was usually bad, compilation of the gazetteer was a herculean task, but high standards of work were maintained throughout, deadlines were met, and crises were dealt with. Thank you everyone, starting with the survey and excavation staff: Austin Ainsworth, Glyn Barrett, Denise Buckley, Robert Chester, Shona Connolly, Judith Driver, Colin Forcey, Robert Foreman, Paul Gibbons, Steven Haig, Richard Harrison, David Hodgkinson, David Johnson, Philip Kibberd, Robin Lambert, David Maynard, Ian Miller, Michael Peace, Sarah Peacock, Fiona Pitt, Peter Redmayne, Matthew Robinson, Ian Scott, Trevor Simmons, Jonathan Smith, Jenny Swift, Andrew Thompson, Patrick Tostevin, Michael Wane, Angela Whitworth, and Chris Wild; excavation directors: Katharine Buxton, Denise Drury, Nick Hair, and Tove Oliver; line inspectors: Prince Chitwood, Denise Drury, and Mark Leah; surveyors: Michael Krupa and Jamie Quartermaine; draughtsmen: Richard Danks and Peter Lee, and briefly, Richard Cooper; finds manager:

Christine Howard-Davis; archivist: Helen Quartermaine; aerial photography: Christine Cox, plotting and interpretation: Malcolm Harrison; finds photography: Nigel Neil; desktop publishing: Ruth Parkin; gazetteer and office organisation: Sonia Ely, Richard Harrison, and Deirdre Winstanley. LUAU consultants were industrial archaeologist: Michael Trueman; wetlands: Robert Middleton and Colin Wells; and computing: Peter Iles; and LUAU management and editorial: John Williams, Adrian Olivier, Rachel Newman, and Jason Wood.

Janet Lambert, project director  
Lancaster, July 1993

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## INTRODUCTION

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In 1988 the Lancaster University Archaeological Unit was commissioned by Shell Chemicals UK Ltd to undertake a phased archaeological assessment of the English sector of a proposed pipeline route. The North Western Ethylene Pipeline was designed to carry ethylene from Grangemouth in Scotland to the existing Shell refinery facilities at Stanlow in Cheshire.

The LUAU studies were concerned entirely with the pipeline route south of the Scottish border, at the river Sark, while north of the border, the Scottish section of the route was evaluated by archaeologists from the Centre for Field Archaeology at Edinburgh University.

The detailed management policy originally put forward by LUAU was subsequently adapted for incorporation in the archaeological section of an Environmental Statement, as part of the planning process. The initial evaluation, in 1988-1989, formed part of the environmental impact assessment commissioned by SCUK, which also included the geology, hydrology, ecology, and land use of the proposed route. All the factors resulting from these studies imposed constraints which were taken into account in the routing of the pipeline. SCUK then published an Environmental Statement, in September 1989, in support of their application to the Department of Energy for Pipeline Construction Authorisation (SCUK 1989).

Following the identification of statutory archaeological constraints for the purpose of the planning application, LUAU was requested to design a project for the investigation and recording of sites and areas of archaeological interest along the chosen route.

The pipeline route passes through one of the archaeologically lesser known areas of England, providing a cross-section of many of the widely varying landscapes to be found in the North West, and affecting, or running in close proximity to, a number of important archaeological sites. The aim of the study was to preserve sites wherever possible by avoidance, and where this was not feasible, a management plan was devised to mitigate the impact of construction.

Approximately 500 sites were evaluated, in a structured manner designed to identify and record each site at a level appropriate to its archaeological value. This major investigation of a corridor 253 kilometres long consisted of a review of existing records, field validation, aerial photography, and survey or excavation where necessary, while a watching brief was maintained throughout pipeline construction. The fieldwork was accompanied by the synthesis of all information into a computerised database, and progress reporting at all stages. The fieldwork and excavation occasioned by the NWEF project make a notable contribution to the archaeological record of the North West.



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## ARCHAEOLOGICAL OBJECTIVES

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LUAU applies professional standards in accordance with the stated policy of English Heritage, and the Code of Conduct of the Institute of Field Archaeologists. The aim of the project was to advise the developer on the best means of protecting archaeological features, to record all threatened sites and areas of archaeological interest, and to make public the findings of the investigation.

The primary objective was to seek to preserve archaeological remains *in situ*. Excavation was considered as action of the last resort, when all other possibilities for protecting a site had been exhausted. Every effort was made to identify and record sites of archaeological importance prior to pipeline construction, thus reducing the risk of lengthy work delays to record sites identified during construction, and to minimise its destructive effects.

A change in procedures was generated by the major policy revision expressed in the English Heritage publication, *The management of archaeological projects*. The fieldwork, in 1990 and 1991, had been conducted according to the provisions of the first edition of this manual (English Heritage 1989), while the revised methodology of reporting and archiving was followed in the post-excavation phase (English Heritage 1991).



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## HEALTH AND SAFETY

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One of the project's greatest achievements was an excellent safety record. All staff were personally reminded that their health and safety was more important than any archaeological consideration, whatever heroic notions they might entertain about rescue archaeology. With guidance from LUAU's safety officer, rigorous safety regulations were adhered to, in line with the most recent directives from the Health and Safety Executive, and with the manual produced by the Standing Conference of Archaeological Unit Managers, which defines standards for safe archaeological practice (Allen and Holt 1986).

SCUK also enforced stringent regulations regarding safe working practices in the dangerous environment of the linear construction site, and required all staff to wear approved protective helmets, and steel toe-capped work boots, when working on or visiting the construction spreads. This directive was complied with throughout the construction phase.

All personnel working on the construction spreads were required to attend the safety inductions organised by the pipeline contractors for their staff, at the construction bases of MacAlpines, outside Carlisle, Costains, at Holme Park, and PEC, at Preston Docks. The line inspectors, the rapid response team, and the many other LUAU staff members involved at one time or another in the pipeline construction phase, all attended one or more of these inductions, and the project director attended all three.

As a result of the importance accorded to personal responsibility for safety, only four minor accident reports were filed in the five-year life of the project. These were a case of heat exhaustion, and another of mild hypothermia, both experienced, at different seasons, at Low Borrowbridge, and a minor ankle injury. The only injury requiring hospital treatment was again sustained at Low Borrowbridge, when gale-force winds slammed shut a Portacabin door on the site director's fingers, which fortunately proved to be stronger than the door hinges.



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## 1. METHODOLOGY AND CHRONOLOGY OF THE STUDY

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LUAU's involvement in the NWEPP project began in July 1988, once a two kilometre wide corridor had been established by SCUK. The pipeline route was primarily designed to avoid 'obviously unsuitable areas such as areas of high relief and urban conurbations' (SCUK 1989).

The project was divided into four successive phases, with separately negotiated funding, over a period of five years. Phase I (1988-1990) was concerned with the identification of sites from existing records, aerial survey, and fieldwalking, and the assessment of the appropriate archaeological response. Phase II (1990) comprised a selected programme of surveys and trial excavations, and Phase III (1991) included some additional fieldwork, the more detailed excavations immediately prior to pipeline construction, and monitoring of the construction process. The final phase (1992-1993) consisted of the post-excavation programme necessitated by the considerable accumulation of data and artefacts engendered by the preceding phases of the investigation, and the preparation of texts for publication.

The phased programme of archaeological investigation progressed from the collection of recorded data on all known sites in a broad corridor of interest, followed by reconnaissance in the field, to a selection of sites for further recording and investigation, within a much narrower corridor. Results were rapidly collated, analysed, and transmitted to SCUK with minimal delay, as an aid to route planning.

About half the archaeological sites within the scope of the evaluation were identified and located from the desk-based search, using Scheduled Ancient Monument lists, Listed Building schedules, county Sites and Monuments Records, and the North West Wetlands Survey archive. The other half of the sites were identified by means of field survey, aerial photography, and the watching brief during construction.

### Phase I

The archaeological assessment was in the first instance concerned with the identification of Scheduled Ancient Monuments, and strategies for their management, and was completed in August 1988 (Williams 1988).

#### Scheduled Ancient Monuments

Archaeological remains that are considered to be of national importance are listed as SAMs, and afforded a measure of statutory protection. Any proposed disturbance of a scheduled area is subject to Scheduled Monument Consent, which must be obtained from the Secretary of State for the Environment.

A two kilometre wide corridor was screened for sites with statutory protection. The Department of the Environment's county lists of SAMs were assessed, in conjunction with the OS 1:50,000 mapbase, supplied and annotated by SCUK with the boundaries and centre-line of the proposed corridor.

This first level of assessment was concerned with a broad corridor within which a tentative route could be varied, in respect of the statutory protection afforded to those ancient monuments considered to be of national importance. With the exception of Hadrian's Wall, the aim was to ascertain the extent of all SAMs along the proposed pipeline route, which would otherwise become a constraint on development.

The first priority was to identify any scheduled sites lying within the designated two-kilometre wide corridor, and 32 were found, of which 28 were in Cumbria, three in Lancashire, and one in Cheshire. Eight of these were located on, or immediately adjacent to, the proposed centre-line. Prehistoric monuments included three stone circles on Hardendale Fell, two round cairns on Windrigg Hill and at Seal Howe, a long barrow on Trainford Brow,

and two Iron Age or Romano-British settlements near Brougham. An additional site of national importance, currently without statutory protection, although likely to be the subject of scheduling in advance of any proposed development, was a Bronze Age cairn at Manor Farm, near Borwick.

Sites of the Roman period included Hadrian's Wall, and forts at Old Penrith, Brougham, and Low Borrowbridge, a fortlet, six marching camps, and a Roman road. Medieval sites included the gatehouse at Wetheral Priory, Norman motte and bailey earthworks at Tebay and Halton, and a deserted medieval village at Dalton near Burton-in-Kendal. Post-medieval sites included the Countess Pillar by the A66 road at Brougham, Wetheriggs Pottery in the same area, Rufford Old Hall in Lancashire, and Ince Manor House, the only SAM potentially affected in Cheshire.

The provision of such a broad corridor of interest allowed for the elimination, by careful routeing, of the threat to sensitive sites, and in only one area other than Hadrian's Wall was it likely that the scheduled area might be unavoidable. In the environs of the Roman fort at Low Borrowbridge, Tebay, the centre-line came extremely close to the southern boundary of the scheduled area, across a field likely to contain remains of the Roman *vicus*. It was thought that the risk to the features here might prompt spot scheduling by the Department of the Environment, in which case excavation in advance of ground disturbance would be likely to be required by the Secretary of State, as a condition of Scheduled Monument Consent.

SCUK was advised in August 1988 (Williams 1988) of the archaeological constraints, and of the implications for the surrounding areas. Extensive re-routeing followed, and as the corridor of interest was narrowed to 500 metres, and subsequently to 400 metres, only four SAMs remained within the corridor. These were Hadrian's Wall (825, Cu 28(16)), a prehistoric settlement on Lazonby Fell (934, Cu 194a), affected as a result of a re-route to avoid the Roman camps in the vicinity of Old Penrith, another prehistoric settlement at Sceugh Farm near Brougham (998, Cu 388), and the *vicus* associated with the Roman fort at Low Borrowbridge (1139, Cu 33).

With the exception of Hadrian's Wall, it was, in the event, possible to avoid all the SAMs during pipeline construction.

Consideration was nonetheless given to the fact that associated features might survive outside the limits of the scheduled areas, as proved to be the case at Low Borrowbridge (see Chapter 5). The presence of Scheduled Ancient Monuments was regarded as a crude measure of the archaeological values of the surrounding area, providing some general indication of the archaeological potential along the pipeline route. The relative importance of such areas, and the existence of other archaeological sites, could only be established from a more detailed assessment of all known sites and monuments.

#### Record search

Once the constraints of the scheduled areas had been resolved, the next stage was to consult the existing records of sites without statutory protection, but nonetheless of archaeological importance. The advice of the county archaeologists was sought, and the Sites and Monuments Records for the counties of Cumbria, Lancashire, Merseyside, Greater Manchester, and Cheshire, were searched by National Grid Reference. The Department of the Environment's Listed Building Schedules, aerial photograph collections, and the North West Wetlands Survey archive, were also consulted. A subsequent re-route meant that the county of Greater Manchester was only affected by a fringe of the broader corridor, and once the corridor had been reduced to 40 metres, the county was no longer affected, and was thereafter excluded from the study.

240 known archaeological sites and findspots, identified from the existing records, were within the 500 metre wide corridor now specified by SCUK. The information relating to these sites was collated in a computerised database, to which all subsequent site data, from all sources, was added for the duration of the project.

It was considered that many of these sites could be avoided by minor diversions of the pipeline route within the established corridor, and a detailed report in January 1989 advised SCUK on a more closely defined route (Williams 1989). Strategies for recording the sites remaining within the corridor were also put forward, and emphasis was laid on the clear identification, at an early stage, of the nature and extent of the sites, in order to minimise the amount of excavation required. To define these parameters, fieldwalking was considered essential.

In response to numerous archaeological and environmental constraints, the pipeline route was subject to extensive revision in the first half of 1989, and a reappraisal of 63 kilometres of the route was required. At the same time, the corridor was narrowed from 500 metres to 400 metres, the implication of which was a further assessment of the known archaeological sites, leading to the addition, or the elimination, of many entries in the gazetteer. 229 archaeological sites, 11 less than previously, now lay, at least partly, within the 400 metre corridor.

Advice was given on the appropriate techniques for recording the known sites, and for identifying others as yet unknown. The need for field validation was stressed, as knowledge of a number of sites had been derived originally from aerial photographs or from documentary evidence. The limits of the purely desk-based record search had been reached, and it was agreed that the next stage should consist of rapid fieldwalking of most of the pipeline route, concentrating particularly on upland areas where earthworks were more likely to survive unrecorded. Field reconnaissance would help to determine the amount and type of detailed recording necessary. It was also anticipated that the result of fieldwalking would be a substantial increase in the number of archaeological sites on record.

The other non-destructive techniques advocated were aerial photography, of the entire pipeline route south of the Scottish border, accompanied by detailed topographical survey, and geophysical survey, of selected sites of archaeological significance. The need for excavation was predicted at Hadrian's Wall, a linear site which could not be avoided, Brougham, an area of very high archaeological potential, and the Lune gorge at Tebay, where topographical constraints made it inevitable that important sites would be affected. The pipeline route would also cross several Roman roads, including the Stanegate (831) south of Hadrian's Wall, and it was recommended that those locations should be examined by excavation in section, to determine their constructional form. The report containing these findings and recommendations was submitted in July 1989 (Iles *et al* 1989).

#### Rapid field scan

LUAU was then commissioned by SCUK to carry out a rapid field scan, accompanied by outline topographical survey, and aerial photography. Fieldwalking and survey were now restricted to a 40 metre wide corridor, while record searches and aerial photography were still required to cover the full 400 metre corridor.

The rapid field scan started in late January 1990, and was completed by mid March, having covered 210 kilometres in seven weeks, an average of three kilometres per team per day. All available areas of the pipeline corridor were fieldwalked, with the exception of heavily industrialised or archaeologically sterile areas. SCUK had obtained permission for walk-on access from the majority of the landowners involved, but in certain areas access was denied until shortly before construction began in 1991. These excluded areas amounted to 32 kilometres of the pipeline route, and included sites of archaeological significance on Lazonby Fell, Orton Low Moor, and Tebay Fell.

The tight schedule relied on rapidity of reporting, and close communication with the field teams was maintained by means of mobile telephones. Rapid results were required because major decisions were to be made by SCUK concerning revisions to the pipeline route in early April. For maximum speed and efficiency, three fieldwork teams operated simultaneously. Two teams worked south from the Scottish border, the first team fieldwalking and identifying sites, the second team following to survey the sites with a Zeiss Elta-4 total station. The third

team started from Stanlow, working north and fieldwalking only. Approximately midway, a few miles north of Lancaster, the teams met, and the survey team continued their work southwards. This system ensured the identification of all new sites in the shortest possible time. Weekly progress reports and monthly interim reports during fieldwork kept SCUK informed of all sites located and any problems encountered (Lambert and Quartermaine 1990a, 1990b).

The number of records in the gazetteer of sites was nearly doubled by the rapid field scan. 193 new sites were identified, of which 117 were in Cumbria, 63 in Lancashire, six in Merseyside, and seven in Cheshire.

### Aerial survey

Five flights for oblique aerial photography were made simultaneously with the rapid field scan in the spring of 1990, with three further flights that summer. The aerial survey team, consisting of photographer and navigator, flew with a qualified pilot from the Blackpool Air Centre, in a Cessna 172 high-winged single-engined aircraft. The photographs were taken from the open window of the aircraft, using a Hasselblad 500 EL/M camera and Zeiss 80mm lens, with yellow filter, and 70mm FP4 panchromatic film rated at 250 asa to improve contrast. A Pentax MX 35mm camera was also used, with a 50mm lens and FP4 film.

The aim of the aerial survey, which covered the entire 253 kilometres of the pipeline route, from the Scottish border to Cheshire, was to locate new sites and illustrate known sites of archaeological interest. Sites identified from the aerial survey were later subject to field validation, to assess the need for further work.

The route was flown in the spring, while vegetation cover was low, to record upstanding earthworks, and in summer to record buried archaeological features which might show as cropmarks caused by differential crop growth, or parchmarks in pasture. Relatively few cropmark sites were observed during the summer of 1990, which was not a particularly dry season.

Photographic coverage was extended by examination of photographs from 1974 to the present, from the National Monuments Record, SMRs, the Potato Marketing Board, and Bechtel's 1:10,000 verticals. Results were interpreted, and sites were plotted using the Bradford Aerial Photograph Rectification Computer Programme.

On completion of field and aerial survey, information from the survey record forms was synthesised with the existing records in the gazetteer, to describe each site fully, but succinctly, from the documentary, field survey, and aerial perspectives. The extent of all known archaeological features within the 400 metre pipeline corridor was plotted onto 1:10,000 scale strip maps of the route. Sets of revised plans, or alignment sheets, at the larger scale of 1:2500, were annotated with scale drawings of the survey data and plots from aerial photographs, together with the locations of all sites previously recorded.

### Hadrian's Wall

A strategy for crossing Hadrian's Wall, a SAM of international importance (825, Cu 28(16)), was the subject of a separately timetabled assessment from the earliest stage of the project. An accelerated programme of work began in the winter of 1988, to determine the optimum route through the designated area, north-east of Carlisle and east of Brunstock Park.

The evaluation was designed to locate the area of least survival of the various elements of the Hadrianic frontier, and consequently to devise a programme of further work to investigate and record any surviving remains. Scheduled Monument Consent would then be sought by SCUK from the DOE, to excavate within the scheduled area.

A study of records relating to the section of Hadrian's Wall between Tarraby and Walby revealed that the Wall, although in a ruinous state, survived in Brunstock Park, while 'for

about 2 miles east of Brunstock, Wall and *Vallum* have almost wholly vanished before the plough' (Haverfield 1895). Fieldwork confirmed that this was the case, and the initial assessment, completed in December 1988 (Williams 1988), concluded that east of Brunstock Park, Hadrian's Wall was not visible above ground, and that arable farming and localised quarrying had destroyed most of its associated features.

By means of geophysical survey and topographical contour survey, in May 1989, efforts were made to determine the line of the Wall, the Wall ditch, and the *vallum*. The work included investigation of a hollow way, which crossed the area from east to west, approximately on the projected line of Hadrian's Wall, and which appeared to be the only part of the area which had not been levelled by ploughing. It was considered that the hollow way might preserve archaeological deposits relating to Hadrian's Wall. Geophysical survey confirmed that the locations of the Wall-ditch and *Vallum*, as shown on the current Ordnance Survey 1:2500 scale map, were essentially correct (Williams and Howard, 1989).

Trial excavation, in November 1989, demonstrated that no Roman stratigraphy or features survived in any of the trenches, which traversed the quarried area favoured for the crossing point (Gibbons and Olivier 1989). On the basis of these investigations, the pipeline route in this area was finally determined, and Scheduled Monument Consent was obtained, to excavate 'one long narrow trench about two metres wide and two metres deep across the line of the hollow way and the apparent line of the ditch and *vallum* and the construction of a pipeline trench'.

This excavation, immediately preceding pipeline construction, in April 1991, demonstrated that most, but not all, of the area had been rendered archaeologically sterile by recent quarrying. Sealed archaeological deposits were present under the hollow way, although their significance was unclear in the two metre wide trench, and the southern end of the trench lay outside the quarried area, revealing the *vallum*, in section, as a broad, deep, ditch (Drury 1991).

The investigation of Hadrian's Wall was intended to minimise the destructive impact on any surviving remains, and to this end, an area frequently ploughed, and subject to recent quarrying and landfill, was selected for the crossing point. The trench excavated in advance of pipeline construction confirmed the lack of features for most of its length, but also located a surviving section of the *vallum*, thus making a useful contribution towards the definition of the course of the Hadrian's Wall complex east of Brunstock Park.

#### Gazetteer of archaeological sites

From the beginning of the project in 1988, a specially designed database was set up to hold information on all sites within the pipeline corridor, in a readily accessible format. Southdata's Superfile software ran on IBM and Opus 286 computers, with the ability to assimilate and order data from many different sources, and to provide flexible output in the form of reports containing selected data from the site records.

Initially, details of all existing SMR records were input to the database, together with scheduling information obtained from English Heritage for the SAMs, and extracts from Listed Building Schedules. During the rapid field scan in 1990, and in all subsequent survey and excavation work, a constant updating and input of new data kept abreast of the incoming information, from survey record forms completed by the fieldwork staff.

The product of this record-keeping was a gazetteer of sites, which went through four major revisions before final editing and selection produced a definitive record of all archaeological sites affected by the pipeline, and of all work carried out at those sites. This basic reference tool, in conjunction with the annotated 1:10,000 scale maps and 1:2500 scale plans of the route, enabled SCUK to vary the route of the pipeline in full knowledge of the archaeological hazards, and to discuss the selection of sites meriting further fieldwork.

All the stages of the work programme are represented in the gazetteer entries, which give precise locations and extents of sites, classification by site type and period, summary reports of all excavations and surveys, and aerial photographic references and interpretations.

A register of sites provides a one-line summary of the gazetteer (Appendix 1), while the gazetteer of sites is reproduced in four volumes, one for each of the four counties traversed by the pipeline (Gazetteer Volumes 1 to 4). For archive purposes, the gazetteer will be copied to microfiche. The county SMRs will each receive a copy of the present report and the appropriate volume of the gazetteer. The Superfile format of the gazetteer was chosen at the outset for its compatibility with the databases used by the Lancashire, Merseyside, and Cheshire SMRs, to enable the efficient transfer of data directly into the SMRs, and to this end, the data will also be supplied on computer disk as an ASCII file.

The archaeological sites are individually numbered for reference, to correspond to the 1:2500 alignment sheets (Revision P1) supplied by SCUK in 1990, and used during the latter stages of pipeline routing. All the archaeological sites located prior to construction were plotted on these sheets, which will be deposited as an integral part of the project archive. A new set of 1:2500 alignment sheets was produced by SCUK to record the 'As-Built' pipeline route, which varied in detail from the previous set of plans, and in the process, the sheet numbers were changed.

Site numbers have now been rationalised, in order to provide a coherent set of archive numbers, and to facilitate transfer of numbers and NGRs to FastCAD, for computer aided design of distribution plots. Site 83.1, for instance, becomes 831, while site R92.100 becomes 9201, and so on.

The results of the first phase of work, and the recommendations for further fieldwork, together with a revised gazetteer of sites, were the subject of two reports at the end of Phase I, in May and June 1990 (Lambert *et al* 1990a, 1990b).

### Recommendations

Following the record search, rapid field scan, and aerial survey, and with the number of sites in the database approaching its maximum, detailed route planning advice was provided to SCUK. Records of sites previously known from national and county archives, and from aerial photographs, were held for a corridor width of 400 metres, while sites identified from fieldwork were concentrated within the 40 metre wide corridor.

An overview was now possible that would allow a standard set of recommendations for the treatment of archaeological sites to be applied to each site identified as at risk. Each site was assessed for its archaeological value, and a strategy was suggested, as appropriate, from a set list of recommendations. Several of these involved the protection of important sites, ranging from re-routing the pipeline or narrowing the corridor, to avoidance and fencing of discrete monuments, and reinstatement of earthworks following construction. Where avoidance was clearly not feasible, investigation and recording by means of geophysical or topographical survey, and trial or full excavation, were recommended. For many sites, however, of limited archaeological significance, the recommendation was for no further action. Finally, it was advised that a general watching brief should be held on the pipeline corridor throughout construction, and that this should be intensive in areas of known archaeological significance.

### Phase II

The second phase of work was commissioned without delay, SCUK having authorised excavation or survey, as appropriate, of the sites deemed the most important. This fieldwork campaign extended over two seasons, with trial excavations, geophysical surveys, and topographical surveys, in the summer of 1990. At the same time, three additional flights for the aerial survey resulted in the identification of 11 new sites.

The second season, in the spring and summer of 1991, included two trial excavations, at Sceugh Farm (998) and Farleton (12504), and two area excavations, at Fremington (10014) and Powsons (1132). The trench across the Hadrian's Wall complex (825) also formed part of this season's work. Several additional topographical surveys, and fieldwalking in areas where access was now permitted, completed the investigative programme prior to construction.

The results of the fieldwork were incorporated in the gazetteer, which contains full reports of the topographical surveys, and summarised excavation reports. The complete reports and records of all the excavations will be deposited with the project archive at the termination of the post-excavation programme (see Appendix 3).

### **Topographical survey**

The outline surveys carried out in Phase I provided accurate locations for the sites recorded during the rapid field scan. More detailed survey was now required for sites with upstanding earthworks which would be affected by pipeline construction. A total of 24 sites was recorded by detailed topographical survey, 19 in July to September 1990, four in January to March 1991, and one during construction, in August 1991.

18 of the surveyed sites were in Cumbria, and six in Lancashire, but the scarcity of upstanding earthwork features in the two southern counties meant that no sites were surveyed in Merseyside or Cheshire. The distribution of the surveys reflects the survival of earthworks in the rural sector of the pipeline route, and particularly in the Cumbrian uplands, where there was widespread survival of features representing the relics of former settlements and field systems, of medieval and post-medieval date. The sites and features surveyed are summarised in Table 1.

The surveys were carried out using a Zeiss Elta-4 total station and Husky Rec 500 data-logger, with respect to the PGM survey control installed by SCUk throughout the pipeline route, and tied into the National Grid. Computerised plots of the detailed topographical survey results were used to produce site drawings at a scale of 1:500. Each site was then redrawn at a reduced scale of 1:2500, to provide a set of acetate overlays for the alignment sheets at the same scale. The original drawings and plots will be deposited with the project archive (see Appendix 4).

Accounts of the topographical surveys were included in a report of October 1990, summarising the results of the first season of surveys and excavations (Lambert 1990), and a report of December 1991, including accounts of surveys carried out in spring 1991 (Lambert 1991). The sites are also fully described in the gazetteers of Cumbria and Lancashire (Gazetteer Volumes 1, 2).

Site no	Site name	Type of feature surveyed
<b>Cumbria</b>		
934	Lazonby Fell	Trackway, boundary, settlement
939	Lazonby Fell	Bank
948	Tarn Plantation	Trackway
998	Sceugh Farm	Trackway, boundary
1026	Oaklands	Trackway, boundary, bank
1027	Oaklands	Trackway, boundary, platform
10211	Great Strickland	Trackway, boundary, lynchet
10311	Thrimby	Trackway, boundary, ridge and furrow, mound, platform
1123	Tebay Gill	Bank
1132	Powsons	Trackway, boundary, enclosure
1133	Powsons	Trackway, bank, wall
1139	Low Borrowbridge	Trackway, lynchet, enclosure, bank, ridge and furrow, mound
1142	Salterwath Bridge	Trackway, boundary
1144	High Carlingill	Watercourse, gully
1145	High Carlingill	Enclosure, pit
1146	High Carlingill	Bank, enclosure
1242	Hollins Farm	Trackway, lynchet, bank
12601	Holme Park	Wall, enclosure
<b>Lancashire</b>		
1284	Priest Hutton	Lynchet, ridge and furrow
1305	Over Kellet	Trackway, boundary, bank, mound, ridge and furrow
1313	Over Kellet	Boundary, platform, building, ridge and furrow, quarry
13801	Eastrigg	Trackway, enclosure, platform, bank, ditch
1422	Middle Crimbles	Trackway, boundary, bank, ditch, platform, ridge and furrow,
1522	Newton with Clifton	Trackway, platform, ridge and furrow, headland, ditch, quarry

Table 1: Topographical surveys, 1990-1991

### Geophysical survey

16 sites were subjected to geophysical survey, 13 in Cumbria, and three in Lancashire. The geophysical survey work was sub-contracted to the University of Durham, and carried out in July and September 1990, with the exception of the survey of Hadrian's Wall, which was part of the accelerated programme and took place in May 1989.

Site no	Site name	Type of feature surveyed
<b>Cumbria</b>		
825	Hadrian's Wall	Wall complex
831	Stanegate	Roman road
852	Wetheral	Medieval chapel
999	Brougham	Ditch, enclosure
1004	Brougham	Roman cemetery
1008	Brougham	Bronze Age cist, pit
1043	Little Strickland	Field system, ridge and furrow
10610	Hardendale	Enclosures, pits
1116	Tebay	Settlement, ridge and furrow
1138	Low Borrowbridge	Settlement, bank, ditch
1139	Low Borrowbridge	Roman <i>vicus</i> , ridge and furrow
1142	Salterwath Bridge	Trackways, field boundaries
1145	High Carlingill	Enclosure, pit
<b>Lancashire</b>		
1299	Manor Farm	Bronze Age ring bank
1302	Kellet Lane Bridge	Settlement
1421	Little Crimbles	Watercourses

Table 2: Geophysical surveys, 1989-1990

The resistivity surveys were carried out using a Geoscan RM4 resistivity meter and DL10 data-logger, employing the twin-electrode configuration. For the magnetic surveys a Geoscan FM18 fluxgate gradiometer was used. The results were processed on a portable IBM-compatible computer using Geoplot software supplied by Geoscan, to produce dot-density plots, and on a Sun workstation at Durham University, where the UNIRAS graphical system was used to produce grey-scale shaded contours and three-dimensional plots.

The surveys were designed around a series of 20 metre squares, within which measurements were normally taken at the nodes of a grid of one metre. Where the suspected nature of the archaeological deposits warranted a closer scan, a grid of 0.50 metres was used. The Roman cemetery site at Brougham (1004) was covered by a 0.25 metre grid, as it seemed unlikely that a less intensive search would be productive. An exception to the usual grid layout was made for the Stanegate (831), where single long transects were used, in the attempt to locate a road whose location was not precisely defined.

The results of the geophysical surveys are included in the gazetteer entries for each of the sites investigated (Gazetteer Volumes 1, 2), and plans showing the survey grids are included in the collection of site location plans (Appendix 3). The findings of the geophysical survey of Hadrian's Wall were contained in a report of May 1989 (Howard and Williams 1989), and a report on the main programme of surveys was submitted in December 1990 (Howard 1990).

#### Trial excavation

A series of 15 trial excavations was carried out in August and September 1990, at 11 sites in Cumbria, and four in Lancashire. The trial excavation at Hadrian's Wall (825) had taken place previously, in November 1989, and has been discussed earlier in this chapter. Two more trial excavations took place in April 1991, before construction began, one in Cumbria, at Sceugh Farm (998), the other in North Lancashire, at Farleton (12504). There were no sites south of the river Ribble, of those identified prior to construction, which merited excavation. This reflects the higher rate of destruction of sites in the arable lowlands of West Lancashire, and the industrial areas of South Lancashire and North Cheshire.

Site no	Site name	Site type
<b>Cumbria</b>		
825	Hadrian's Wall	Wall complex
912	Tarn Wadling	Drained tarn
934	Lazonby Fell	Settlement
998	Sceugh Farm	Settlement
999	Brougham	Bank, enclosure
1004	Brougham	Roman cemetery
1008	Fremington	Bronze Age cist, pit
10610	Hardendale	Enclosure, pit
1116	Tebay	Settlement
1132	Powsons	Settlement
1138	Low Borrowbridge	Settlement
1139	Low Borrowbridge	Roman <i>vicus</i>
1142	Salterwath Bridge	Trackway
<b>Lancashire</b>		
12504	Farleton	Charcoal pitsteads
1299	Manor Farm	Bronze Age ring bank
1302	Kellet Lane Bridge	Settlement
13801	Eastrigg	Settlement, trackway, field system
1421	Little Crimbles	Earthworks

Table 3: Trial excavations, 1989-1991

The negative outcome of most of these excavations eliminated a number of archaeological hazards within the pipeline corridor, and demonstrated that no further work would be necessary at these sites, other than a watching brief during construction. None of the sites with a negative archaeological result subsequently revealed features during construction, leading to the conclusion that the sites did not survive below ground. As the overall aim of the project was to avoid archaeological sites rather than to confront them, this can be seen as a successful result of the careful planning.

Only three sites displayed potential for further investigation. At Fremington, near Brougham, a stone-lined circular pit and other features, in association with coarse pottery, were recorded in the trench sections (1008). In the Lune gorge, south of Tebay, a rectangular stone building was sectioned at Powsons, a medieval or post-medieval settlement (1132). Two kilometres further down the valley, the supposed site of the *vicus*, associated with the Roman fort at Low Borrowbridge, produced a small pit containing Roman pottery and iron nails (1139). There was a clear case for further excavation at these three sites, which had the greatest archaeological potential of all the sites located prior to construction.

Trenches were excavated using JCB or CASE backactor mechanical excavators, fitted with toothless buckets varying from 0.70 metres to 1.55 metres in width. The turf, topsoil, and subsoil, were separated to ensure correct backfilling and returfing. Standard methods of recording consisted of scaled section drawings, context records, and photography. A Zeiss Elta-4 total station was used to locate the centre-line of the pipeline route, and to survey the trenches and relevant topography.

Three reports presented the results of the trial excavations. The first was for Hadrian's Wall in November 1989 (Gibbons and Olivier 1989), the second, in December 1990, described the 15 trial excavations of the 1990 summer season (Buxton *et al* 1990), and the third, in December 1991, accounted for all the surveys and excavations completed in 1991, which included the two remaining trial excavations (Lambert 1991).

#### Palaeoenvironmental survey

From the early stages of the project, the importance of wetland sites in North West England had been stressed (Williams 1989). Wetland areas containing peat are known to be of considerable archaeological potential, as they were prime settlement locations in prehistoric times due to the coincidence of economic resources, such as wildfowl, fish, and grazing for animals. The unique conditions found in wetland locations allow for the preservation of sites and artefacts, as well as plant microfossils and macrofossils.

The North West Wetlands Survey is based at LUAU, and NWWWS staff were involved in consultation and practical intervention throughout the project. The wetlands were considered at all stages, and included in the programme of fieldwork. During the rapid field scan, in February and March 1990, two members of the North West Wetlands Survey were responsible for the fieldwalking in known wetland areas, and as a result, a closer assessment was made of the potential of wetlands likely to be affected by pipeline construction. The areas of concern, known to contain deep, well-preserved, peat deposits, with a high potential for archaeological remains, were Cockerham, Winmarleigh, and Rawcliffe Mosses, in the Fylde, and south of the river Ribble, Croston, Hoscar, and Rainford Mosses.

Several wetland sites were recorded during the rapid field scan in 1990, at Knells (811) and Drybeck Moss (1183) in Cumbria, and Hall Green (1601) and Marsh Moss (1611) in Lancashire. Palaeoenvironmental sampling, in the form of gouge auger transect coring of the peat, was carried out in October 1990 near Hall Green on Croston Moss (1601), where a sand island was located adjacent to deep peat deposits. A further site, near Nook Farm (1446) in the Fylde, was recorded during construction.

### Phase III

#### Excavations at Fremington and Powsons

The spring of 1991 was the period designated by SCUK for two of the area excavations where trial excavation the preceding summer had demonstrated the need for further work. These were both in Cumbria, at Fremington (10014), south-east of Penrith, and at Powsons (1132), in the Lune gorge south of Tebay. The excavations were due to begin in early April, but both were unavoidably delayed until 7 May. Construction had meanwhile started, on 1 May, and there was necessarily a constraint to finish the area excavations before serious delays were caused to the construction schedule. In the event, the fencing and construction crews did not reach these sites until the excavations were complete.

Once the complex nature of the site at Fremington (10014) was revealed, the excavation was extended until 19 July, to allow the full recording of this important post-Roman settlement of sunken-featured buildings (see Chapter 4). The features excavated at Powsons (1132), primarily a stone building forming part of a farming settlement of late medieval or post-medieval date, were of a less complex nature, and it was therefore possible to finish on schedule, on 21 June.

#### Archaeological line inspectors

A watching brief was conducted over the full length of the pipeline route. For the duration of construction, 1 May to 1 November 1991, three members of LUAU staff were seconded to the SCUK project team, to conduct the watching brief as archaeological line inspectors. They were responsible to SCUK and were based in the site offices at Holme Park and Preston Docks, but were provided with equipment, including all-weather and safety clothing, vehicles, mobile telephones, recording equipment, and accommodation, by LUAU. They attended safety induction courses at the contractors' site offices, and wore safety boots and helmets in the field at all times. The project manager was informed of their progress and activities through the medium of copies of their weekly reports to SCUK, and provided support in all practical matters.

The three inspectors covered Spreads 3 (Penrith to Cockerham) and 4 (Cockerham to Stanlow), each working six days a week, ten hours a day, two weeks on and one week off. One of the inspectors was assigned to each spread, while the third alternated between the two spreads. This system ensured their availability to cover construction activities at all times.

The line inspector for Spread 2 (Moffat to Penrith) was employed by the Centre for Field Archaeology at Edinburgh University, the consultant for the Scottish section of the NWEPP, and likewise was seconded to SCUK for the duration of construction. Spread 2 extended 40 kilometres south of the Scottish border, to Penrith, and for consistency of recording and further analysis, it was arranged that the results of the watching brief would be sent to LUAU, for processing with the other records from the English section. The results of the Spread 2 watching brief were communicated to LUAU by post, and the weekly reports, survey forms, photographs, finds, and other documentation, were subsequently integrated with the project archive.

The intensive watching brief resulted in the recording of 65 new sites. The inspectors recorded sites to a basic field survey level, referring sites which warranted further survey or excavation to SCUK's pipeline archaeologist. A team of archaeologists was maintained on standby by LUAU, to excavate or survey at short notice, as appropriate and whenever required.

The inspectors also monitored sites previously known, and noted how they were affected by pipeline construction. Observations on known sites, and new sites identified during topsoil removal or trenching, were incorporated in the project database.

The difficulties encountered by the line inspectors while monitoring an extensive linear corridor of operations were compounded by the construction methodology, which adapted

to a tight schedule by sending topsoiling and trenching crews into several areas simultaneously and at short notice. As a result of this duplication of activity, the inspectors were at times obliged to prioritise areas to be monitored during topsoiling, and for this reason some archaeological features may have gone unrecorded.

#### Rapid response team

For the duration of pipeline construction, LUAU maintained a rapid response team, composed of experienced excavation and survey staff, to investigate and record any archaeological hazards encountered.

Based at LUAU, located near the mid-point of the English section of the pipeline route and adjacent to the M6 motorway, the response team was equipped to respond to any urgent situation at very short notice. Recording efficiency was maximised by the use of a Zeiss Elta-4 total station for all survey purposes. All members of the team attended safety induction courses, when appropriate, at the contractors' site offices for Spreads 2, 3, and 4, and wore safety boots and helmets in the field at all times.

On two occasions, when the circumstances required rapid intervention for rescue excavations at Low Borrowbridge and Sproatgill, the response team was expanded to include many other members of LUAU staff. The team was of necessity flexible and drew on most of the resources of the Unit at different times. It was called out on ten separate occasions, between June and September 1991, to investigate and record sites threatened by construction activities.

Site no	Site name and type	Call-out days	Dates in 1991
1957	Beckett's Wood, brick clamp	5	4-10 June
1451	Watson's Wood, boundary	2	13-14 June
1139	Low Borrowbridge, cemetery	32	18-30 June
831	Stanegate, cobbled surface	5	22-26 July
9202	Aiketgate, pit	2	6-7 August
948	Tarn Plantation, trackway	1	8 August
10014	Fremington, ditch	3	14-16 August
1091	Sproatgill, road	12	22 August-1 September
831	Stanegate, ditch	1	4 September
853	Scotby Shield, ditch	1	5 September

Table 4: Rapid response team fieldwork, 1991

#### Artefacts recovered during the watching brief

*Christine Howard-Davis*

Near Hadrian's Wall, a shallow pit was briefly investigated, and found to contain more than 50 fragments of handmade, decorated, ceramic vessels (827), later identified as Peterborough Ware, of Neolithic date. The series of vessels known as Peterborough Ware is conventionally dated to the later third millennium BC. It is a ceramic tradition well known elsewhere in Britain, although an uncommon find in Cumbria. Isolated sherds, usually in poor condition, have, in recent years, been found at Brougham (Charlesworth 1972), on Crosby Ravensworth Fell (Cherry and Cherry 1987), and at Shap (Ellwood pers comm), all areas in the vicinity of

the pipeline route. Such a large quantity, however, was hitherto unknown from an inland site in the North West.

Small pits such as this are thought to have been rubbish or storage pits, associated with domestic settlement, although often some distance away. Funerary and ritual monuments of Neolithic date are recorded from the Eden valley, but domestic sites are virtually unknown, and thus the discovery of such a site is of regional significance. The pottery was in good condition. Examination of the broken edges suggests strongly that the vessels were broken and incomplete prior to deposition, presumably the reason why they were discarded. There were, however, enough fragments to suggest that at least three different vessels were represented. No other finds of Neolithic date were associated with the pottery.

With the exception of the Neolithic pottery from Old Grove (827), finds recovered from the watching brief were unexceptional. They fell predictably into two very clearly defined groups, struck flints, and post-medieval domestic ceramics, artefacts which are to be expected in any situation where high intensity field collection is undertaken.

Small fragments of post-medieval ceramic and glass domestic vessels, and clay tobacco pipes, often appear in appreciable numbers on agricultural land, and derive largely from the practice of night-soiling to enrich the land, and the localised clearance of domestic middens. Such fragments are of little archaeological significance, although it is good practice to record their presence. The only other finds of significance were a few fragments of medieval ceramic (11317, 1151), indicating activity of that period in the Lune gorge.

Since great care was taken to minimise the impact of the pipeline on sites of archaeological importance, a paucity of significant finds is indicative of a successful strategy.

#### Excavations during construction

Nine excavations were authorised by representatives of SCUK, and carried out by the LUAU rapid response team, during pipeline construction. The majority of these were brief investigations, of one or two days' duration, of defined features revealed as a result of topsoil stripping.

Three ditches containing evidence of burning were excavated to the north-west of Scotby Shield farm (853, Fig 6); several features, probably representing traces of a small-scale industrial site, were excavated north of Oak Bank, near Aiketgate (9202, Fig 8); and a linear feature, probably a hedge line, was excavated at Watson's Wood, near Nateby (1451, Fig 54). A trench was excavated to record linear ditches and gullies in the vicinity of the fenceline between the two excavation areas at Fremington, and an isolated fire-blackened sandstone flag was recovered some 90 metres south of the same site (10014, Fig 18).

Three more significant excavations, each of approximately a week's duration, provided an opportunity to investigate two Roman roads in Cumbria and an industrial site in Cheshire. The Stanegate, south of Hadrian's Wall, yielded structural evidence for this important road linking the principal forts along the original Roman frontier, and on a later occasion, parallel ditches, associated with the Stanegate, were also recorded (831, Fig 4). The main north-south Roman road linking Manchester and Carlisle, was evaluated at Sproatgill (1091, Fig 26), west of Orton. An industrial site in Cheshire, at Beckett's Wood, near Aston, proved on investigation to be a brick clamp kiln, probably dating from the Industrial Revolution, of a type rarely located (1957, Fig 55).

The Roman cemetery at Low Borrowbridge (11318, Figs 35, 36) in the Lune gorge, was excavated in the first instance by the rapid response team, following its discovery during topsoil stripping. In the south-east corner of the field thought to contain the *vicus* of the nearby Roman fort, the LUAU line inspector observed five discrete burnt areas, containing charcoal, Roman pottery and metalwork. Topsoiling of the remainder of the area was monitored, and construction activity was suspended by SCUK later the same day. The rapid response team was called in the following day, to evaluate the site. As the work progressed

it soon became clear that this was a discovery of major importance, as the site was undoubtedly a Roman cemetery. Additional funding was provided by SCUK to continue the rescue excavation, between the contractors' running track and the edge of the pipeline corridor, which, despite employing a team of up to 20 people, eventually lasted seven weeks.

## Final phase

### Reporting

Frequent reports advised SCUK on the progress of the archaeological studies, enabling route planning, and the construction timetable, to be adjusted in accordance with the most recent archaeological knowledge obtained. This was achieved by a combination of interim reports and assessments at the end of each phase of work, weekly progress reports during the field work campaigns and the construction phase, and frequent contact by telephone and Fax. Management meetings with SCUK's environmental advisers were held at SCUK offices in London, Aberdeen, Carrington and Carlisle, at LUAU and, during construction, on the excavation sites at Low Borrowbridge and Sproatgill.

<b>Phase I</b>		
1	Assessment: Scheduled Ancient Monuments	August 1988
2	Initial assessment: Hadrian's Wall	December 1988
3	Assessment: Sites and Monuments Records	January 1989
4	Geophysical survey: Hadrian's Wall	May 1989
5	Revised route: Sites and Monuments Records	July 1989
6	Trial excavation: Hadrian's Wall	November 1989
7	Interim: rapid field scan	March 1990
8	Interim: rapid field scan	April 1990
9	Final report	May 1990
10	Revised final report	June 1990
<b>Phase II</b>		
11	Interim: surveys and excavations	October 1990
12	Interim: surveys and excavations	November 1990
13	Trial excavations: 1990	December 1990
14	Geophysical surveys: 1990	December 1990
<b>Phase III</b>		
15	Excavation: Hadrian's Wall	October 1991
16	Surveys and excavations: 1991	December 1991
<b>Gazetteers</b>		
1	400 metre corridor	January 1989
2	400 metre corridor	July 1989
3	400 metre corridor	May 1990
4	40 metre corridor	June 1990
5	40 metre corridor	July 1993

Table 5: Archaeological progress reports, 1988 - 1991

Attention was given to making public the findings and progress of the NWEF project, through articles in regional and national journals, lectures, and interviews. All texts were submitted to SCUK's Head of Public Affairs for approval before publication. Articles or brief summaries have so far been published in the Council for British Archaeology, Group 3 Newsletter (October 1990), *Britannia* (1992), *Medieval Archaeology* (1992), the Bulletin of the Centre for North-West Regional Studies (CNWRS New Series No 6, Summer 1992), and *Cheshire Past* (No 2, 1993). A booklet more accessible to the general public, entitled 'Archaeological Studies along the North Western Ethylene Pipeline' (SCUK 1993), was produced by SCUK in February 1993, in association with RSK Environment Ltd, for which the text relating to the English section of the route, and numerous illustrations, were supplied by LUAU.

#### Post-excavation analysis

Fieldwork was followed by the processing of records, plans, photographs and finds, to provide a comprehensive archive of the sites investigated. Each site was then assessed to place it in its correct archaeological context, and to determine the level of analysis required, in accordance with English Heritage guidelines on the management of archaeological projects (English Heritage 1991).

At the conclusion of each excavation, finds and raw data were returned to LUAU for preliminary processing. Finds were washed, marked, and stored in archivally stable bags and boxes. For the major excavations, the data was input to a database (Delilah), indexed and catalogued. To facilitate further analysis, context, object, plan, and photographic records, were also checked and input to Delilah. Following initial post-excavation assessment, three sites were considered to merit detailed analysis: the post-Roman settlement at Fremington (10014), the medieval or post-medieval settlement at Powsons (1132), and the Roman cemetery at Low Borrowbridge (11318).

For each of these sites, the post-excavation analysis has been completed. Finds have been catalogued, analysed by the appropriate specialists, conserved where necessary, and illustrated. The fully computerised archive has been analysed to produce a phased account of each site. The discussion placing the sites in their cultural and historical context is in progress. Summary versions of these accounts and discussions, pending the publication of the full analytical reports, are included in the present report for Fremington (10014, Chapter 4) and Low Borrowbridge (11318, Chapter 5).

The site narrative of the Powsons excavation is complete, but requires some further work prior to publication. The Lune gorge has the greatest concentration of sites on the pipeline route, including the Powsons settlement and associated features, and the Roman fort, *vicus*, and cemetery, at Low Borrowbridge. The valley has been dramatically affected by the communication routeways driven through it, and in comparison with, for instance, the M6 motorway, the impact of the pipeline has been relatively low-key. Nonetheless, 29 sites in the valley, between Tebay and Lowgill, lay within the 40 metre corridor (Table 6), and many more were narrowly avoided. A discussion of the settlement at Powsons, within the broader context of the many other sites in the vicinity, is in preparation, with a view to inclusion as Chapter 6 of the publication text.

#### Gazetteer of archaeological sites

The final version of the project gazetteer contains 321 archaeological sites, and represents the sum of the knowledge gained of each site, from many sources, as a result of the studies occasioned by the NWEF project. A constant updating process has kept track of further developments at each site subject to field work, and the results of the watching brief and post-excavation work, together with finds catalogues and basic documentary evidence, have been collated, to bring the record completely up to date.

The dual purpose of the gazetteer has been to inform SCUK of the current status of each site, as an aid to route planning, and to enhance and update the county and national monuments

1101	Old Tebay	Ridge and furrow
1112	Tebay	Ridge and furrow
1113	High Beck Lane	Hollow way
1115	Tebay	Field system, bank
1116	Tebay	Settlement
1117	Tebay	Field boundary
1118	Tebay	Field boundary
1121	Tebay	Ridge and furrow, bank, ditch
1122	Tebay	Trackway
1123	Tebay Gill	Bank
1131	Powsons	Field boundary
1132	Powsons	Settlement
1133	Powsons	Walls, banks, trackways
1134	Powsons	Field boundary
1135	Powsons	Field boundary
1138	Low Borrowbridge	Bank, ditch
1139	Low Borrowbridge	Roman <i>Vicus</i>
11315	Powsons	Field boundary, ridge and furrow
11316	Powsons	Findspot
11317	Low Borrowbridge	Findspot
11318	Low Borrowbridge	Roman cemetery
1142	Salterwath Bridge	Trackway, field boundary
1144	High Carlingill	Watercourse, gully
1145	High Carlingill	Enclosure, pit
1146	High Carlingill	Bank, enclosure
1151	Low Park	Findspot
1161	Lowgill	Field boundary, trackway
1162	London and NWR	Disused railway
1167	Lowgill	Field boundary

Table 6: Archaeological sites from Tebay to Lowgill

records. The primary records of known archaeological sites were obtained, in the first instance, with the cooperation of the county SMRs, and the enhanced information is now ready to be deposited with those SMRs. As the data was input in a format closely related to that of three of the four SMRs, it is hoped that the reintegration will be practically straightforward.

The final version of the NWEPP project gazetteer comprises synthesised records of all archaeological sites which lie, at least partially, within the revised 40 metre pipeline corridor. The gazetteer has been divided into four sections, one for each of the four counties affected:

Cumbria, Lancashire, Merseyside, and Cheshire, for ease of reference. These sections are contained in separate volumes, to accompany the report (Gazetteer Volumes 1 to 4).

A single set of numbers has been adopted as the primary identification for all sites in the four counties. The number set has been rationalised, and slightly modified, from that originally used, which was based on the sheet numbers of the 1:2500 scale pipeline route plans, or alignment sheets (Revision P1), supplied by SCUK in 1990. As a consequence of many re-routes, the numbering of the 'As-Built' pipeline route plans varies from that adopted previously. Both sets of plans, and earlier plans at 1:10,000 scale, will be deposited with the project archive (see Appendix 3).

Sites were originally numbered according to the 1:2500 scale alignment sheets, which were numbered from 1 to 199, north to south from Grangemouth in Scotland to Stanlow in Cheshire. The English section of the route comprised sheets 77 to 199, and sites were numbered as follows, eg 113.2 was the second site identified on plan 113. New sites recorded during the watching brief were attributed numbers from 100 upwards, eg 113.101. The revised archive numbering simply omits the false decimal point, in most cases, while the watching brief sites are given the next available number in the sequence for each sheet, eg 100.102 became 10015. Several sheet numbers were prefaced with an R, and a zero was inserted to replace this, eg R92.100 became 9202.

The number sequence appears incomplete because some sites recorded in Phase I of the project have subsequently been deleted from the database. The progressive refinement of the pipeline route meant that many sites no longer fell within the corridor. The records of these sites, not updated since Phase I, have however been retained in a separate database, and are therefore available for any more extended study of the area of the pipeline route. These basic records will be included in the project archive. As a result of late re-routes during the construction process, not notified to LUAU, it is possible that some of these outlying sites may, in the event, have been affected by construction.

#### Project archive and publication

The archaeological studies have generated a considerable volume of data of many types. The results of the fieldwork and research have been synthesised to provide a detailed assessment of each site investigated. These results include the processed records of the rapid field scan, the watching brief, 24 detailed topographical surveys, 16 geophysical surveys, one palaeoenvironmental survey, and no less than 28 excavations, of varying scale and extent. The flight logs and photographic interpretations of the aerial survey are incorporated, together with documentary and cartographic evidence.

The project archive also contains catalogued survey data, photographs, plans, finds records, specialists' reports, and finds illustrations. Details of the deposition of the archive are given in the Appendix to this report ( Appendix 3).

Publication of the results of the NWEPA archaeological studies will take the form of a monograph, entitled provisionally 'Archaeological studies on the English section of the North Western Ethylene Pipeline, 1988-1993'. This final report adopts the format envisaged for the publication text, and while the content will remain substantially the same, more detailed discussion and analysis will enhance Chapters 2 and 3, and the complete excavation reports will replace the present summaries in Chapters 4 and 5. An additional chapter, currently in preparation, will provide a discussion and perspective on the archaeology of Powsons and the Lune gorge. The provisional chapter headings are listed below.

- Chapter 1 Methodology and chronology of the study
- Chapter 2 An appraisal of the archaeology along the pipeline
- Chapter 3 The archaeological sites in the landscape
- Chapter 4 Excavation of a post-Roman settlement at Fremington
- Chapter 5 Excavation of a Roman cemetery at Low Borrowbridge

Chapter 6 Powsons settlement and the archaeology of the Lune gorge

This final report marks a major step towards a publication text, for which only a very limited amount of further research remains to be accomplished. The constraints of LUAU's extremely busy work programme have engendered delays in the production of a final text, and it is anticipated that the text will be complete by October 1993, with camera-ready copy and illustrations prepared within the following month, and a view to publication shortly thereafter. The final text will be submitted to SCUk for approval, as required, before publication.



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## 2. AN APPRAISAL OF THE ARCHAEOLOGY ALONG THE PIPELINE ROUTE

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The pipeline route effectively forms a random transect across North West England, from the Solway Firth to the Mersey estuary, as the route was selected for study following non-archaeological criteria. The detailed five-year assessment of this narrow ribbon of land 253 kilometres long vividly confirms perceived differences in the survival of archaeological evidence between upland and lowland, and rural and urban, landscapes. The NWEPP project has made a significant academic contribution to our knowledge and understanding of the development of this varied range of landscapes, spanning many centuries of human activity.

The route encompasses upland areas of marginal agricultural value, rich arable lowlands, a busy communications corridor, bleak moorlands, and densely populated river valleys and estuaries. The greatest contrast was between the remote Westmorland fells, and the conurbations and industrial landscapes of Merseyside and North Cheshire. The range of sites recorded reflects these contrasts in North West England. The preponderance of field system elements indicates the rural nature of much of the route, while the many linear features crossed, including rivers, Roman and later roads and trackways, canals, and railways, demonstrate the importance of transport arteries crossing the area over many centuries. Artefacts discovered range in time from Neolithic flints and pottery, relics of the earliest occupants of the region, to post-medieval pottery, usually resulting from the redeposition of domestic middens from farms, or from the wholesale spreading of nightsoil from the towns. Very little medieval pottery was recovered, but this probably indicates infrequent use of such material in the medieval period in poor rural areas.

### Areas of high archaeological potential

For route planning purposes, SCUK required, at an early stage in the project, a listing of the areas of greatest archaeological potential, and an assessment of the risk to sites within these areas. Nearly all the areas regarded as being particularly sensitive were in Cumbria, where there has been less subsequent disturbance of the landscape than in Lancashire, Merseyside, or Cheshire.

Consideration was given to a broad zone of interest, and together with the list of SAMs, areas where known sites clustered were identified. The areas of high potential were listed in the report of July 1989, which also predicted that fieldwork would probably reveal hitherto unknown sites (Iles *et al* 1989). The absence of previous archaeological research in these areas meant that it was not possible to define their survival or extent precisely without investigative fieldwork.

At this stage the study was based entirely on existing records of known sites. The areas with the highest archaeological potential were all in Cumbria, and in addition to Hadrian's Wall, they were located at Aglionby, east of Carlisle, the site of a Bronze Age cemetery; Tarn Wadling, a drained wetland with palaeoenvironmental potential as well as documentary evidence of medieval activity; Lazonby Fell, relict moorland preserving many prehistoric earthworks and artefacts; Brougham, with its concentration of prehistoric, Roman, and medieval monuments, at a major crossroads; Gunnerkeld, where a stone circle with an internal cairn was likely to have outlying associated features; Hardendale Fell, which preserves earthworks of field systems and settlements of prehistoric to medieval date; Tebay and the Lune gorge, a major north - south routeway since prehistoric times, with a Roman fort, road, and possible *vicus*, together with satellite settlements; and Dalton Park, adjacent to the southern county boundary, where parkland preserves as earthworks many components of the medieval field system.

At this stage, only one area in Lancashire was considered to have a high archaeological potential. At Manor Farm, near Borwick, a Bronze Age burial cairn and ring bank (1299) had been excavated in recent years (Olivier 1982), and at least one other such feature was known

to survive in the immediate vicinity. The Cheshire county archaeologist suggested two areas with previous evidence of prehistoric occupation: Fiddler's Ferry, the crossing point of the river Mersey, where prehistoric artefacts have been recovered from the waterlogged estuarine deposits; and the long ridge north of Aston, an area favourable to prehistoric settlement.

The pipeline route became more closely defined in the course of 1990, and the rapid field scan identified many new sites. The report at the end of Phase I modified the assessment of areas of high archaeological potential (Lambert *et al* 1990). The results of fieldwork and aerial survey, combined with the known evidence, indicated several additional areas of particular interest, characterised by extensive and well-preserved remains, or a concentration of sites of a particular type.

In Cumbria, Hadrian's Wall (825) was already the subject of a separate assessment, but the earlier frontier, marked by the Stanegate Roman road (831), also merited close attention. Two areas of post-medieval rural industry were identified: in the narrow confines of the Lune valley at Lowgill, a disused railway viaduct (1162), packhorse bridge, former watermill and various associated features, are superimposed on one another between Beckfoot and the river; and on the western slopes of Farleton Fell, in the south of the county, relics of the eighteenth century limeburning industry form a complex of limekilns, quarries, trackways, and charcoal pitsteads (12501, 12502, 12503, 12504).

Several additional areas were suggested in Lancashire, where aerial photographs revealed settlements, of Iron Age or Romano-British date, near Over Kellet (1302), and at Eastrigg (13801), near Lancaster. At Little Crimbles (1421), near Cockerham, existing evidence suggested the survival of a deserted medieval village, and at Newton-with-Clifton (1522, 1523), in the Fylde, aerial photography and fieldwork confirmed the good state of preservation of the medieval or early post-medieval field system. Two areas on Merseyside were also thought to have archaeological potential: the medieval or post-medieval ruins at Startham Hall (1751) and Hall House Farm (1814), both located in areas containing remains of medieval moated sites.

An interesting comparison can be made between the areas of high potential, identified on the basis of the SMR search and the rapid field scan, in 1988-90, with the areas where the highest density of archaeological sites had been recorded by the end of pipeline construction in 1991.

Survey, excavation, and fieldwalking in areas not previously accessible, led to a revised judgement of areas such as Eastrigg (13801), where documentary evidence and fieldwork later demonstrated the site to be of much later date, and Little Crimbles (1421), where features observed only from the air proved to be former watercourses. The shoreline of the former Tarn Wadling (921), tested by trial excavation, was unrewarding, and the crossing of the Mersey estuary at Fiddler's Ferry (1871) by thrust boring obviated the need for archaeological observation. A few prehistoric worked flints were collected during the watching brief in the area below Aston ridge (1932, 1933, 1958), providing slight evidence for a prehistoric presence in the area, but Startham Hall (1751) and Hall House Farm (1814) had little or no evidence for the survival of any outlying features.

Pipeline re-routes, and the narrowing of the corridor to a final 20 metre width fenced off during construction, meant that some of these highlighted areas were avoided or affected to a much lesser degree. The prehistoric monuments at Aglionby, Gunnerkeld, Brougham, and Manor Farm, were successfully avoided, as was the pocket of rural industry at Lowgill. A re-route at Over Kellet (1302) avoided the cropmarked areas of former settlement, and trial excavation confirmed the lack of surviving features within the pipeline corridor.

Lazonby Fell, Hardendale Fell, the Lune gorge, and Dalton Park, all proved to be rich in surviving earthwork remains of settlement and former land management, as predicted. The associated features thought likely to survive in the vicinity of SAMs at Brougham and in the Lune gorge, turned out to be the most significant sites of all: the post-Roman settlement at

Fremington (10014, Chapter 4), and the Roman cemetery at Low Borrowbridge (11318, Chapter 5).

The computer-generated distribution plots of all sites located within the 40 metre corridor show the sites clustering in most of the identified areas of high potential, reflecting the conclusions of the original assessment. The judgement made at that time, regarding the higher concentration and survival of earthwork sites in favourable upland areas, appears to have been largely sustained, as demonstrated by the site distribution (Figs 56 to 59). The recording of new sites through fieldwork and aerial survey has enhanced the clustering of sites in areas of known archaeological potential, and in areas where the preservation of earthworks has resulted from sympathetic land use.

### **The distribution of archaeological sites**

The uneven distribution of sites is clearly demonstrated by the accurately plotted locations of all archaeological sites recorded within the 40 metre corridor, reproduced for this report at a scale of 1:250,000 (Figs 56 to 58).

In avoiding the most rugged and most urbanised areas, the pipeline route largely affected land which has been intensively exploited for agriculture over many centuries, although where possible it crossed marginal areas of least agricultural value. The study revealed a palimpsest of prehistoric, medieval and post-medieval rural settlement, with a later overlay of transport systems and associated industry.

The upland areas preserve the relics of rural settlement, early field systems and agricultural practices. Numerous earthwork features represent territorial division, settlement, and land use, from prehistoric times up to the parliamentary land enclosures of the eighteenth and nineteenth centuries. The choice of route also determined the presence of many sites relating to communications, for much of the route lay within the main west coast corridor shared by a succession of routeways, including Roman roads, drove roads, turnpike roads, canals, and railways, and more recently, the M6 motorway.

In the lowlands of the Eden Valley and parts of West Lancashire and Cheshire, a milder climate and deeper fertile soils made arable farming viable. Consequently settlement has been more concentrated and prosperous, often resulting in the growth of nucleated village settlements. Upland sites are frequently preserved as earthworks because the marginal nature of the land precludes the destructive effect of repeated ploughing so common in lowland areas, where cropmarks are often the only visible sign of the earlier pattern of settlement and agriculture. The lowlands south of the river Ribble have been subject to intensive agricultural and industrial activity, and the survival of prehistoric earthworks is correspondingly low, although the abundance of finds of prehistoric date, over the last two centuries, confirms the early occupation of the region.

The evident disparity between the extensive surviving remains in the upland rural areas of Cumbria and North Lancashire, and the paucity of sites in lowland industrial and arable South Lancashire, Merseyside and Cheshire, serves to emphasise the special nature of the northern uplands, where well-preserved earthworks abound. Although the large number of upland sites indicates a higher density of rural population in the past than is now the case, the relatively small number of sites recorded in the south indicates only a more intensive and disruptive subsequent land use, which has served to obliterate most traces of earlier occupation.

### **The historical context**

The archaeological remains recorded along the pipeline route can be divided into four broad categories, attributed to the prehistoric, Roman, medieval, and post-medieval periods.

### Prehistoric sites

The route crossed the highland zone of Britain, where glaciation continued later than in more southerly lowland areas. The region could not be occupied by man until the final retreat of the glaciers at the end of the last Ice Age, and for this reason, finds from the Palaeolithic period are almost entirely absent. Mesolithic hunter-gatherers occupied the area from around 12,000 BC, when the climate was improving and the forest cover increased. They lived by hunting, moving around on the high ground above the forest margin, and by fishing in the rivers and on the west coasts of Scotland and northern England.

The Neolithic period, beginning in about 4000 BC, brought the first farmers to the North West, when for the first time more settled communities developed, using polished stone axes from the Langdale and Scafell Pike axe factories to make small clearings in the forest in order to grow cereal crops. Most known Neolithic occupation sites are found on the west coast or near rivers and lakes. Flints were still being used until knowledge of metalworking reached the North West after 2000 BC, during the Bronze Age, when metal tools began to replace them.

Prehistoric finds are quite sparsely represented in the overall pattern of site distribution within the pipeline corridor. The scatter of Neolithic and Bronze Age flints found serves to reinforce the existing evidence for the presence of early man in certain parts of the North West, notably the Cumbrian limestone uplands and the low ridges south of the Mersey estuary in Cheshire, known to have been favourable to early settlement. Flint tools and the struck waste from their manufacture are common finds of prehistoric date, reflecting their thin but widespread distribution throughout the landscape. The artefacts gain significance by their proximity to known sites, or by any increase in density which might suggest the presence of a site, rather than because of any intrinsic interest in them as individual objects.

Evidence for domestic settlement is far more elusive, and with the exception of an assemblage of Neolithic pottery found in a small pit at Old Grove (827), south of Hadrian's Wall, no sites were located which indicate settlement prior to the Iron Age.

The rapid field scan produced worked flints (841, 921) and a waste flake from a Langdale stone axe (1013). The county SMRs hold records of other artefacts found in the past, including stone axes (943, 1046), a flint arrowhead (944), and Bronze Age spearheads (1971) and a bronze axe (1995), found in Frodsham and Ince Marshes during the construction of the Manchester Ship Canal in 1897. Investigation of the supposed location of a Bronze Age cist (1008) at Fremington, near Brougham, led to the discovery instead of a post-Roman settlement (10014). Elsewhere, however, prehistoric human occupation was indicated by the survival of several earthwork sites, including two possible long cairns (947, 1208), several possible funerary mounds or barrows (1052, 1188, 1263), and a Bronze Age ring bank (1299).

Following discussions with LUAU, and by arrangement with the landowners, the acknowledged expert on the prehistoric habitation sites of the limestone uplands in east Cumbria (see Cherry and Cherry 1987) fieldwalked part of the pipeline route after reinstatement of the topsoil, in 1992, with the specific purpose of recovering surface flints. This resulted in the identification of numerous flints, collected and accurately located within the corridor, on the limestone uplands between Little Strickland and Orton. The records of these flints have been incorporated in the project gazetteer.

### The Roman frontier

During the Roman occupation of Britain, the north of the province was a military zone, where native Iron Age traditions appear to have continued alongside the Roman military infrastructure. The pipeline route followed the main corridor of communications west of the Pennines used throughout recorded history, alongside which numerous Roman forts, temporary camps, and roads are to be found. Sites in this northern sector, near the Roman frontier of Hadrian's Wall, related primarily to military and transport use, whereas the few

Roman remains in the southern sector appeared to represent civilian settlement, consistent with the more settled nature of the Roman occupation in the less turbulent regions.

The Stanegate (831), slightly to the south of Hadrian's Wall (825), was the main east-west road serving the early Roman auxiliary campaigns in the north, and linked a system of forts, marking the line of the earliest Roman frontier, prior to the construction of Hadrian's Wall. The route of the Stanegate can be traced for much of its course, but at the point of intersection with the pipeline, the road could not be seen on the ground. Excavation during pipeline construction recorded a broad cobbled surface below the turf, 16 metres wide, with parallel ditches to either side.

On Orton Low Moor, in Cumbria, the main Roman north-south highway between Ribchester and Carlisle (1091) was excavated at the crossing point during pipeline construction. The line of the road here was visible before topsoil stripping, which revealed a fragmentary surface, 10 metres wide, with central and lateral lines of large stones, and a gravel makeup. Beyond the western kerb were a gravelled strip and a drainage ditch.

Roman forts, built to defend strategic positions along the network of roads, and to guarantee supply lines, were garrisoned with legionary or auxiliary troops, and often gave rise to civilian settlement nearby. The fort at Low Borrowbridge controlled access through the Lune gorge, and must have dominated the valley for centuries. The earthworks of the fort survive almost intact, despite the proximity of the modern railway and motorway.

*Vici*, the extra-mural civilian settlements which grew up outside many Roman forts, were closely associated with the military occupation, and were probably economically dependent on the forts. A number of native settlements of the Romano-British period are seen to cluster in the vicinity of the forts at Brougham and Low Borrowbridge. Some of these settlements appear to have outlived their function as providers of food for the garrisons, however, and may have survived for centuries after the end of the Roman occupation in the early fifth century, suggesting continuity of a late Iron Age lifestyle into the early medieval period.

The existence of a *vicus* at Low Borrowbridge (1139) remains unproven, although excavation during pipeline construction was precipitated by the discovery of the Roman cemetery (11318) in a corner of the field, adjoining the fort, where the *vicus* is thought to be located.

#### Rural settlement and agriculture

Among the most frequent and widespread of all the archaeological remains are the earthworks associated with medieval and post-medieval rural settlement and land use. As dating evidence for such features is extremely rare, these are the least securely dated of all the remains, and there is often little to distinguish between earthworks of late prehistoric date, and those of the medieval or later periods.

In the uplands the environment has always been more hostile than on the coastal plain and in the lowland valleys. This has resulted in a fairly dispersed settlement pattern, the product of a subsistence economy based on pastoral farming. The survival of these relict landscapes means that past patterns of settlement and farming can be traced on the ground. Low, turf-covered banks define forgotten fields, level terraces along the contours of hillsides are a product of gradual lynchet formation by ploughing, deep linear hollows indicate old tracks and routeways, and circular or linear mounds may simply be field clearance in stony areas, but may potentially be the remains of prehistoric burial mounds.

Landscape features such as field systems and cultivation terraces are not easily classifiable by period, unless excavation reveals finite evidence for their dates. Some field boundaries and lynchets may be prehistoric, yet subsequent reuse is likely to mask their origin. Reliable dating of cultivation features is almost impossible, as their development is more a function of the underlying geology and soil conditions than a historically datable technique. Likewise, field boundaries were constructed from the building materials locally available, and since

the techniques employed were related to the nature of the materials used, these may have remained the same for many centuries.

The remains of ancient fields and cultivation techniques survive to a greater or lesser extent throughout the rural North West. Although individual components of these historic landscapes may not necessarily have a high intrinsic archaeological value, when considered as part of a field system, the patterns of past settlement and land use begin to emerge.

The elements of field systems include lynchets, ridge and furrow, headlands, and field boundaries. These features cannot be dated from surface evidence alone, but can be considered in terms of the morphology of their formation. Ridge and furrow is produced by the action of ploughing with a heavy plough, capable of turning the sod and producing ridges, and hence can be of any period subsequent to the introduction of such a plough. A date has not yet been established for the introduction of the heavy iron-shod plough, and this is currently the subject of much debate, as it has implications for the earliest possible occurrence of this type of feature. Very narrow ridge and furrow may in some cases pre-date the Roman occupation, although the majority of occurrences along the pipeline route conform to the widths and profiles usually associated with cultivation of medieval or later date.

Broad, deep, ridge and furrow, approximately seven to 15 metres wide, is the result of ploughing using oxen, often producing the curved selions characteristic of medieval strip fields. Narrow ridge and furrow, approximately two to six metres wide, is likely to be the result of horse-ploughing in the post-medieval period, and often survives on marginal land only ploughed during expansion of cultivation in wartime, from the Napoleonic Wars up until the First World War, when horse-ploughs were still used in upland areas.

Headlands are ridges formed at right angles to the ridge and furrow, in the turning area of the oxen and plough at the end of the furrow, and indicate the terminal limits of each furlong or field. These headlands, or baulks, were rarely ploughed, and so tend to survive when the surrounding fields are ploughed down. Cultivation terraces, or lynchets, were formed as a result of ploughing across a slope, where gravity and rainwash caused the downhill movement of the disturbed soil. These features may have been formed at any period since the first prehistoric cultivation of an area.

Field boundaries in the upland areas usually take the form of low earthen or stone banks, which in some cases may have been buried under the lynchets which subsequently developed. Evidence of prehistoric field boundaries may thus be preserved beneath the later lynchets. Aerial photography is particularly useful in the study of field boundaries, giving an overview which facilitates the identification of patterns of boundaries in the landscape, and thus of field systems with their associated features.

The pipeline route traversed many areas of ridge and furrow of different types in varying situations, from faintly defined one metre wide cord rig, seen in parts of Cumbria, to the ten metre wide, high-profile ridge and furrow near the river Ribble. The majority of occurrences were, however, between two and five metres in width, ridge to ridge, and probably of post-medieval date.

Attempts to date ridge and furrow are made by reference to its width, profile, and context, but very little is actually known about the origins and development of this effect of cultivation. The phenomenon of ridge and furrow, which generally evolved as a result of ploughing methods using oxen and subsequently horses, seems to have been exploited as a partial solution to the problems of a damp climate. Survival is influenced by later land-use, and the frequency of ploughing, but also by the nature of the underlying soil. At Newton-with-Clifton (1522, 1523), the survival of high-profile earthworks, together with ploughmarks in the subsoil, is more a function of the heavy boulder clays, which, as in the heavy Midland clay soils, preserves the profiles well.

### **Industry and communications**

A considerable number of sites represent the transport revolution which, from the late eighteenth century, accompanied the Industrial Revolution into the hitherto remote North West. Nine disused railway lines were crossed by the pipeline route, three of which were in Cumbria, four in Lancashire, and two on Merseyside (771, 1015, 1162, 1343, 1441, 1561, 1651, 1792, 1811).

Although the canals generally pre-date the nineteenth century railway network, it is interesting to note that many canals are still in use, although not for transporting freight, their original purpose. Eight canals were crossed by the pipeline, the Lancaster Canal in Cumbria and Lancashire, the Leeds and Liverpool Canal, also in Lancashire, one on Merseyside, and no less than five in Cheshire (12910, 13912, 1631, 1822, 1872, 1881, 1882, 1923, 1951).

The Manchester Ship Canal is of different proportions to the earlier canals, and unlike the others, was not built until the late nineteenth century. The 35-mile long canal was intended to free the Manchester business community from the cost of trading at Liverpool docks, and enabled sea-going vessels to travel up to the then new docks at Salford. This canal is still in operation as a major inland waterway.

The canals had a profound effect on the economic history of the surrounding area, even in the less industrialised northern parts of the region. At Farleton, the Lancaster Canal was re-routed to serve the needs of the limeburning industry on the western slopes of Farleton Fell. Quarries set into the scree slopes of the fellside provided the limestone, while trackways linked these with a series of limekilns, of which two are still in good condition (12501, 12502). Charcoal fuel was produced by the combustion of wood on charcoal pitsteads, or platforms, many of which survive on the lower slopes of the fell (12503, 12504). The lime was transported away from the area by the canal, and there are some large loading bays extending from the canal for the loading of barges. Although the lime industry was in existence previously, its scale of operation increased following the extension of the canal north to Kendal in 1819. The barges bringing coal north from the Lancashire coalfield now began to carry lime south for land improvement and building purposes.

A further aspect of the Industrial revolution was revealed during pipeline construction in Cheshire. On a steep bank above the Weaver Navigation Canal, the foundations of a brick structure were recorded by partial excavation and survey (1957). It appeared to have been a brick clamp, a temporary form of kiln used for producing bricks, probably during the building of the nearby canals, railways or other industrial buildings. At the time when this part of Cheshire was undergoing rapid industrial development and population increase, bricks would have been in great demand, and it seems likely that the clamp kiln was contemporary with these developments, and therefore of eighteenth or nineteenth century date. The temporary nature of clamp kilns, and the fact that they were intended to be dismantled after use, means that they are rarely found or recorded, and their remains are elusive and fragmentary.



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### 3. ARCHAEOLOGICAL SITES IN THE LANDSCAPE

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In this section, archaeological sites are considered briefly in their wider landscape context; this is important because the area investigated is only a very narrow strip through the landscape of North West England, and most of the sites referred to fall at least partly within a corridor only 40 metres wide. Within this corridor only a 20 metre width was topsoiled and excavated for the running track and pipeline trench, although this was exceeded in places, as at Low Borrowbridge, and narrowed elsewhere, as at Hadrian's Wall.

Many of the recorded features were elements of more extensive sites, especially former field systems, which in their entirety extended far beyond the corridor. Many sites, not mentioned here, lay just outside the final corridor, although within the 400 metre wide corridor originally assessed, and these were considered at an early stage of the study.

The first requirement for the pipeline route was that it should avoid urban areas and mountainous terrain, and it therefore traversed a rural landscape, skirting towns, villages and the higher fells. It constitutes a cross-section of North West England, from the point where it crosses the border with Scotland north of Gretna onto the Solway Plain, through the Cumbrian farmland and uplands between the Lake District and the Pennines. The pastoral farming landscape of South Lakeland and North Lancashire is succeeded by the peatlands of the Fylde and the industrialised areas of South West Lancashire, Merseyside and North Cheshire.

The distance covered by the pipeline route from the Scottish border at the river Sark, north of Longtown in Cumbria, to the refineries east of Ellesmere Port in Cheshire is approximately 253 kilometres. From north of Carlisle to Galgate, south of Lancaster, it followed a line roughly parallel and to the east of the M6 motorway. The motorway was crossed at Galgate, and the route continued at some distance to its west through the Fylde, before turning east again to avoid the urban and industrial conglomerations of South West Lancashire and Merseyside. Finally, after crossing the River Mersey, it turned to the west on the approach to the refineries at Stanlow, near Ellesmere Port in Cheshire.

The pipeline route traversed the four counties of Cumbria, Lancashire, Merseyside, and Cheshire. It was anticipated that the great contrasts in the landscape, between the rural uplands in the north, and the industrial lowlands of the south, would be reflected in the nature of the archaeological remains, and that their survival would also be in proportion to the amount of post-medieval activity. The wide-ranging dramatic differences between sites in the northern uplands, where many sites were recorded, and the southern lowlands, where sites were comparatively scarce, probably bears little relation to the distribution of settlement in prehistoric, Roman, or medieval times, but is a direct consequence of the post-medieval events which have had a devastating effect on the landscape. These were the parliamentary Enclosures of the eighteenth and early nineteenth centuries, contemporary with the Industrial Revolution accompanied by a transport revolution, and the later nineteenth and twentieth century expansion in population leading to the urban sprawl and conurbations in the industrial areas. The combined destructive effects on the landscape have obliterated much of the former rural agricultural field systems, and intensive ploughing of surviving fields has reduced former earthworks to insubstantial cropmarks which on investigation appear to have no subsoil existence.

#### Cumbria

##### Solway

The Carlisle Basin is a relatively level expanse of Carboniferous sediments, including limestones, sandstones, and shales. The area from the river Sark at the Scottish border, to the river Lyne at Barrockstown, is mainly pastoral farmland, with some arable farming, deciduous woodland, and peat moss under commercial exploitation. Some archaeological sites of minor importance were recorded in this area, generally elements of former field

systems (774, 782, 802) including widespread ridge and furrow of medieval or post-medieval date (773, 791, 801), usually associated with headlands and field boundaries. A single prehistoric flint waste flake was found north-west of Barrockstown (792). Post-medieval pottery scatters, probably the result of manuring, were found at several locations during fieldwalking, and subsequently during construction (781, 793, 803), at which time the embankment of the disused North British railway line from Hawick to Carlisle was crossed (771).

### Carlisle

North-east of Carlisle, the area bounded to the south by the river Eden is mainly grassland, with an area of waterlogged pasture containing some peat at Knells (811), and some cereal cultivation around the Hadrian's Wall complex east of Brunstock Park. North of Hadrian's Wall (824, 825) the only sites recorded were field boundaries (821, 823) and one instance of medieval ridge and furrow (822), while in the field to the south of the Wall an important assemblage of Neolithic pottery was recovered only during construction (827). At Park Broom the main focus of interest was the projected alignment of the Stanegate (831), the Roman road between Carlisle and Corbridge, and other sites included a ditch of recent origin (836), a field boundary (832) and medieval ridge and furrow (833).

### Hadrian's Wall

By the early second century AD, no troops were stationed further north than the Tyne-Solway line, along the east-west Stanegate road. This route was strengthened and fortified by Hadrian, and construction of Hadrian's Wall (825) began in AD 122, marking the consolidation of the province's northern frontier within its existing boundaries. Initially the Wall was constructed as a turf rampart; a later stone rebuild did not take place along its entire length, and the western portion remained as a turf barrier. The north side of the wall was defended by a deep ditch, and to the south the *vallum*, a shallow ditch bordered by two banks, defined the rear of the frontier.

Hadrian's Wall is protected as a Scheduled Ancient Monument (Cu 28(16)) and classified as a World Heritage Site; its remains are considered to be of outstanding national and international importance. The purpose of the preliminary survey work and trial trenching was to minimise the degree of disturbance caused by pipeline construction in this archaeologically sensitive area. In the immediate area of the proposed crossing there were no visible remains of Hadrian's Wall and the exact positions of the various Wall elements were not known.

To the west, in Brunstock Park, the remains of the *vallum* and Wall ditch are visible as earthworks; these were investigated in the late nineteenth century, when excavation revealed the *vallum*, the Wall ditch, the 'much ruined' Wall itself, and a degraded road behind it. The same report noted that for about two and a half miles east of Brunstock, 'Wall and *vallum* have almost wholly vanished before the plough' (Haverfield 1895).

The original pipeline route crossed the projected line of the turf Wall, on the north-eastern outskirts of Carlisle at Brunstock Park, in the area which had never been rebuilt in stone. No physical trace of the Wall survived here, but geophysical survey was used to locate any surviving subsoil features, and to indicate that the line of the *vallum*, Wall, and Wall ditch, as projected on the current Ordnance Survey map, were essentially correct, although the course of the latter two elements appeared to be located slightly further north. During this work, an area that had been quarried and backfilled in the 1950s was discovered over the line of the Wall; trial excavation in 1989 confirmed that no archaeological deposits survived here, and the pipeline was re-routed to take advantage of this earlier disturbance (Figs 1, 2).

Limited excavation in April 1991, along the line of the pipe trench, was designed to investigate and record any surviving archaeological features in advance of pipeline construction. Consent was granted under Section 2 of the Ancient Monuments and Archaeological Areas Act (1979) for 'The excavation of one long narrow trench about 2m

wide and 2m deep across the line of the hollow way and the apparent line of the ditch and *vallum* and the construction of a pipeline trench'.

The re-routed crossing point lay across relatively level fields, under cereal cultivation at the time of excavation. An overgrown trackway, or hollow way, followed the east-west course of the projected line of the Wall and Wall ditch. The quarrying had apparently not disturbed the hollow way itself, and it was thought that this feature might overlie the Wall.

The trench extended 68 metres to the south of the hollow way, and 13 metres to the north. It soon became clear that the higher ground at the southern end of the trench had not been quarried. Forty metres south of the hollow way a deep-cut ditch was revealed below the ploughsoil, approximately on the projected line of the *vallum*. The feature was examined in section and excavated to the maximum permitted depth of two metres, without reaching the base of the ditch. The sloping edges of the ditch were clearly seen cut through natural sand; the northern edge of the ditch was steep, and the southern edge appeared in profile to be partially stepped. The ditch was eight metres wide at the top and four metres wide at a depth of 1.70m.

The trench to the north of the hollow way crossed a pronounced hollow, but just below the surface large blocks of reinforced concrete were encountered, which could not be removed without disturbing an area much larger than the trench. Consequently the section was recorded and the trench was backfilled without further excavation.

There was no evidence for the Wall or Wall ditch in this area, but to the south the line of the *vallum* was established in section.

#### Old Grove

A shallow pit (827) was observed, during the topsoil strip, in a field at Old Grove, south of Hadrian's Wall, less than a kilometre north of the river Eden. This was briefly investigated, and found to contain more than 50 sherds of pottery, later identified as Peterborough Ware, a type of Neolithic pottery which is well-known elsewhere in Britain, although it is extremely rare in Cumbria. Isolated sherds have, in recent years, been found at Brougham and on Crosby Ravensworth Fell, both areas crossed by the pipeline route, but such a relatively large quantity is hitherto unknown from an inland site in the North West. The pit may have been used for grain storage, but it seems more likely that it was for rubbish, and that the pottery was discarded, although it shows little sign of wear. Many of the sherds, some of which are decorated, appear to be derived from two or three vessels. The presence of the pottery here is a likely indicator of settlement nearby in the Neolithic period.

#### Stanegate

South of Hadrian's Wall, the pipeline also crossed the Stanegate (831), the Roman road marking the earliest northern Roman frontier in Britain, which was accompanied by a line of forts from Carlisle to Corbridge. Hadrian's Wall was later constructed immediately to the north, and the Stanegate continued to provide an important supply route for the garrisons stationed on the Wall.

The intersection of the pipeline with the projected line of the Stanegate was 350 metres north of Linstock Castle, and 200 metres west of Park Broom Farm. Despite attempts to locate the road during field walking and by geophysical survey (Fig 3), the first indication of its survival was revealed during the topsoil strip, when a cobbled surface was identified at the projected intersection. This was briefly excavated in July 1991, and in September, two ditches exposed on either side of the cobbled surface during the cutting of the pipeline trench were recorded in section (Fig 4).

A broad scatter of pebbles uncovered during topsoiling revealed the location of the surface, on an east-west alignment, only 0.30 metres beneath the present turf level. A very broad cobbled surface, 16.40 metres wide, was exposed beneath the topsoil and a silt layer,

apparently orientated east-west. The depth of the surface varied between 0.17 metres, where up to four layers of cobbles were distinguished, and 0.07 metres, where the surface comprised a single uniform layer.

The two ditches, exposed in section during excavation of the pipeline trench, were aligned parallel to the cobbled surface. The southern ditch, 2.70 metres wide and 0.90 metres deep, was four metres from the edge of the cobbled surface, and the northern ditch was two metres from the edge of the road, 0.70 metres wide, and 0.20 metres deep.

There was no indication of the use of kerbstones or large broken stones as a road foundation, and the cobbled surface was considerably wider than other sections of the Stanegate previously excavated (Haverfield 1899, Margary 1957, Richardson 1976). The cobbles, of similar size throughout the layers recorded, did not appear to have been carefully laid, but to have been deposited and roughly spread out. The original road surface may have been composed of smaller pebbles or gravel, but no evidence was found to confirm this.

The cobbled surface and ditches coincide with the projected course of the Stanegate, but no associated Roman material was found. The considerable width of the surface, 16.40 metres, is almost double the width of any section of the Stanegate investigated previously, and must cast some doubt on the interpretation.

#### **Wetheral**

South of the river Eden, pastoral farming in the open valley landscape is ubiquitous. Around Cumwhinton, the extensive medieval strip field system survives in the form of small linear fields, with many hedgerow trees.

There was no sign of remains associated with the Bronze Age cemetery discovered near Aglionby in the 1920s (Cumbria SMR), and geophysical survey found no trace of the medieval chapel at Wetheral (852, Fig 5)). A prehistoric flint dressing chip was found during fieldwalking near Aglionby (841) and two further flint waste flakes were collected during construction at Wetheral Shield (862) and near Cotehill (873).

Also during construction, several stone hearths (854, 855) and charcoal spreads resulting from a fire (861, 871, 872) were found to the east and south-east of Cumwhinton. Other artefacts found were post-medieval, including pottery and a lead seal (846, 842).

A trackway running along a former lynchet (844) was destroyed during construction west of Aglionby, and a field boundary was noted during fieldwalking at Scotby Shield (851).

On pastureland 200 metres north-west of Scotby Shield Farm, three ditches (853) were cut by the pipeline trench, and were briefly excavated in September 1991 (Fig 6). The ditches had been backfilled with material that was associated with the burning of wood.

#### **Aiketgate**

A post-Enclosure pastoral landscape of large squarish fields extends over Barrock Fell and Blaze Fell, but around Aiketgate the medieval strip field system survives, defined by hedged field boundaries. The pipeline route cut through many of these small linear fields, in one of which broad medieval ridge and furrow was noted (9201). On level ground, to the north of the slope rising from Oak Bank, two pits containing vitrified industrial residues (9202) were investigated during construction in August 1991 (Fig 8). The summit of the hill immediately east of Aiketgate is the site of Castle Hewen, a medieval stronghold with supposed Arthurian associations.

#### **Tarn Wadling**

Tarn Wadling (912) is the site of a former tarn, once a hundred acres in extent (Hutchinson 1794), which was drained in the late eighteenth or early nineteenth century. It is likely to have

been a focus of prehistoric settlement, and in the medieval period it appears to have been a centre of power associated with Inglewood Forest, and a meeting place of the Forest Court. Trial excavation in 1990 revealed deposits indicating the shallow silted edge of the former tarn, but was otherwise unproductive (Fig 7). On the shoreline of the tarn was a building said to have been a boathouse, but named on the Ordnance Survey first edition 6" map of 1868 as Tarnwadding Cottage (914), with a smaller, unnamed, building to the north, now completely ruined (913). During construction a post-medieval scatter of pottery and glass (915) was located adjacent to these buildings, and a charcoal spread was recorded nearby, at the foot of Blaze Fell (916), within 100 metres of the findspot of a prehistoric flint waste flake (921) collected during fieldwalking. Cropmarks recorded on the western flank of Blaze Fell (923, 924) were not visible at any time during the study.

### Lazonby Fell

The line of the A6 road north of Penrith coincides with the main Roman north-south route, and includes along its length a number of marching camps, forts, and settlements, as well as the Roman road itself. The probable presence of further unknown Roman sites in the area, as well as the likely extent of the known sites beyond the areas scheduled as Ancient Monuments, implied that unless the pipeline route was radically changed, the high archaeological potential of the area would dictate a need for a considerable amount of detailed evaluation and investigation. A re-route was strongly recommended to avoid the five Scheduled Ancient Monuments which would have been directly affected, and the pipeline was subsequently diverted east over Lazonby Fell, avoiding the Roman camps. Ironically, this diversion affected sites of an earlier period on Lazonby Fell, most notably an Iron Age settlement which is also a Scheduled Ancient Monument (934, Cu 194a), and its associated boundary features.

Much of the fell is unploughed heathland, and many prehistoric earthworks and artefacts have survived in good condition. In the eighteenth and nineteenth centuries, antiquarians identified grooved or sculptured stones (935, 936) and a cairnfield with burial urns (941), as well as collecting stone axes (943) and flint arrowheads (944) from the fell. This cluster of Neolithic or Bronze Age sites and findspots, some of which lay within the pipeline corridor, represents the highest concentration of known prehistoric sites along the English section of the route.

Other sites located during fieldwork included elements of an earlier field system, to the north, south, and west, of the prehistoric settlement (934). A glacial esker appeared to form the natural northern boundary of the field system, and a narrow trackway ran the length of its summit, with ridge and furrow was visible to either side (938). A circular cairn, possibly of prehistoric origin (9310) was situated on a small rise north-west of the settlement, and other cairns were noted in the vicinity, including one to the south of the settlement (949).

The upstanding remains of the settlement (934) comprised a stone-walled enclosure and large hut, with associated field boundaries. The settlement site was bounded by marsh to the north, east, and south sides. The position and nature of the site suggest a late prehistoric defended agricultural settlement. Topographical survey of the area before excavation revealed a series of previously unrecorded platforms and trackways outside the scheduled area. The major features surveyed consisted of a discontinuous curvilinear bank and ditch with an external counter bank to the south and east (Fig 9).

The 40 metre wide corridor encroached on the scheduled area, but Scheduled Monument Consent was not sought by SCUK and therefore the trial excavation, in September 1990, avoided the scheduled area. The only features of any archaeological significance were two pits or hollows, both of which were cut from below the subsoil, approximately 1.2 metres in diameter, and filled with a dark, burnt orange loose sand containing many small pebbles. The pits did not contain rubbish deposits or other easily identifiable material, and appear to have silted up naturally. During construction, the working width was restricted in the vicinity of the scheduled area, and the running track was located to the west of the pipeline trench, to avoid outlying features of the settlement.

A double linear bank (939), similar in form to other banks associated with the settlement, ran in a south-easterly direction 250 metres to the south. The bank continued beyond the field wall which divides the open moorland to the south from the improved pasture to the north, and was surveyed before its removal during construction (Fig 10).

Three deeply incised parallel trackways (948) ascended the western slope of Lazonby Fell, broadly following the line of a trackway shown on the Ordnance Survey 1st Edition 6" map of 1868. The sections of the trackways within the fenced pipeline corridor were surveyed during construction (Fig 11). These multiple hollow ways were probably variants of the trackway, which climbs the slope from the general direction of the Roman fort at Old Penrith towards the quarries above Scratchmill Scar.

The pipeline route left the open moorland, descending the slope to avoid Scratchmill Scar, and entered a post-Enclosure landscape of regular walled fields. These are in striking contrast to a sinuous, turf-covered stony bank and ditch (9410), located in the valley bottom at Scarfoot, which separated an area of low-lying bog from rising ground to the east.

A bank and ditch (952) of different character were recorded south of the Plumpton to Lazonby road (B6413) at West Brownrigg, and on the western flank of Wan Fell, a complex of trackways (953) crossed the open moorland towards the east, perhaps marking an earlier route to Lazonby. The only other features in this section of the route were faint ridge and furrow in the fields east of Bowscar (961, 962).

South of Bowscar, the route descended gradually towards the river Eamont, and the few sites recorded from the area east of Beacon Hill were a charcoal spread (983), a sheepwash (982), a terraced trackway (992), and a lynchet (993).

### **Brougham**

The Eamont valley has been a favoured location for settlement since prehistoric times. The river forms an east-west corridor, in its short course from the foot of Ullswater to the river Eden, and has long been at an important junction between the main north-south road from Carlisle (A6) and the road up the Eden valley (A66). The latter road connected the military forts at Brougham and Brough, later succeeded by Norman castles, before crossing the north Pennine hills by the Stainmore pass.

At this important crossroads, a fort was established by the Romans at Brougham. The Roman cemetery (1004) lay to the east of the fort, and a dispersed civil settlement grew up around the fort. There may well have been no nucleated settlement but rather a concentration of fairly small native farmsteads, including the known Iron Age settlement at Sceugh Farm (998).

### **Sceugh Farm**

An Iron Age or Romano-British settlement, protected as a Scheduled Ancient Monument (998, Cu 388), is located in the field immediately to the east of the Sceugh Farm buildings. It consists of a series of ditches, stone banks and enclosures on the raised, relatively level ground, above a steep scarp slope overlooking the River Eamont to the south. Although the pipeline avoided the settlement nucleus, peripheral elements of the field system, and possible trackways visible on aerial photographs, lay within the corridor. Topographical survey recorded a complex of enclosures and banks, and the outlying features were plotted from aerial photographs (Fig 12).

Trial excavation, in April 1991, investigated two possible trackways, shown as cropmarks on aerial photographs, and a field boundary. Other than a steeply sloping middle horizon suggestive of terracing, there was no evidence to confirm the presence of trackways, such as metalling or wheel ruts. On excavation, the profile of the upstanding field boundary was not reflected in any variation to the underlying natural strata.

Opposite Sceugh Farm, on the floodplain south of the river Eamont, an upstanding linear bank and ditches (999) were investigated by geophysical survey and by trial excavation in August 1990, but did not survive in section as identifiable stratigraphic units (Figs 13, 14).

The survival of the combination of fort, civil settlement, cemetery, settlement sites, and field systems around Brougham is unusual, however the density of sites in the vicinity of the Roman fort and civil settlement was such that not every site could be avoided, although the pipeline was re-routed to the east of the area, in order to skirt the eastern edge of the Roman cemetery.

The Roman cemetery at Brougham (1004), had been subject to disturbance during the A66 road improvements in the late 1960s, when over 200 burials and many artefacts were recovered during the excavation preceding the roadworks. Neither geophysical survey, nor trial excavation at the east end of the site, in September 1990, revealed archaeological features at the location of the proposed revised route (Figs 15, 16). There was no indication of the cemetery during topsoil removal, and it may be assumed that it did not extend this far east at this point.

A railed enclosure on the verge of the A66 road near Brougham contains the Countess Pillar, a Scheduled Ancient Monument (Cu 410, 1005, 1006). The octagonal stone pillar is surmounted by a square block, painted with coats of arms and sundials, and was erected to commemorate the last parting, in 1656, of Lady Anne Clifford and her mother. Nearby, a post-medieval pottery scatter was located during construction (10013).

### **Fremington**

Prehistoric funerary monuments also cluster in the Brougham area, the closest known site to the pipeline route being a stone cist (1008), discovered in the nineteenth century, which contained a contracted skeleton, together with a beaker and food vessel. The supposed location of the cist was near the top of a low hill north-east of Fremington Farm, less than a kilometre from the Roman fort at Brougham. Trial excavation here, in September 1990, revealed a pit containing fragments of very coarse pottery, and a small quantity of Roman pottery was found nearby (Fig 17). These finds suggested possible prehistoric and Roman activity in the area, and prompted further excavation from May to July 1991 (Fig 18).

Traces of a settlement (10014) were first seen as dark patches of soil filling large subrectangular features, five metres by four metres in diameter, cut into the sand and gravel subsoil (Fig 19). These were identified as small sunken structures, three of which were identified as buildings, with a posthole at the centre of each gable end. These buildings seemed to have been in use over a long period, as all showed signs of refurbishment.

Two other post-built timber structures were associated with the sunken buildings. One of these contained a sandstone hearth, and the other seemed to be associated with a shallow pit, which was lined with fire-cracked stones. In and around the pit was found a large quantity of hand-made pottery, characterised by its extreme coarseness and heavy grit tempering. Finds associated with this settlement probably date from the seventh to the ninth centuries AD, and indicate that it is probably associated with the expansion of Northumbrian control into Cumbria at this time. Many small fragments of Roman material, all dating to the second and third centuries AD, were also found, perhaps reflecting the existence of earlier Roman settlements in the area, or the later collection of Roman goods by the people of the settlement. The small number of coins and metal artefacts may suggest that Roman artefacts were acquired as heirlooms.

The settlement seems to have been largely domestic, although evidence of small-scale blacksmithing was found scattered across the site. Textile manufacture was indicated by a quantity of spindle whorls and loomweights, some of which were made of re-used Roman pottery, and others of stone. Traces of grain and legumes were recovered from the site, as was a fragment of a rotary quern.

During pipeline construction, a possible hearth, consisting of a blackened flagstone, charcoal and other burnt debris (10015), was found slightly to the south of the excavated site (10014), and, if contemporary, may represent a shift in the location of the settlement.

Sunken buildings similar to those found at Fremington are rarely found on Anglo-Saxon sites in North East England, and these are the first to be identified in the North West. Although high-status sites of the Anglo-Saxon period have been found in recent years at Carlisle, Birdoswald, and Dacre, a settlement site has not until now been excavated in the North West, where it is virtually impossible to demonstrate settlement continuity between the departure of the Romans and the arrival of the Normans.

The Fremington settlement was not excavated in its entirety, and the area lying beyond the pipeline corridor remains beneath the ploughsoil for posterity to determine whether the area was part of new Anglian colonisation, or the continuation of a community which had remained in existence since the Roman period.

A fuller account and discussion of the excavation at Fremington is the subject of a separate Chapter of this report (Chapter 4).

### Clifton

The pipeline route left the Eamont valley *via* Fremington, rising gradually through the large arable fields on red sandy soils, to Clifton Dykes, where a ditch and boundaries of the medieval strip field system survive (1011, 1014). In the field adjacent to the disused Eden Valley Railway (1015), a fragment of volcanic greenstone (1013), thought to be a waste flake from a re-touched Langdale Neolithic stone axe, was found during fieldwalking. A pattern of small, squarish, fields lies to the south of the strip fields, and in one of these, broad medieval ridge and furrow and a bank and ditch (1018) were noted.

### Great Strickland

Beyond Melkinthorpe, the route joined the steep-sided valley of the river Leith, which cuts through the limestone topography. North of Great Strickland, medieval ridge and furrow was visible in most of the fields, and lynchets on the eastern valley slope (10213) were not affected by pipeline construction. To the south-west of the village, the strips of the medieval strip field system are still defined by stone walls.

On the west bank of the river, the modern boundaries do not reflect the pattern of the medieval fields associated with Hackthorpe. Well preserved areas of medieval ridge and furrow, separated by headlands, a terraced trackway, banks, and a linear stone revetment (1022, 1025), were located during fieldwalking, north-east of Hackthorpe Hall.

Downstream from Strickland Mill, terraced trackways, banks, and a building platform (1026, 1027), were surveyed between the river and the railway (Fig 20). South of the mill, post-medieval ridge and furrow and field boundaries (10210) were intersected by the pipeline in its descent to the river Leith, which was crossed at this point.

On the eastern slope of the valley, aerial photography revealed a complex pattern of lynchets, ridge and furrow, field boundaries and trackways (10211), which were surveyed in detail (Fig 21). The pipeline ascended the slope along the northern boundary of Sheriff's Park Wood, traversing many more elements of the medieval field system (1034, 1035, 1036, 1037).

### Little Strickland

Field walking of the pipeline route after construction, following reinstatement of the topsoil, resulted in the collection of a number of prehistoric flints on the limestone upland, including a blade and a scraper from the eastern slope opposite Thrimby Hall (10312, 10313).

A former field system was surveyed on the western edge of the Little Strickland fields, above Thrimby Bridge (10311, Fig 22), and similar features were encountered as the pipeline passed

close to the village (1041, 1044). Geophysical survey of earthworks south-west of Little Strickland did not reveal features possibly associated with deserted house plots (1043, Fig 23). The whole area between Great and Little Strickland displayed a high density of earthworks associated with earlier land management and lines of communication, whether medieval or prehistoric in origin.

### Hardendale

Between Towcett and Hardendale, an area of early prehistoric funerary and ritual monuments was traversed, below Windrigg Hill. Extensive cairnfields and field systems, sometimes associated with settlements, are found on these limestone uplands.

A basalt hand axe (1046) had previously been recorded near the prehistoric stone circle at Gunnerkeld, which lay outside the corridor. Two prehistoric flint scatters (1058, 1059) were found south-east of the stone circle, after reinstatement of the topsoil.

Field boundaries (1045, 1047) and narrow post-medieval ridge and furrow (10411) were observed in this area, and an oval mound (1052), possibly prehistoric, near the Cross Stone of Keverigg, was fenced off and protected during construction, together with several nearby subrectangular enclosures of unknown date (1056, 1057).

On the outcropping limestone escarpment at Trainriggs, enclosures and pits (10610), visible on aerial photographs, were investigated by trial excavation in August 1990, but although a pit and linear bank were observed in section, the very slight cropmark features did not yield further evidence of occupation, and the features could not be dated (Figs 24, 25). South of Trainriggs Farm, field boundaries, post-medieval ridge and furrow (1061, 106.3, 1064), and a derelict stone structure (1062), were recorded on the outskirts of a field system (1065, 1067) which is likely to have been an outfield of the deserted medieval village at Hardendale. A group of banked enclosures and building platforms, with lynchets and ridge and furrow nearby (1068), probably indicate a long deserted farmstead, and further elements of this field system (1069) were found below Hardendale Nab. In this stony area west of the extensive modern Hardendale quarries, a number of flints and fragments of chert (10611, 10612) were found during fieldwalking following reinstatement of the topsoil.

### Crosby Ravensworth Fell

The high density of sites associated with medieval or prehistoric occupation and land use, between Great Strickland and Hardendale, is in contrast to the almost complete lack of earthworks recorded on the inhospitable open moorlands of Shap Summit. Around the western shoulder of Crosby Ravensworth Fell, a late re-route to the west on the limestone escarpment left two derelict stone structures (1081, 1083) untouched, but a third walled enclosure (1084), not previously recorded, was identified only during construction, when it was destroyed. These structures may have been shelters or bields, built for protection from the prevailing south-westerly winds. A prehistoric flint, and a concentration of chert fragments (1085), were found near a disused quarry on the same limestone escarpment following reinstatement of the topsoil. Further south, towards the Orton to Shap road, two flint waste flakes (1092, 1093) were found during topsoil removal in an area which had previously yielded many flint artefacts (Cherry and Cherry 1987).

The pipeline route crossed Orton Low Moor to follow the Orton parish boundary wall, which marks the line of the main Roman road from Ribchester to Carlisle for several kilometres across the moor. This road once linked the forts at Ribchester, Overburrow, Low Borrowbridge, Brougham, Old Penrith, and Carlisle. The predicted intersection of the Roman road with the pipeline was 400 metres north of Sproatgill Farm, where during topsoil removal in August 1991, a 42 metre length of the Roman road (1091) was disturbed. Excavation began immediately, and over the next few days, demonstrated that the road surface was about ten metres wide, with a discontinuous central line of stones, and a stone kerb at the western edge, beyond which was located the western ditch (Fig 26). The finds from this site were mainly post-medieval and insignificant, and the only other finds recorded from the vicinity of the Roman road were two post-medieval potsherds (1094).

### Tebay

No further sites were encountered on the rough moorland south of Sproatgill, until the route turned south-east to descend into the upper Lune valley, where ridge and furrow was visible on either side of the river (1101, 1112), and a hollow trackway (1113), possibly a former route of some importance, was sectioned. Crossing the river Lune for the first time above Tebay Bridge, the pipeline traversed a number of field boundaries (1115, 1117, 1118) west of Cocklake Farm, and skirted the edge of a possible prehistoric settlement, identified from aerial photographs (1116, Figs 27, 28)). Trial excavation in August 1990, at the edge of the site, revealed no features, and the pipeline was subsequently re-routed further east, seemingly avoiding the settlement altogether.

On the open moorland of Tebay Fell, another re-route avoided narrow post-medieval ridge and furrow and a trackway (1121, 1122) in the enclosed fields at Tebaygill Farm. The route ran parallel to the farm track over the fell to Roger Howe, where, at the saddle on the ridge, it turned south-west to descend the steep valley side. On the saddle, low linear banks (1123) were faintly visible, and were surveyed in 1991 (Fig 29). The stony banks appeared to define enclosures and possible building platforms, and may represent a shieling or an early farmstead, perhaps linked with the farms in the valley by a narrow trackway ascending the fell obliquely from Powsons (113.2). The indistinct earthworks were not identified during topsoil removal.

### Lune gorge

The route descended into the Lune valley at its most constricted point, where the motorway (M6), the Kendal to Tebay road (A685), and the main line railway, are terraced into the eastern flank of Jeffrey's Mount, above the river. East of the river, enclosed pastures extend up to the intake wall, and the farm track to Brockholes provides the only means of access to the eastern side, which remained relatively undisturbed. The pipeline crossed many earthworks of earlier field systems and trackways, including field boundaries and narrow ridge and furrow (1131, 11315) north of the Powsons settlement (1132), and further walls, banks, and a trackway, to the south (1133, 1134).

### Powsons

A line of settlements is strung along the eastern valley side from Tebay to Lowgill, ranging from the long deserted subcircular enclosures of Iron Age or Romano-British farms, to the present day farms, whose buildings generally date from the eighteenth century. Several of the abandoned settlements survive as visible earthworks, and one of these, of indeterminate date, was crossed by the pipeline in a boulder-strewn field below Powson Knott. A cluster of features was surveyed here, including field boundaries, trackways, enclosures, and a rectangular stone structure (1132, Fig 30). Excavations in August 1990 and May-June 1991 investigated several features which lay within the corridor, although much of the extensive site was left undisturbed. A rock outcrop adjacent to the principal excavated feature was removed by blasting during construction.

A rectangular stone structure was located by survey, tested by trial excavation, and recorded by full excavation, prior to its disappearance during construction. The structure was 8.5 metres long and 4 metres wide, built across the slope at a height of 180 metres above sea level. The skilfully built dry-stone walls survived up to three courses high, and the original entrance faced uphill at the eastern end. Later the building was enlarged, with a platform to level the floor at the western end, and further entrances in the west and north sides. Finally the building and associated field walls decayed and became turf-covered and forgotten. A possible annex at the north end of the building was the only external enclosure identified by excavation, although a relic field wall abutted the south-east corner of the building, and many other relic boundaries have been recorded within the adjoining modern fields.

Although three worked flints (11316), probably of Bronze Age date, were found at Powsons during the excavation, their significance is limited, as they are likely to have arrived at the site in hillwash from the fells above, known to have been used in prehistoric times. The site

otherwise lacked datable or diagnostic artefacts, perhaps reflecting the living conditions of the later medieval period, when the few utensils were commonly of wood or leather, which decay without trace in the wet climate. The building was quite empty of the type of rubbish generated by human or animal use, and it can only be surmised that it was a modest homestead, or a shieling hut, used in the summer season only by herdsmen tending their stock on the upland pastures.

There is firm documentary evidence, from the early eighteenth century, for a farmstead or smallholding at Powsons, which was finally merged with the next farm down the valley, Brockholes, and it is equally possible that the building excavated at Powsons was a dwelling or outhouse associated with the last occupation of the site.

Stone-walled enclosures and a trackway, which pre-date the present field boundary, were surveyed in the field immediately to the south of Powsons (1133, Fig 31). Beyond Brockholes Farm the route passed through riverside meadows, with deeper soils more frequently ploughed. Earthworks would be more vulnerable here, and although a boundary bank (1135) survived south of the farm, and a Romano-British settlement site was only narrowly avoided by an unforeseen re-route upslope, little else was visible in the relatively lush meadows of the valley bottom. Towards the southern end of the meadows, cropmarks suggestive of another Romano-British settlement (1138) were identified on aerial photographs, but on investigation by geophysical survey and trial excavation in August 1990, no subsoil features were found which might confirm the interpretation (Figs 32, 33).

#### Low Borrowbridge

The pipeline's second crossing of the river Lune, above Salterwath Bridge, brought it into contact with the nucleus of Roman occupation in the valley. A Roman fort was built at Low Borrowbridge to control communications and supply lines through the valley, beside the Roman road which crossed the river near Salterwath Bridge. This road was another section of the main north-south artery linking Ribchester and Carlisle, also encountered at Sproatgill near Orton (1091).

South of the Roman fort, in the large field running down to the river by Salterwath Bridge, aerial photographs revealed a number of indeterminate features (1139), thought to represent elements of the *vicus* associated with the fort. Although the field is subject to occasional ploughing, detailed topographical survey recorded many slight earthworks, including faint ridge and furrow and possible lynchets, but also banked enclosures and subcircular platforms (Fig 35).

Geophysical survey preceded trial excavations in August 1990, within the pipeline corridor at the south end of this field, which identified a small pit containing Roman pottery sherds, burnt material, and iron objects (Figs 34, 35). During pipeline construction the following year, the archaeological inspector monitoring topsoil stripping noted five discrete burnt patches, with Roman pottery, charcoal, and iron nails at the surface of the subsoil. Construction was halted, and archaeological evaluation began immediately. It rapidly became clear that this was the site of the Roman cemetery, and excavation continued for seven weeks, to record the remains of more than 50 cremations, including 18 damaged but complete cremation urns, grave goods, and a number of subcircular or subrectangular enclosures associated with the cremations, defined by shallow ditches (Fig 36). The end of the excavation was marked by the discovery of a splendid Roman tombstone, in almost perfect condition, of 3rd century date.

Further damage was caused to the cemetery in early 1992, when preparation for a new farm access road beside the river Lune revealed more cremations perilously near the surface. A further excavation was rapidly organised, and partly funded by English Heritage, resulting in the recovery of 18 additional cremations and several enclosures in this relatively small area.

A fuller account and discussion of the excavation at the Low Borrowbridge Roman cemetery is given in Chapter 5 of this report.

Following the west bank of the river around the bend at the south-west corner of the field containing the cemetery, the pipeline entered the confines of the valley side below the motorway and railway. The steep terrain here is unlikely to have supported settlement, although the gradient may have been altered by railway construction in the nineteenth century.

Two sites on this slope were subjected to topographical and geophysical survey. These were a former driveway running obliquely upslope (1142, Figs 37, 38), and a stone-walled enclosure to the south (1145, Figs 39, 40). Other possible enclosures, and a possible Roman road alignment, visible on aerial photographs, were identified on the ground as natural watercourses, gullies, banks, and a river terrace (1144, 1146). Otherwise, no further sites were recorded until the pipeline reached Low Park, below Dillicar Common.

### **Lowgill**

The Lune valley has attracted settlement by virtue of its busy communications route, but in recent times the imperatives of communication have overtaken some of the settlements, which have fallen by the wayside, isolated by road or railway. At Low Park, the abandoned farmhouse and barns, on a narrow shelf above the river, are derelict. Occupation of this site over many centuries is evident in the enclosures, ridge and furrow, and deeply indented trackways, below the farmstead. A single sherd of medieval green glazed ware (1151), found by a drainage inspector during construction, also hints at the longevity of the farm.

The pipeline crossed the river Lune twice between Low Park and Lowgill, to avoid the steep deciduous woodland on the west bank. As the route climbed from the fourth Lune crossing, field boundaries and a trackway (1161) were observed in the field behind the railway cottages at Lowgill. Another field boundary (1167) was recorded south of Lowgill, but otherwise the only archaeological site affected was the embankment of the disused Lowgill branch railway to Sedbergh (1162). At an early stage of the study, the complex of sites at Beckfoot and Lowgill, relating to the railway, early roads and a packhorse bridge, and Davy Bank Mill, had been highlighted, and these were completely avoided as a result of a fortunate re-route.

### **Firbank Fell**

South of Lowgill, the route rose past Birchfield to cross Firbank Fell, an upland area of acidic grassland and peat mosses without modern settlement or roads, and apparently lacking in archaeological sites. The only site identified in this area was a square enclosure, previously recorded, in the vicinity of Capplethwaite Moss (1184).

An early drove road, used from at least the twelfth century for bringing cattle from Scotland to England, and known as Scotch Lane or the Old Scotch road (1191), underlies the modern minor road over Lambrigg and Killington Parks (Farrer 1905). The road was crossed by the pipeline east of Killington Reservoir.

Two mounds of possible prehistoric origin (1188) near Mutton Hall were avoided during construction, and in a nearby field, ploughmarks were observed in the subsoil (1192) after topsoil removal.

The route through the enclosed pastoral farmland of Old Hutton and Preston Patrick rural parishes avoided the known archaeological sites of the area, affecting only a lynchet and two low banks, possibly of medieval origin (1223) near Gatebeck Reservoir.

### **Farleton**

The route descended through fields to Hollins, where elements of a former field system, including lynchets, boundaries, ridge and furrow, and a trackway (1241, 1242), were surveyed (Fig 41). South of the Kendal to Skipton road (A65), near Dove House Farm, were

terraced platforms, post-medieval narrow ridge and furrow, and a bank which appeared to dam a small valley (1243). The valley of Farleton Beck was crossed and the route ran alongside the Lancaster Canal to Farleton, where lynchets and post-medieval ridge and furrow (12413) were observed in the narrow fields running up the fell.

When the northern part of the Lancaster Canal was built in the early nineteenth century, it was diverted from its original route in order to serve the needs of the limeburning industry on the western slope of Farleton Fell. Barges bringing coal north from the Lancashire coalfield began to carry lime south for land improvement and building purposes.

Derelict limekilns, with associated trackways (12501, 12502) leading from the fellside quarries, lay on the periphery of the pipeline route behind Marsden Farm and Townend Farm. The pipeline climbed the slope to the south, where parallel boundary banks defined a former field, or parcel of woodland, containing two small oval platforms and a trackway (12503). Beyond the parish boundary wall, the fellside, once tree-covered but now enclosed rough pasture, was scattered with similar platforms, terraced into the slope. These were identical, in size and shape, with charcoal burners' pitsteads found in woodlands in other parts of Cumbria. Two of the platforms lay directly on the pipeline route, and were excavated in April 1991, to ascertain whether they had been used for making charcoal (Fig 42). A charcoal-rich layer was located near the surface, confirming the interpretation, but no finds were forthcoming, and it seemed likely that the pitsteads had only been used for one season's work.

At the base of Holme Park Fell, beside the trackway leading up to the quarries on the fell, a low turf-fast wall crossed the exposed limestone strata from east to west, in association with two small enclosures (12601). This small complex of features, which pre-dates the existing field boundaries, was surveyed in August 1990 (Fig 43). Beyond the large modern Holme Park Quarry, on the limestone pavement in Curwen Woods, was a mound, 22 metres long and 12 metres wide (1263), similar in character to a Neolithic long barrow. The best course of action here was to avoid the mound, and so it remained undisturbed during construction.

### **Burton-in-Kendal**

The limestone geomorphology continued through Clawthorpe, and past the site of a deserted medieval village (1265), of which there was no visible sign. To the east of Burton-in-Kendal, elements of the medieval or early post-medieval field system were noted, including ridge and furrow, linear banks, and a trackway (1273). The route crossed these former town fields in a direct line between two boundary stones (1271, 1276), both in lanes leading to Dalton, one to the north of Burton, the other to the south, probably marking Burton's eastern boundary.

Immediately south of Dalton Lane, the pipeline route entered Dalton Park, where extensive earthworks of a medieval field system preserved in the parkland included lynchets, ridge and furrow, and enclosures (1275). Rising over a shoulder of the park with evident banks and lynchets, the route passed between Coat Green and Dalton Old Hall, to cross the county boundary into Lancashire.

## **Lancashire**

### **Priest Hutton**

In the damp valley bottom of White Beck were several earthwork features of unknown date (1282), identified from an aerial photograph. Set into a low ridge at the edge of the wetland was a circular ditch, 15 metres in diameter and 1.5 metres wide, a low boulder wall forming an enclosure on a platform, a double ditch linking the enclosure to a small pond, and a raised trackway across the wetland. Post-medieval pottery was recovered from these features during construction.

The surviving boundaries of the medieval Priest Hutton strip fields curve over a low ridge and down to White Beck. An impressive set of lynchets is stepped into the north-facing slope of the hill, outside the pipeline corridor, but other elements of the earlier field system were affected during construction, including lynchets, and ridge and furrow with headlands (1283, 1284), in the fields above White Beck, some of which were surveyed in August 1990 (Fig 44).

#### **Borwick**

The pipeline crossed the Lancaster Canal (12910) north of Borwick, where the remains of a small brick structure (1288) were recorded during construction. Both broad and narrow ridge and furrow and a headland were recorded in the fields at Sander's Farm and Manor Farm (1293, 12920).

The low-lying area west of Borwick has been exploited on a large scale for its gravel deposits, and in recent years quarrying has expanded east of Dock Acres to Kellet Lane and beyond.

#### **Manor Farm**

Previous fieldwork, in 1979, recorded two dished earthworks south of Manor Farm, and in 1982, in advance of further expansion of the gravel pits, excavation identified one of these as a Bronze Age funerary monument (Olivier 1982). Excavation of the larger earthwork revealed a substantial early Bronze Age funerary cairn, that may originally have contained a number of inhumations, lying below a cairn of smaller stones, with associated cremations suggesting re-use in the later Bronze Age.

The second of these earthworks (1299) had not so far been affected by gravel extraction, and fieldwalking in March 1990 revealed that the monument, consisting of a ring bank, 12 metres in diameter, defining a small subcircular enclosure, had an annex to the north, increasing the overall diameter to 25 metres. Geophysical survey confirmed the perimeter of the ring bank. The pipeline was re-routed here to avoid the rise of the mound, but this did not account for any possible outlying features related to the monument. Geophysical survey and trial excavation in August 1990 at its eastern edge (Figs 45, 46), however, failed to identify any associated features on the limestone bedrock, neither was any additional evidence gathered during construction.

At Capernwray, post-medieval lynchets and ridge and furrow (12913, 12919) were visible in the fields between the canal, the Leeds to Carnforth railway line, and the river Keer. The canal was bored for a second pipeline crossing east of Overhead Cottages, and the route then made a right-angled turn across Capernwray Road, to enter the Over Kellet field system.

#### **Over Kellet**

The Lancaster Canal formed the northern boundary of the field system, which extended over a low glacial ridge north of the village. Cropmarks plotted from aerial photographs showed two settlements (1302), probably of Iron Age date, between the pipeline route and the canal. Geophysical survey and trial excavation in September 1990 at the edge of these features (Figs 47, 48), did not reveal any outlying elements of the settlements, or provide any dating evidence for the settlements, which remained undisturbed by construction.

Curving round to pass Over Kellet on its western side, the route cut through fields containing many relic boundaries, lynchets, ridge and furrow, and a disused trackway (1305). The area was surveyed in detail (Fig 49), and further study demonstrated that many of the relic boundaries coincided with those shown on the tithe map of 1840. A sherd of northern gritty ware was recovered from one of the boundaries, datable to the twelfth or thirteenth century.

South of Hall Farm, another extensive area of the former field system was surveyed (Fig 50), comprising strip fields, ridge and furrow, lynchets, and a building platform (1311, 1313, 1314). In both these areas (1305, 1313), to either side of Kellet Road, nearly all the old

boundaries had been removed, to form large modern fields, and the current Ordnance Survey maps do not reflect the earlier field system, which is likely to be medieval.

Small quarries, and a possible limekiln, on the outcropping limestone at Slack's Wood, post-dated the medieval field boundaries, but are long disused and in total contrast to the vast modern Leapers Wood and High Roads quarries just over the hill. The pipeline route veered to the east to avoid the quarries, and by Kit Bill Wood a stone wall along the base of a limestone outcrop was noted, together with a small post-medieval cairn (1316). Terraces and broad medieval ridge and furrow (1318) were observed on the western slope of Birkland Barrow.

#### Nether Kellet

East of the Dunald Mill quarries and Intack Farm, a broad, low, bank appeared to form a causeway across a marshy area, in which there were also two low mounds, four metres and 21 metres in diameter (1322). Field boundaries, narrow ridge and furrow, and trackways (1323), overlain by modern lanes and walls in the fields adjoining Green Hill Lane, indicated the earlier post-medieval farming landscape, but former industry was also present in the form of quarrying and a bellpit (1325). The upper part of the bellpit was sectioned by the pipe trench during construction, revealing the spoil from the central shaft, but there were no finds.

#### Halton

Just over the parish boundary at Scargill Wood, aerial photographs showed earthworks of curvilinear banks and ridge and furrow, overlain by modern field boundaries (1331).

No further sites were recorded south of the extensive Nether Kellet quarries, until the route began its descent to the Lune valley, east of Halton. Oakenhead pond, surrounded by a low bank (1341), was situated on the crest of a small hill, on the slopes of which were post-medieval narrow ridge and furrow, boundaries and terraced trackways (1342).

The Lune valley upstream of Lancaster marked the southern limit of the limestone topography which had been followed intermittently since the pipeline left the Eamont valley at Clifton, south-east of Penrith. East of Halton Mills, the pipeline crossed the river Lune for the fifth and last time, climbing the southern bank to cross the Lancaster to Wennington railway line (1343), disused since 1967.

#### Scotforth

Farmland on the western side of Quernmore Park preserved extensive post-medieval narrow ridge and furrow (1347, 1353, 1354, 1356), and terraced trackways and hollow ways (1353, 1361). The route then traversed the long ridge east of Lancaster to Scotforth Heights, where a cluster of sites was recorded near Langthwaite and Blea Tarn reservoirs. Former cultivation was represented by post-medieval narrow ridge and furrow and field boundaries (13701, 13703). A derelict building incorporated in the field wall (13702) was avoided, and several trackways (13706, 13708) were recorded, during construction.

Blea Tarn was originally partially moss-filled, and during the extraction of the peat for construction of the reservoir, a prehistoric dugout canoe was discovered (13705). The area was closely observed before and during construction, but the only tentative evidence for prehistoric activity in the area was a turfed oval mound, three by four metres in diameter (13704). Two patches of burnt ground, on the subsoil immediately below the topsoil (13707), were however observed at the western edge of the corridor, during construction near Langthwaite Reservoir.

The route then descended from the ridge to the river Conder, where the possible remains of an oval settlement enclosure had previously been recorded west of Banton House Farm (13801). Detailed survey revealed a rectangular building platform within the enclosure, a further subcircular enclosure, and terracing of the slope, together with banks and trackways (Fig 51). A map of the Banton House estate, dated 1858, showed a terrace of cottages at the

same location as the building platform. Trial excavation in September 1990 revealed several post-medieval features, including a cobbled surface, and during construction the cobbled surface was observed extending over a large area. The earthworks concentrated here may simply be the remains of nineteenth-century farmworkers' cottages, but are quite likely to represent a succession of settlement over many centuries, at this favourable spot with extensive meadows beside the river Conder.

On the adjacent floodplain was a network of drainage ditches, recently infilled, which correspond to field boundaries shown on the Ordnance Survey first edition 6" map of 1848. Ridge and furrow was visible at the south side of the floodplain (13804) and on the steep bank of Kit Brow (13805).

### Ellel

Behind Cockshades Hill, east of Galgate, hedgebanks and ditches (13916) were sectioned during construction near Whitley Beck and across the motorway at Pennine Farm (13914). A trackway (13915) was observed after topsoil stripping for an access road to the motorway crossing point, outside the corridor at Galgate. West of the A6 road at Hampson Green was a concentration of hollow trackways with lynchets and field boundaries (1393, 1394, 1395, 13917). The Lancaster Canal (13912) was bored south of Double Bridge, and the route then entered the Ellel Grange estate, where a post-medieval field system seen on aerial photographs was visible during field walking as a series of ditches, ridge and furrow, and a lynchet (13910, 13913, 1401). West of Home Farm was a terraced trackway (1402), which after topsoil removal was seen to have a cobbled surface overlying an earlier, narrower, trackway.

### Cockerham

Ridge and furrow was observed in the fields north of Cockerham (1403, 1406), but the reclaimed marshland to the west appeared featureless, and at Marsh Houses, circular cropmarks seen on aerial photographs (1414) were not confirmed during examination of the subsoil after topsoil removal.

South of the river Cocker, a succession of linear earthworks was recorded between Little Crimbles and Hardhead. Crimbles was mentioned in Domesday Book as a small manor within the lordship of Preston, and was listed in a rental of the 1150s preserved in the cartulary of the Abbey of St Mary of the Meadows. There was reason to believe a deserted medieval village might be traversed by the pipeline route here, and the area was closely observed, by means of aerial, geophysical, and topographical survey, prior to trial excavation in September 1990 (Figs 52, 53). South-west of Little Crimbles Farm, promising linear depressions turned out to be redundant watercourses (1421), and no archaeological stratigraphy or medieval artefacts were found here during either trial excavation or topsoil removal.

An extensive area of medieval or post-medieval field boundaries, ridge and furrow, hollow ways, ponds, and platforms (1422), survived in the neighbouring fields of Middle Crimbles. A substantial boundary bank separated the upper part of one field, containing ridge and furrow, from the lower-lying section, quite different in character and once probably peat-covered, which contained linear ditches, ponds and rectilinear platforms. During construction, peat was observed between Middle Crimbles and Hardhead, and it is likely that peat-cutting and drainage of the moss in the last two centuries have contributed to the pattern of earthworks here. Cropmarks seen on aerial photographs, interpreted as ditched field boundaries overlying trackways (1423), were not visible on the ground or after topsoil removal.

### Nateby

The embankment of the Garstang and Knott End Railway (1441), disused since 1965, was demolished at the crossing point of the pipeline. The route continued across the farmland of the Fylde, from Nateby to St Michael's on Wyre, encountering few archaeological sites in this low-lying landscape of reclaimed mossland. During topsoil removal an exceptionally deep

peat deposit (1446) south of Nook Farm was tested by an auger traverse, which established the depth of the deposit as at least 5.8 metres, originating in the post-glacial period. A field boundary was recorded during construction west of Watson's Wood (1445) and another was briefly excavated (1451, Fig 54) but no features were seen on the extensive floodplain of the river Wyre east of St Michael's, and south of the river, boundaries seen on aerial photographs (1471) were not visible during construction.

### **Inskip**

Broad medieval ridge and furrow, in a poor state of preservation as a result of later ploughing, was visible in most of the fields east of Inskip (1482, 1483, 1484, 1485, 1486, 1492), and south of Higham Side (1493), indicating intensive cultivation in the past.

The route crossed the motorway (M55) between Stanley Lodge and Stanley Grange, where cropmarks of field boundaries seen from the air (1501, 1503) were not visible on the ground, or after topsoil removal.

### **Newton-with-Clifton**

East of Kirkham, at Dingle Farm, broad medieval ridge and furrow was again visible (1521), and nearer to Newton, well preserved broad medieval ridge and furrow (1523) was not only over a metre in height, and up to ten metres wide, but formed a clear pattern in the subsoil after topsoil was stripped.

The best preserved field system in the lowland sector of the route was recorded at Hanging Banks Plantation, between Newton and Clifton (1522). The features covered a large area of the terrace above the plantation, a steep wooded scarp, and of the floodplain of the river Ribble below. The fields on the terrace contained narrow and broad ridge and furrow 2.5 metres and 13 metres wide, with headlands, trackways, ditches, small quarries, and a building platform, of medieval and post-medieval date. On the floodplain, ridge and furrow 4.5 metres wide was probably of later date. As with the previous site (1523), the broad ridge and furrow was visible in the subsoil after the topsoil strip in the two fields north of the plantation.

The final site north of the Ribble was a sea bank at Clifton Marsh (1532) which was sectioned during construction. The bank was apparently the earlier of two dykes built successively to control floodwaters in the Ribble estuary. South of the Ribble, at Hall Pool Bridge by Longton Marsh, was an isolated survival of narrow post-medieval ridge and furrow (1551).

### **Much Hoole**

The West Lancashire Railway (1561), closed in 1964, was crossed at a cutting west of Much Hoole. Cropmarks of field boundaries (1562, 1564) on the alluvium east of the river Douglas, identified from aerial photographs, were not confirmed on the ground, but broad medieval ridge and furrow and headlands were visible in one field (1563).

South of Much Hoole, a small, shallow pit, possibly of prehistoric origin, was observed after topsoil removal, cut into the clay subsoil and filled with a stiff, charcoal stained, black clay, containing a few burnt pebbles (1565).

### **Croston Moss**

The farmland from Croston to Burscough is the result of large-scale reclamation of the peat mosses. Croston Moss was a former raised mire which retained deep peat deposits in places, while elsewhere the level of the peat had been lowered by agricultural activity, to the extent that the underlying non-peat deposits were exposed. A gouge auger core transect here confirmed the existence of a sand island, formed of Shirdley Hill Sand, which in prehistoric times would have been ideal for settlement, as a dry island surrounded by mosslands (1601). A prehistoric worked flint was recovered from the surface during the coring.

### **Beckett's Wood**

On a steep bank above the Weaver Navigation, construction activity disturbed the foundations of a brick structure, consisting of parallel rows of bricks, laid end to end on the natural subsoil, with evidence of firing (1957). A brief excavation and survey of the site in June 1991 (Fig 55) indicated that this had been a brick clamp, a temporary form of kiln used for producing bricks, probably during the building of the nearby canals or railways in the eighteenth or nineteenth century. At the time when this part of Cheshire was undergoing rapid industrial development and population increase, bricks would have been in great demand. The temporary nature of clamp kilns, and the fact that they were intended to be dismantled after use, means that they are rarely found or recorded.

The Weaver Navigation (1951) was crossed near the Mill Cut, and further west, near the south bank, a brick chamber, probably a disused cess pit (1959), was located during construction.

### **Frodsham and Ince Marshes**

Considerable disturbance of the alluvial deposits of Frodsham and Ince Marshes occurred during the construction of the Manchester Ship Canal in 1897, and a number of prehistoric artefacts were recovered from the alluvium at that time, including Bronze Age spearheads (1971) and a looped and socketed bronze axe (1995). The pipeline followed the southern bank of the canal for the last six kilometres of the route to the Stanlow oil refineries, through the area of major previous disturbance. Stratified finds were not, therefore, expected, although there was some potential for random finds of prehistoric artefacts, but an undated piece of scrap bronze (1981) discovered by fencing crews was the only find in this area.

Finally, a series of rectangular platforms (1994), alongside the Ship Canal at Holme Farm, may have been the foundations for a navy camp, set up during the construction of the canal, in 1897.

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## 4. EXCAVATION OF A POST-ROMAN SETTLEMENT AT FREMINGTON, NEAR BROUGHAM

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*Tove M Oliver*

The excavations near the farm at Fremington (NY 54702880-54772870) were undertaken by LUAU during 1990 and 1991 in advance of pipeline construction. The area surrounding this site has been a focus of human activity since prehistory, and although fieldwalking and an aerial photographic survey revealed no identifiable archaeology within 20 metres of the pipeline route, a cist discovered during sand quarrying in the nineteenth century, if the Ordnance Survey located it correctly, lay directly on the route.

In view of the high archaeological potential of this site, geophysical survey and trial excavation were carried out, to determine whether additional burials were likely to be found in the area (Fig 17). The geophysical survey was conducted by the Department of Archaeology, University of Durham, in July 1990. This revealed evidence of two faint anomalies (aligned approximately north-east to south-west), but did not detect any feature that could have been associated with a cist or similar structure.

Trial excavations were undertaken in September 1990 to establish the existence of the cist and any related archaeology in the pipeline corridor. Two areas were investigated, on either side of a fence aligned north-east to south-west. A trench in each field (each with a width of 0.92m) was excavated by mechanical excavator, and additional trenches were offset from these (Trenches 1-7). The discovery of several features and finds, including simple handmade pottery and also vessel fragments of Roman date, indicated the possible multiperiod remains of domestic, rather than funerary, activity.

Agreement was reached with SCUK that the areas on either side of the fenceline should be further examined by open area excavation in 1991, in order to record any surviving features, and to test the hypothesis of domestic activity. The excavation took place between May and July 1991 (Area 1, 33m x 16m; Area 2, 43m x 12m; Area 3, 40m x 14m).

Following the identification of several linear features during the construction of the pipeline in August 1991, located between Areas 1 and 2, after the dismantling of the boundary fence, a team was called out to investigate (Trench O). These features appeared to correspond to the two faint anomalies which were identified by the geophysical survey conducted in 1990.

### Location

(Fig 18)

Most of the excavated site (Areas 1 and 2) was located on the north-facing brow of a broad plateau, at 120 metres OD, about one kilometre south of the river Eamont, and less than a kilometre to the east of the Roman fort at Brougham. The northern portion of the site (Area 3) was located on a slight break in the slope leading gently down towards the river. The general position, at the confluence of the rivers Eamont and Lowther, is the meeting point of several natural routes, from Stainmore, the Lune valley, Ullswater, and Keswick, and allows easy access to Carlisle.

Fremington lies about ten kilometres to the west of the Pennine massif, on mixed glacial deposits, manifest locally as sands and gravels, above Permian Penrith Sandstone. Today this broad fertile corridor contains Grade 2 soils, suitable for agriculture, represented by deep, well-drained sand and coarse loam. The excavated area, however, had not been ploughed for three years, and was under pasture at the time of excavation.

The site of a cist, discovered during sand quarrying in the nineteenth century, is marked at NY 54782873, to the north-east of Fremington Farm, by the Ordnance Survey. This contained a contracted skeleton with a beaker and a food vessel. However, the original accounts placed the site south-east of the farm (Harkness and Stalker 1880), whilst the Ordnance Survey (and

consequently the Cumbria SMR) locate it to the north-east. No evidence of quarrying activity was disclosed during the 1990-1991 archaeological work, but the Cumbria SMR contains evidence of this occurring to the south-east of the farm. This strengthens the possibility that the original account gives the correct location.

## Phase 1

(Fig 19)

The earliest activity was represented by several small and medium-sized irregular linear features and two small oval pits (each <3.40m x 2.00m). These were cut into the natural sand and gravels [52] and were grouped towards the south of the excavated site (Area 1). It is suggested that Phase 1 consisted of one large, subdivided, or more likely, two smaller, very elusive, structures, now only suggested by gullies ([103], [115] and [49]), which may either be the result of direct or indirect anthropogenic influence, and three associated post-settings ([138], [128] and [51]), together with a fire pit [97], and possible animal burial pit [47] (see below), just beyond the eastern structure. None of these features produced datable or diagnostic finds. The fills of two of these features ([97] and [115]) contained a relatively moderate amount (28 small fragments) of animal bone. Sufficient bone, possibly representing a single animal (species to be determined), was recovered from the fill of pit [47] to suggest the specific disposal of an animal. Their common orientation, in relation to shallow, roughly parallel linear depressions ([178], [180], [190], [186]) (each <3.40m x 0.53m x 0.05m) and interpreted as the vestige of narrow or cord rigg, situated to the north, might suggest that these structures were contemporary with the remains of an early type of cultivation practice. This would imply the deliberate layout of several spatially discrete elements, which possibly represented related arable and pastoral activities.

## Phase 2

This represents the main period of activity in the settlement, which was located towards the centre and north of the excavated site, spatially discrete from the activity represented by Phase 1. Phase 2 comprises the construction (2A) and occupation (2B) of four sunken structures (designated Structure 1-4) and each represented by a large subrectangular cut ([41], [87], [237], [171] respectively). These exhibited the same west-south-west to east-north-east, or (in the case of Structure 4), a similar south-west to north-east orientation. A fifth, ground-level post-built structure (Structure 5), and a possible sunken-kiln (Structure 6), are also attributed to this phase. These structures were bounded to the south by a ditch [13].

Structure 1 (4.80m x 3.60m x 0.30m) was situated towards the centre of the excavated area, in the north of Area 2. The evidence indicated that sunken feature [41], and associated post-settings at either end, formed the basis of a timber superstructure. A conventional interpretation for this opposed 'two-post' type ground plan has been a basic ridge-pole construction (for example West 1985). A sandstone hearth [62] rested upon the sunken floor [71], and lay below a charcoal rich layer [15], which probably accumulated as the hearth fell out of use. Only a few finds were recovered from the living surface represented by [71]. They were domestic in nature and could be assigned a Roman origin. They comprised a spindle whorl made from a decorated Samian body fragment, a probable wool comb tooth, and two fragments of ceramic vessels, one Romano-British coarseware, the other a small and abraded fragment of a Samian vessel (Dr37, CG). Layer [15] contained two fragments of plain Samian vessels, one (Dr27) from Lezoux, the other East Gaulish. The botanical remains from this layer indicated the presence of oats and barley, along with small fragments of burnt bone.

Structure 2 (4.60m x 4.00 x 0.50m) was located 48m to the south, within the north-eastern quadrant of Area 1, and seemed to exhibit a similar basic ridge-post design. However, the consecutive recutting of at least one of the main structural elements ([107], [213], [219], [221]) reflected the successive refurbishment of this building. A burnt mortar-like layer has been interpreted as a hearth [212], situated within the base of the structure. The primary post-packing ([218]) of [219] produced a small opaque blue ground glass cabochon. Precise dating of this piece is difficult; glass imitation gemstones are common in the later Roman period, but the poor quality of the glass might suggest a closer affinity with the jewellery and furniture

inlays that are known from early medieval contexts at Whitby (Peers and Radford 1943). A small oval pit [150] (1.60m x 1.50m) lay 1.60m to the south of Structure 2. It was filled by a loose grey brown loamy sand [129] containing charcoal. Its close proximity to Structure 2 (below), 1.60m to the north, and their similar fills, may imply that they were related.

The largest structure (Structure 3, measuring 5.30m x 4.40m x 0.80m) was located 7m west-south-west of Structure 2 and exhibited evidence for a more elaborate constructional design, and internal post-built fixtures. There was no evidence for an *in situ* hearth, but a floor within the base of the structure was represented by a thin layer [124]. Again, the material from the living floor appeared exclusively Roman in date, probably later second and third century. Like Structure 1 it produced a spindle whorl made from a fragment of Samian. Several copper alloy fragments were also recovered, which included a small diameter ring with iron tag, a poorly preserved possible coin and an undiagnostic fragment. The deposit also produced a silver coin of early third century date (Julia Paula, AD 218-222). Botanical remains included oats and barley along with weed varieties.

The remains of a probable fourth sunken structure (Structure 4, measuring <5.00m x 3.00m x 0.20m), was, at over 180m north-west of Structure 1, isolated from the others in the northern part of Area 3. Its similarity to Structures 1-3 suggests that it was a comparable structure, but it was less robust than the others. Two other ill-defined areas of activity ([158] and [216]) were situated nearby on a slight break in the north facing slope. Activity spread [158] produced Romano-British coarsewares, as well as a fragment of pre-Conquest loomweight, a very small amount of industrial residue (<5g) and numerous fragments of burnt animal bone. Several objects were also recovered from activity area [216], including a loomweight fragment, a turned mudstone spindle whorl and small fragments of a single, probably Roman, glass jug.

A narrow, predominantly U-shaped ditch ([13]) traversed the site, 3m to the south of Structure 2 and 4m south of Structure 3, and all of these features lay on the same alignment. This ditch (16.50+m x 1.20m x 0.30m) cut the natural sand and gravels [52] and presumably formed a boundary which defined the extent of the settlement at this period, or perhaps, a property within it. The eroded sides implied that it had remained open for some time, becoming filled, probably as the settlement was abandoned (see Phase 3 below).

Several other features in the central part of Area 2 have been attributed to this phase. Despite the lack of stratigraphic evidence to link these components, they all cut or lay upon the natural subsoil [52] and their proximity, similarity of form and that many were aligned, suggest that they mainly represented the south-western wall of a single post-built structure (designated Structure 5) and its associated attributes. These features included seven post-settings, five which demonstrated a north-north-west to south-south-east alignment ([118], [156], [112], [130], [77]), and two offset from this ([174], [143]), a hearthstone [56] and a complex of pits [18] (each <1.50m x 0.80m x 0.20m) lay immediately to the west of the hearth and were traversed by the post-alignment. The contemporaneity of these pits with the building is postulated in particular by the evidence of burning within them which apparently links this activity with the use of the hearth. The only material from this building complex was a single loomweight of pre-Conquest date from posthole [174].

A group of three small irregular oval pits [168], [208], [202] (each <1.50m x 1.00m x 0.36m) was situated to the south of the post alignment and, less than a metre outside the projected area of the building. These pits cut the natural sand [52] and their irregular form displayed considerable natural disturbance. They may also have been associated with the hearthstone [56] within Structure 5, although they differed in character to pit complex [18], situated less than a metre to the north.

A second group of features, situated immediately to the south of Structure 5, also cut the natural sand [52]. Several were exposed by the 1990 Evaluation (Trenches 2, 5, 6 and 7). The largest of these was a shallow subcircular depression [64] (<4.00m in diameter and 0.36m deep) into which a smaller roughly circular pit [163] (2.10m diameter and 0.13m+ deep) had

been incorporated, towards the northern edge. Pit [163] was defined by the lining of fire-cracked stone [164], although it was first marked by an arc of large rounded stones, above this. Each pit had gently sloping sides and a curved base. The sands into which these features were cut were bright, mottled orange, yellow and red brown, almost certainly affected by heat, and were more intensely reddened within the smaller hollow. Together these pits contained a relatively large assemblage of crude, handmade pottery, probably of early medieval date, which, together with joining fragments from associated contexts, represent at least five straight sided bucket-shaped vessels of varying size, and possibly one or more open bowls, a carinated bowl, and large amounts of fire-cracked stone. It may be suggested from their form and the evidence for burning (fills [92] and [164]), together with their contents that they represent an oven, or more probably the base of a simple kiln. Four post-pits ([226], [227], [507], [66]) positioned at the south and western perimeter, which seemed to be associated, could have represented either a temporary barrier or kiln-superstructure. A small oval pit [105] (1.05m x 0.97m x 0.27m), with steep sides and curved base, was situated 1.50m to the south-west of hollow [64]. The proximity, and the similarity of the pottery within the fill [106] including eighteen fragments of a single vessel almost identical to those described above, suggest that they were associated. This fill, however, also contained a fragment of Wilderspool-type mortarium and a small amount of possible glass-working residue.

### Phase 3

The gradual decay of the main phase of settlement (Phase 2: the major features comprising Structures 1 - 6 and the boundary ditch) was represented by several fills in each sunken structure. These have been interpreted as the initial demise (Phase 3A) and their subsequent decay affected by post-depositional activity (3B). This phase also included the infilling of the boundary ditch (fill [14]), in which the gradation in colour towards the sides of the cut seemed to indicate its gradual deposition. This fill contained a fragment of horseshoe, dated probably to the ninth to eleventh centuries, which provides a tentative terminus post-quem for the occupation of the settlement.

Evidence for the demise of the sunken structures was provided by the abandonment fills of both the main structural post-pits and of the post-pits resulting from their repair. In addition, Structure 1 was filled by layers [9] (0.10m deep) and [8] (<0.10m deep), which lay above the occupation layers (for example floor [71] and hearth deposit [15]), and were therefore associated with the gradual decay of the structure, but they did not necessarily reflect complete abandonment. Layer [9] contained a fragment of fourth century, Crambeck ware. Again the botanical remains included oats. A more substantial abandonment fill [39] (0.25m deep) was deposited after the disassembly of the structural framework. This seemed to represent further decay of associated building materials, and the remaining hollow may also have been used for casual dumping of refuse, and had finally been modified by ploughing (see Phase 4). Fill [39] contained a fragment tentatively identified as part of a copper alloy annular brooch, possibly of fifth to seventh century date, part of a small whittle tang knife blade of late Roman or early medieval date, and a (probably early medieval) trapezoidal hone. A small group of Romano-British coarsewares, including fourth century Crambeck wares, and glass, were also recovered from fill [39], along with a single fragment of the later handmade pottery identified in quantity from Structure 6.

Overlying hearth [212], and the fills of the post-holes within Structure 2, was a substantial fill [83] (<0.25m deep). This seemed to represent the initial decay of the building, containing, as it did, domestic debris which probably reflected the final activities associated with its use. Above this lay a group of sandstone blocks and some rounded stones [191]. Fill [82] (with lens [81]) (<0.25m deep) formed the uppermost deposit filling this building, and probably reflected similar processes to those suggested for the decomposition of Structure 1 (for the further decay of the structure, perhaps casual discard and, infilling of the remaining hollow with ploughsoil, see Phase 4). All three contexts produced objects of mixed Romano-British and early medieval date. These were largely undiagnostic but included tile fragments and an iron pin or wool comb tooth from [83], and a fragment of handmade pottery, roof tile and mortar, and animal bone from [81]. Context [82] contained a single small fragment of smithing debris, a simple iron latch lifter, a fragment of wool comb tooth, and small

fragments of animal bone. The botanical remains included oats, barley, wheat, chaff and seaweed.

Above occupation layer [124] in the base of Structure 3 was a substantial layer [104] (<0.27m deep), which had probably collapsed from the side of this structure. It contained a small glass bead, most likely to be sixth or seventh century in date and an irregular hone, probably using local stone. Above this, deposit [67] (<0.25m deep) contained a very high concentration of burnt materials, including burnt bone, fragments of an early medieval ceramic vessel and part of a loomweight fragment. Fill [60] (<0.39m deep) clearly extended as a 'tipped' layer, above fills [67] and [104], demonstrating the orientation of its deposition, and its origin from beyond the northern side of the structure. It contained several early medieval ceramic vessel fragments and three large fragments of loomweight of typical early medieval type, an iron tenter hook(?) and a shale spindle whorl, probably of early medieval date, a small amount of vitrified material, and a substantial amount of animal bone, much of it burnt. The uppermost fill [53] (1.90m diameter and 0.42m deep) apparently represented further decay of the structure, and subsequent infilling by ploughsoil of the remaining hollow (see Phase 4). Fill [53] contained a substantial number of objects which could be assigned a possible early medieval date, including typical ceramic loomweight fragments, three iron whittle tang knife blades and a possible arrowhead fragment and an iron wool comb tooth. There was also a large fragment of metal-working debris, probably from smithing, and some burnt bone. Two worked flints, probably prehistoric, were also recovered. As has been suggested for Structures 1 and 2 ([39] and [238], [81] and [82]), it is also possible that this hollow was used as a casual repository for refuse or clearance.

Filling the base of Structure 4 was a layer [170] (0.12m deep), fairly similar to the natural sand [52]. Above this was fill [153] (0.08m deep). Both these layers seemed to represent the gradual decay of the structure. Fill [153] contained only one fragment each of early medieval and Romano-British ceramic vessels, a small amount of hammer scale and numerous pieces of burnt animal bone.

The pit complex [18], associated with the post-built ground-level Structure 5, was filled by [57], its mottled colour perhaps implying that this fill was intermixed with heat affected sands ([159], Phase 2) may have represented decay from this building, since it was similar to the abandonment fills within the sunken buildings (1-4). However, the fairly frequent occurrence of burnt materials could also imply that [57] contained debris which accumulated during its final use, and probably in association with hearthstone [56]. It contained a small amount of vitrified clay and two small fragments of loomweight. A botanical sample from this context produced oats, and barley, in addition to residual fragments of burnt bone and industrial waste/slag. Fill [46], above [57], was slightly darker than the surrounding ploughsoil [45], and extended beyond the limit of pit complex [18] (perhaps having been spread by subsequent ploughing, see Phase 4). Like the upper fills within Structures 1-4, [46] may have also been the affected by casual dumping.

The upper levels of the kiln-hollows ([64] and [163] Structure 6) were filled by layer [44]. This was distinguished from the surrounding ploughsoil [45] only by the presence of fire-cracked stones and densely distributed fragments of charcoal. Above the primary fill [164] of the smaller kiln-pit, [12] was probably the remains of domestic debris deposited in the vicinity of the remaining hollows after the kiln fell out of use. It is likely that both fills had subsequently been disturbed by ploughing (Phase 4).

#### Phase 4A

Shallow parallel ridges [48] (<0.10m high) were identified within the western central portion of Area 1. They were aligned north-north-east to south-south-west and lay above ditch fill [14] and several of the features attributed to Phase 1. It seems likely that they were the remains of narrow ridge and furrow (measuring 1m ridge to ridge).

### Phase 4B

Modern ploughsoil [45], ranging in depth from 0.10m - 0.30m, covered the majority of the excavation, and was generally deeper towards the north.

Two linear features ([605] and [606]) were situated to either side of the modern fenceline. Another linear feature [607], immediately to their north, was also a fairly recent boundary ditch, which post-dated the ploughsoil [45].

Topsoil [1] was the surface mineral and humic material mixed by cultivation, soil fauna and flora. Plough furrows (11) in the south west quadrant of Area 1, aligned north-east to south-west, cut the narrow ridges [48] (4A above). This topsoil ranged in depth from 0.10m - 0.25m, again generally at its deepest in the northern part of the site. The range of finds within the plough and topsoils clearly demonstrates that the activity had disturbed and truncated earlier features, probably at a relatively late date, although clusters of finds in the topsoil still clearly closely reflected the underlying archaeology, perhaps suggesting a small number of disturbance episodes, for example, occasional ploughing, rather than a continuous process.

### Discussion

The potential significance of the geographical location of this settlement at the confluence of several natural routes, including the rivers Eamont and Lowther, may be expanded by a number of other sources. Although there is little documentary evidence for the North West until the twelfth century (particularly William of Malmesbury), there are indications that the Eamont valley acted as a major route from the Neolithic period onwards, and that the river may have marked a cultural and political boundary during the post-Roman period. For example, the latter is implied by the Worcester recension of the Anglo-Saxon Chronicle (Earle and Plummer 1892) which states that a treaty between Athelstan, King of the expanding kingdom of the English and Constantine, King of Scots took place 'aet Eamotum' in AD 926. Although it is not specified whether 'Eamont' referred here to a particular settlement, the Roman fort at Brougham may be considered to be one interpretation.

Evidence for the Battle of Stainmore suggests that the course of the present A66 was an important east-west route by the early tenth century (Earle and Plummer 1892), and the geographical position of Brougham was one of the few north-south to east-west meeting points in use during the Roman period (Margary 1957). The east-west route is now masked by the A66. The course north-south is less well defined, and Margary states 'There is now no trace for 2½ miles, but the line would cross the Appleby-Penrith road near to Lowther Castle and then Moorhouse Farm, Moor Lane seems to mark it for the final mile to Brougham, where the road passes the east side of the fort to reach the ford on the river Eamont.' (Margary 1957, 118). Traces of this route have now been identified on aerial photographs (Cumbria SMR, Higham and Jones 1975, 26 Fig 5) and in addition, Higham and Jones have interpreted an alignment extending from the south of the fort, although there does not appear to be a clear indication of an associated entrance to the fort. Aerial photographic evidence, and excavation by the Ministry of Public Buildings and Works in 1966 and 1967, to the north of the Eamont, demonstrate this route to have a north-west to south-west alignment. Roman Brougham therefore straddled the main roads from western Scotland and from the Lake District over Stainmore and the Pennines, leading ultimately to York. It can also be suggested that during the post-Roman period the settlement at Fremington was also open to a range of external influences.

Today the local soils are of good arable quality and the drift geology implies that despite a potential variety of intervening vegetation, climatic and human factors, this is likely to have been the case in the post-Roman period (Higham 1986, 182). There are, however, other indications for a domestic economy related to the settlement which most likely utilised the surrounding land. For example, the recovery of a probable early medieval rotary quern (<1150>) from the decay ([43]) associated with Structure 5, and the botanical samples, revealed evidence for contemporary arable activity. The excavated animal bones demonstrated the potential use of a range of products related to a number of domesticated species.

The presence of fertile land may have been significant in attracting settlement/activity at this location since prehistoric times. The continuity of settlement in the area is demonstrated by, for example, the evidence for Neolithic and early Bronze Age monuments and burials, including Mayburgh Henge, King Arthur's Round Table Henge, Long Meg and Her Daughters stone circle (Harkness and Stalker 1880; Fell 1972; Higham 1986, 84, fig 3.1), the Roman fort (overlain by the medieval castle) and a putative 'dispersed *vicus*' (Higham and Jones 1975, 26-7, fig 5), the Roman cemetery located close by to the north-east (Ministry of Public Building and Works Excavations, 1966, 12, and 1967, 17; Andrews *et al* in preparation), and the tapestry of air photography sites known in the immediate area, many of which have been thought by some authors to be Romano-British in origin (for example, Higham and Jones 1975). This occupation is believed to have been widely dispersed and thinly populated, and reflected in the numerous settlements recorded in the air photography in the vicinity of the fort. However, the enclosures are undated, and some may be of later prehistoric or even Neolithic date (Bewley 1986, 1992; Andrews *et al* in preparation).

Three principal types of structure were observed at Fremington, and it has been suggested above that these represent sunken-floored buildings and a post-built ground-level building and a sunken-kiln. The assessment of their function has considered various types of evidence including structural attributes and the associated finds. Except for the 'kiln', the artefactual material from the buildings and associated features did not demonstrate a specific function for each building, but a variety of domestic activities was represented. These included the fairly frequent evidence for textile production (spindle whorls, loomweights and wool comb teeth), and of small-scale blacksmithing (industrial residues). Pottery production was apparently demonstrated by the interpretation given to Structure 6 (see also below).

The range of finds from the Fremington excavations, both of Roman and early medieval date, is clearly domestic, and there is nothing from the assemblage that would be out of place in a small-scale, relatively low status rural settlement, either associated with the Roman occupation of the area, centred about the fort at Brougham, or settlement subsequent to that, which continued, probably sporadically, throughout the early medieval period, ending in the early post-Conquest period. This material culture overall appears to span many centuries (over a thousand years), although, the period of deposition of the material is likely to have been considerably less (see below). The Roman material generally is unexceptional, however, the pottery dates from the second to the fourth centuries AD, and there is a surprisingly large amount of Samian ware (from both Central (Lezoux) and East Gaulish factories) for a low status site, but there are other mechanisms to account for its presence on site (see below). The general date range of the pottery is corroborated by the glass, which likewise dates from the second to fourth centuries AD. Much of the ironwork is difficult to assign to a precise date, but contexts suggest that the small whittle tang blades from the site are more likely to be early medieval than Romano-British in date. The fine metalwork assigned to the period of Romano-British activity on the site is in poor condition. It is therefore clear that much, if not all, of the Romano-British finds assemblage from the site is residual. Romano-British finds were only found in stratified contexts within the sunken buildings, either on the living floor or in the somewhat mixed fills which appear to have accumulated on their abandonment. Much of the Romano-British material derives from the highly disturbed plough and topsoil contexts. No datable finds were associated with Phase 1 activity, although a little datable material in the topsoil and ploughsoil towards the south of the site, is almost exclusively Romano-British. The material is somewhat fragmentary and abraded, suggesting that it has either been exposed for a long period and damaged by trampling, or that it has moved around within the soil. This residual material may have been collected from elsewhere (for example, the Roman fort or cemetery) during the post-Roman period.

If one follows the accepted date range for sunken-floored structures, placing them in a context dating from the fifth century to the immediately post-Conquest period (11th century, see the examples below), then the presence of living floors with exclusively Romano-British material would seem somewhat anomalous. There is, however, evidence from a number of sites to suggest that later groups deliberately sought and used Romano-British objects. Excavations at West Stow (West 1985) have suggested the deliberate collection of Samian

fragments and it has been implied that red pottery, and especially Samian, was regarded as desirable, and even, if ground to a powder, medicinal (Roman objects from Anglo-Saxon graves, White 1988). It is not unreasonable therefore to suggest that the Samian spindle whorls were used during the occupation of the sunken buildings, and perhaps collected on the same basis. Likewise Romano-British glass was deliberately collected and re-used, especially for the production of beads, because of its high quality. Slight evidence for glass-working on this site, and evidence from Dacre (Newman and Leech forthcoming), nearby, might account for the presence of vessel glass. Of the other fragments of interest, the cabochon is as likely to be of early medieval manufacture as Roman, and the small blue bead of third-fourth century date could have been collected as a trinket. It may be suggested from the stratigraphic evidence that the living (or activity) floors within the sunken buildings were kept relatively clean. This would account not only for the absence of contemporary domestic refuse, but also for the presence only of slightly more valued objects, such as spindle whorls, and a coin, which had been genuinely lost, rather than casually discarded. It is of note that botanical samples from these living floors consistently include oats, a cereal not often grown during the Roman period (Huntley, pers comm) although frequently found in early medieval contexts.

Although small and clearly of low status, the assemblage of early medieval material from the site is of importance within the national context. Little or none of it can be dated with precision but the general trend might point to a seventh-eighth century date, slightly earlier than material from the monastic site at Dacre, west of Penrith (Newman and Leech forthcoming). The ceramic assemblage presents a problem, for whilst the loomweights are clearly of early medieval type, and can be easily paralleled at numerous sites in the north, the only vessels are in a simple, handmade fabric which is probably made on site and is not paralleled elsewhere, although a single similar fragment is known from an otherwise undated context at Dacre (Newman and Leech forthcoming). The vessels do not correspond in fabric or form to vessels from York (Mainman, pers comm), East Anglia (Hamerow, pers comm) or the monastic sites at Jarrow and Whitby (Mills, pers comm), and are clearly in the long-lived, very simple tradition of local prehistoric types. Excavators of other northern sites of comparable date, for instance, Yeavinger (Hope-Taylor 1977) and Thirlings (O'Brien and Miket 1991), have occasionally noted pottery in a native tradition, but it often remains unpublished. One exception, from southern England, is the site at Purwell Farm, Cassington, Oxfordshire (Arthur and Jope 1962-3), where simple, handmade pottery, indistinguishable from local Iron Age forms, was excavated from a sunken-kiln in a securely dated Middle Saxon context. Iron Age pottery is extremely scarce, if not unknown, from the North West, but the forms excavated at Fremington do, in form at least, bear a strong resemblance to Iron Age vessels from East Yorkshire, Humberside and Teeside.

There appears to be sufficient evidence, especially in view of the presence of a putative kiln, to suggest that the pottery from Fremington is early medieval in date, particularly since no prehistoric material, other than the occasional struck flint, was recovered from the site.

Fine metalwork was scarce, only a possible annular brooch and a garment tag being recovered. There was also a single glass bead of possible seventh century date. Ironwork, as has been stated above, is often very difficult to date with precision, and objects are frequently dated from the context rather than *vice versa*, but the presence of at least six small knives in or above the abandonment fills of the sunken buildings is of note.

With the exception of the ceramic material from the kiln, all of the early medieval material derives, like the Romano-British objects, from contexts associated with the demise of the settlement, and thus could also be described as residual. They were, however, generally represented by larger fragments than the Romano-British material and had thus probably not travelled as far in the soil. As mentioned above, the distinct concentrations of material in the plough and topsoils over the buried structures, perhaps implies that the site was not disturbed frequently until more recent times, although ploughing has now seriously truncated the archaeological stratigraphy.

In order to establish the individual life of the early medieval buildings represented at Fremington, the precise date of construction and destruction phases, or the rates of sedimentation must be known. Unfortunately, such precision is not attainable here, and indeed rarely elsewhere, given accumulations containing such a widely datable material culture, particularly due to the lack of diagnostic artefacts for the earlier part of the period (*ie* fourth-sixth centuries).

Although there was no stratigraphy to link the individual structures, the artefactual evidence indicates that all of the structures, except those indistinct and enigmatic traces of activity in the southern portion of the excavated site (attributed to Phase 1), appear to have been broadly contemporary, the main phase of activity seeming to cluster around the seventh to eighth centuries. Their design and the internal stratigraphic evidence was consistent with this interpretation.

The evidence for the replacement or refurbishment of the main structural members in three of the sunken buildings at least indicates an extension beyond the life of single load-bearing timbers. Elsewhere, in urban contexts, repeated resurfacing of floors has been taken to represent longevity of early medieval buildings (Horseman *et al* 1988, 109). However, the absence of such evidence at Fremington does not necessarily preclude a moderate life span (as implied by the structural refurbishment). Such a build-up of material may not have been desired, particularly in a sunken floored building (thus effectively limiting head room), nor is it demonstrated by the stratigraphy.

In Britain, sunken structures from the post-Roman period are normally associated with rural settlements of the south and east of England, and are considered to be of continental origin (for example Rahtz 1981, 55-56). In the North West, there is no evidence for settlements which parallel Fremington, although other putative, or clearly demonstrated, sunken buildings in the region, include those from Manchester and Chester. The likely rural siting of the Manchester examples may perhaps be compared to that of the settlement at Fremington. However, although these may be broadly attributed to the post-Roman period, their specific dating and function are open to question and the paucity of structural attributes is not typical of sunken buildings in Britain (Tanner 1986; Walker 1986; Holdsworth 1983). The Chester examples, like those in York, differ in that they are later in date. One 'sunken hut' in Chester was dated to the late ninth century, whilst those attributed to the tenth century were substantial cellared buildings, and considerably different in character, relating to the Anglo-Saxon burgh (Mason 1985). In York, the evidence for the immediately post-Roman period is apparently scarce, and the sunken buildings are generally considered to be associated with an Anglo-Scandinavian tradition, dating from c970-80 to approximately the early eleventh century (Hall 1984). Apart from the site at Fremington, the only other 'open' rural settlement in North West England which has been dated to the eighth century AD is Bryant's Gill in Kentmere, which revealed a quantity of structural remains, including wall footings, paved areas and post-settings, but which appears to have been significantly different in character (Dickinson 1985).

The settlement clearly extended beyond the limit of the pipeline corridor, but, because excavation was limited to the corridor, it is difficult to assess its original extent. All of the excavated early medieval activity (Phase 2) appears to have been defined to the south by a small ditch, and, although no boundary was discovered to the north, the line of the former Roman road, now the A66, may have been an approximate limit.

The excavations at Fremington have, for the first time, conclusively demonstrated the existence of post-Roman rural settlement, with sunken buildings, in the North West of England.

Broadly, this seemingly diverse evidence implies an 'insular' tradition co-existing with influence derived from external, 'exotic' sources. The natural geographic position of the settlement, and an established communications network, and probably other pre-existing, particularly Romano-British, socio-economic factors, are likely to have facilitated this

distribution of influences, and perhaps physical exchange. Given this setting, it would appear likely that these processes were an entirely normal cultural phenomenon.

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## 5. EXCAVATION OF LOW BORROWBRIDGE ROMAN CEMETERY

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Nick Hair and Christine Howard-Davis

The Roman fort at Low Borrowbridge is situated south of Tebay in the Lune gorge, which has for centuries been a major north-south communications link. The main Roman road to Carlisle followed this route, and the fort at Low Borrowbridge would have controlled this vulnerable stretch. Today the London to Glasgow railway and the M6 motorway pass through the valley, avoiding the difficult terrain of the Howgill Fells.

The pipeline route was designed to avoid all known archaeological sites at Low Borrowbridge and was routed as far away from the Roman fort and its environs as possible, but its course was constrained by the river Lune and the deciduous woodlands to the east of the valley. It was thus impossible to avoid completely the presumed area of the civilian settlement, in the field to the south of the fort, and it was here that the Roman cemetery, previously unknown, was discovered in level pasture, west of Howgill Lane, and adjacent to Salterwath Bridge.

Trial excavation in 1990 in the field to the south of the fort identified a small pit containing Roman pottery sherds, burnt material and iron objects. During pipeline construction the following year, the archaeological inspector monitoring topsoil stripping noted further Roman features. Construction in the immediate area was halted and a rescue excavation took place between June and August 1991 in the area within the pipeline corridor. A second rescue operation, in March 1992, followed the discovery of more Roman features to the south of the 1991 site, during the creation of a new farm track.

Standard LUAU recording procedures were used, involving the completion of 500 context records and 1000 object records, input to an archaeological database (Delilah), which increased data manipulation and retrieval efficiency. 30 plans of the site were drawn at a scale of 1:20, and 80 sections were drawn at a scale of 1:10. 1500 photographs of the excavations were catalogued. The original position of each artefact was recorded on site using a Zeiss Elta-4 total station linked to a Husky Rec-500 data-logger. The resulting data made it possible to reconstruct the position of finds within features during the post-excitation programme.

A strategy was developed for the excavation of the cremation pits, which were normally half-sectioned. Where cinerary vessels were identified intact, these were removed *en bloc* from the pits, to be excavated under the controlled conditions of a laboratory. This was accomplished by wrapping the fragile pots *in situ* in plaster of Paris bandage. The recovery of all of the cremated bone from the pits was deemed impractical, given the time constraints of the excavations, as much of it was very small in size and distributed throughout the fill. The larger fragments of cremated bone were hand collected, and samples of each pit fill were collected which could be sieved later. Artefacts were analysed by both in-house and independent specialists as appropriate, and, reports have been prepared for incorporation in the final publication text.

### Site evaluation

In early 1990, fieldwalking and aerial photography identified a number of indeterminate bank and ditch features in the field to the south of the fort. Geophysical survey in the south-east of the field identified a number of convincing anomalies, which influenced the positioning of the trial trenches.

In August 1990 six trial trenches were cut within the proposed pipeline corridor, using a mechanical excavator. The same basic stratigraphy was identified across the field. The lowest horizon consisted of a substantial layer of natural gravels; this was sealed by orange-brown silty loam. This layer appeared to have been truncated by later activity, possibly by ploughing. The silt was sealed by a uniform layer of topsoil. A metallised surface, 7m wide, was identified in the west of the field, which appeared to represent a road orientated north-

south. It seemed to lead towards the natural position for a southern gate to the fort, but its date remains somewhat uncertain as no artefacts were associated with it. A small circular U-shaped pit, 0.50m in diameter and 0.20m deep, was identified in one trench section, and contained burnt material, Roman pottery fragments, and iron objects including nails. This was a strong indicator of Roman domestic/industrial occupation of the site.

### **Area excavation**

In June 1992, during pipeline construction, the archaeological inspector monitoring topsoil stripping noted five discrete burnt patches, each about 0.70m in diameter, with pottery sherds, charcoal, and iron nails visible at the surface. Construction activity in the immediate area was halted, and the burnt patches were investigated, and identified as cremation burials. The majority of the site within the pipeline corridor, an area measuring 20m north-south by 30m east-west, was then excavated under rescue conditions, between 17th June and 2nd August 1991.

Construction of a farm track in early 1992, just south of the previous excavations, revealed more Roman remains which necessitated further excavation, in March 1992, of an area 4m north-south by 35m east-west. This excavation was partially financed by English Heritage.

The results of all three stages of excavation have been combined in a single archive.

### **Finds**

Approximately 1000 fragments or artefacts were recovered during the three seasons of excavation, and have been treated as a single assemblage. The bulk of the assemblage comprised the burnt bone from the site, ceramic vessel fragments and complete vessels, iron nails and hobnails. Other classes of find were less numerous, but included copper alloy brooches, a copper alloy toilet item, copper alloy coins, very small fragments of melted glass and lead, glass and stone beads (deriving from a single necklace), copper alloy and iron casket fittings, and a large sandstone tombstone. The soils on the site were so acidic that it is unlikely that any unburnt bone survived. Examination of a proportion of the palaeoenvironmental samples, for plant remains and bone, suggests very strongly that this was the case.

The great majority of the bone is human, and the pottery suggests a date range generally in the later second and third century, with some continuation into the fourth century AD.

### **Site stratigraphy**

The earliest stratigraphy at Low Borrowbridge was a substantial layer of gravel, deposited by glacial or fluvial action, lying directly below the topsoil in the north and centre of the site, with many archaeological features cut into it. This horizon dipped towards the south, east, and west, and in these areas it was covered by a fairly substantial layer of silt, on average 0.30m deep. This sealed a small number of early cemetery features, and may have been deposited as a result of the river Lune flooding at an early stage of cemetery use. However, many features were cut into the upper surface of the silt horizon, which was sealed by a thin layer of silty ploughsoil, on average 0.15m deep. Several truncated cremation pits were identified in this horizon; these had probably been damaged as a result of post-Roman agricultural activity. The ploughsoil was sealed by loamy topsoil, on average 0.25m deep. Few archaeological remains were detected within this layer.

### **The features**

Three types of feature were identified within the cemetery. A series of ditched enclosures was found. Post-dating these enclosures, and sometimes, but not always, respecting their position, was a large number of cremation pits. The third type of feature consisted of a series of large pits, two of which were oval in plan and were cut into the centre of enclosures. A further five large subrectangular and oval pits, similar to these, were located within the enclosure ditches. These contained almost identical fills to the enclosure ditches, thus making their relationship with the ditches difficult to determine. Unlike the cremation pits, these contained little carbonised or burnt material. A further six pits, similar to those

described above, were isolated. Two were located below the silt horizon in the east of the site, and the others were cut into the gravel in the west of the site.

Ten ditched enclosures were identified, of which eight were subrectangular, with rounded corners, and two were subcircular. The evidence suggests that there were at least another six enclosures, although their exact shape was unclear, due to damage sustained as a result of post-Roman ploughing of the site.

The enclosures measured externally between 1.60m and 4.10m wide. All were composed of shallow U-shaped ditches between 0.30m and 0.50m wide and c0.20m deep. Most cut the stony subsoil, and were filled with a gritty, silty, sandy, or clayey matrix, which was almost identical to the surrounding subsoil, except that it occasionally contained small pockets of burnt and carbonised material. The ditches were difficult to identify except in conditions of preferential drying after rain, when they were visible as slightly darker stains contrasting with the more rapidly drying subsoil.

Most of the subrectangular ditches enclosed a single central island or cell, although two were more complex. Enclosure ditch 164 formed three subrectangular central cells linked together, whilst enclosure ditch 157 formed two adjoining cells.

The subrectangular and subcircular enclosures were mainly located in the north of site, and were distributed fairly regularly throughout this area, with the exception of the central northern part, where a particularly complex sequence of intercutting enclosure ditches was revealed. This complexity suggests at least two phases to these features.

Many enclosures incorporated a gap or possible entrance in one side, although its size and position varied. These putative entrances measured between 0.70m and 1.20m wide, and were located on all but the west side; in every case the ditch terminals on either side were rounded. All the subrectangular enclosures were orientated approximately along the cardinal points of the compass.

There are no finds which might be regarded as stratigraphically contemporary with the excavation of the enclosure ditches, or with their primary use. All finds derived from the fills of these ditches were presumably deposited some time after they were dug and had been allowed to fill, or had been backfilled. The finds date from the early second century to the mid third century AD.

Small quantities of cremated bone were recovered from only three of the ditches, but there were no clear concentrations which might have indicated obvious disturbed burials within the fills. Likewise, individual nails and hobnails are recorded from 14 enclosure ditches, but again no obvious concentrations were identified which might suggest the substantial remains of disturbed burials. The distribution of ceramic vessel fragments would suggest a similar situation. It is, however, most likely that this material derives from severely damaged cremation burials, which have been effectively spread through the topsoil by ploughing, as many of the small pits containing cremations had clearly been cut into the upper fills of the filled enclosure ditches. Thus these finds must be regarded as of the same date as the small cremation burials discussed below.

The centres of the majority of the enclosures were empty, but two contained large pits. Pit 176 was oval, measured 1.01m x 0.73m, and was 0.30m deep. It was located within subcircular enclosure 139 and was aligned with its long axis orientated east-west. It had a gently rounded profile. Pit 155 was also oval, and had a rounded profile. It measured 1.80m x 0.60m, and was 0.35m deep. It was located within subrectangular enclosure 157. Its long axis was orientated north-east to south-west. In contrast to the cremation pits, these had a distinct elongated shape, were generally larger and deeper, and contained little carbonised material. Unusually, both pits contained a layer of medium and large river-washed cobbles within their fills. Although they were not linked stratigraphically, their position within the centre of the enclosures would suggest that these features were either contemporary with the enclosures,

or were constructed with prior knowledge of their position. Limited ceramic evidence from within the fill of pit 155 indicates that this feature probably dates from the late second to the early third century AD (pit 176 contained no dating evidence). It is possible that they represent inhumation burials, the acidic soil conditions having subsequently removed all traces of the bodies.

Six large pits, cutting into the subsoil, were not associated with enclosures. In contrast to the cremation pits, these were generally larger and more elongated, and contained little carbonised or burnt material. These pits had no common orientation.

Pits 261 and 284 were sealed by the silt in the east of the site, which suggests an early date for their construction. Pit 261 was subrectangular and had its long axis orientated north-south. It measured 2.20m x 0.80m, was approximately 0.35m deep, and had a U-shaped profile with steeply sloping sides and a rounded base. It contained several pottery sherds from more than one vessel. Imprints of the sides of a completely decayed large wooden box or coffin were identified within its fill, as well as a nail. Pit 284 was subrectangular, and had a similar alignment to 261. It measured 2m x 0.90m and was 0.35m deep, with gently sloping sides and a rounded base. A number of nails were found within it, and imprints of the sides of a possible decayed wooden box were revealed within its fill, suggesting that it may also have contained a coffin. It might alternatively be suggested, since there is also a very small fragment of melted lead, that the nails derive from the remains of a funerary pyre or bier, although the absence of burnt bone in this context argues against such an interpretation.

Four large pits were located in the north-west area of the site, cut into the natural gravel. Pit 184 was subrectangular, and was orientated with its long axis aligned east-west. It measured 1.20m x 0.50m and was 0.17m deep. It had steeply sloping sides and a flat base which was lined with medium and large rounded stones.

Large pits 278 and 280 were identified below large pit 252. Pit 278 was oval, aligned with its long axis orientated north-east to south-west. It had steeply sloping sides and a flat base, measured 1.10m x 0.70m, and was 0.45m deep. Pit 280 was oval, and was aligned with its long axis orientated north-south. It had steep sides and a rounded base. Neither of the pits contained any artefacts, in contrast to pit 252, which was larger and more complex than the other pits. It was roughly oval in plan and was aligned with its long axis orientated north-south. It measured 3.10m x 1.80m and was 0.30m deep, with irregularly sloping sides and an almost flat base, lined with large rounded stones. These sealed the fill of pit 280. Cremation pits were cut into its surface. Several pottery sherds were recovered from its fill, including the partial remains of a Nene Valley beaker. It also produced a single nail and approximately 200 hobnails, which, when deposited, had obviously been within the soles of *caliga*-type shoes. Whilst the use of nailed shoes is common in the Roman period, the number of nails and the patterns used seems to have been arbitrary, and the number per sole varied greatly, from eight or nine to 30 or more. Thus it is not possible to state with confidence the number of shoes represented by these nails, although it is clearly more than two pairs. Heavy duty nailed shoe soles were not confined to male wearers and it is known that the uppers associated with heavily nailed soles can in fact be quite delicate. They simply represent outdoor shoes, probably worn by the more Romanised members of the community.

All these pits appeared to represent graves. Pits 261 and 284 contained evidence suggesting that inhumation burials may have been placed within a wooden box or coffin, whilst pits 184 and 252 had medium and large stones lining the pits, which may have supported a corpse. Ceramic dating evidence from pits 252 and 261 suggests that they date to the mid third century AD.

Five large pits appeared to cut two of the infilled enclosure ditches, although the similarity of the fills made the precise relationships difficult to determine. All the pits were situated within the complex central northern part of the site. Similar features were notably absent from the dispersed enclosures to the south, east and west. They did not appear to represent cremation pits, as they contained little carbonised or burnt material.

Three large pits appeared to cut the ditch of double celled enclosure 157, two of which were within the ditch of the western cell. Pit 171 formed a steep sided oval shaped depression in the north-west of the enclosure. It measured 1.12m x 0.90m and was 0.40m deep. A single fragment of cremated bone was recovered from this feature. Pit 122 was located in the south-west corner of the enclosure. It was orientated with its long axis east-west, and had an elongated oval plan, with steep sides and a flat base. It measured 2m x 0.75m, and was c0.40m deep.

A third pit was located in ditch 157, which connected the two cells of this enclosure. This pit was orientated east-west, along the line of the ditch, and had steeply sloping sides and an irregular base. It measured 1.20m x 0.70m, and was c0.30m deep. It contained a large associated group (67) of shale, jet and glass beads which represent a necklace, probably still strung when deposited. Several of the glass beads are of uncommon type (gold-in-glass, silver-in-glass (see Boon 1977) and one chevron decorated bead (see Guido 1978). None of the beads can be assigned a close date but Guido suggests a general third-to-fourth century date for the glass and a similar range is usually assigned to the popular use of jet and shale. Boon has suggested a possible south-eastern European origin for gold-in-glass beads, whilst the chevron bead probably derives from North Africa, and the jet is almost undoubtedly from Whitby. Thus no conclusions can be drawn as to the origins of the necklace or its owner, although it is perhaps an excellent illustration of the wide-ranging trade network covering the Roman Empire.

It is tempting to interpret this necklace as a deliberate deposition, either as grave goods or a votive gesture. The generally slightly later date of the necklace than the majority of finds from the enclosure ditches suggests that the pit was inserted.

Two large pits were probably cut into infilled subrectangular enclosure ditch 153. Large elongated oval pit 197 was in the north-west of the enclosure. It was orientated with its long axis aligned north-south, and had steep sides and a gently curved base. It measured 2.10m x 0.75m, and was c0.40m deep. No finds, apart from a small amount of cremated bone, were recovered from this feature. Another large elongated oval depression was located in the southern ditch of the enclosure. This was orientated east-west, and had steep sides and a gently rounded base. It measured 1.25m x 0.75m, and was 0.40m deep. A complete inverted miniature Black Burnished ware jar / cooking pot (dated to the late third century AD) was found in the base of this feature.

All the large pits were aligned parallel to the enclosure ditches and, like pit 122, probably post-date the enclosures. The necklace and miniature Black Burnished ware jar support this view, as both are slightly later in date than the finds usually recovered from the ditch fills. Their shape, and the finds assemblages located within the fills of two of the pits, suggest that they may originally have functioned as graves, containing inhumation burials, which were deliberately inserted into the earlier infilled enclosure ditches.

The cremation pits, in contrast to the large pits, had a distinctive dark appearance, due to high concentrations of carbonised material contained within them. They were smaller in size and had an irregular subcircular shape, with a shallow U-shaped profile.

69 cremation pits, some of which contained vessels, were identified. All contained fragments of cremated bone, and relatively high concentrations of charcoal. Their average diameter was 0.65m, although they ranged from 0.15m to 1.70m in diameter; the steepness of their sides and the shape of their bases varied from pit to pit. On average they were 0.18m deep, although their depth varied from 0.05m to 0.50m, suggesting that at least some of the pits had been severely truncated by post-Roman ploughing. Most pits had slightly irregularly cut bases, indicating that they were probably dug with a small spade or adze.

Cremation pits were identified throughout most of the site. Most were cut directly into the subsoil, although over twenty pits were cut into the silt in a limited area in the north-west of the site; these, together with the pits located in the south-east of the site, were beyond the

area of enclosures. Where the two types of feature coincided in the north, east, and extreme north-west of the excavation, the cremation pits were usually cut into the infilled ditches or central areas of the enclosures. This implied that in general the cremation pits post-dated the infilled enclosure ditches, and related to a later phase of cemetery use.

Cremated bone from 34 of the original 69 cremation pits was subjected to detailed specialist analysis. The evidence suggests that each cremation pit contained the partial remains of one individual. In total 23 individuals were identified. Ages, where established, ranged from infants to older mature/older adults (four infants, one older subadult, three subadult/adults, eight adults, one young mature adult, one mature adult and five older mature/older adults), although, as expected, adults dominated the sample. Both males and females were buried within the cemetery, although the small quantities of bone recovered prohibited further detailed interpretation. The evidence demonstrated quite clearly that only a token amount of the cremated bones from each corpse were placed within each pit.

24 ceramic vessels containing cremated bone were recovered from cremation pits; all had been damaged to some extent, and, although some were truncated and broken, others were almost complete. This damage was probably sustained when the site was ploughed in the post-Roman period, although it is possible that some of the vessels were damaged prior to deposition. Almost all the vessels were placed in the pits in an upright position, although one was almost inverted, and another was lying on its side. Both were located close to the present day ground surface, and may have been moved as a result of post-Roman ploughing, although it is possible that each was placed within the pit in this position.

The vessels containing cremated bone were all ordinary types, usually associated with domestic use. 16 Black Burnished ware jars/cooking pots were discovered, by far the most frequent cremation vessels. A dish and bowl made from the same fabric also contained cremations. Two other cooking pots were used as cremation vessels, one of a probable local grey fabric, and the other of a hard grey fabric. Four Severn valley narrow-necked jars were also found. These were grouped in the eastern and southern margins of the site, and may indicate a spatial shift in cemetery use over time. All of the Black Burnished ware and Severn valley ware vessels must have been imported through the Roman military trade network, stressing the link between cemetery and fort.

Almost all the imported vessels used in the cremation pits date to the third century AD, suggesting that the cremation burials within the excavated area also date to around this period. Most of the pits contained small numbers of pottery sherds which were from more than one vessel or fabric type. Secondary vessels were found within a few of the cremation pits.

The cremation burials clearly represent a later phase of Roman activity on the site, as many were cut into the infilled enclosure ditches. Their interpretation is not in dispute and most can be paralleled elsewhere in Roman Britain, although the cremation rite appears to have persisted longer here than is suggested by the cemeteries of southern England.

None of the burials contained grave goods of great value, and the most frequent association was cremated bone in a domestic vessel, and a few nails and hobnails. Other grave goods found in lesser quantities included secondary vessels, two single coins, one of which was in the cremation vessel, the other in the cremation pit, and three brooches. Animal bone, including domestic fowl, bone of pig/sheep size, and horse/cow tooth enamel, is also represented, presumably as food offerings for the dead. Three burials contained sufficient hobnails to suggest the deposition of pairs of shoes, two contained an iron hasp and staple, suggesting box burials, whilst another contained copper alloy fragments, suggesting a more delicate casket accompanying the burial.

Several of the burials are somewhat less well furnished, represented either by bone deposited in the grave without a vessel, perhaps in an organic container, or in a vessel but without iron nails and hobnails. No attempt seems to have been made to line the grave pits, or cover the cremation vessel to prevent soil from filling it.

## Discussion

The lack of interconnecting horizontal stratigraphy across the site, combined with the similarity of both enclosure ditch and associated large pit fills, and the relatively short period of cemetery use, are impediments to a detailed phasing of the site. The site was badly damaged by post-Roman ploughing, which disturbed and truncated many of the features. However, a number of conclusions can be drawn from the excavations, and the activity over the site can be divided into three broad phases.

### Phase 1

The earliest features on the site were the ditched enclosures, and the large pits located within the centres of two of them.

The majority of the enclosures were subrectangular in shape, although two were subcircular. They were aligned in rows, along the cardinal points of the compass. Some contained possible entrances, although there is no common position for these. These enclosures almost certainly represent funerary monuments, although their original appearance is difficult to determine, due to damage sustained by post-Roman ploughing. Where such sites are known in other parts of Britain, it is generally suggested that the ditches defined and provided material for barrows and there is no evidence to contest this here. There is clearly a chronological separation within the enclosures, although it is not clear if there is a chronological change between the subcircular and subrectangular forms. Most enclosures were of single cell construction, although two contained multiple cells. It remains unclear whether the latter were constructed in a single operation, or whether smaller linking cells were added to an existing enclosure, at a later date. The association of later burials with the original enclosure may signify family or tribal ties, acquired status, or the arrogation of historical significance (see, for instance, Dent 1983).

There is no dating evidence for the construction and primary use of any of the enclosure ditches, although they appear to have been infilled between the early second and mid third centuries AD. They may have contained small flower beds or hedges, although the lack of palaeobotanical information, due to the acidic soil conditions, made this impossible to determine.

Only two of the enclosures appeared to surround stone lined primary burial pits. A small collection of pottery sherds, from more than one vessel, was found within the upper part of one pit fill. Examination of the sherds suggests that, if they can be used to date the primary use of the feature, the burial dates to the later second or early third century AD. No skeletal remains were identified within the burial pits, or, indeed, from anywhere on the site, again, presumably due to the acidic soil conditions.

### Phase 2

The six large pits not associated with enclosures also appeared to represent burials. Two were securely dated to the mid third century AD, suggesting that this group of pits may have been slightly later in date than those discussed above. Evidence within the two pits, located below the silt, in the east of the site, suggested that wooden coffins may have been used to contain the dead. Some of the pits contained grave goods consisting of shoes and perhaps ceramic vessels, these were similar to those found within the cremation pits. Several were cut by cremation pits, clearly indicating a stratigraphic sequence.

The cremation burials appear to form a discrete element within the site, although dating evidence suggests some overlap with the putative inhumation burials (above).

It can be suggested that these cremations fall into two groups. Many of them are carefully cut into the upper fills of the enclosure ditches, and also into the central areas of enclosures, whilst others appear to be grouped away from them. A slight difference in the distribution of vessel fabrics might also suggest a horizontal stratigraphy within the burials.

Philpott has noted a number of traits common to Romano-British cremation burials in the Northern military zone (Philpott 1991). When compared with Philpott's criteria, the cremations at Low Borrowbridge appear to be fairly typical, with no great show of wealth. There are a series of consistent factors within the burials, although none is universal. Cremations are either un-urned or contained in a pottery vessel. All the vessels are common domestic forms and fabrics, mainly cooking jars in Black Burnished ware 1, and most have sooty deposits on the outside, suggesting that they are reused kitchen vessels. All of the cinerary urns were damaged to some extent, although much of this, but perhaps not all, occurred after burial. Few were accompanied by secondary vessels.

All but two of the vessels were placed upright in the grave and were part filled with material from the pyre. It is clear that no attempt was made to bury anything but a token quantity of the remains of the deceased, recovered from a pyre burnt elsewhere. Use of the *ustrina*, a communal burning place, was by far the most common process of disposal for corpses. The location of this burning place at Low Borrowbridge is unknown, but it might be possible to suggest that the scatter of small lenses of charcoal, odd fragments of pottery, and small amounts of bone, which characterised many of the fills of features on the site, might be the result of clearing and dispersing the burnt material from the *ustrina*. Evidence for a second, rare type of rite, *bustum* cremations, where the body was burned over an open grave, is absent from Low Borrowbridge, although a group of such burials is known in a military context from the cemetery at Petty Knowes in Northumberland (Grew 1976).

The bone and burnt material seems to have been deposited somewhat carelessly in the grave, clearly tipped, or thrown, into the urn as it stood in the open grave, since small piles of burnt material, including bone, were noted elsewhere in the grave pits. Such an apparently careless approach, where a token burial was all that was required, has been noted elsewhere, especially within the cemetery at Trentholme Drive, York (Wenham 1968), where an attempt was made by the excavator to associate it with low status burials.

Analysis of the cremated bone has produced limited demographic information. The cemetery contained both male and female remains with ages ranging from infant to older mature/older adult.

Many of the graves contained a few nails and hobnails, perhaps indicating that these too were recovered from the pyre, perhaps incidentally, whilst collecting bone, and suggesting that the corpse was wearing shoes, and perhaps lay on a nailed wooden bier. No attempt appears to have been made, in general, to line the graves or to close the mouth of the vessel containing the remains. There is, however, evidence to suggest that two of the burials were accompanied by, or contained within, fairly substantial wooden boxes, a practice recorded elsewhere, notably at Skeleton Green (Partridge 1981) and Brough-under-Stainmore (Jones 1977). The presence of hobnails, and hence shoes, appears to be a common factor and represents a widely held Roman or Romanised belief, symbolising and facilitating the journey of the deceased to the Afterworld (Philpott 1991). Most of the burials suggest that the shoes were burned on the corpse, but several of the graves appear to have contained one or more pairs of unburnt shoes. This has been cited elsewhere (Partridge 1981) as evidence for multiple burials, but the suggestion cannot be substantiated here. There were few other grave goods, notably brooches, which presumably represent personal possessions. They bear no sign of burning and thus were probably placed in the urn along with the burnt bone.

In two cases coins were included in the burial. The provision of a coin as payment to Charon, to ensure entry to the Afterworld, is a practice known widely in the Classical world, but does not appear to have been adopted with enthusiasm in Britain (Alcock 1980). In consequence, it is suggested that it might be more closely linked with the Roman military establishment, rather than native burial traditions.

A well made tombstone was recovered from the site, probably displaced, since it was found face down over a possible infant burial; the dedication is to a woman, Aelia Sentica, by her husband. The marking of graves with written tombstones is again an imported practice, suggesting Romanisation.

Almost all of the imported pots used as cremation vessels date to the third century AD, suggesting that the cremation cemetery also dates to this period. The dating of this cemetery indicates that the practice of cremation here persisted for some time after it had been superseded and abandoned elsewhere in Britain. The persistence of cremation can, however, be paralleled locally, and it has been suggested as an example of 'rural conservatism' which can be reinforced by the presence of late cremation burials at Brough-under-Stainmore (Jones 1977) and Brougham (Wilson 1967; 1968), further to the north.

### Phase 3

The latest phase of cemetery use seems to be represented by five large pits which were probably graves. These pits were similar in size and shape to the inhumations defined in Phase 1, and appear to have been cut into the infilled enclosure ditches, therefore post-dating them. Artefactual evidence recovered from two of the pits suggests that they date to the third and fourth centuries AD. In contrast to the Phase 1 and Phase 2 graves, none of these pits contained stones. Two contained significant artefact assemblages which probably represent grave goods. These consisted of a late third century miniature jar in Black Burnished ware 1, and a group of 67 shale, jet, and glass beads dated to the third and fourth centuries AD.

### Conclusions

The subrectangular enclosures, together with the subcircular enclosures, represent the earliest activity on the site, but their function and date remain unknown. Roman square ditched barrows are known, as are ditched grave enclosures, perhaps containing hedges (Clarke 1979), and also square stone-built mausolea, like that at Skorden Brea, Corbridge (Gillam and Davies 1968), but they are never common and seldom appear in any number in a cemetery.

The closest regional parallels are the great Iron Age cemeteries of East Yorkshire, which date from the later centuries BC to the first century AD (Stead 1991). They are similar in layout, with ordered rows of square enclosures of roughly comparable size. They are often associated with a small number of round enclosures and even unenclosed graves. They also appear to be orientated roughly north-south, and contain entrances. Iron Age cemeteries are not, as yet, known in the North West and so the links must remain tenuous. The cemeteries of East Yorkshire have been attributed to the Arras tradition, although the similarities with that at Low Borrowbridge probably result, not from defined cultural affinities, but from a well-attested northern Iron Age rite. Such continuity and admixture with Romanised traits is known elsewhere, for instance at Camelon, in Stirlingshire (Breeze *et al* 1976). If it is reasonable to propose an argument based on rural conservatism for the late survival of cremation burials in the Roman period, then it is no less valid to advance the same argument for the persistence of an Iron Age rite into that period.

Whether or not the enclosures are of Iron Age date, continuity of use during the Roman period is clearly demonstrated. Even when the ditches were partially or completely filled they remained in use as preferred locations for cremation burials. Thus they must have been marked, or knowledge of their whereabouts must have been current. Again the Arras cemeteries provide a parallel, where Iron Age enclosures have secondary burials in the ditch fill, and were reused even in the Anglian period.

There was obviously a desire to associate the deceased, even after many years had elapsed, with the primary enclosures. There can be many reasons for this but, perhaps family or tribal ties are the most likely. It can be suggested that the deliberate association of Roman cremation burials with these earlier enclosures represents the continuity of local family or tribal groupings well into the Roman period.

The level of Romanisation was probably never high in this area, even in the *vicus*, whose inhabitants undoubtedly used the cemetery. The incentives to adopt Roman ways were probably limited at Low Borrowbridge, as compared with the settlements associated with large forts and urban centres. For local indigenous groups attracted to the settlement as a

market centre, Romanisation was quite likely to have been more an imposition, easily ignored, than a choice.

The excavations have demonstrated continuity of use of these formalised burial sites, within what may have been an Iron Age cemetery. This implies that, to at least some of the inhabitants of the Lune gorge during the Roman period, their traditions and ancestry were more important than their assimilation into the Roman culture.

The apparent grouping of some of the cremations away from the enclosures is interesting. It could be suggested that they represent incoming inhabitants of the *vicus* without local family ties. Such newcomers might respect and use a traditional burial place, especially if suitable land was at a premium, but would probably be discouraged from using the traditional burial plots.

Roman cemeteries were generally located adjacent to one of the roads leading from the fort. There were two possible Roman roads at Low Borrowbridge, one leading across the field from the river to a postulated south gate of the fort, the other on the line of the modern road, Howgill Lane, which leads from Salterwath Bridge past the east gate of the fort.

The evidence for a Roman road crossing the field is a cobbled surface, seven metres wide, which was aligned approximately north-south, 35 metres to the west of the cemetery. No features were identified between this possible road surface and the cemetery, which suggests that the two were not closely connected, but it is possible that this was the road through the *vicus*.

The location of the cemetery provides some evidence for the existence of another Roman road on the line of Howgill Lane. The cemetery extended to the western edge of this lane, but no features were identified in the area immediately to the east of the lane. This implies that the cemetery was bounded by a linear feature, likely to have been the Roman road. The location of the Roman tombstone close by the road adds weight to this hypothesis.

The cemetery was located next to a river, as were the Roman cemeteries at Watercrock, Brough-under-Stainmore, and Brougham, all in the northern frontier zone. Rivers are thought to have had a ritual significance for the indigenous people of the area, and this may have influenced the siting of their cemeteries. Equally the location of cemeteries could have been dictated by the positioning of forts close to strategic river crossings.

A certain amount of manifest Romanisation was clearly demonstrated by the cemetery, certainly the tombstone suggests some wealth and also Roman citizenship (see Shotter forthcoming) for some of the inhabitants of the *vicus*. Indeed, cremation itself is probably a Roman introduction to northern England. The rite by which hobnailed shoes were included in the burial may likewise be a Roman introduction, but, as Philpott points out, the rite can only be recognised when shoes are nailed and therefore archaeologically visible; nailed shoes were a Roman introduction. He suggests that for the rite to have had such wide currency, it must have been the result of a fairly deep-rooted belief and thus was possibly not a Roman introduction (Philpott 1991).

The area excavated produced artefacts dating to a limited period between the mid second and fourth centuries AD, although evidence from excavations in the fort suggests that this was in existence from the late first century AD. The cemetery associated with this early phase of Roman activity was not represented within the excavations, and it may have been located elsewhere, perhaps to the north of the site, closer to the fort. The enclosures, and many of the large burial pits, suggest the persistence of deep-rooted, local burial traditions well into the Roman period. Some of the apparent inhumations date to the mid third and early fourth centuries AD, although it remains unclear to what extent these reflect a continuation of the local burial rite, and/or the re-introduction of a Roman burial practice which superseded cremation elsewhere in Roman Britain. At Low Borrowbridge the cremation cemetery clearly dated to the third century AD, although cremation in most areas of Britain, with the

exception of the northern frontier zone, declined in popularity in the later second and third centuries AD. The late date of the cremation cemetery, together with the persistence of local burial traditions, almost certainly indicates a high degree of rural conservatism in this region. Relatively few cemeteries have been excavated in the North West to date, and synthesis of the results from Low Borrowbridge should not only make the understanding of the association between the fort, local population, and cemetery much clearer, but will also contribute to the study of the northern Roman military hinterland.



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APPENDIX 1 -  
REGISTER OF ARCHAEOLOGICAL SITES

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## Register of archaeological sites

## Cumbria

Site No	Site name	NGR	Site type
771	North British Railway	NY37597030	Disused railway
773	Scaurbank	NY38126939	Ridge & furrow
774	Scaurbank Wood	NY38506939	Field boundary
781	Longtownmoor	NY38956895	Find scatter
782	Ladyseat Wood	NY39056845	Field boundary
791	Barrockstown	NY39786477	Ridge & furrow
792	Barrockstown	NY39806465	Findspot
793	Barrockstown	NY39856497	Find scatter
801	Barrockstown	NY39886445	Ridge & furrow
802	Down By Rigg	NY40056393	Field boundary
803	Barrockstown	NY39956417	Find scatter
811	Knells	NY40976202	Wetland
821	Knells Park	NY41946059	Field boundary, mound
822	High Moor Plantation	NY42136048	Ridge & furrow
823	Moss Plantation	NY42446030	Field boundary
824	Old Grove	NY42855941	Trackway
825	Hadrian's Wall	NY42675928	Roman wall
827	Old Grove	NY42825918	Pit, findspot
831	Stanegate	NY43035895	Roman road
832	Park Broom	NY43055878	Field boundary
833	Park Broom	NY43085873	Ridge & furrow
835	Scotby Holmes	NY43895753	Findspot
836	Park Broom	NY42965903	Ditch
841	Pow Maughan	NY44095676	Flint
842	Pow Maughan Bridge	NY44185628	Seal
844	Hortside	NY44195612	Trackway, lynchet
846	Hill Head House	NY44235595	Find scatter, wall
851	Scotby Shield	NY45255374	Field boundary
852	Wetheral	NY45575329	Chapel
853	Scotby Shield	NY45015420	Ditch
854	Beck Bridge	NY45755297	Hearth
855	Beck Bridge	NY45635320	Hearth
861	Oak Tree Farm	NY45805270	Charcoal spread
862	Wetheral Shield	NY46105190	Findspot
871	Wrayside	NY47175152	Charcoal spread
872	Oakville	NY47505105	Charcoal spread
873	Oakville	NY47695060	Findspot
9101	Stand End	NY47304845	Ditch
912	Tarn Wadling	NY48704458	Drained tarn
913	Tarn Wadling	NY48814440	Stone building
914	Tarn Wadling	NY48834435	Boathouse
915	Tarn Wadling	NY48784440	Find scatter
916	Blaze Fell	NY48654398	Charcoal spread
9201	Aiketgate	NY47944647	Ridge & furrow
9202	Aiketgate	NY47854705	Pit, ploughmark
921	Old Town	NY48584390	Flint
923	Old Town	NY48504370	Cropmark
924	Blackrack Beck	NY48864254	Cropmark
932	Castle Rigg	NY49814094	Boundary stone
934	Lazonby Fell	NY50134030	Settlement, trackway, boundaries
935	Whinnybank	NY50004048	Sculptured stone
936	Whinnybank	NY50004048	Stone
938	Lazonby Fell	NY50004054	Esker, trackway, ridge & furrow
939	Lazonby Fell	NY50254000	Bank
9310	Low Plains	NY49914060	Cairn

941	Tarn Plantation	NY50274000	Cairnfield, urn
943	Lazonby Fell	NY50003900	Axe
944	Lazonby Fell	NY50003900	Arrowhead
948	Tarn Plantation	NY50703900	Trackway
949	Tarn Plantation	NY50733900	Cairn
9410	Scarfoot	NY50743842	Bank, ditch
952	West Brownrigg	NY51083707	Bank, ditch
953	Burnt Wood	NY51123633	Trackway, bank, cairn
961	Fox Wood	NY51993473	Ridge & furrow
962	Bowscar	NY52203440	Ridge & furrow
981	Drovergate Plantation	NY53773183	Pond
982	Lady Plantation	NY53803138	Sheepwash
983	Hyde Park	NY53833162	Charcoal spread
991	Roundthorn Farm	NY53773108	Hollow
992	Hackmoor	NY53773098	Trackway
993	Mounteden	NY53823078	Lynchet
998	Sceugh Farm	NY45530000	Settlement
999	Brougham	NY54502965	Dyke, enclosure
9910	Carleton Hill Farm	NY54133049	Findspot
1004	Brougham	NY54602900	Roman cemetery
1005	Countess Pillar	NY54612896	Pillar
1006	Countess Pillar	NY54612896	Tombstone, alms table, altar
1008	Fremington	NY54782873	Cist
10013	Brougham	NY54652895	Find scatter
10014	Fremington	NY54752882	Settlement
10015	Fremington	NY54762866	Hearth
1011	Low Dykes	NY54562643	Ditch
1013	Railway Cottages	NY54602620	Findspot
1014	Clifton Dykes	NY54532604	Field boundary
1015	Eden Valley Railway	NY54532610	Disused railway
1018	Clifton	NY54732571	Ridge & furrow, bank
10110	Howe Carl	NY54772528	Ditch
1022	Hackthorpe	NY54932381	Field system, trackway
1025	Hackthorpe	NY55072311	Field system, bank
1026	Oaklands	NY55072287	Trackway, field boundary, bank
1027	Oaklands	NY55082271	Trackway, field boundary, platform
10210	Town Head	NY55142213	Bank, ditch, ridge & furrow
10211	Great Strickland	NY55332214	Field system, trackway
10213	Town Head	NY55202313	Lynchet
1031	Great Strickland	NY55402198	Stone building
1034	Sheriff Park	NY55602128	Field boundary, ridge & furrow
1035	Sheriff Park	NY55772104	Lynchet, ridge & furrow
1036	Thrimby Mill Plantation	NY55902082	Ridge & furrow
1037	Thrimby Mill	NY56042012	Field system, bank, ditch
10311	Thrimby	NY55542151	Field system, trackway, mound
10312	Thrimby	NY55972054	Findspot
10313	Thrimby	NY55942069	Findspot
1041	Little Strickland	NY56091981	Enclosure, ridge & furrow
1043	Little Strickland	NY56151945	Field system
1044	Capple Rigg	NY56361905	Field boundary
1045	Towcett	NY56701850	Field boundary, cairn
1046	Gunnerkeld	NY56681850	Hand axe
1047	Towcett	NY56851814	Field boundary
10411	Gunnerwell	NY56901785	Ridge & furrow
1052	High Keverigg	NY57531676	Mound
1056	High Keverigg	NY57471685	Enclosure, mound, trackway, bank
1057	High Keverigg	NY57461686	Enclosure
1058	Gunnerkeld	NY57101752	Findspot

1059	Gunnerkeld	NY57011768	Findspot
1061	Hardendale	NY57901557	Field boundary
1062	Hardendale	NY57901540	Stone building
1063	Hardendale	NY57941535	Ridge & furrow, field boundary
1064	Hardendale	NY57981507	Bank
1065	Hardendale	NY57971492	Field system
1067	Hardendale	NY57831465	Field boundary
1068	Hardendale	NY57801460	Field system, farmstead
1069	Hardendale Nab	NY57711404	Field boundary, ridge & furrow
10610	Hardendale	NY57891569	Enclosure, pit, field boundary
10611	The Nab	NY57891378	Findspot
10612	The Nab	NY57671434	Findspot
1081	Crosby Ravensworth	NY58991134	Bank
1083	Crosby Ravensworth	NY59301022	Enclosure
1084	Crosby Ravensworth	NY58711139	Enclosure
1085	Crosby Ravensworth	NY58731100	Findspot
1091	Sproatgill	NY60240807	Roman road
1092	Crosby Ravensworth	NY59700930	Findspot
1093	Crosby Ravensworth	NY59640950	Findspot
1094	Sproatgill	NY60300780	Findspot
1101	Old Tebay	NY61470594	Ridge & furrow
1112	Tebay	NY62250535	Ridge & furrow
1113	High Beck Lane	NY62300512	Hollow way
1115	Tebay	NY62220497	Field system, bank
1116	Tebay	NY62260480	Settlement
1117	Tebay	NY62230482	Field boundary
1118	Tebay	NY62240470	Field boundary
1121	Tebay	NY62060369	Ridge & furrow, bank, ditch
1122	Tebay	NY62070346	Trackway
1123	Tebay Gill	NY61900290	Bank
1131	Powsons	NY61400242	Field boundary
1132	Powsons	NY61320233	Settlement, trackway, boundaries
1133	Powsons	NY61340215	Walls, banks, trackways
1134	Powsons	NY61300193	Field boundary
1135	Powsons	NY61250161	Field boundary
1138	Low Borrowbridge	NY61260125	Bank, ditch
1139	Low Borrowbridge	NY61050100	Vicus, platform, bank, ridge & furrow
11315	Powsons	NY61450253	Field boundary, ridge & furrow
11316	Powsons	NY61320233	Findspot
11317	Low Borrowbridge	NY61170098	Findspot
11318	Low Borrowbridge	NY61130092	Roman cemetery
1142	Salterwath Bridge	NY61130056	Trackway, field boundary
1144	High Carlingill	NY61320023	Watercourse, gully
1145	High Carlingill	SD61889956	Enclosure, pit
1146	High Carlingill	NY61170050	Bank, enclosure
1151	Low Park	SD62509812	Findspot
1161	Lowgill	SD62399700	Field boundary, trackway
1162	London & NW Railway	SD61729670	Disused railway
1167	Lowgill	SD61289629	Field boundary
1183	Drybeck Moss	SD60299277	Wetland
1184	Killington New Park	SD60009200	Enclosure
1188	Killington New Park	SD59889107	Mound
1191	Old Scotch Road	SD59899070	Drove road
1192	Mutton Hall	SD59509000	Ploughmark
1208	Black Essett	SD58478877	Field boundary, enclosure
1223	Cocklet Wood	SD56088603	Lynchet, bank
1241	Hollins Farm	SD54548263	Ridge & furrow
1242	Hollins Farm	SD54348241	Lynchet, bank, trackway

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1243	Dove House Farm	SD54288210	Field boundary, ridge & furrow
1246	Dove House Farm	SD53978184	Conduit
12413	Farleton	SD53728103	Lynchets, ridge & furrow
12501	Marsden Farm	SD53618087	Limekiln, trackway
12502	Farleton	SD53518070	Limekiln, trackway
12503	Farleton	SD53508047	Field boundary, charcoal pitstead, trackway
12504	Farleton Fell	SD53658005	Charcoal pitstead, trackway
12601	Holme Park	SD53487923	Wall, enclosure
1263	Curwen Hall	SD53147815	Mound
1264	Sexton Hagg	SD53287804	Wall
1265	Clawthorpe	SD53527770	Shrunken village
1271	Burton in Kendal	SD53767699	Boundary stone
1273	Burton in Kendal	SD53587657	Field system, bank, trackway
1275	Dalton Park	SD53277576	Field system, trackway
1276	Dalton Lane	SD53347590	Boundary stone

**Lancashire**

Site no	Site name	NGR	Site type
1282	White Beck	SD52817435	Enclosure, ditch, trackway
1283	Priest Hutton	SD52677418	Ridge & furrow
1284	Priest Hutton	SD52587399	Ridge & furrow, lynchet
1287	Priest Hutton	SD52907470	Enclosure
1288	Tewitfield	SD52297342	Brick building, findspot
1293	Sander's Farm	SD52347325	Ridge & furrow
1299	Manor Farm	SD52397290	Ring bank
12910	Lancaster Canal	SD52327370	Canal
12913	Capernwray	SD52867204	Lynchet
12919	Capernwray	SD52837187	Ridge & furrow
12920	Manor Farm	SD52427285	Ridge & furrow
1302	Kellet Lane Bridge	SD52207113	Settlement
1305	Over Kellet	SD51467016	Field system, trackway, mound
1311	Over Kellet	SD51696985	Field boundary, ridge & furrow
1313	Over Kellet	SD51806973	Field system, platform
1314	Slacks Wood	SD51956954	Field boundary
1316	Kit Bill Wood	SD51986917	Stone wall, cairn
1318	Birkland Barrow	SD52106898	Ridge & furrow
13110	Birkland Barrow	SD52166882	Boundary stone
1322	Intack Farm	SD52236806	Bank, mound
1323	Green Hill Lane	SD52386763	Ridge & furrow, trackway, boundaries
1325	Green Hill Lane	SD52346761	Bellpit
1331	Scargill Woods	SD51766705	Field boundary
1341	Oakenhead Pond	SD51346552	Ridge & furrow, pond
1342	Halton Green West	SD51306540	Ridge & furrow, trackway, boundaries
1343	Little NW Railway	SD51506473	Disused railway
1347	North Park Plantation	SD51546461	Ridge & furrow
1353	Knots Wood	SD50356267	Ridge & furrow, trackway
1354	Stanley Farm	SD50176259	Ridge & furrow
1356	Lancaster Moor	SD50076246	Ridge & furrow
1361	Lancaster Moor	SD50056215	Trackway, hollow way
13701	Langthwaite Reservoir	SD49695981	Ridge & furrow, field boundary
13702	Middle Langthwaite	SD49545948	Stone building
13703	Middle Langthwaite	SD49505940	Ridge & furrow
13704	Croftlands House	SD49315887	Mound
13705	Blea Tarn	SD49255876	Dugout canoe
13706	Blea Tarn Reservoir	SD49125834	Trackway, field boundary
13707	Langthwaite Reservoir	SD49505951	Burned area
13708	Scotforth	SD49485958	Trackway
13801	Eastrigg	SD49335706	Settlement, field system, trackway
13804	Barrow Greaves	SD49404674	Ridge & furrow, findspot
13805	Higher Kit Brow	SD49435666	Ridge & furrow, field boundary
1393	Lane House	SD48385446	Trackway, hollow way
1394	Quarry Wood	SD48285437	lynchet, field boundary
1395	Quarry Wood	SD48305420	Lynchet, trackway
13910	Keepers Lodge	SD48125422	Lynchet
13912	Lancaster Canal	SD48195425	Canal
13913	Ellel Grange	SD48095420	Field system
13914	Pennine Farm	SD48805468	Field boundary
13915	Normanton House	SD48805516	Trackway
13916	Whitley Beck	SD49365550	Field boundary
13917	Quarry Wood	SD48235430	Trackway, field boundary
1401	Home Farm	SD47975415	Field system, ditch, pond, mound
1402	Flat Wood	SD47595398	Trackway, lynchet
1403	Batty Hill	SD46685319	Ridge & furrow
1406	Hill House	SD46355305	Ridge & furrow

1414	Marsh Houses	SD45855160	Cropmark
1415	River Cocker	SD45915128	Linear feature
1416	Hosty Beck	SD45975275	Find scatter
1421	Crimbles	SD45985066	Deserted medieval village
1422	Middle Crimbles	SD46035022	Field boundary, hollow way, platform
1423	Hardhead	SD46344913	Field system
1441	Garstang Railway	SD46224599	Disused railway
1445	Nateby Lodge	SD46254399	Field boundary, enclosure
1446	Nook Farm	SD46374450	Wetland
1451	Watson's Wood	SD46314360	Field boundary
1461	Hall Lane	SD46904090	Findspot
1471	St Michael's on Wyre	SD46604040	Field boundary, enclosure
1481	Plane Tree Farm	SD46573983	Field system
1482	Inskip	SD46703810	Ridge & furrow
1483	Inskip	SD46693801	Ridge & furrow, hollow way
1484	Inskip	SD46693792	Ridge & furrow
1485	Inskip	SD46683784	Ridge & furrow
1486	Layton's Farm	SD46673766	Ridge & furrow
1492	Carr House Green	SD46583740	Ridge & furrow
1493	Higham Side	SD46133676	Ridge & furrow
1501	Locking Stoops	SD45823500	Field boundary
1503	Stanley Grange	SD45703404	Field boundary, ridge & furrow
1521	Newton with Clifton	SD45263205	Ridge & furrow
1522	Newton with Clifton	SD45653076	Field system
1523	Newton with Clifton	SD45613139	Ridge & furrow, field boundary
1532	Clifton Marsh	SD45952910	Bank
1551	Hall Pool Bridge	SD46212579	Ridge & furrow
1561	West Lancs Railway	SD46042321	Disused railway
1562	Much Hoole	SD46012289	Field boundary
1563	Much Hoole	SD46022309	Field system
1564	Much Hoole	SD46032329	Field boundary
1565	Much Hoole	SD46012276	Pit
1601	Hall Green	SD47341763	Sand island, findspot
1611	Marsh Moss	SD47091535	Bog oak
1621	Bleak Hall Farm	SD46501230	Cropmark
1622	Bleak Hall Farm	SD46401190	Ditch
1631	Leeds/Liverpool Canal	SD46261090	Canal
1633	Ring O' Bells	SD46251080	Field boundary, enclosure
1651	East Lancs Railway	SD44600756	Disused railway

**Merseyside**

Site no	Site name	NGR	Site type
1751	Startham Hall	SJ52989884	Ruined building
1752	Shoots Delph	SJ51579897	Trackway
1771	Arch Lane	SJ55519886	Tunnel
1791	New Hall	SJ56709833	Moated site
1792	Haydock	SJ57429821	Disused railway
1801	Lodge Lane	SJ57969734	Roman road
1811	Haydock	SJ56809600	Disused railway
1812	Newton-le-Willows	SJ56659590	Pond
1813	Hall Farm	SJ56489578	Field boundary
1814	Hall Farm	SJ56429574	Field boundary, bank, pond
1821	Newton Common	SJ56319567	Racetrack stand
1822	Penkford Street	SJ55939505	Canal
1832	Wheatacre Farm	SJ55699258	Wall
1842	Further Mear Hey	SJ54529008	Moated site

**Cheshire**

Site no	Site name	NGR	Site type
1871	Fiddler's Ferry	SJ55608662	Waterlogged deposits
1872	St Helens Canal	SJ55848630	Canal
1881	Manchester Ship Canal	SJ55778457	Canal
1882	Bridgewater Canal	SJ57598348	Canal
1895	Daresbury Hall	SJ58208230	Wall
1901	Newton Bank	SJ57598159	Lynchet
1902	Newton Bank	SJ57578148	Find scatter
1923	Trent/Mersey Canal	SJ58047816	Canal
1928	Longacre Wood	SJ58047822	Findspot
1932	Bird's Wood	SJ56377849	Ditch, findspot
1933	Aston Lane	SJ55537888	Findspot
1942	Sutton Hall	SJ54707870	Bank, trackway, ridge & furrow
1943	Sutton Hall	SJ54507850	Ridge & furrow
1944	Sutton Hall	SJ54757870	Linear feature
1945	Beckett's Wood	SJ54657868	Pit, findspot
1951	Weaver Navigation	SJ53767876	Canal
1957	Beckett's Wood	SJ54177857	Brick kiln
1958	Beckett's Wood	SJ55037895	Findspot
1959	Sutton Bridge	SJ53407885	Cess pit
1971	Frodsham Marsh	SJ49007865	Spearhead
1981	Frodsham Score	SJ48457825	Findspot
1994	Holme Farm	SJ45727727	Platform
1995	Ince Marshes	SJ46007735	Axe



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APPENDIX 2 -  
SITE LOCATION PLANS

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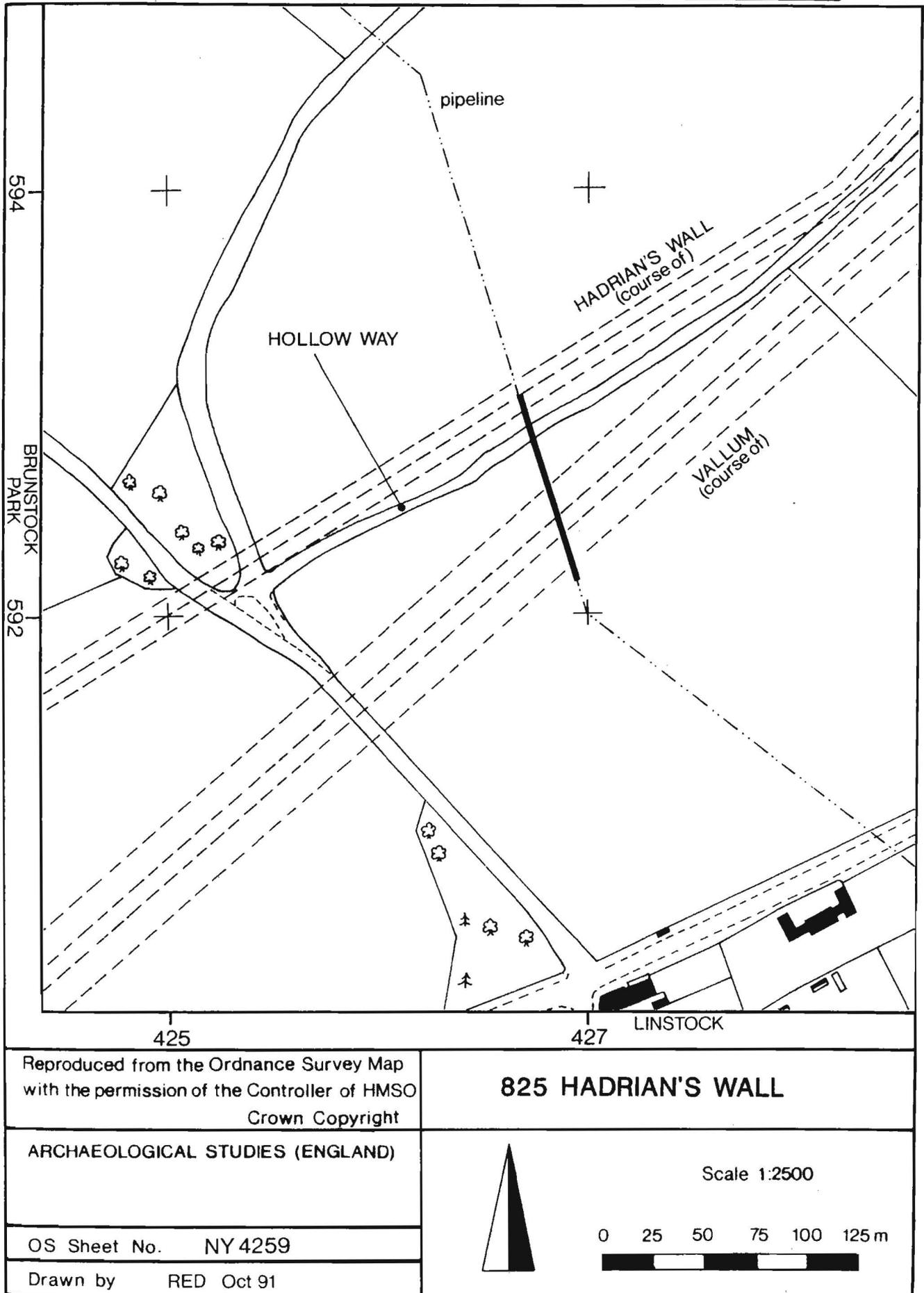


Fig 1 Hadrian's Wall, 825, excavation, 1991

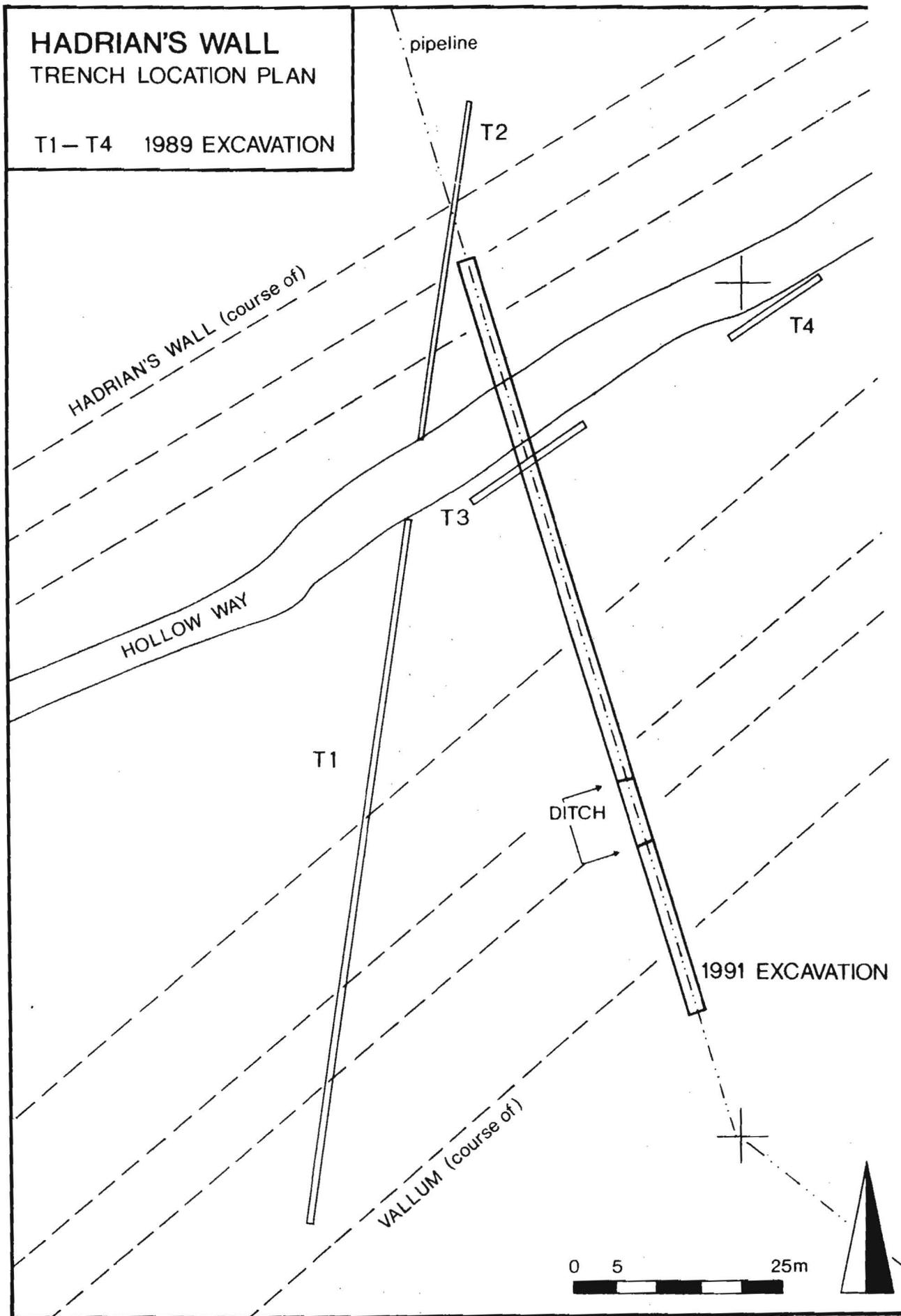


Fig 2 Hadrian's Wall, 825, trenches, 1989,1991

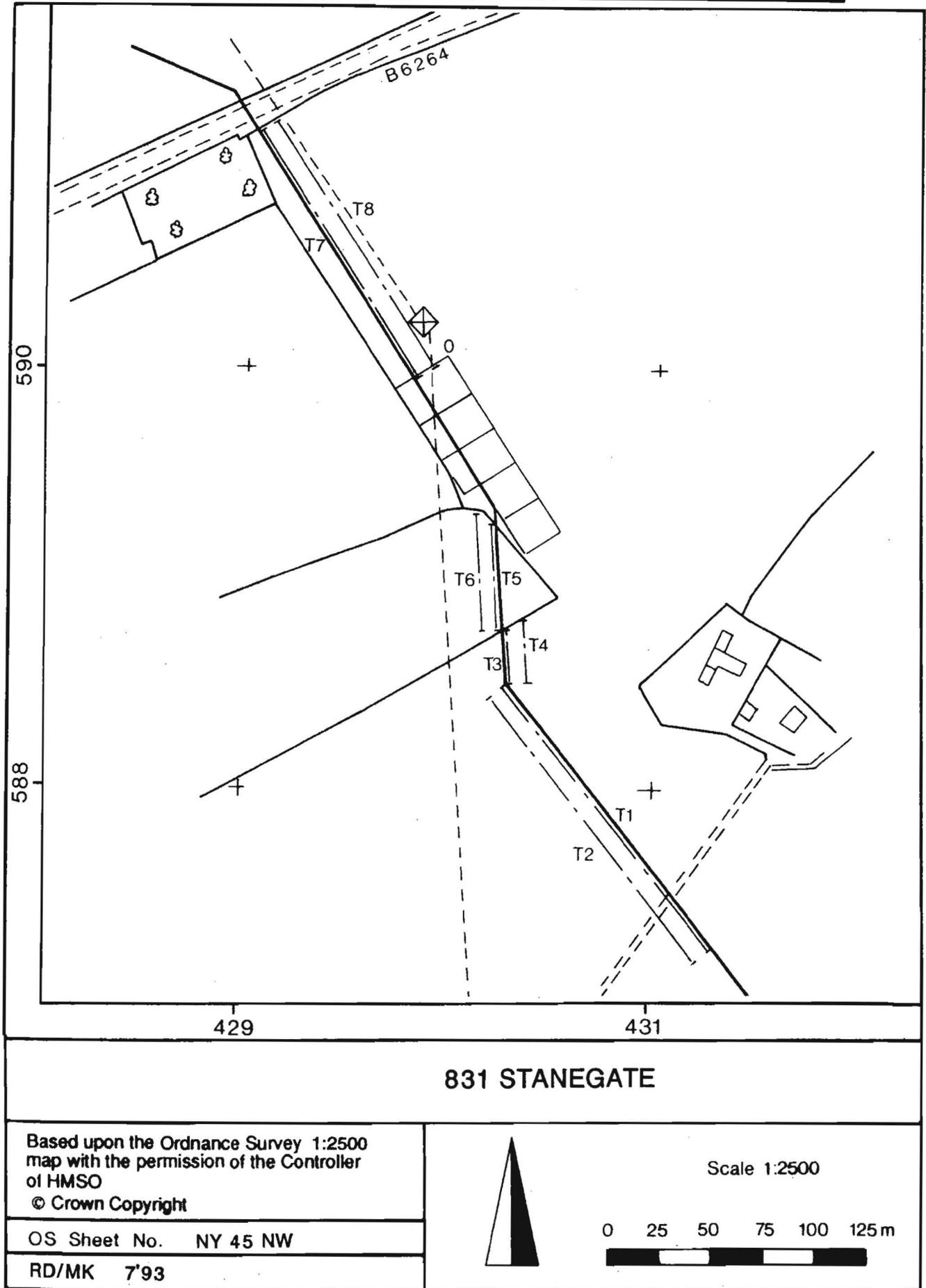


Fig 3 Stanegate, 831, geophysical survey, 1990

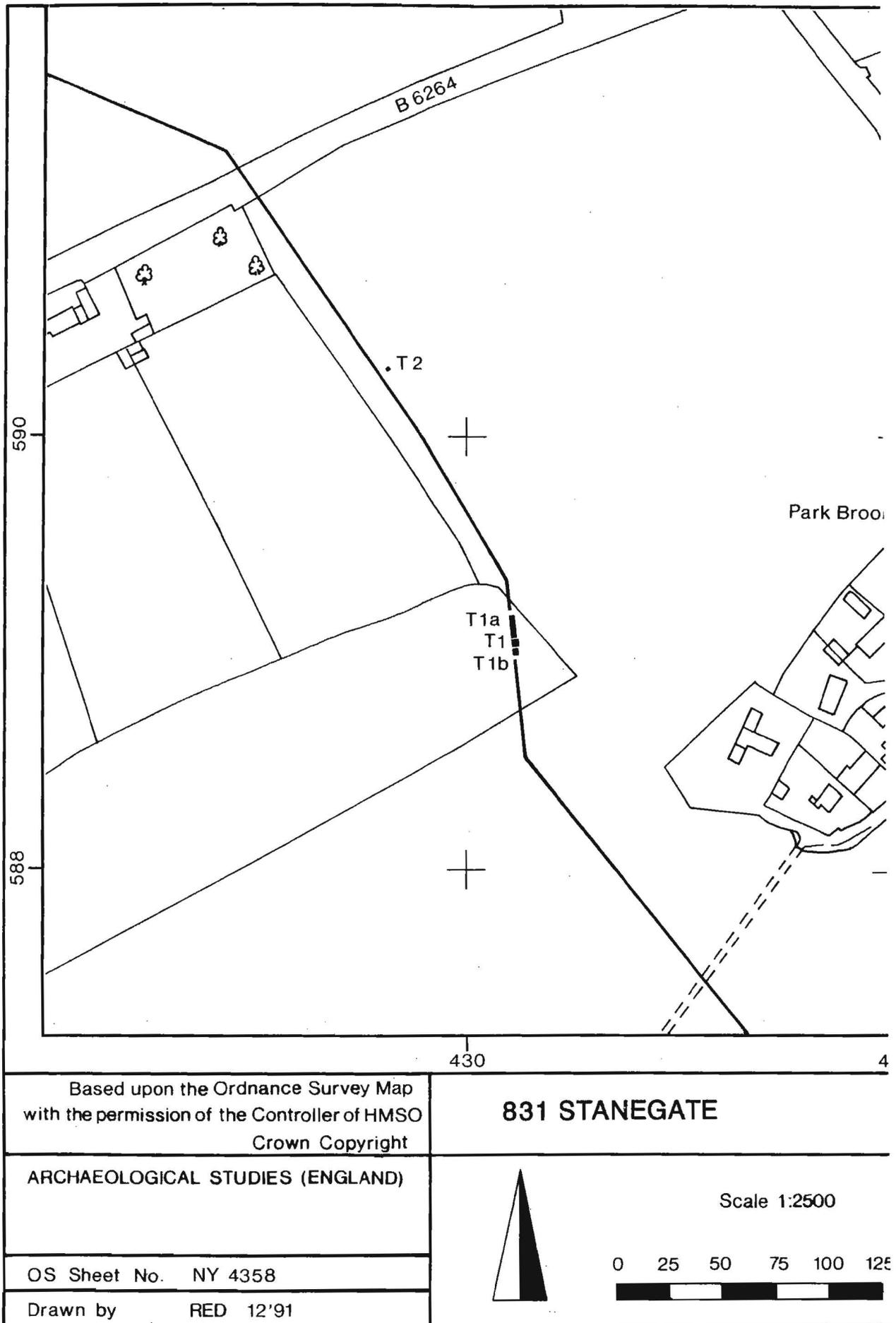


Fig 4 Stanegate, 831, trenches, 1991

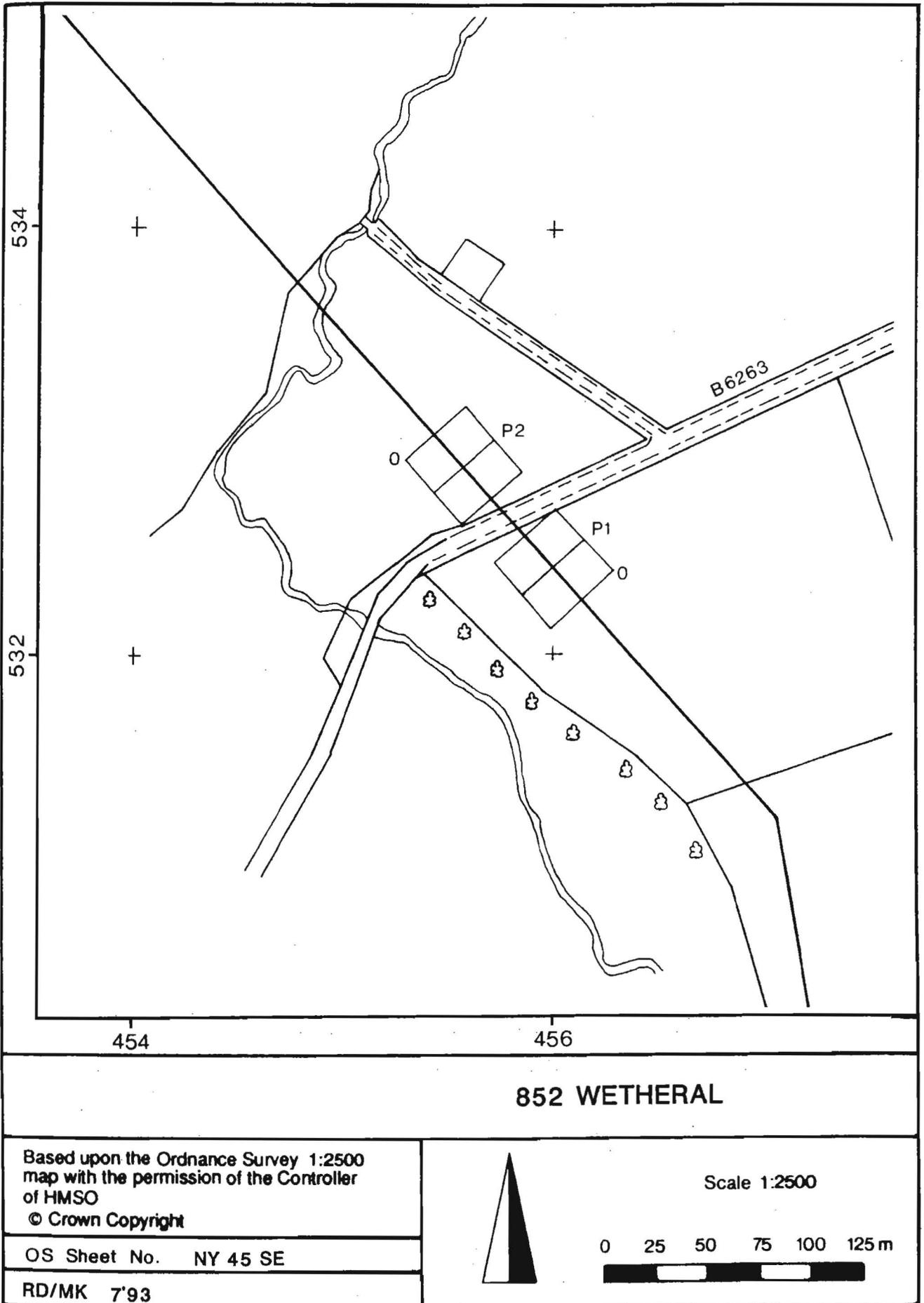


Fig 5 Wetheral, 852, geophysical survey, 1990

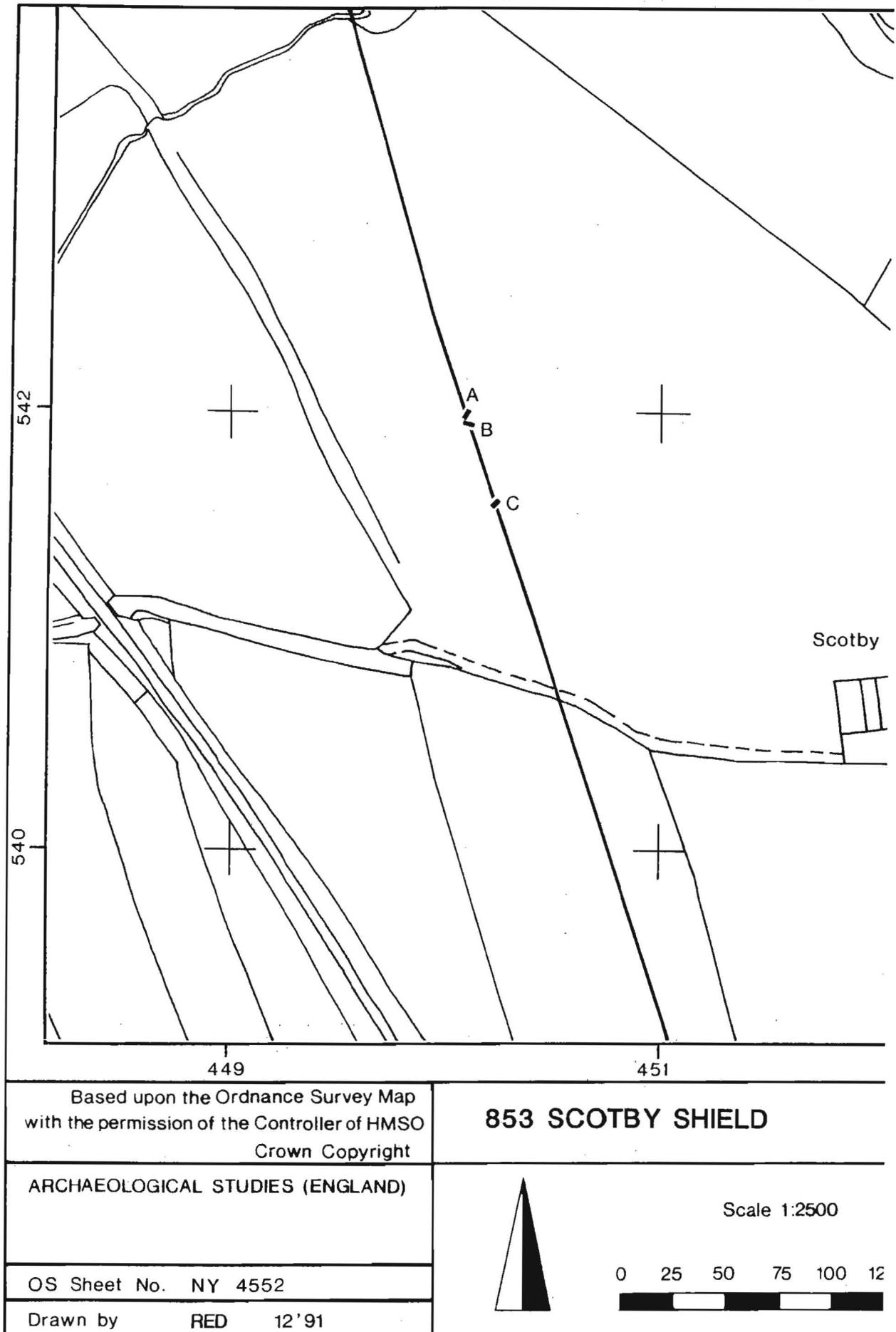


Fig 6 Scotby Shield, 853, trenches, 1991

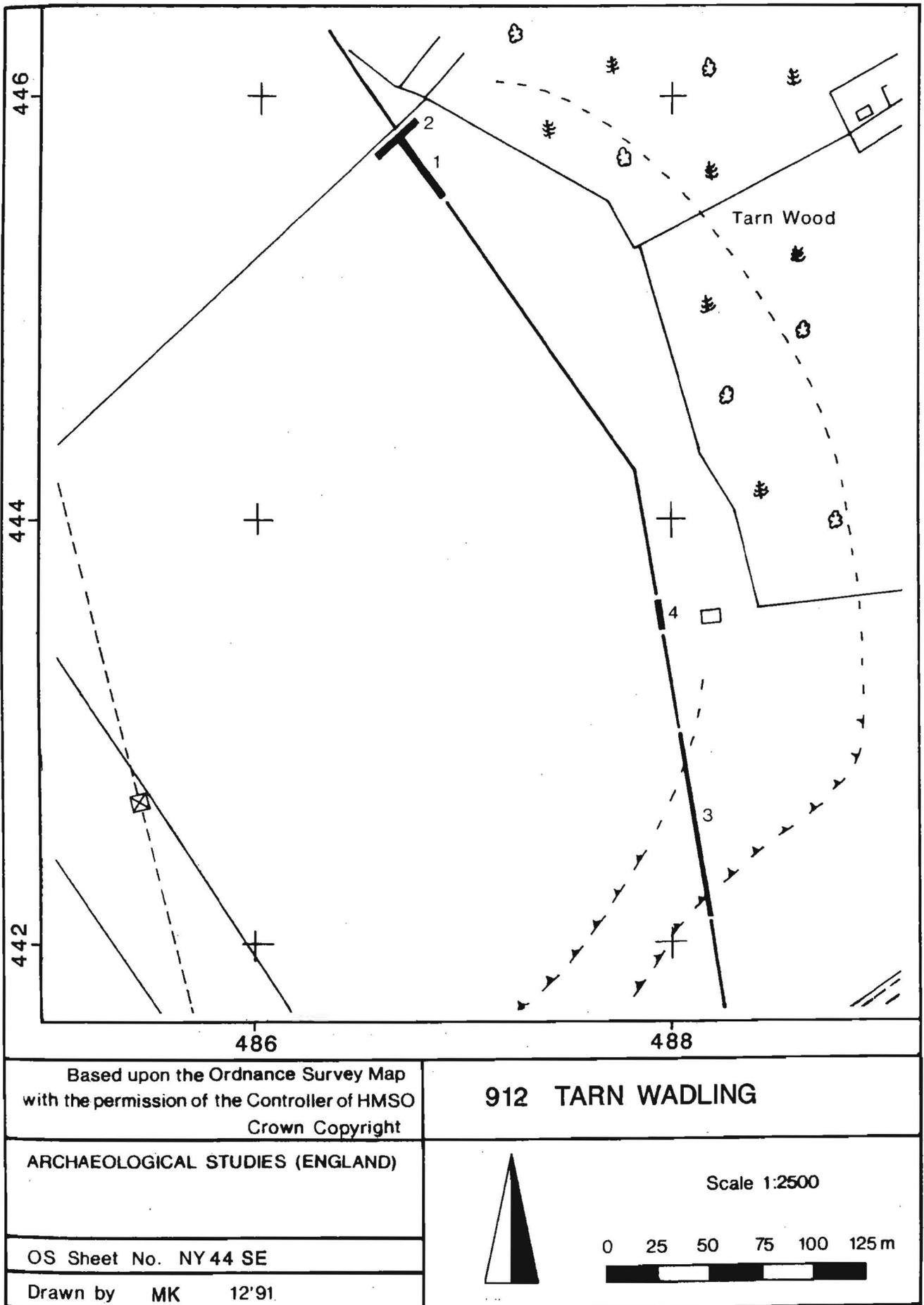
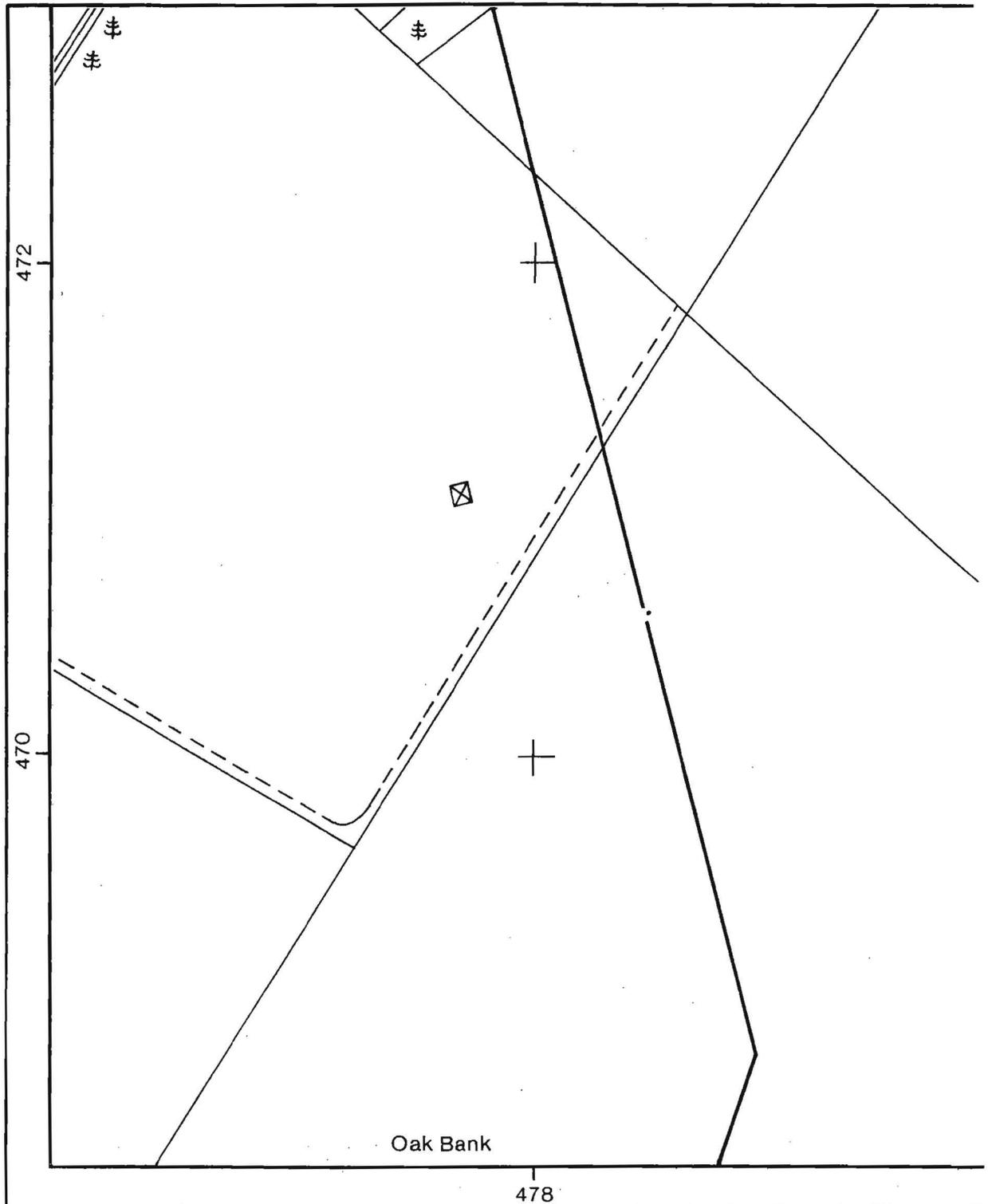


Fig 7 Tarn Wadling, 912, trial trenches, 1990



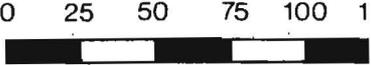
<p>Based upon the Ordnance Survey Map with the permission of the Controller of HMSO Crown Copyright</p>	<p><b>9202 AIKETGATE</b></p>
<p>ARCHAEOLOGICAL STUDIES (ENGLAND)</p>	<p>Scale 1:2500</p>
<p>OS Sheet No. NY 4747</p>	 
<p>Drawn by RED 12'91</p>	

Fig 8 Aiketgate, 9202, trench, 1991

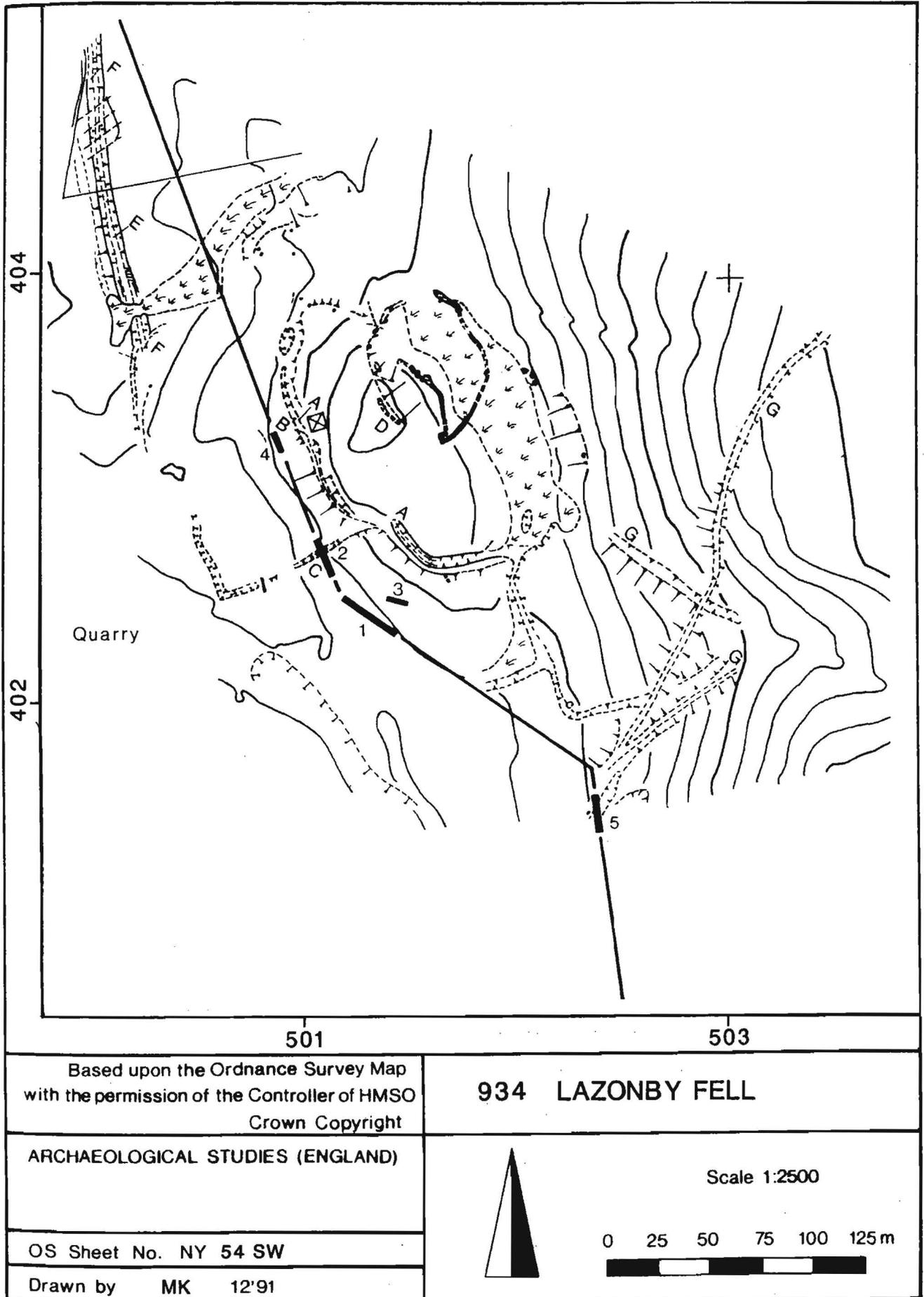


Fig 9 Lazonby Fell, 934, trial trenches, topographical survey, 1990

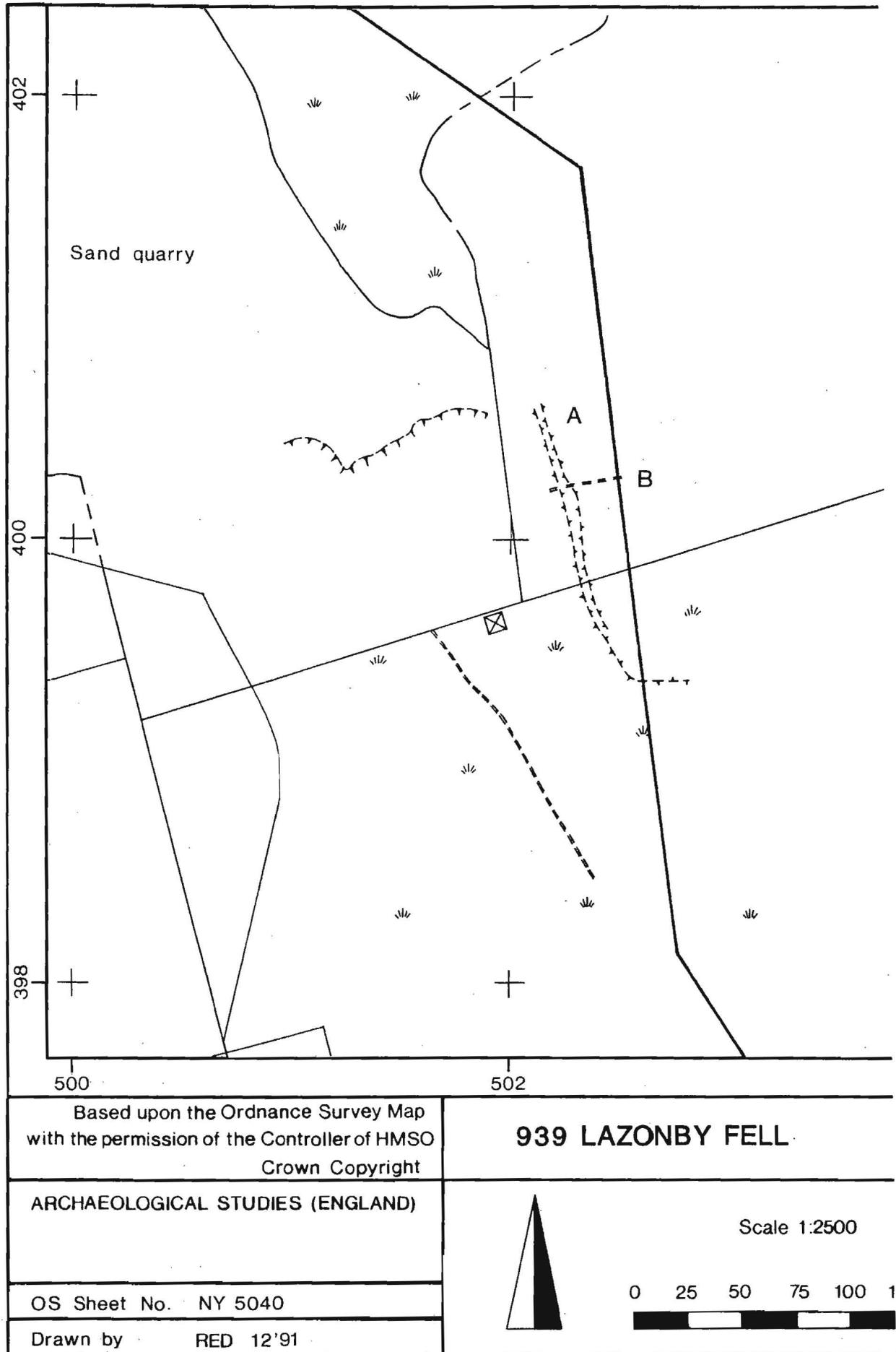
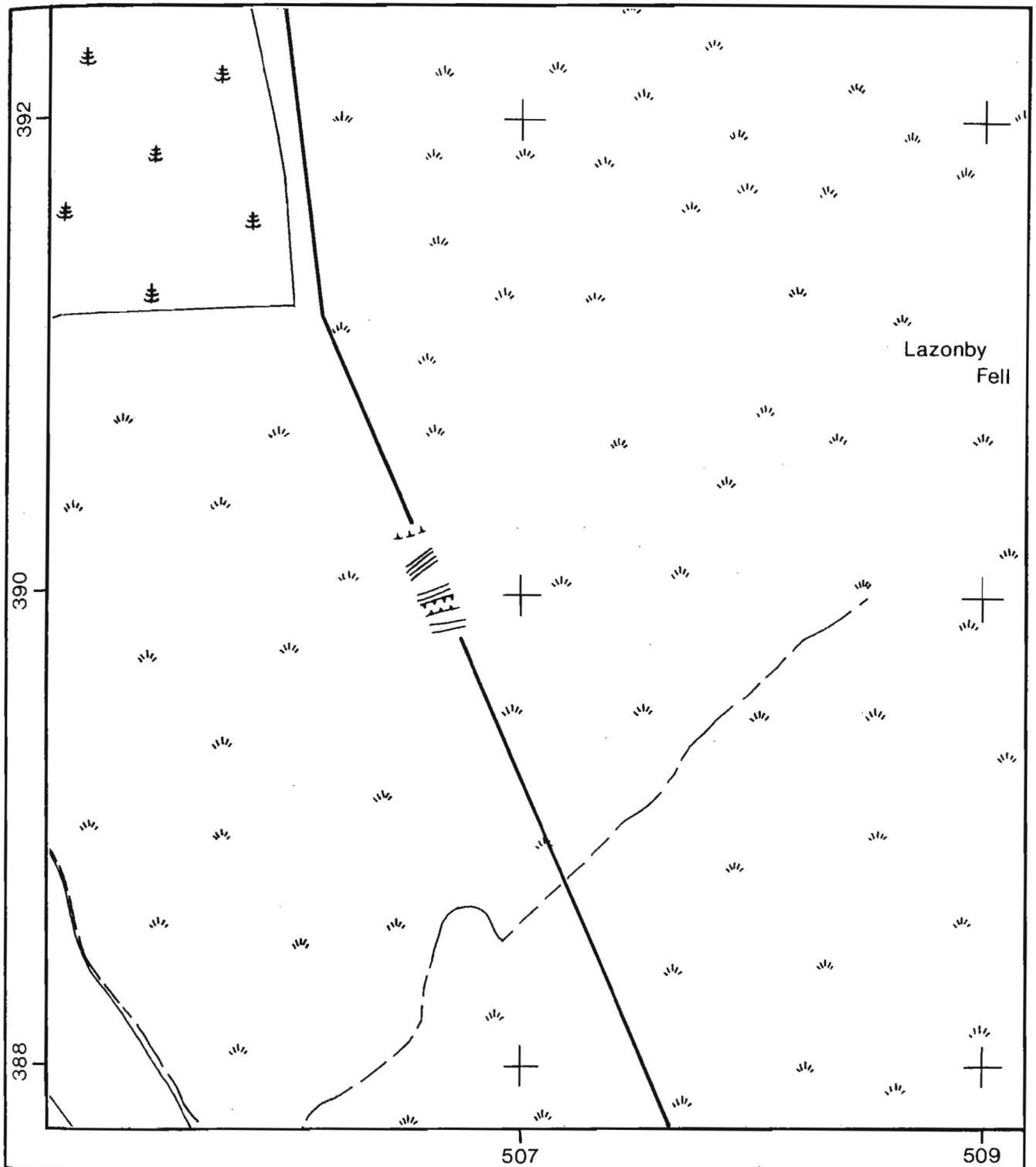


Fig 10 Lazonby Fell, 939, topographical survey, 1991



<p>Based upon the Ordnance Survey Map with the permission of the Controller of HMSO Crown Copyright</p>	<p><b>948 TARN PLANTATION</b></p>
<p>ARCHAEOLOGICAL STUDIES (ENGLAND)</p>	<p>Scale 1:2500</p>
<p>OS Sheet No. NY 5039</p>	<p>0 25 50 75 100 125 m</p>
<p>Drawn by RED 12'91</p>	

Fig 11 Tarn Plantation, 948, topographical survey, 1990

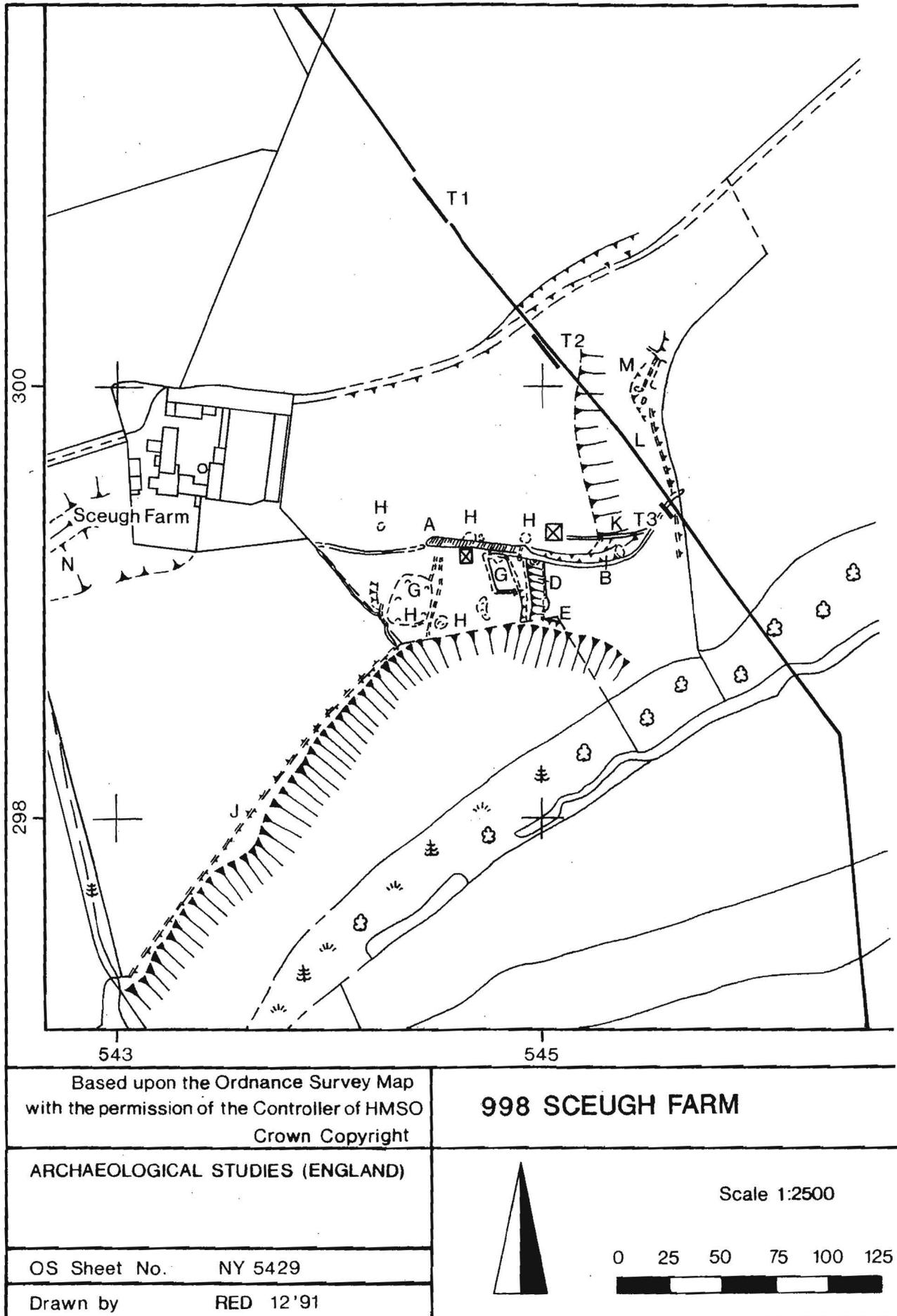


Fig 12 Sceugh Farm, 998, topographical survey, 1990; trial trenches, 1991

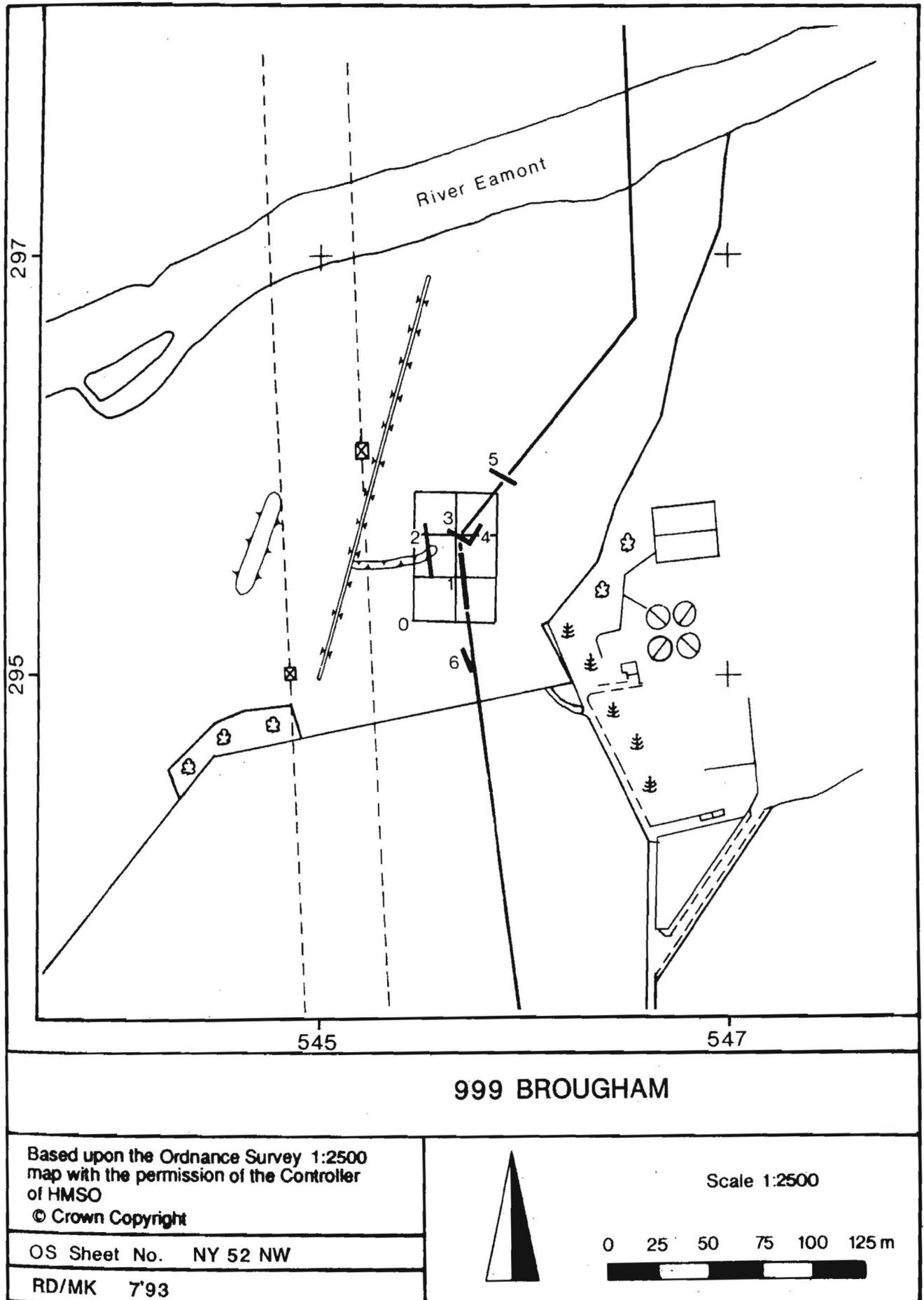


Fig 13 Brougham, 999, geophysical survey, 1990

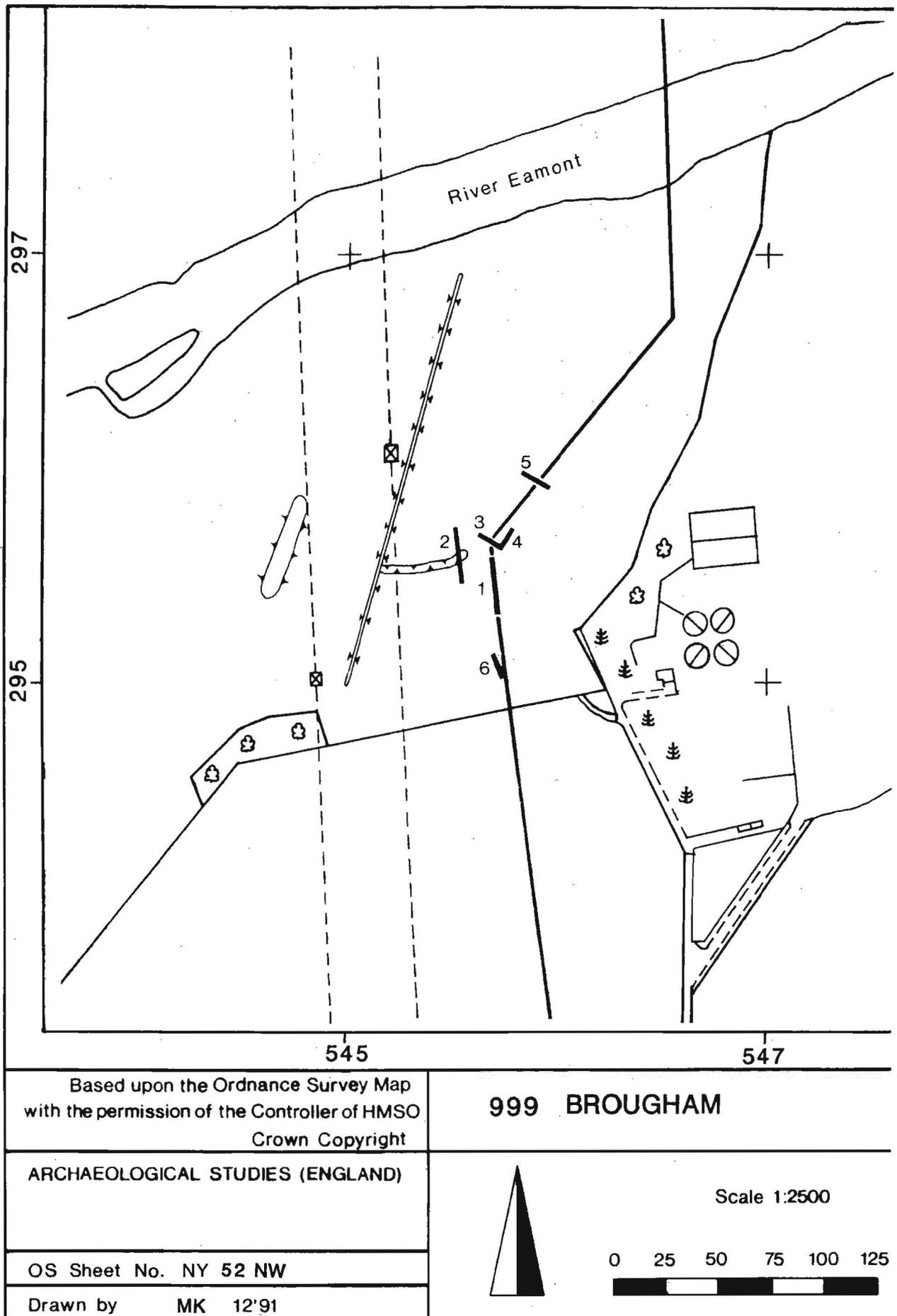


Fig 14 Brougham, 999, trial trenches, 1990

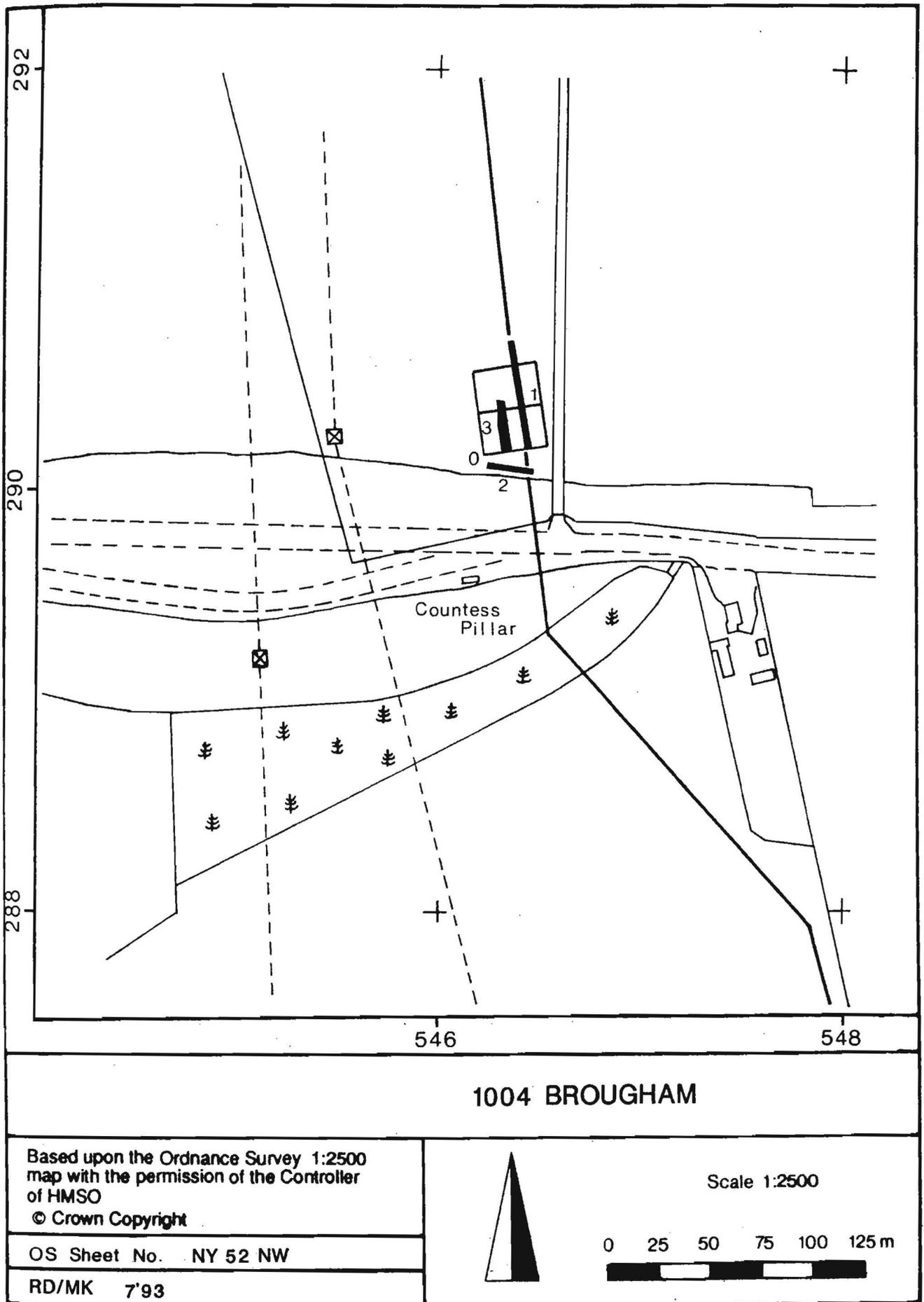


Fig 15 Brougham, 1004, geophysical survey, 1990

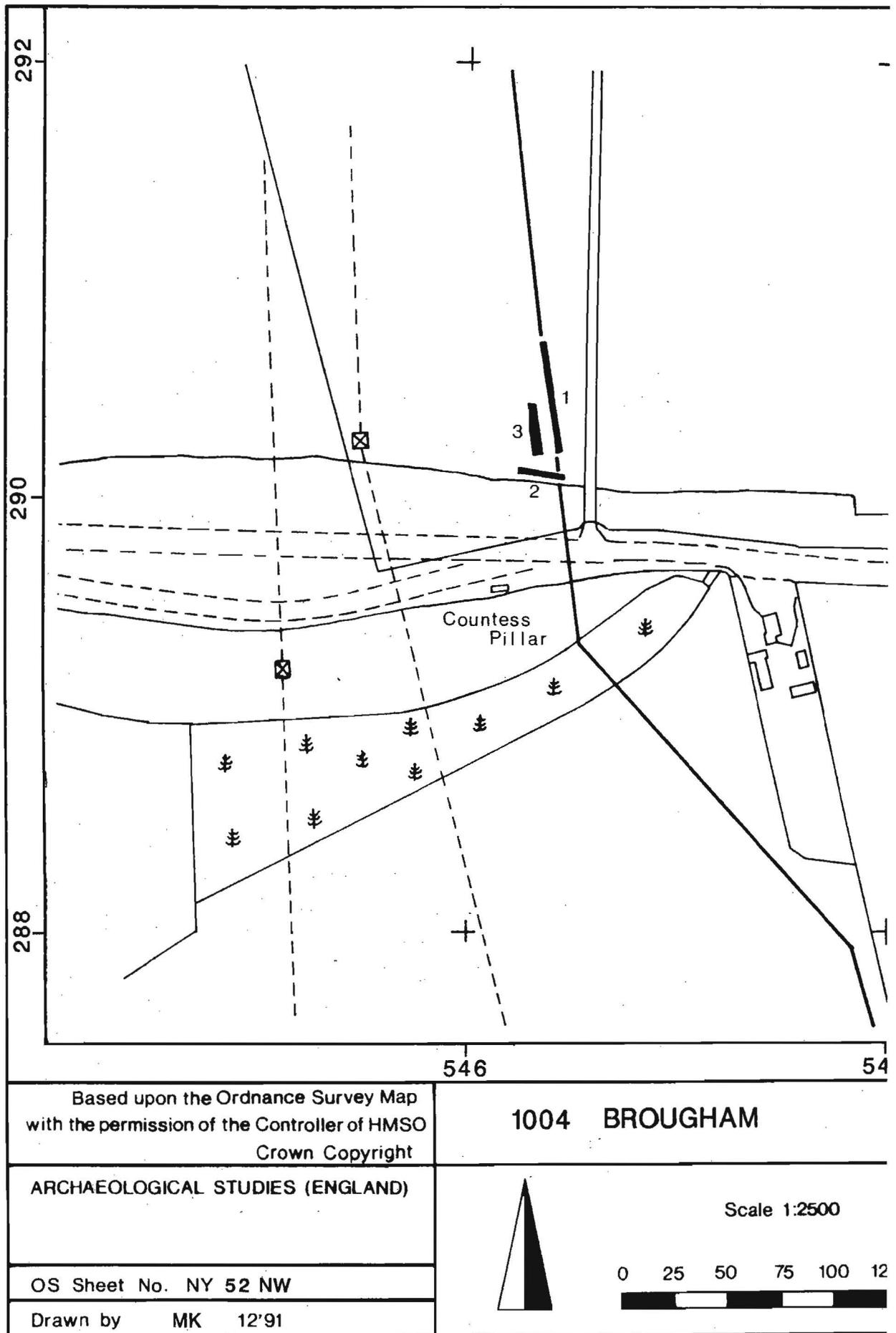


Fig 16 Brougham, 1004, trial trenches, 1990

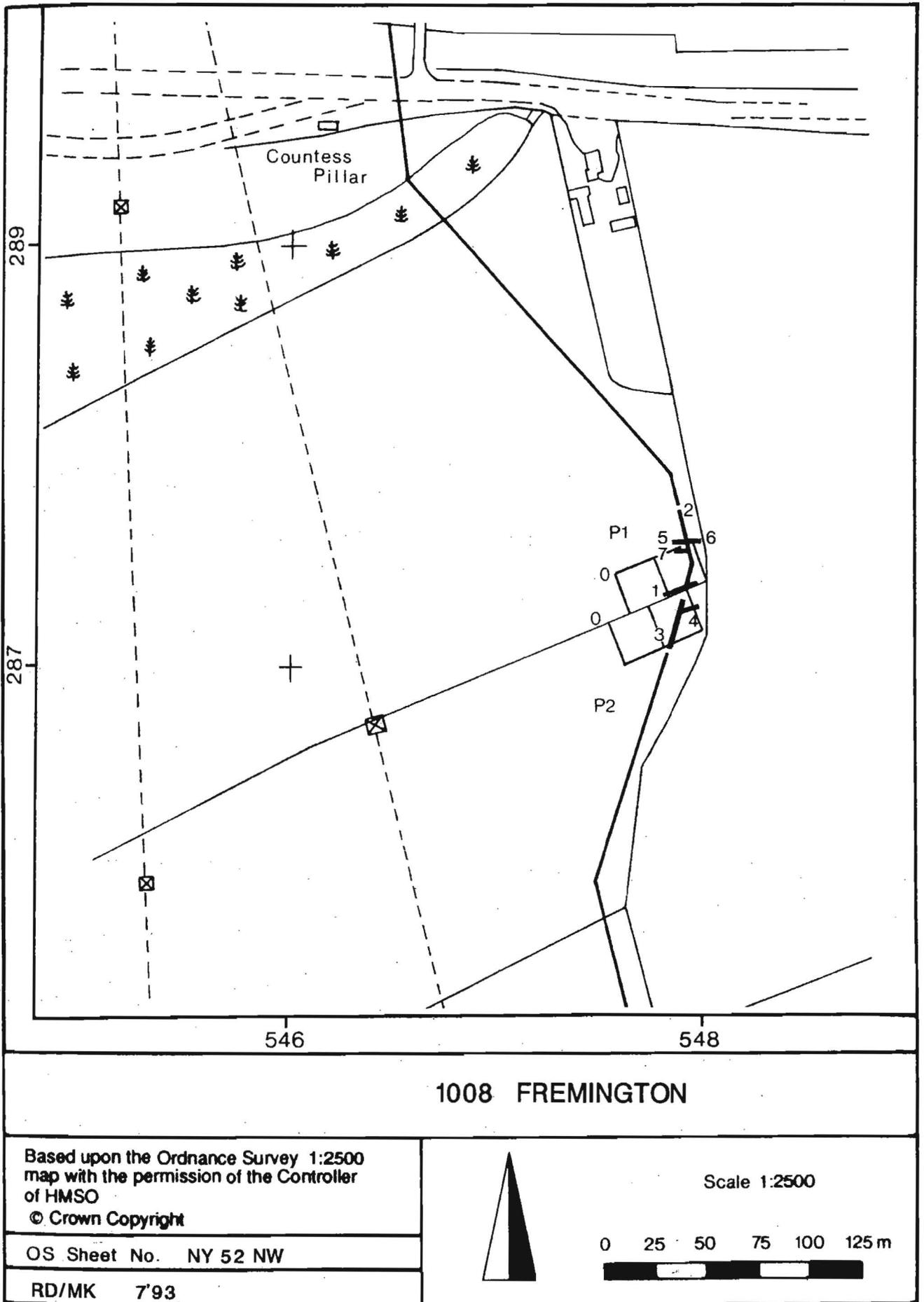


Fig 17 Fremington, 1008, geophysical survey, trial trenches, 1990

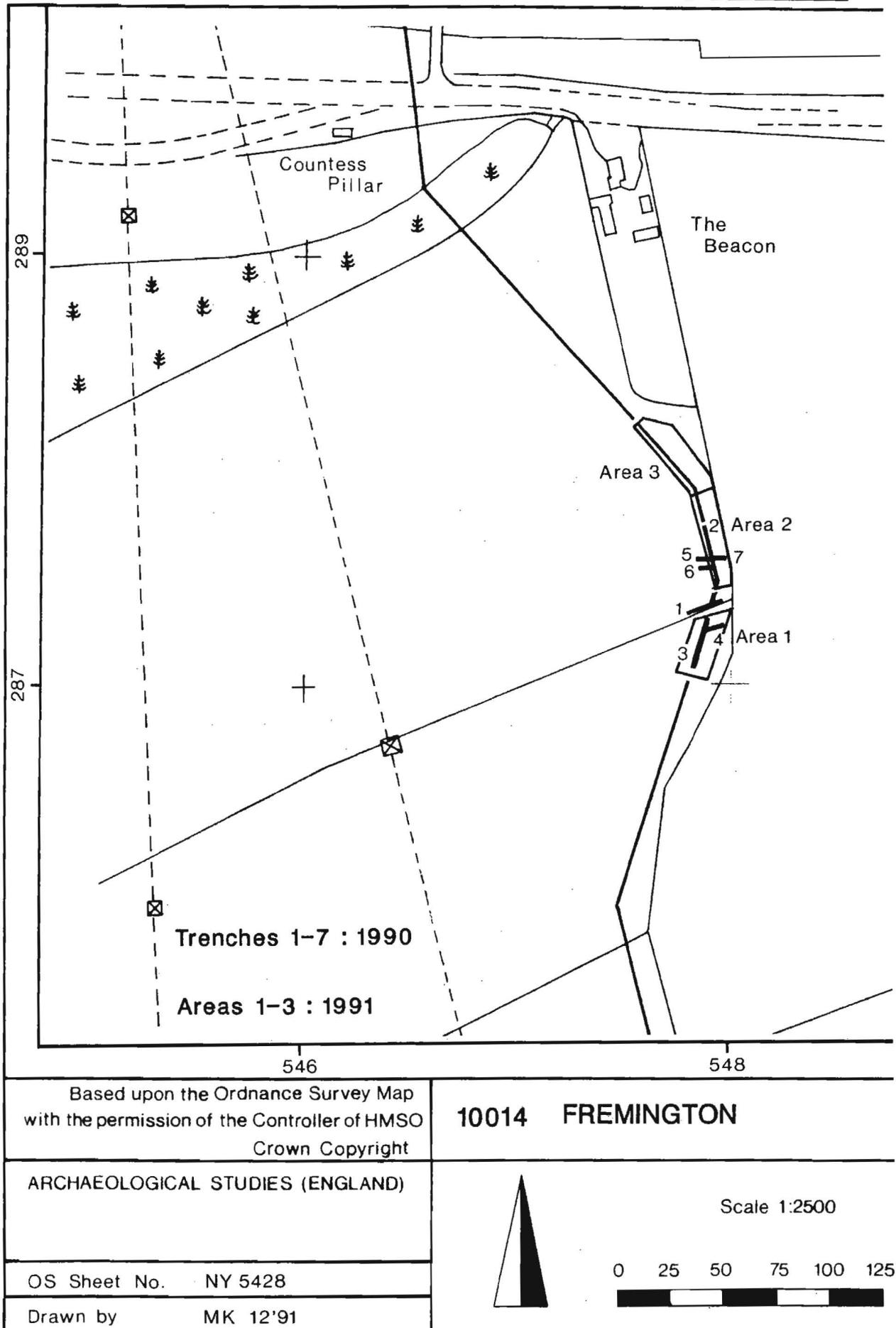


Fig 18 Fremington, 10014, excavations, 1990,1991

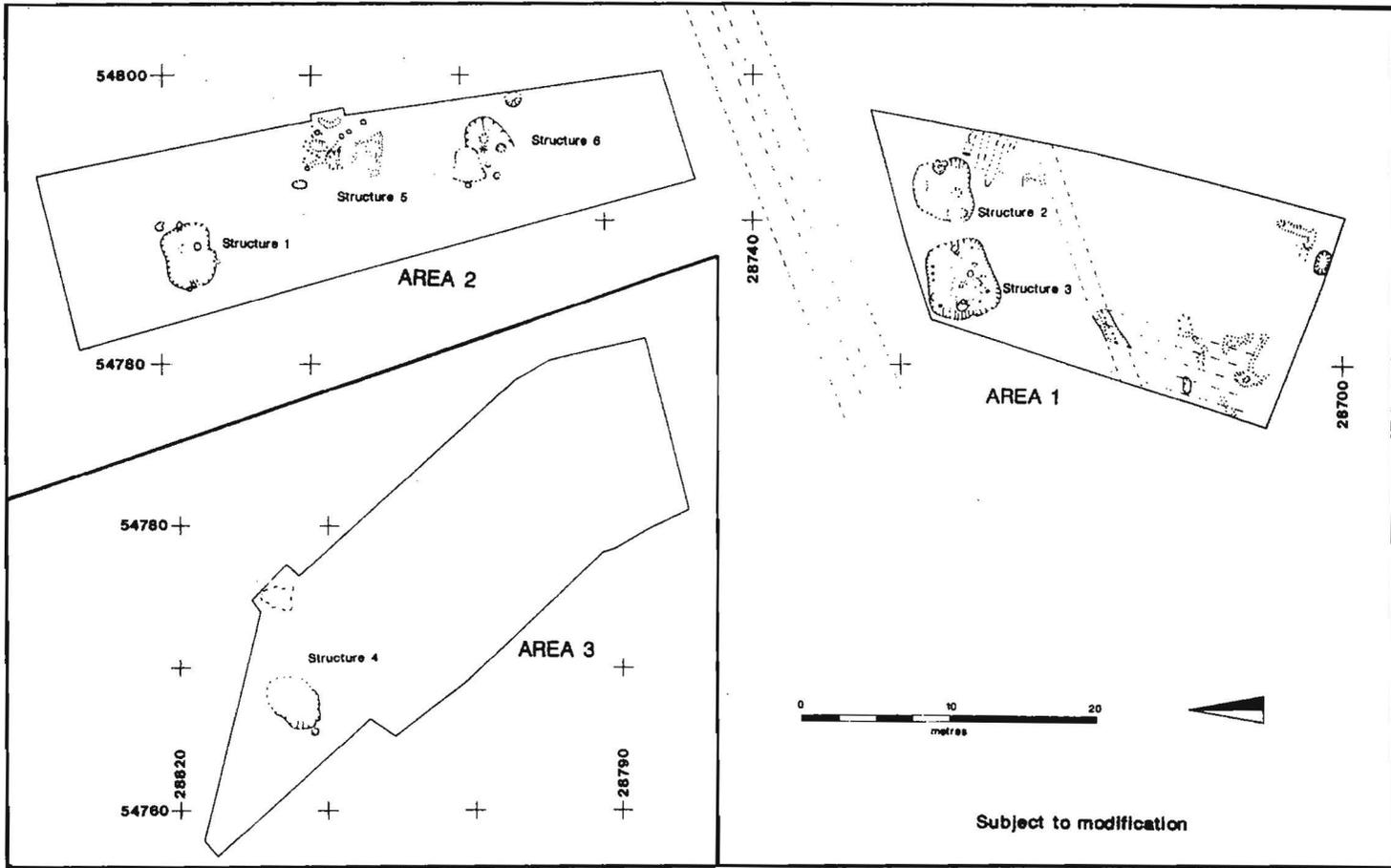
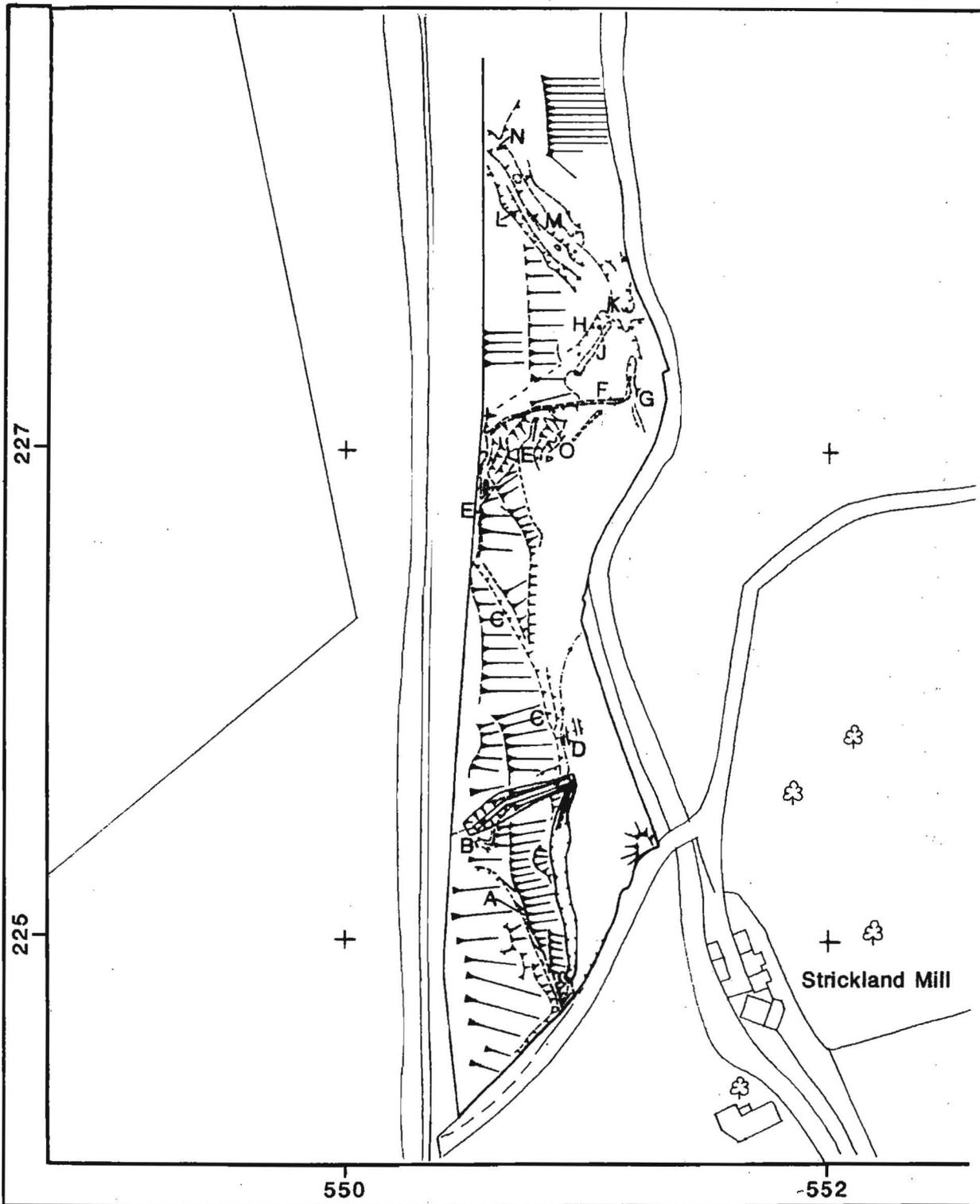


Fig 19 Fremington, 10014, excavation areas, 1991



1026 & 1027 OAKLANDS

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OS Sheet No. NY 5522

RED 7'93

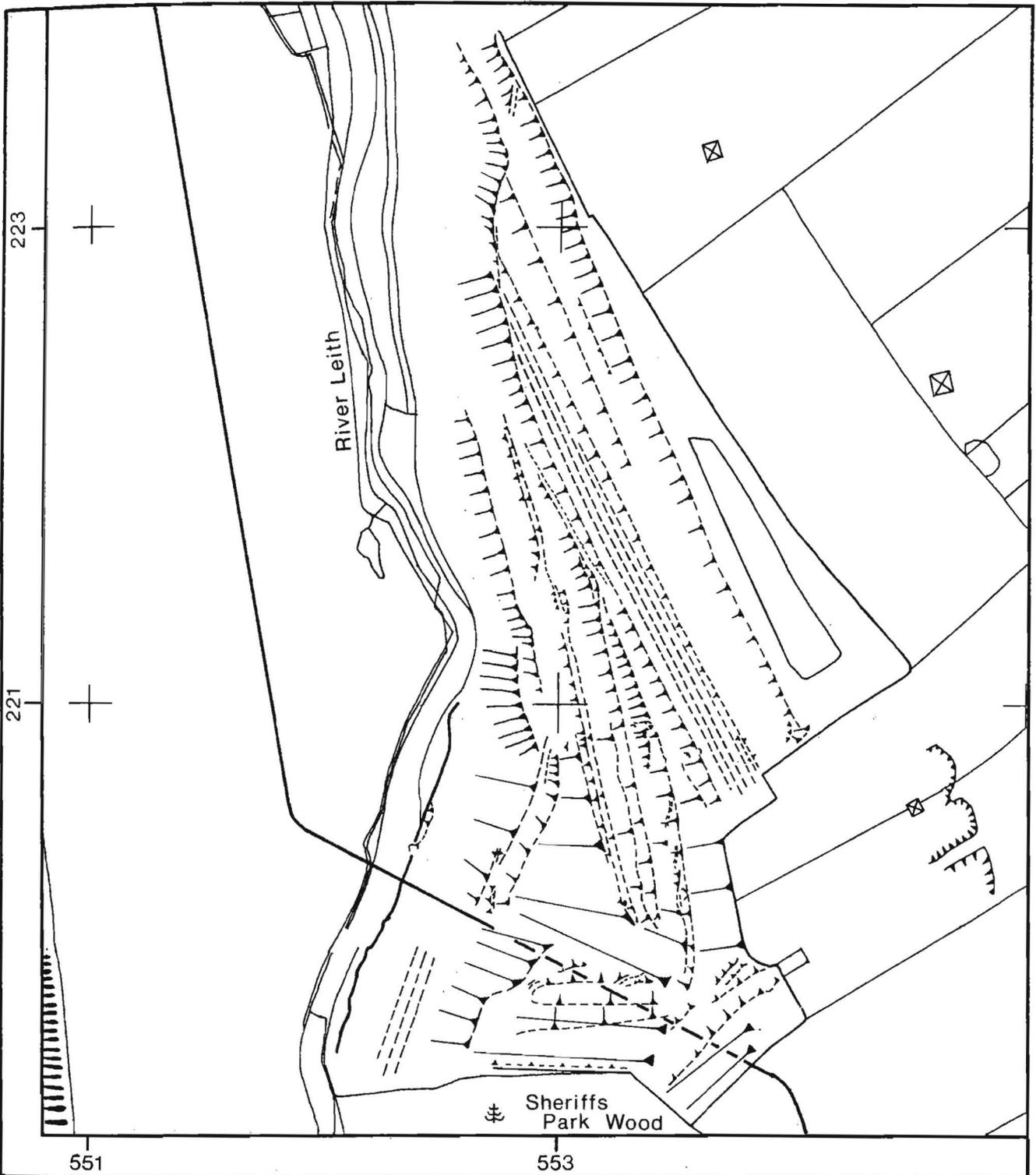


Scale 1:2500

0 25 50 75 100



Fig 20 Oaklands, 1026 and 1027, topographical survey, 1990



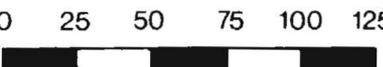
Based upon the Ordnance Survey Map with the permission of the Controller of HMSO Crown Copyright	<b>10211 GREAT STRICKLAND</b>
ARCHAEOLOGICAL STUDIES (ENGLAND)	 Scale 1:2500 
OS Sheet No. NY 5522	
Drawn by RED 12'91	

Fig 21 Great Strickland, 10211, topographical survey, 1991



10311 THRIMBY

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OS Sheet No. NY 5620

RED 7'93



Scale 1:2500

0 25 50 75 100



Fig 22 Thrimby, 10311, topographical survey, 1990

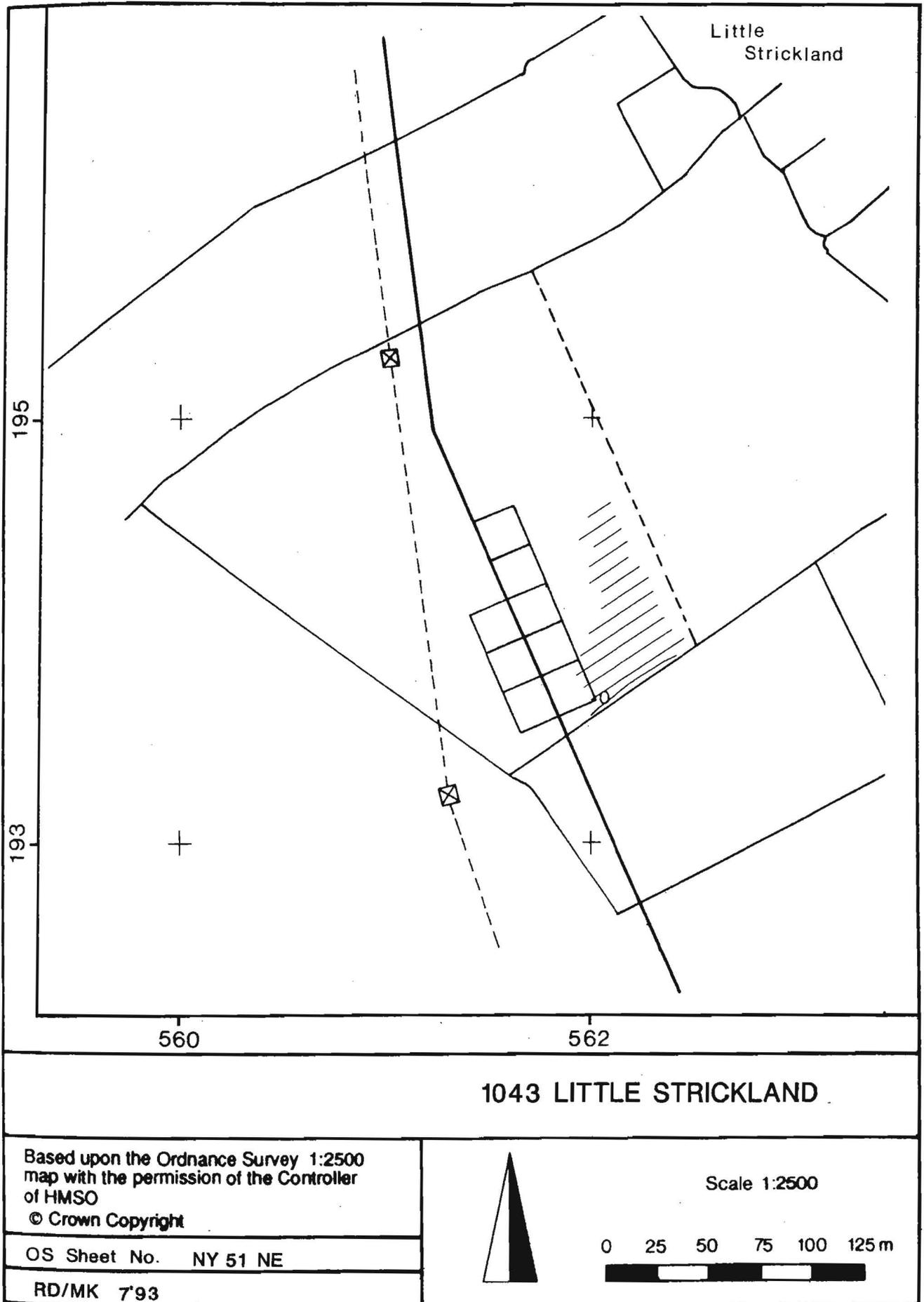


Fig 23 Little Strickland, 1043, geophysical survey, 1990

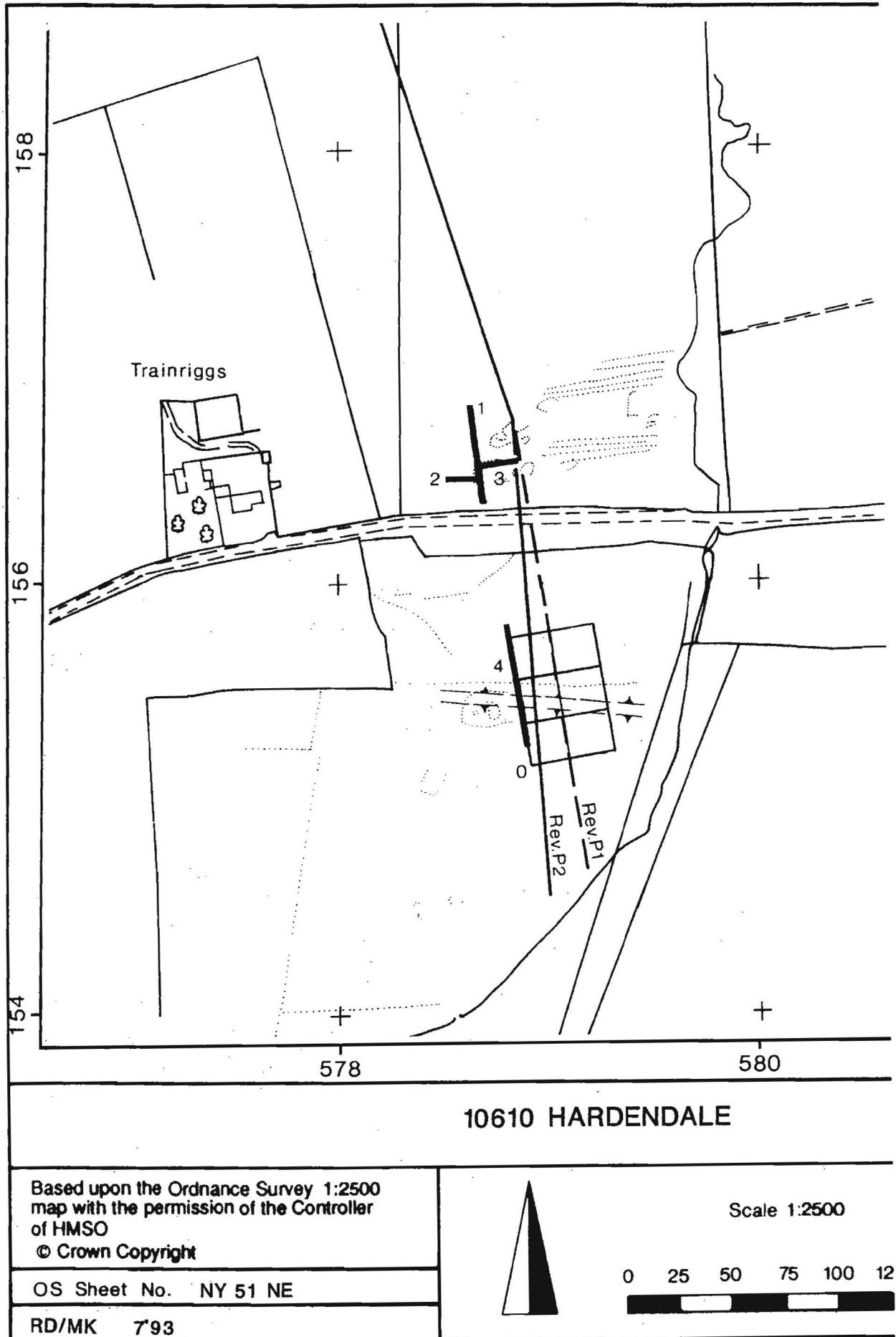
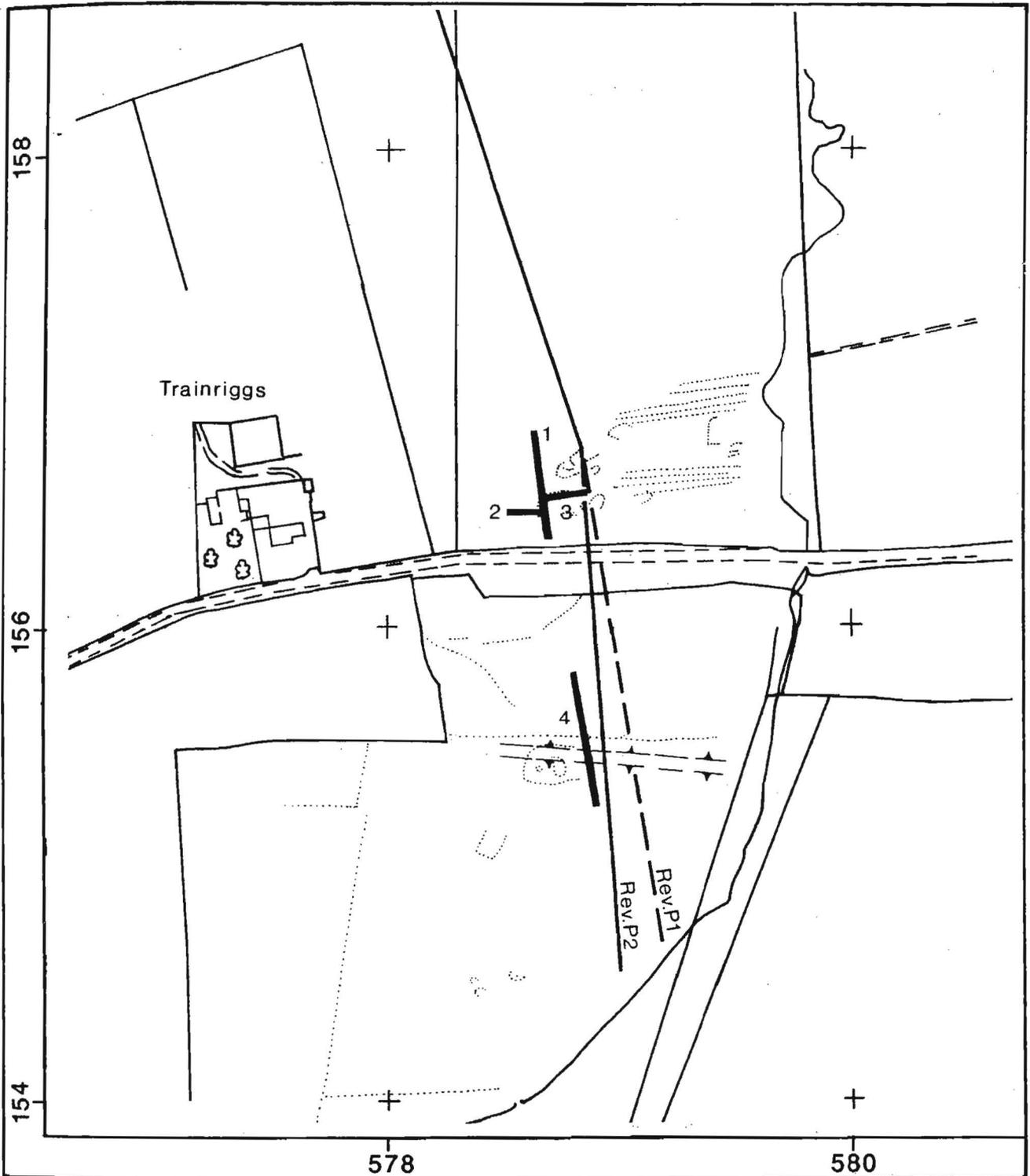


Fig 24 Hardendale, 10610, geophysical survey, trial trenches, 1990



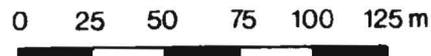
<p>Based upon the Ordnance Survey Map with the permission of the Controller of HMSO Crown Copyright</p>	<p>10610 HARDENDALE</p>
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<p>Drawn by MK 12'91</p>	

Fig 25 Hardendale, 10610, aerial survey, trial trenches, 1990

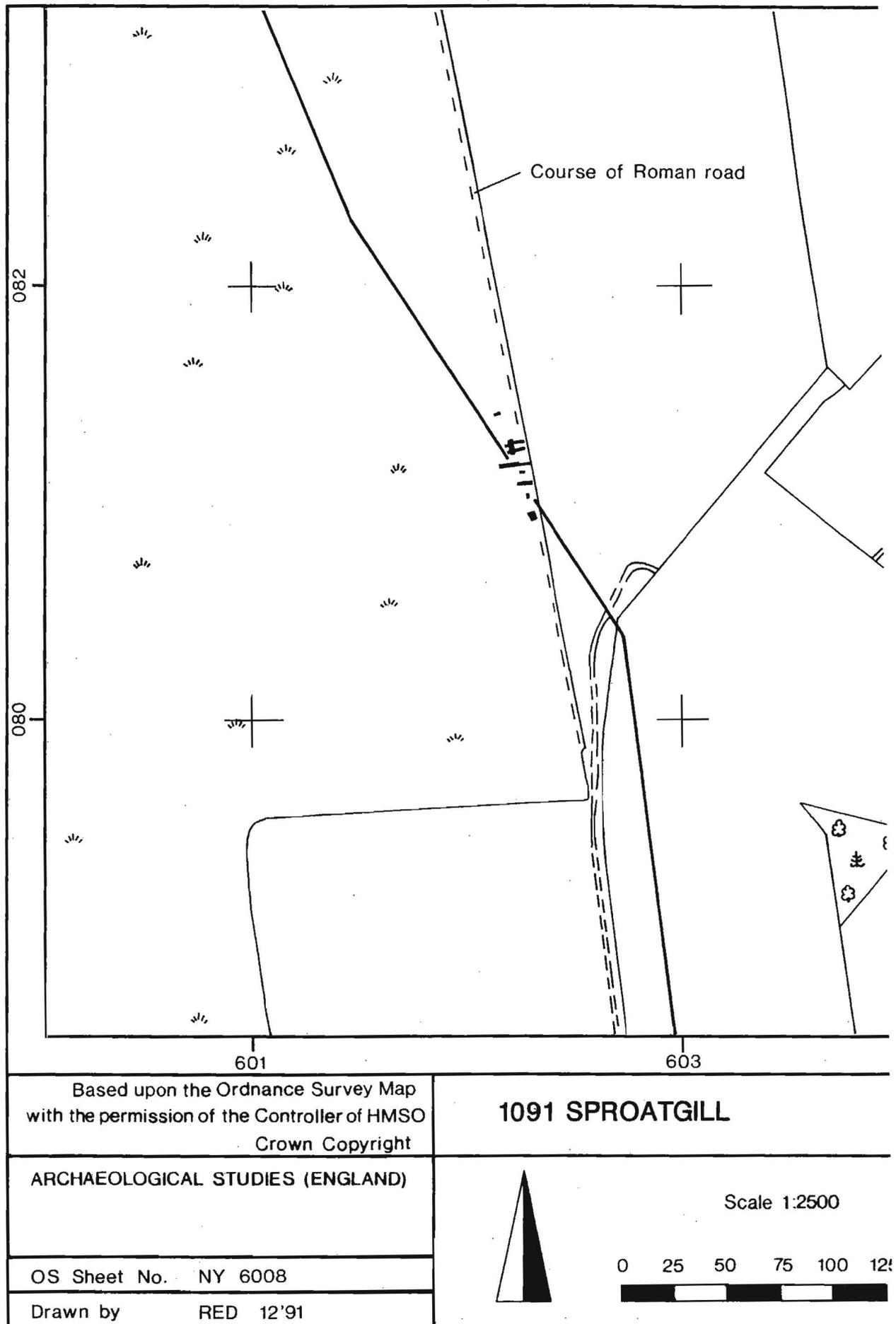


Fig 26 Sproatgill, 1091, excavation 1991

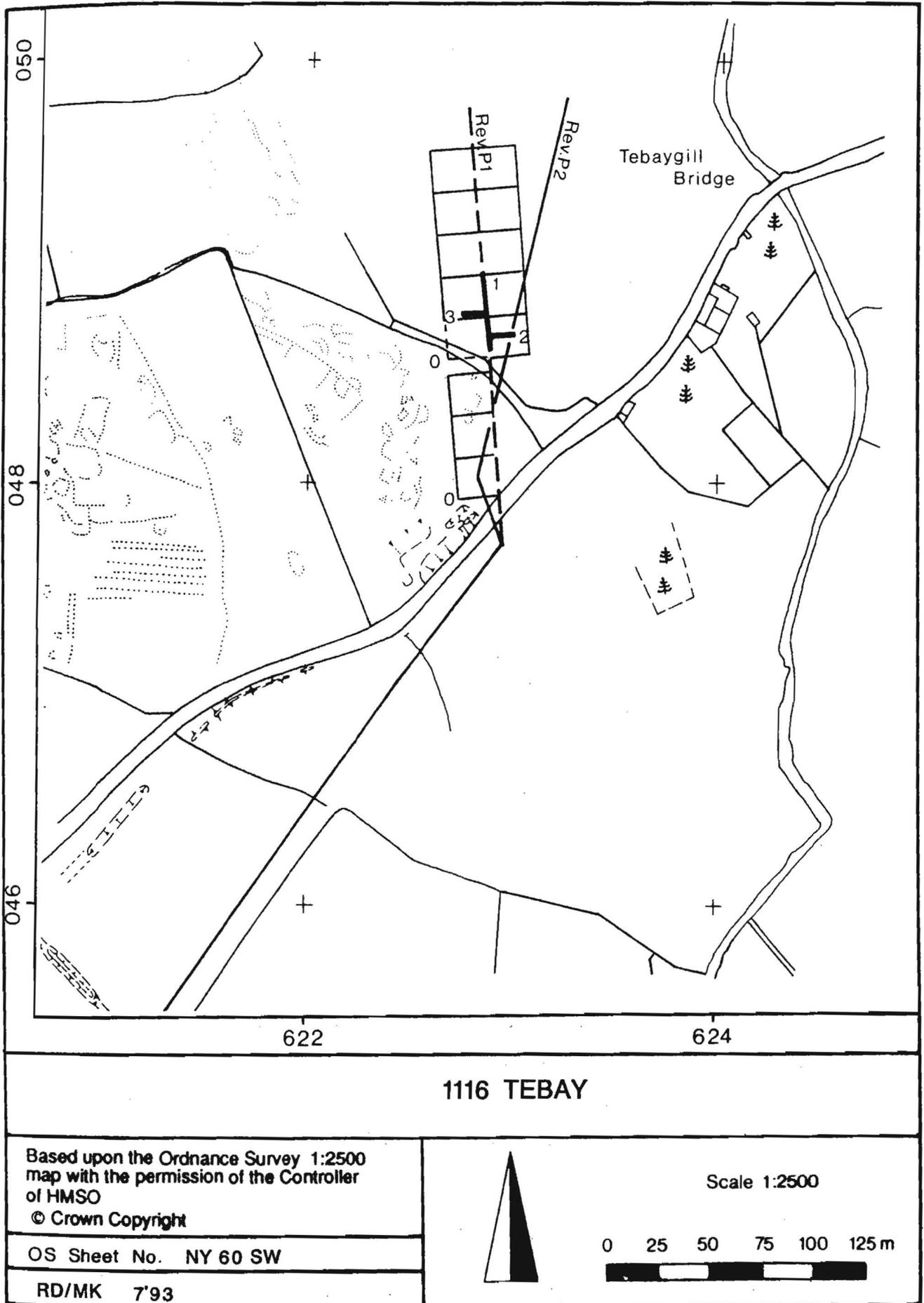


Fig 27 Tebay, 1116, geophysical survey, 1990

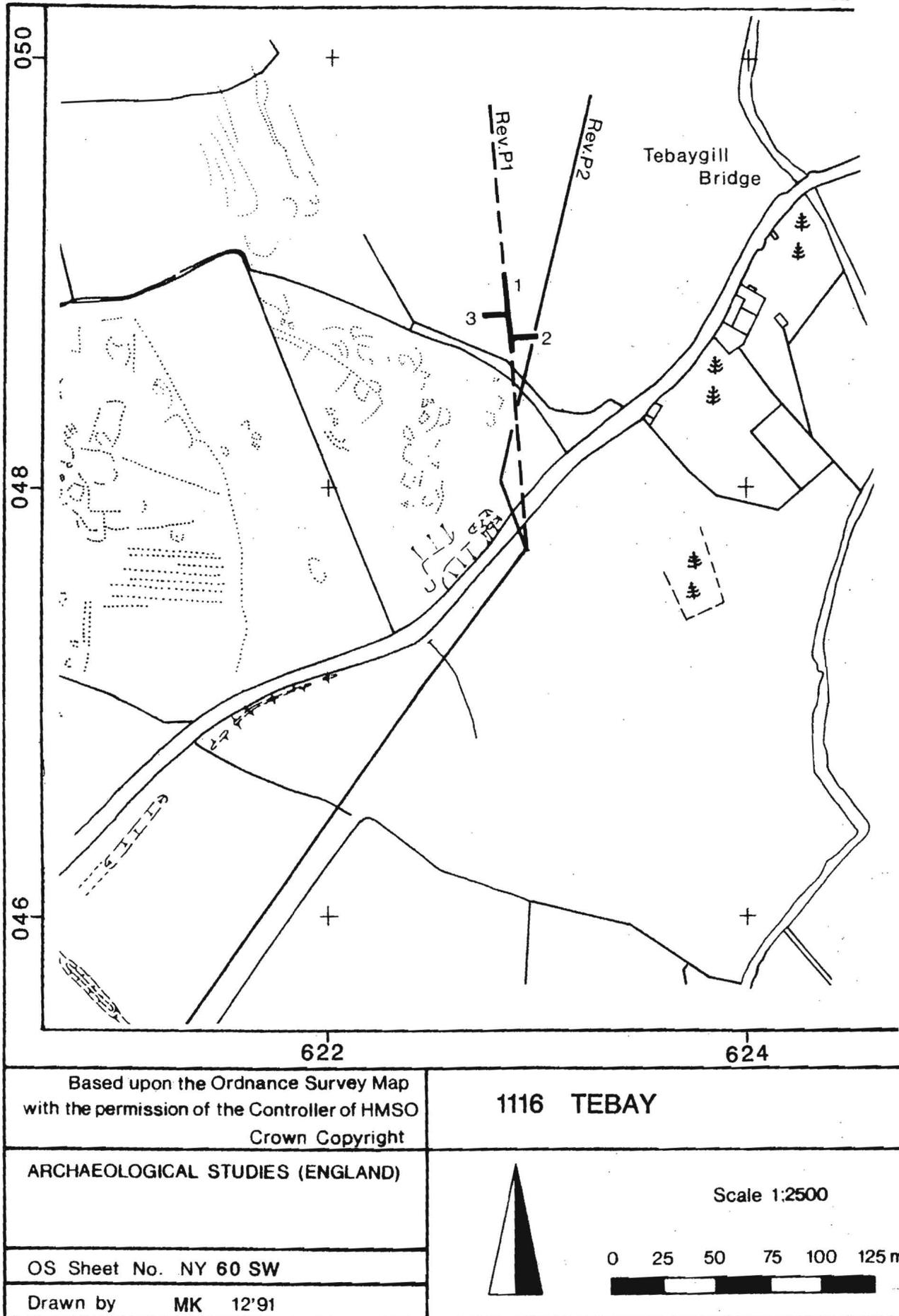


Fig 28 Tebay, 1116, aerial survey, trial trenches, 1990

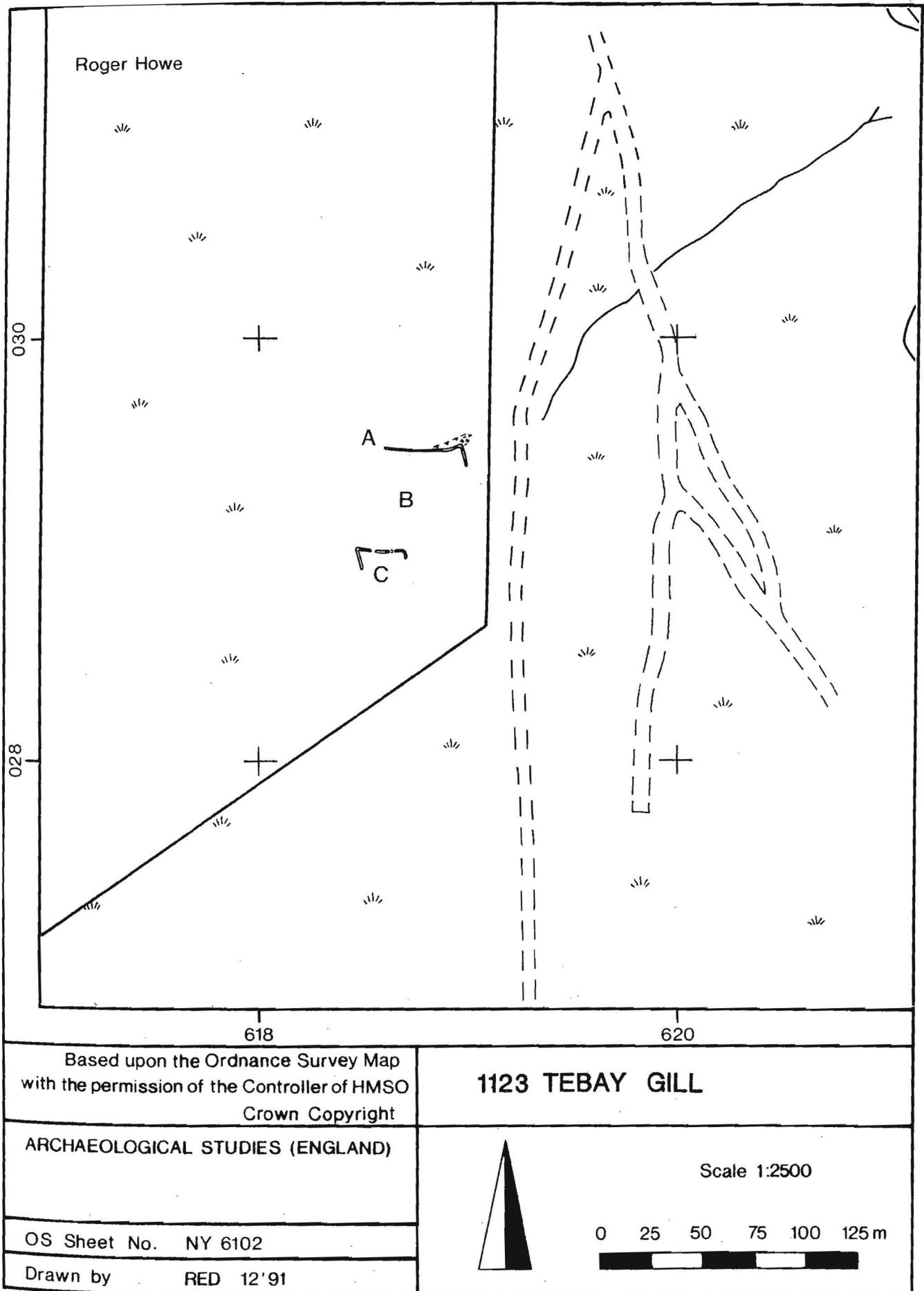
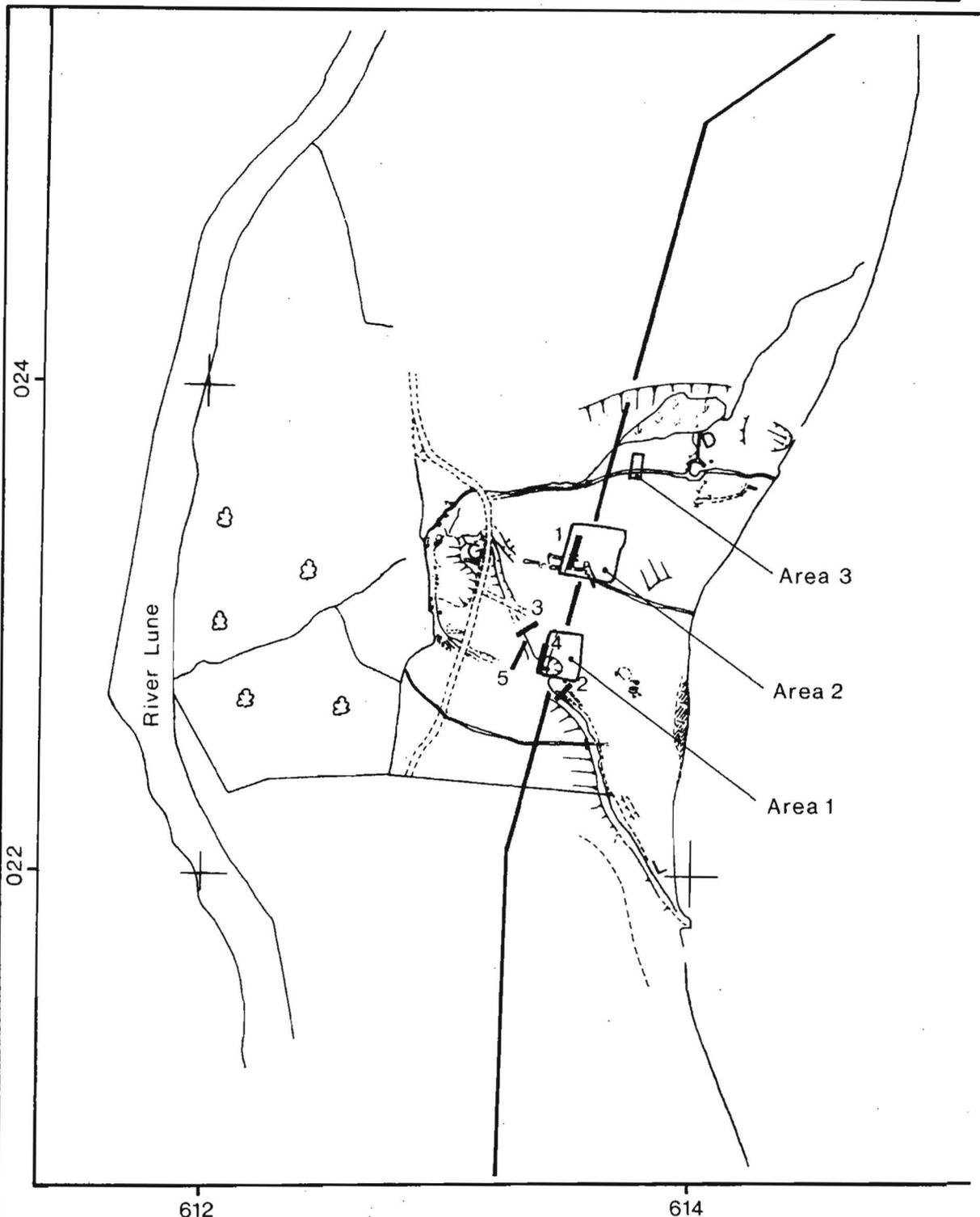


Fig 29 Tebay Gill, 1123, topographical survey, 1991



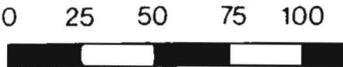
<p>Based upon the Ordnance Survey Map with the permission of the Controller of HMSO Crown Copyright</p>	<p><b>1132 POWSONS</b></p>
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<p>Drawn by MK 12'91</p>	

Fig 30 Powsons, 1132, trial trenches, topographical survey 1990; excavation areas, 1991

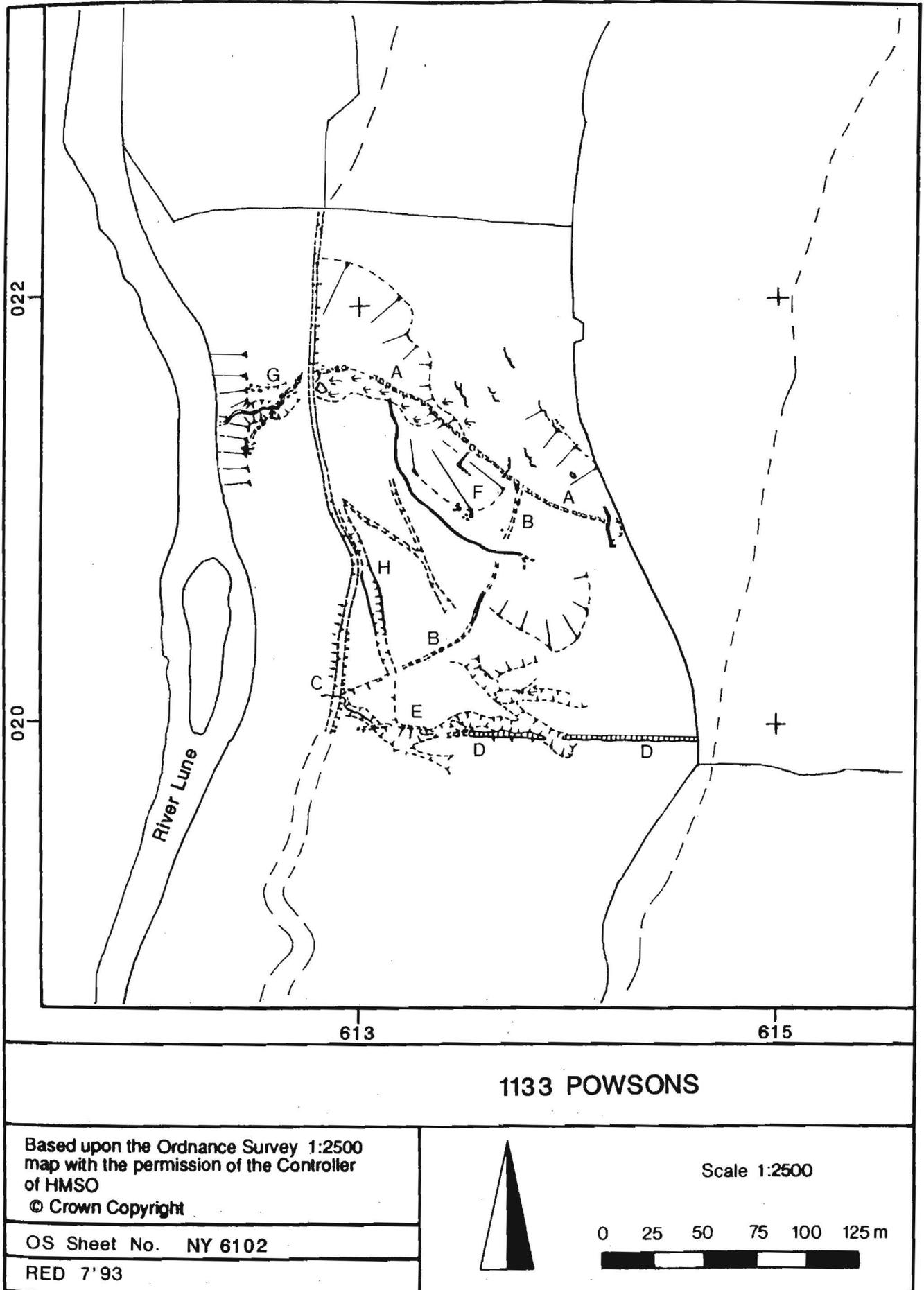


Fig 31 Powsons, 1133, topographical survey, 1990

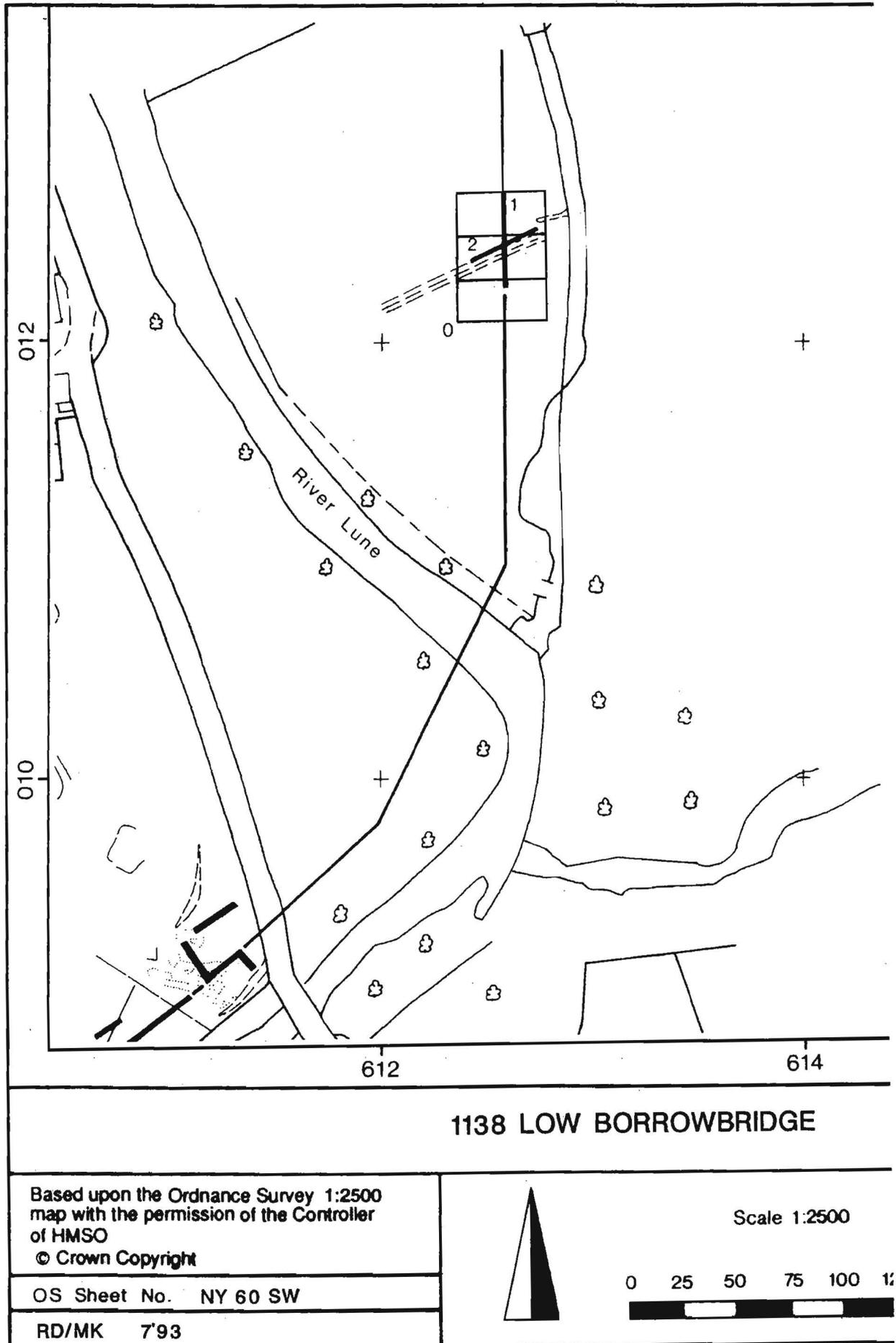


Fig 32 Low Borrowbridge, 1138, geophysical survey, 1990

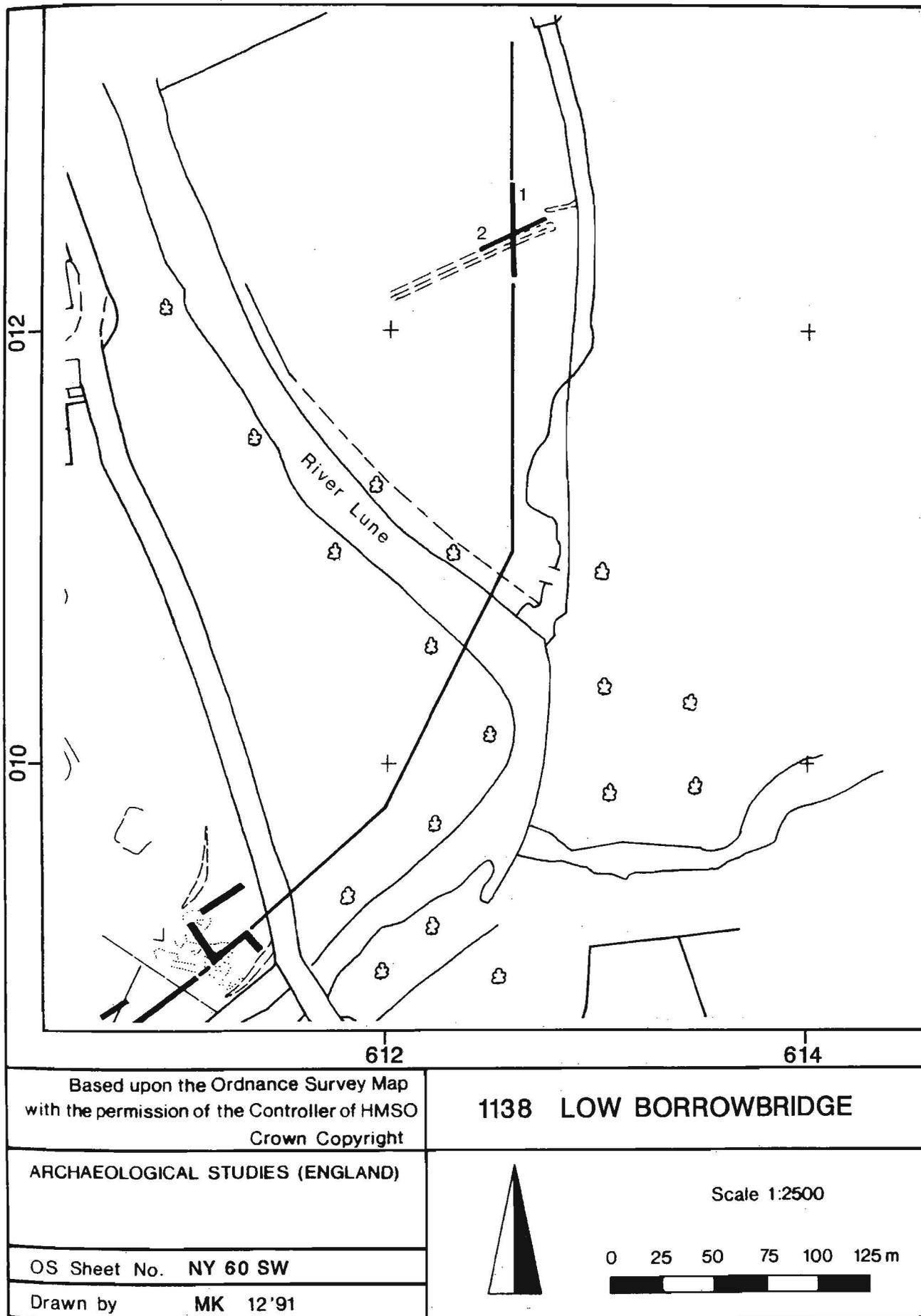


Fig 33 Low Borrowbridge, 1138, trial trenches, 1990

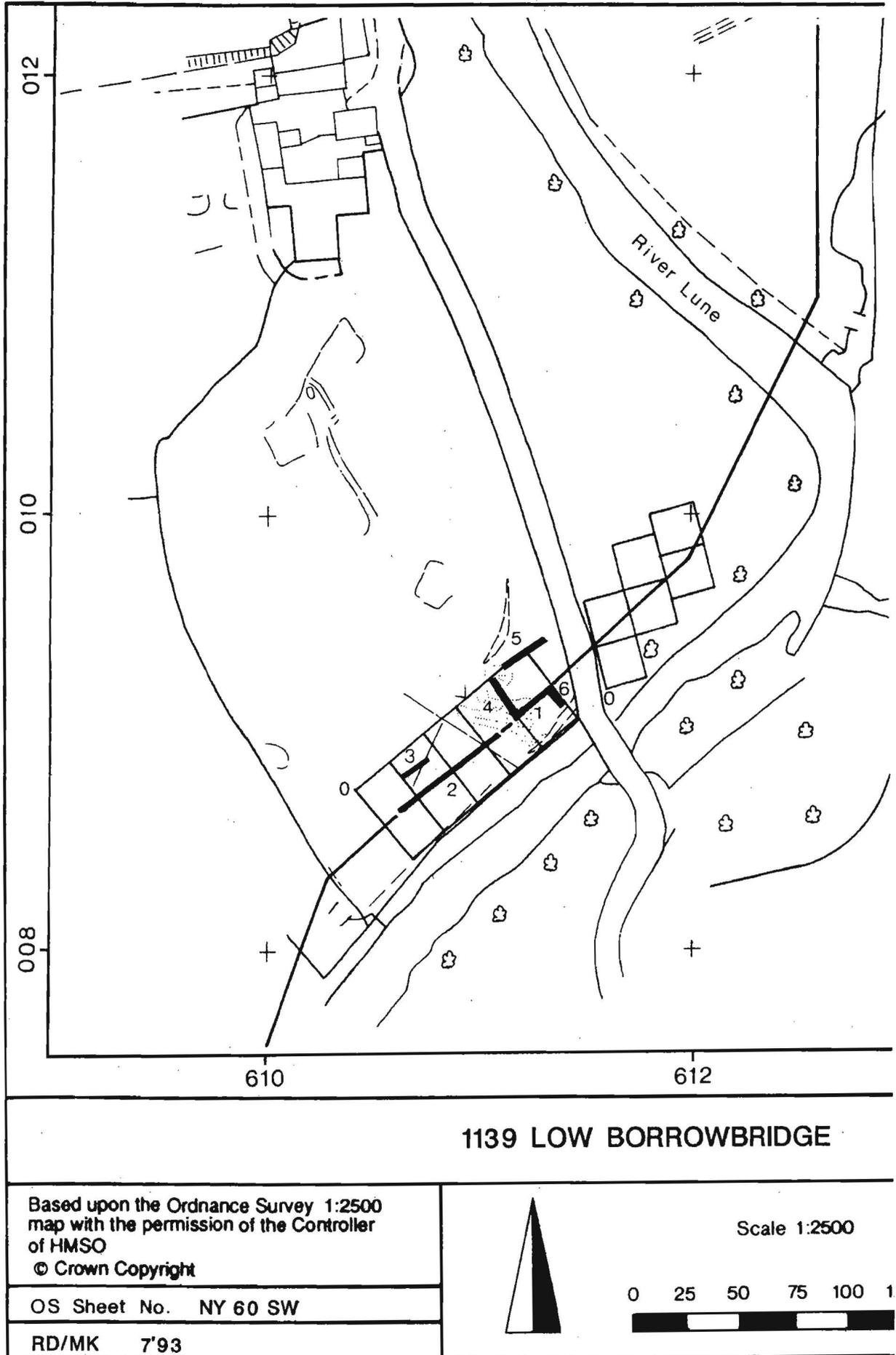


Fig 34 Low Borrowbridge, 1139, geophysical survey, 1990

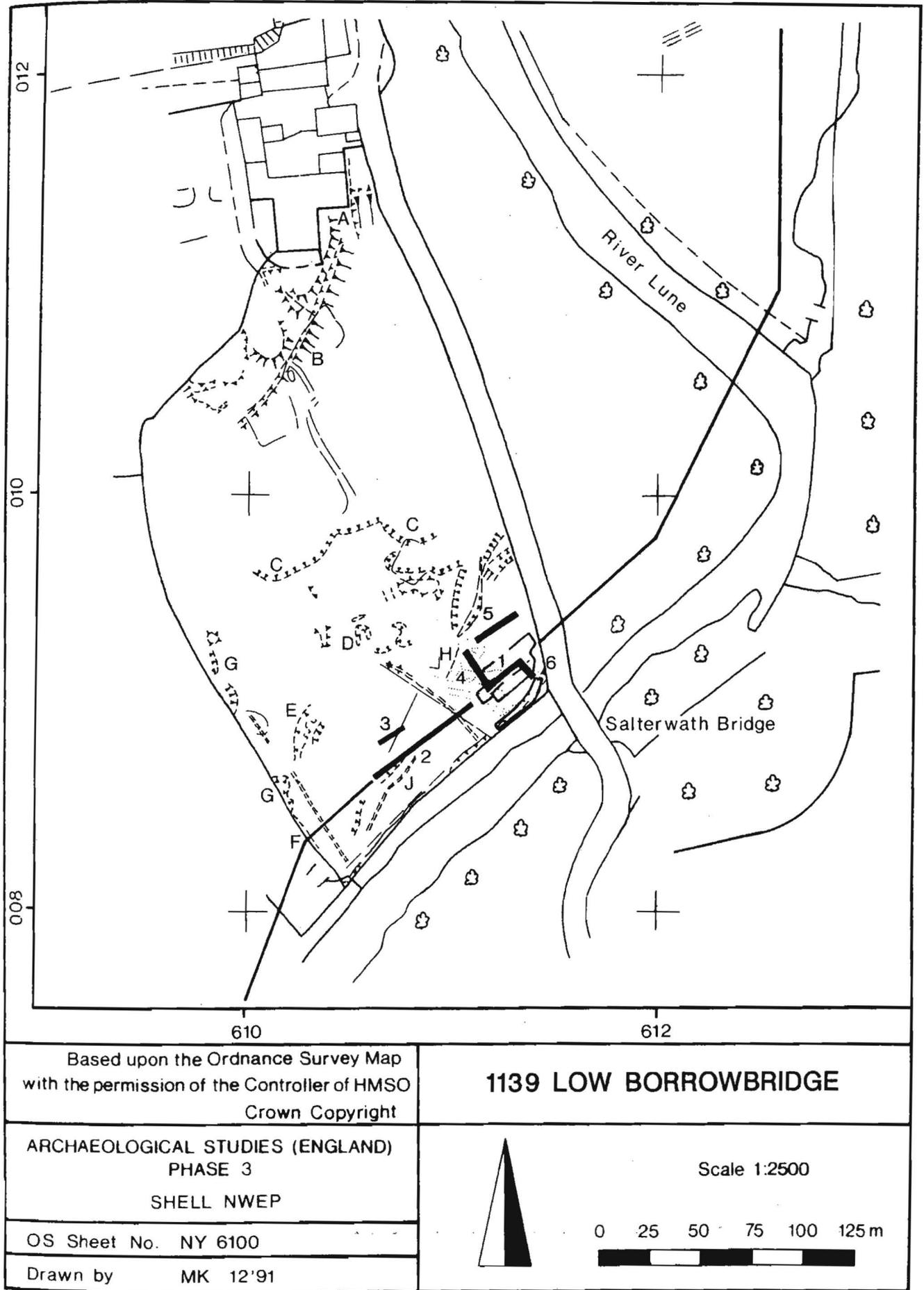
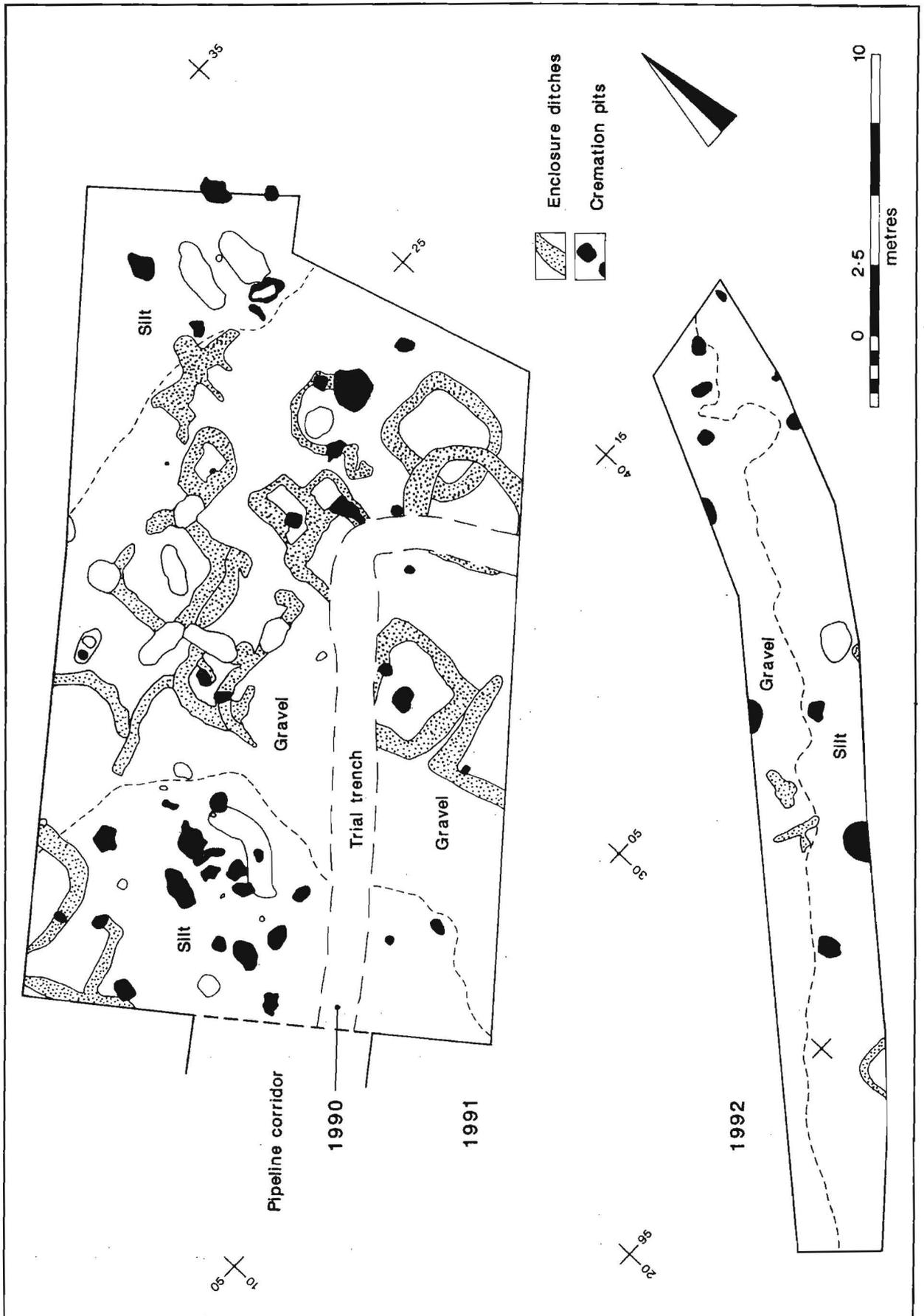
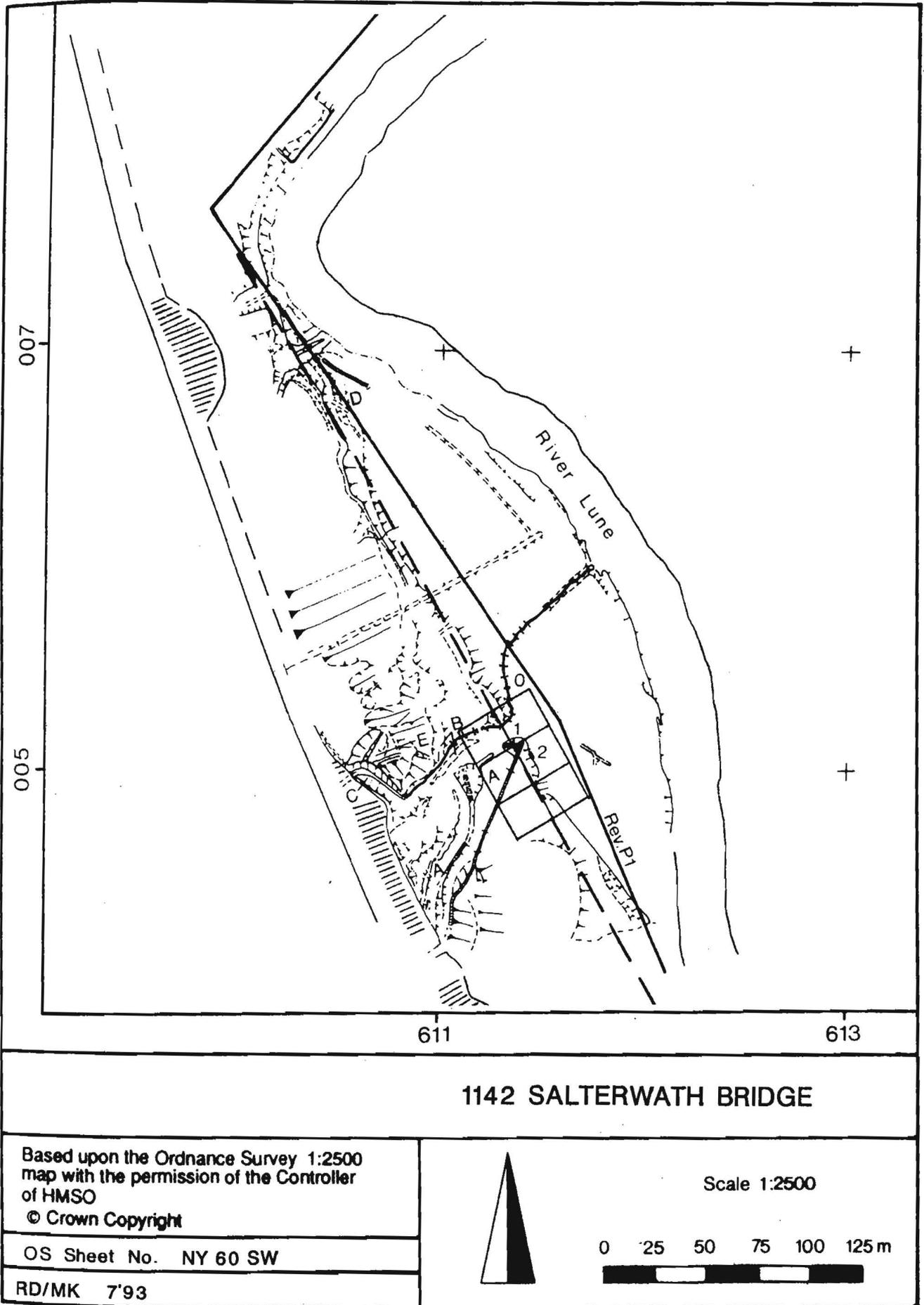


Fig 35 Low Borrowbridge, 1139, topographical survey, aerial survey, trial trenches, 1990





1142 SALTERWATH BRIDGE

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OS Sheet No. NY 60 SW

RD/MK 7'93



Scale 1:2500

0 25 50 75 100 125 m

Fig 37 Salterwath Bridge, 1142, geophysical survey, 1990

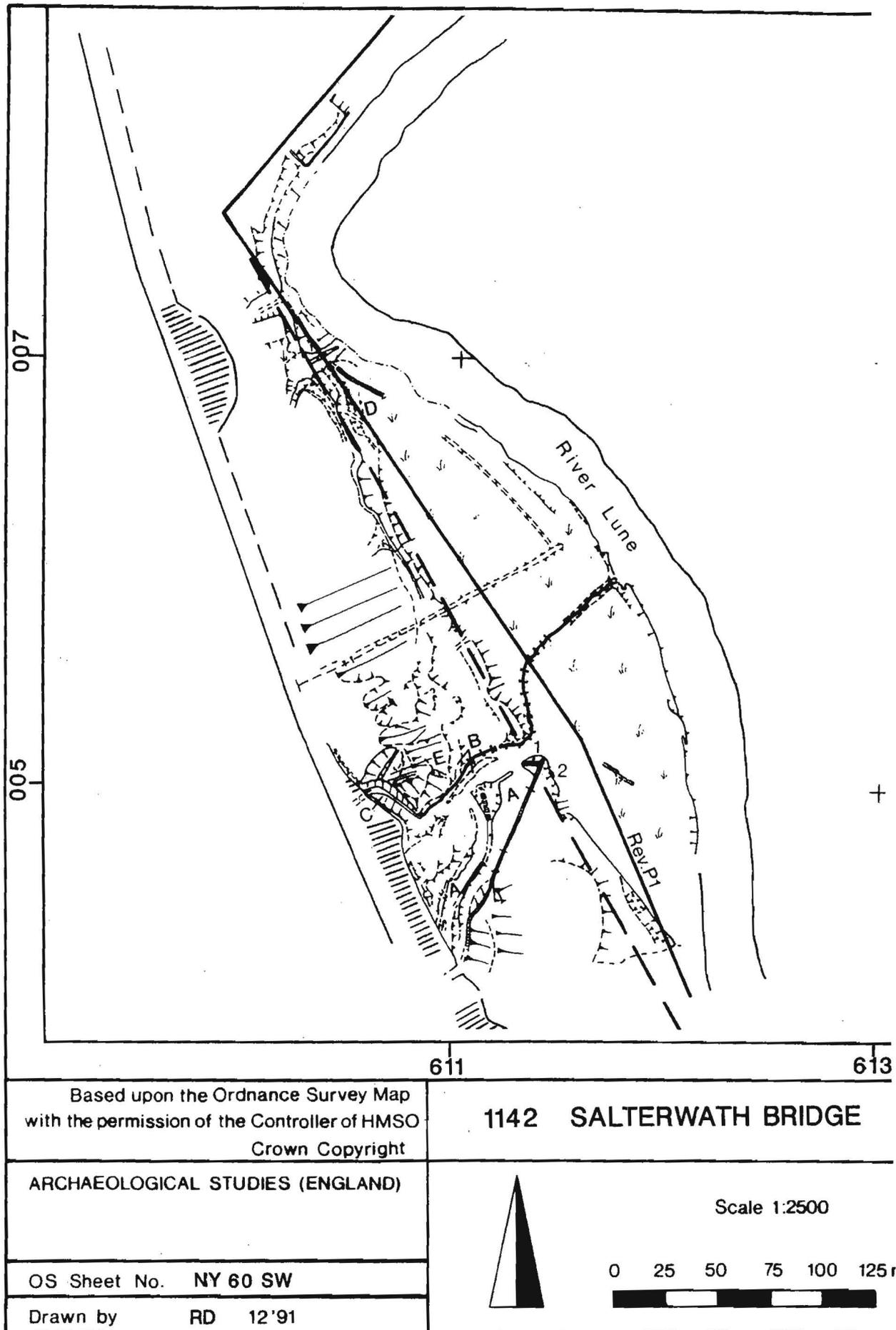


Fig 38 Salterwath Bridge, 1142, topographical survey, 1990

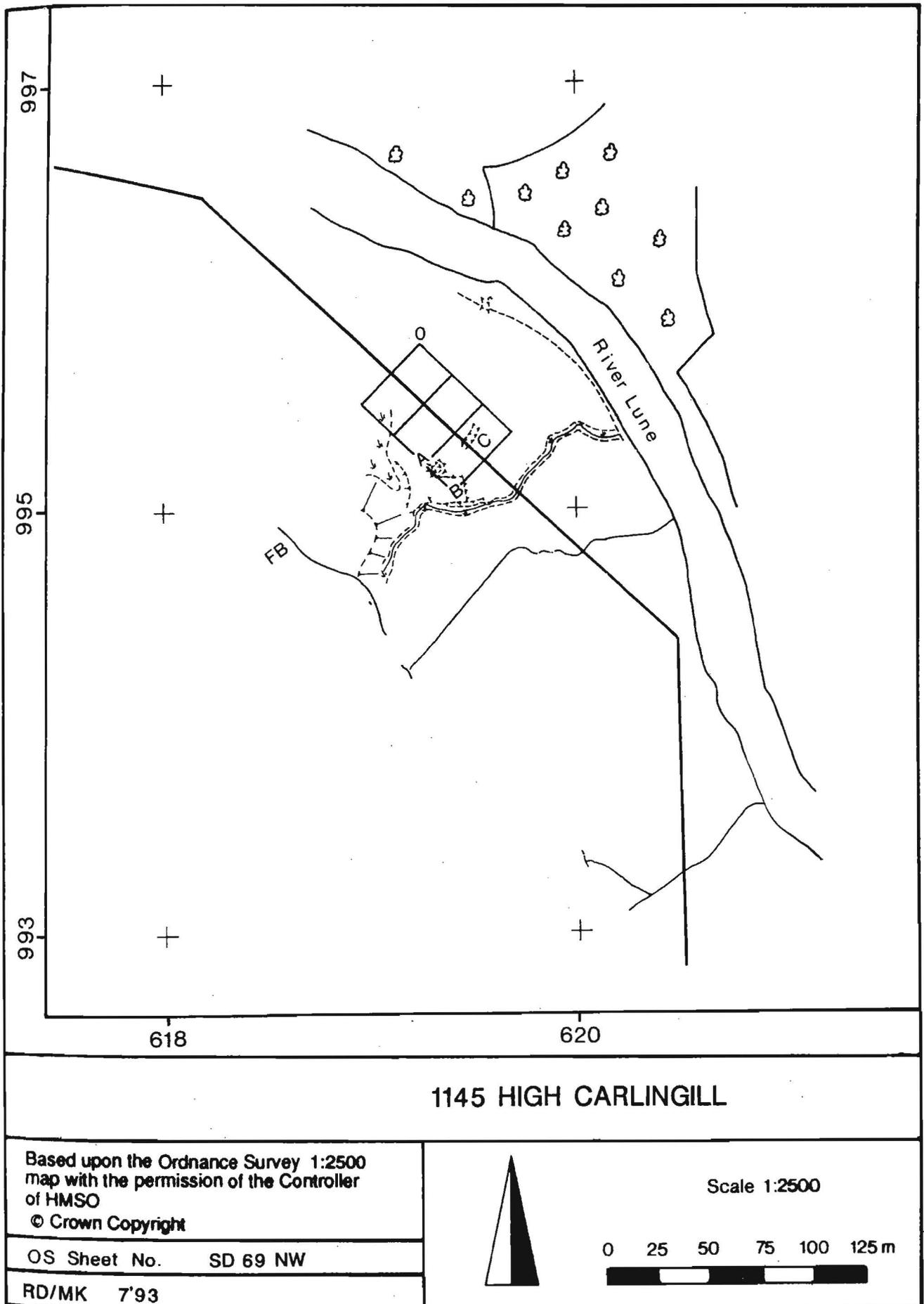
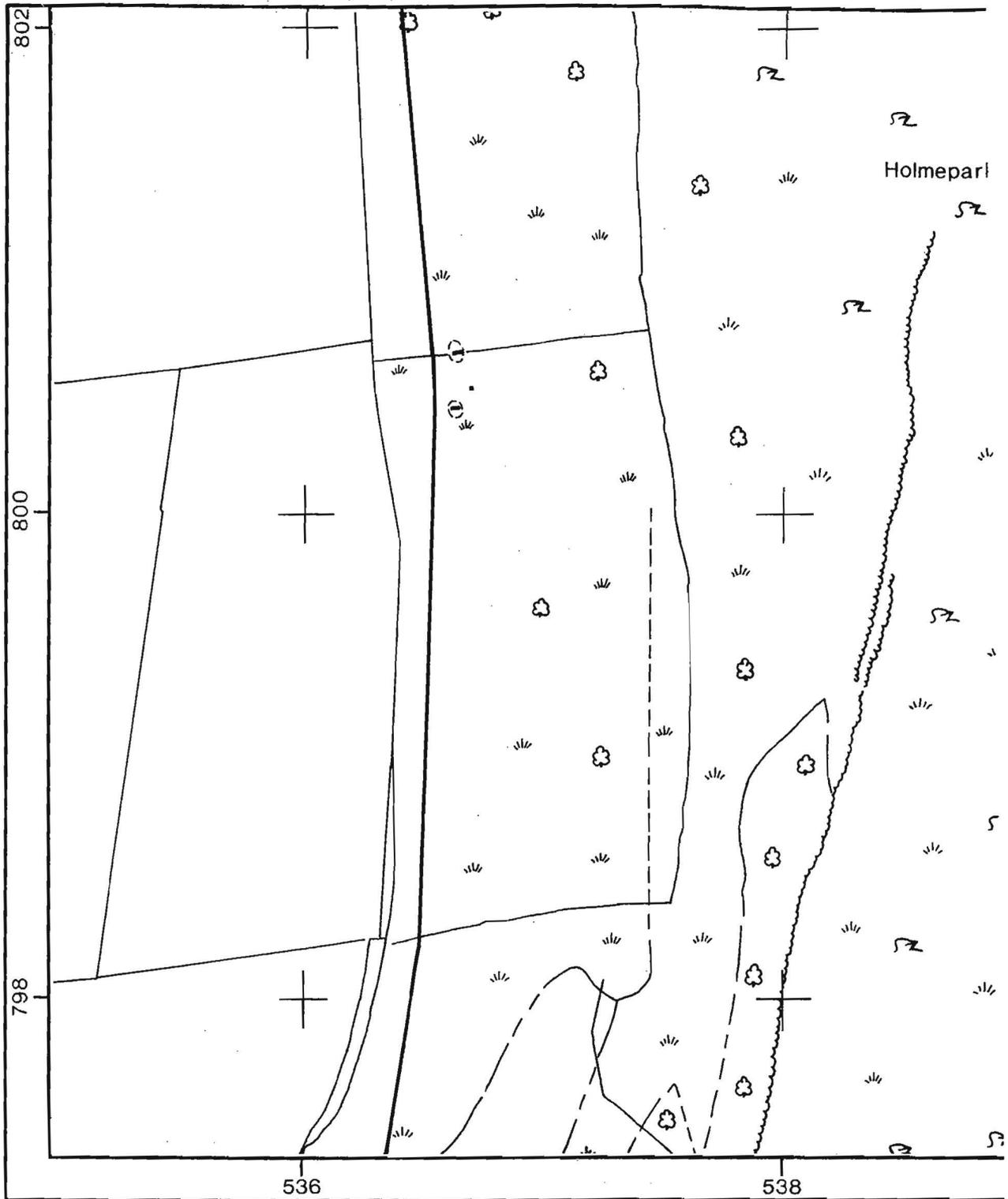


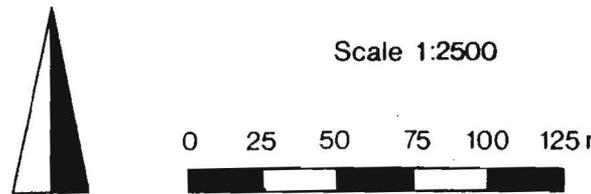
Fig 39 High Carlingill, 1145, geophysical survey, 1990



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**12504 FARLETON FELL**

ARCHAEOLOGICAL STUDIES (ENGLAND)



OS Sheet No. SD 5380

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Fig 42 Farleton Fell, 12504, trial trenches, 1991

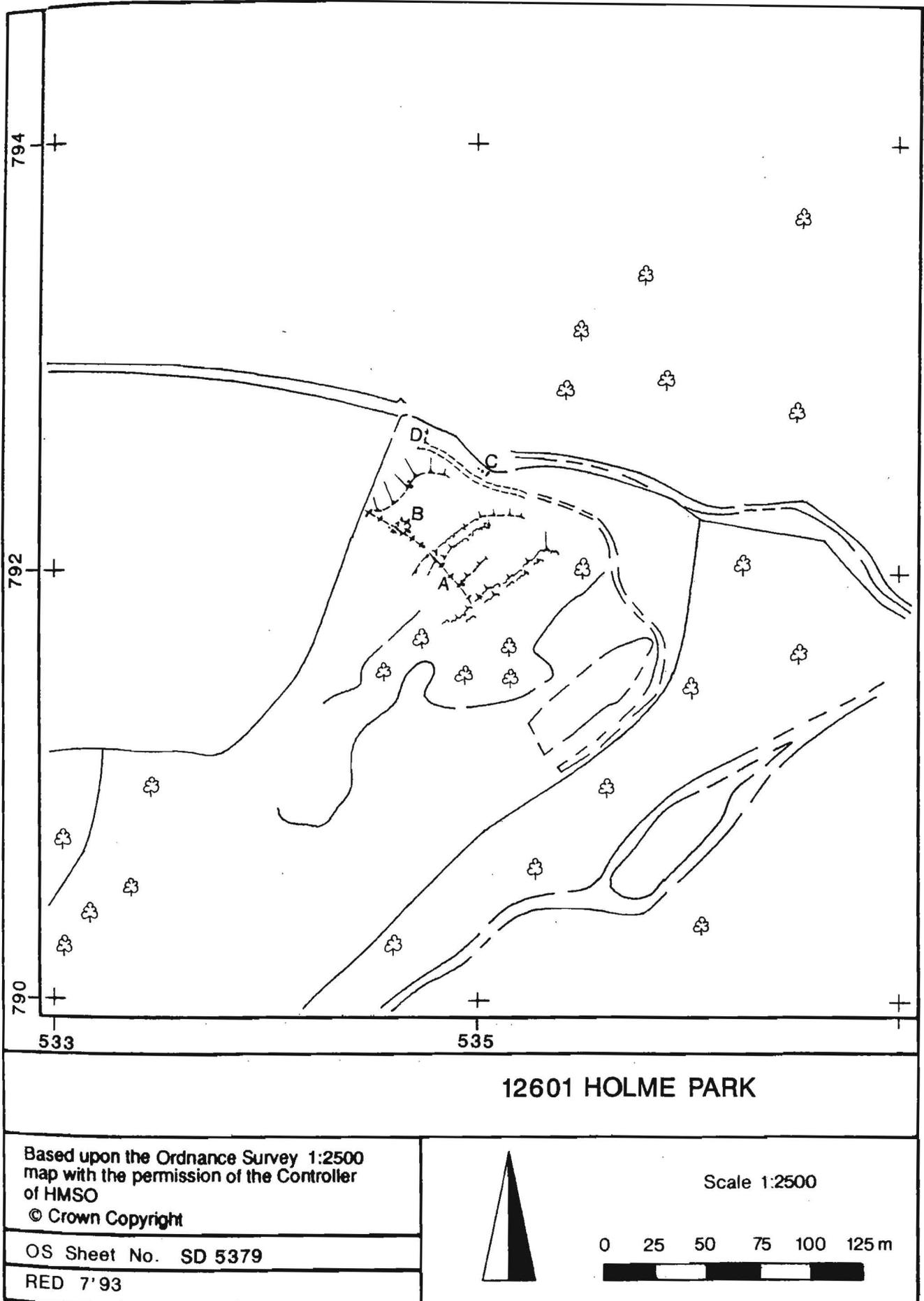


Fig 43 Holme Park, 12601, topographical survey, 1990

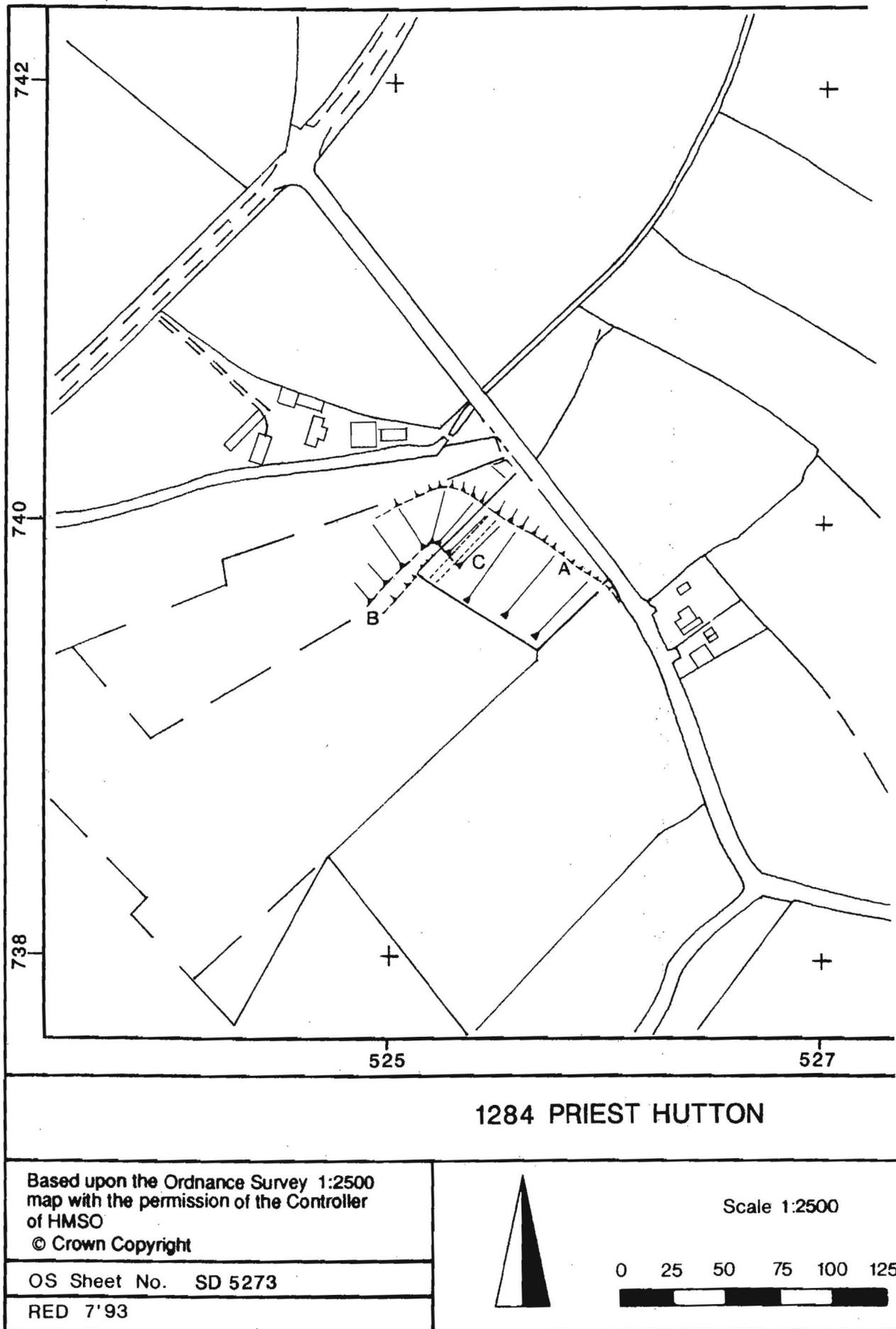
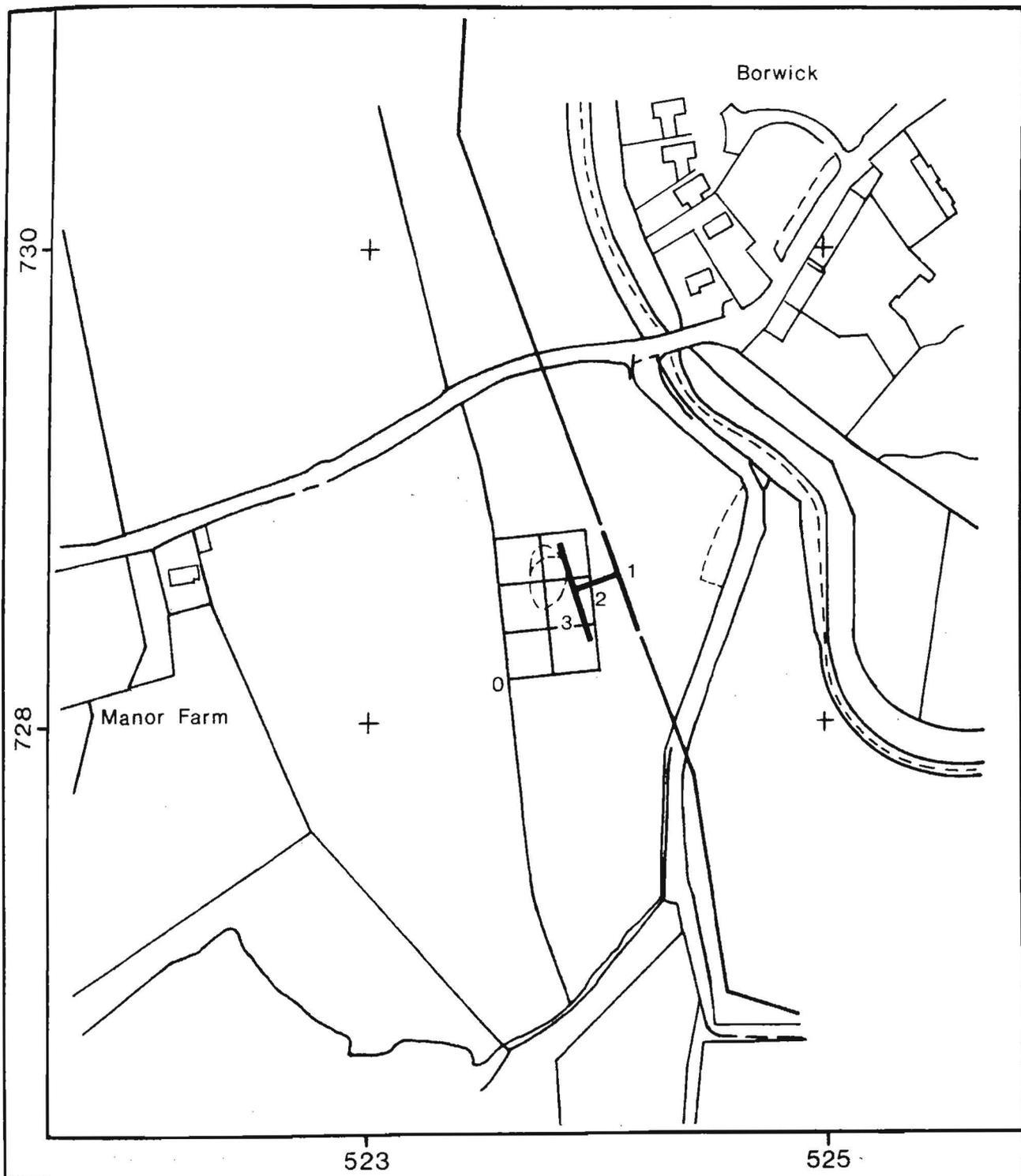


Fig 44 Priest Hutton, 1284, topographical survey, 1990



1299 MANOR FARM

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RD/MK 7'93

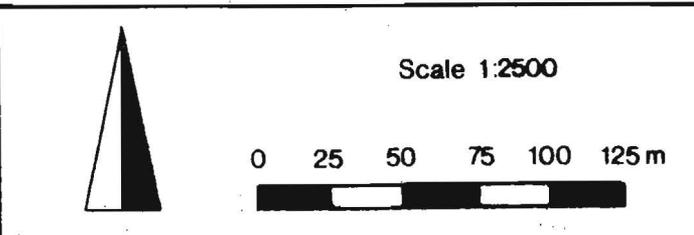


Fig 45 Manor Farm, 1299, geophysical survey, 1990

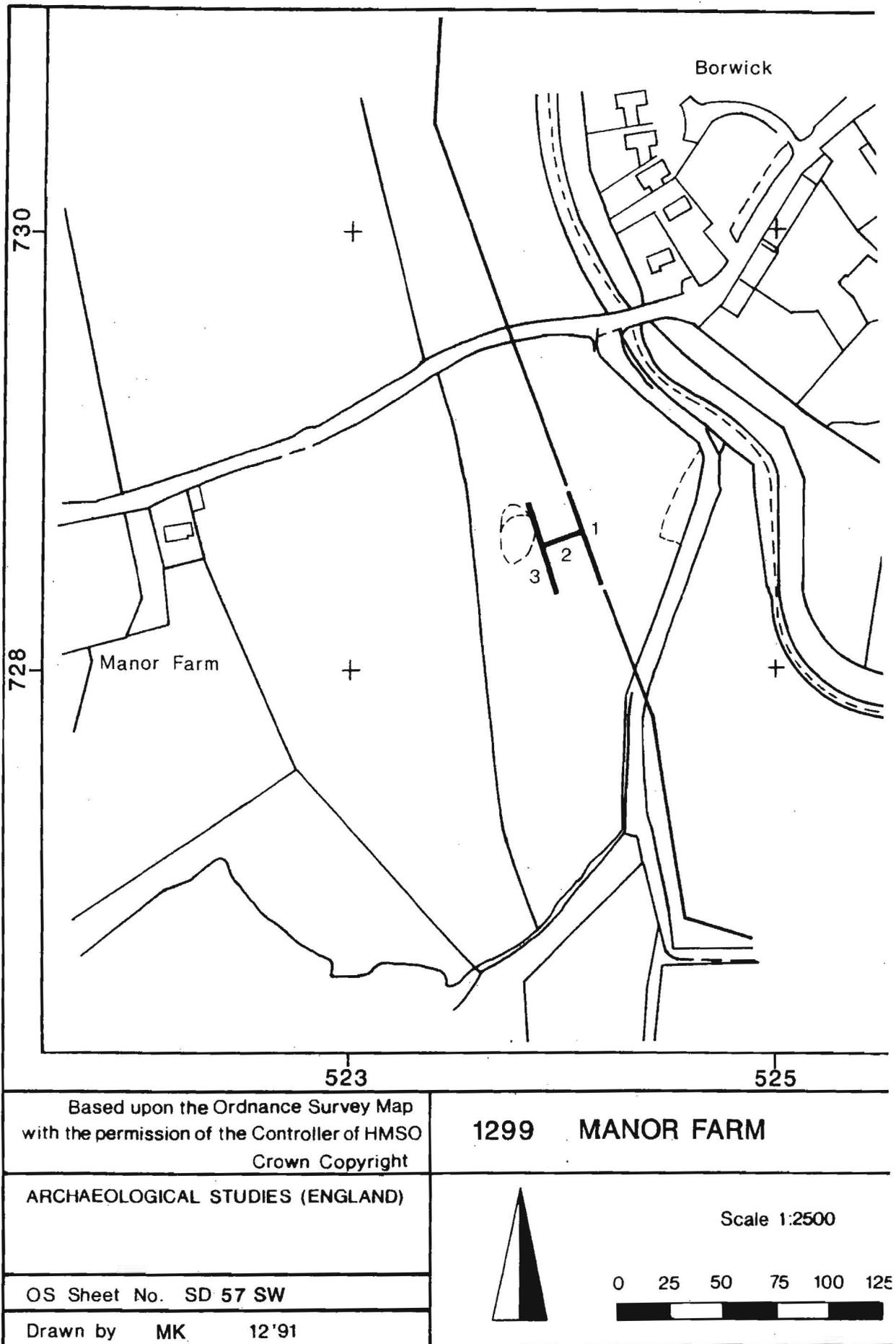
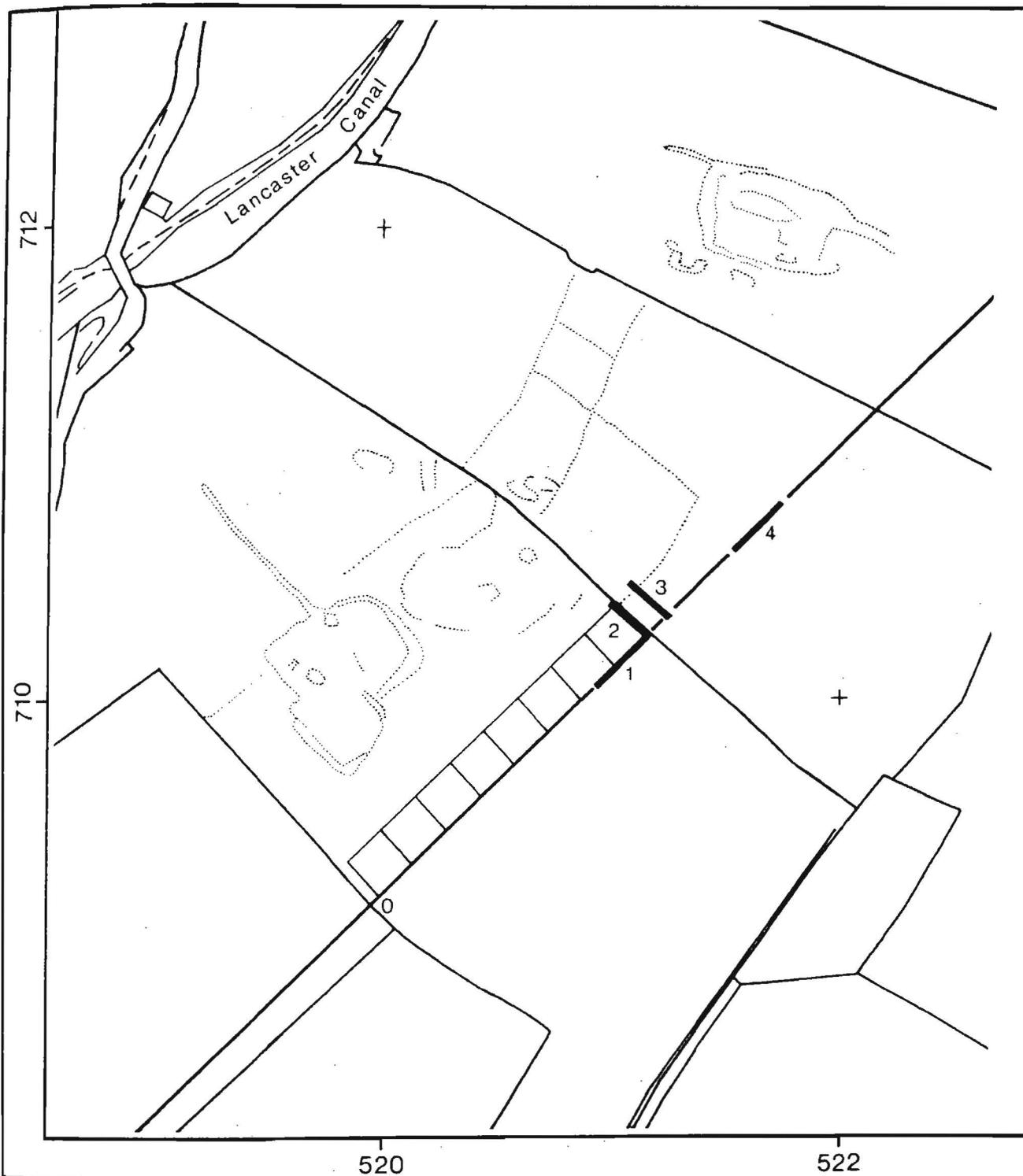


Fig 46 Manor Farm, 1299, trial trenches, 1990



1302 KELLET LANE BRIDGE

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OS Sheet No. SD 57 SW

RD/MK 793



Scale 1:2500



Fig 47 Kellet Lane Bridge, 1302, aerial survey, geophysical survey, 1990

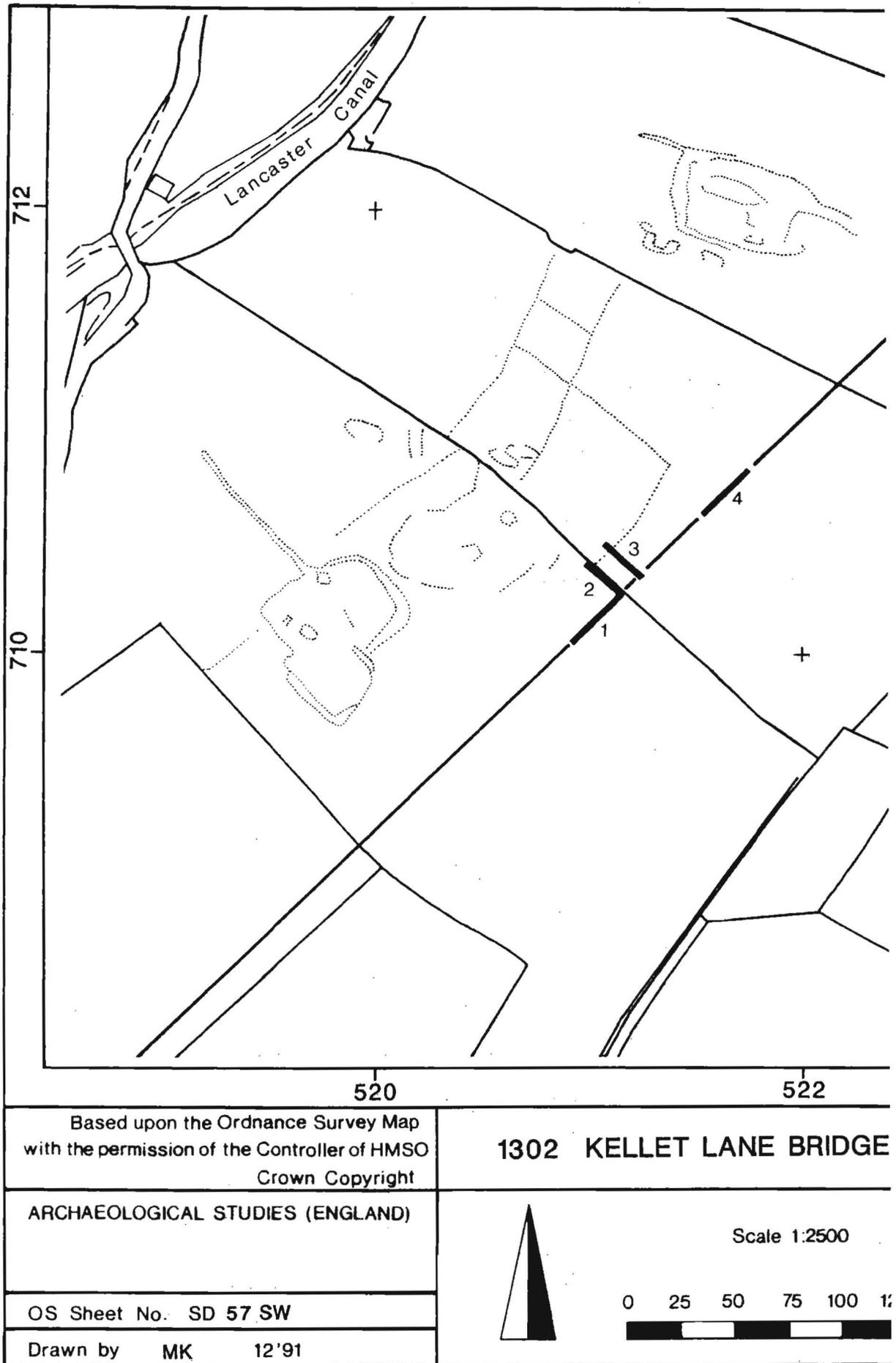
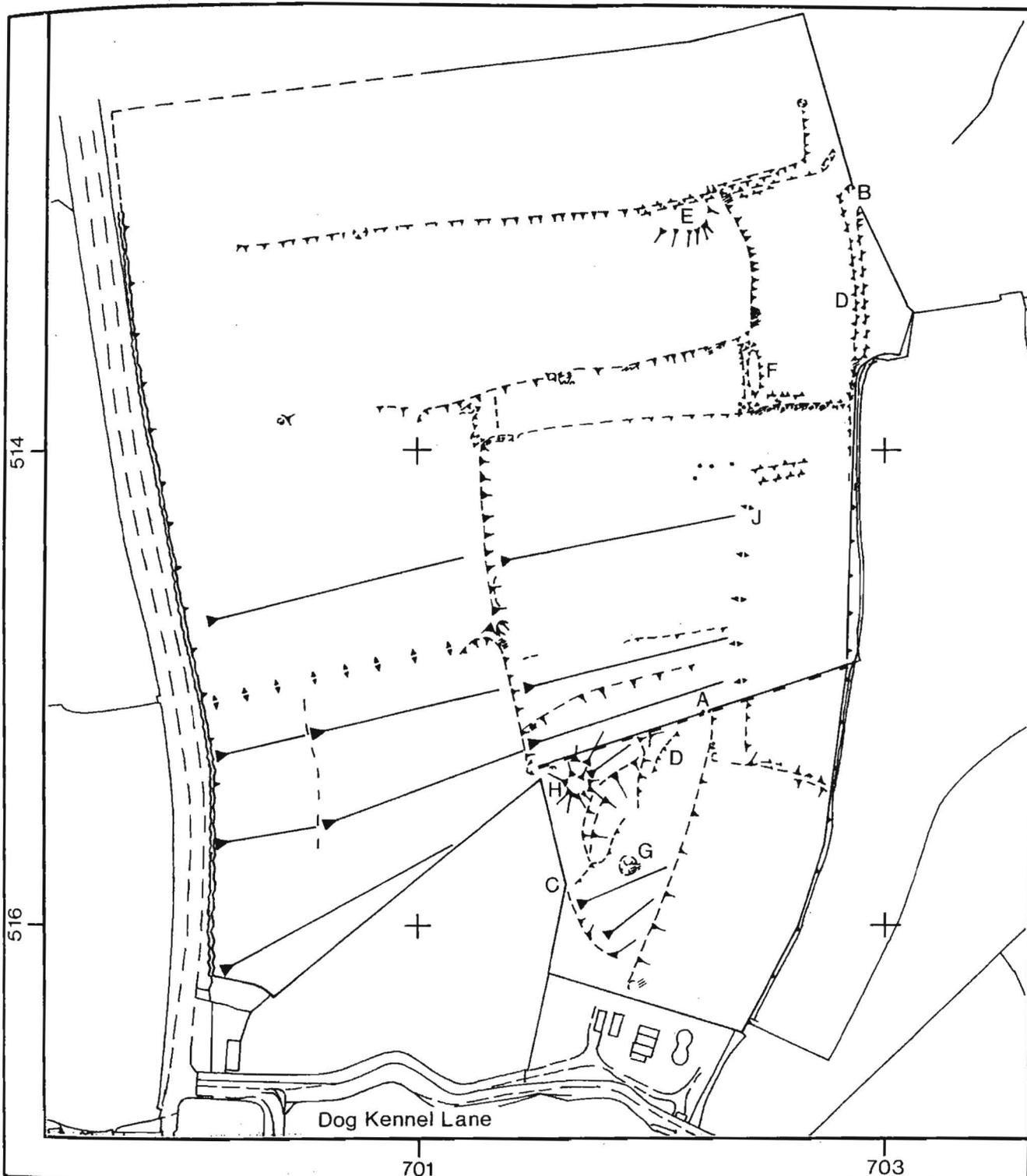


Fig 48 Kellet Lane Bridge, 1302, trial trenches, 1990



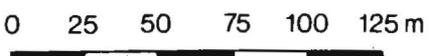
<p>Based upon the Ordnance Survey Map with the permission of the Controller of HMSO Crown Copyright</p>	<h3>1305 OVER KELLET</h3>
<p>ARCHAEOLOGICAL STUDIES (ENGLAND)</p>	<p>Scale 1:2500</p> 
<p>OS Sheet No. SD 5170</p>	
<p>Drawn by RED 12'91</p>	

Fig 49 Over Kellet, 1305, topographical survey, 1991

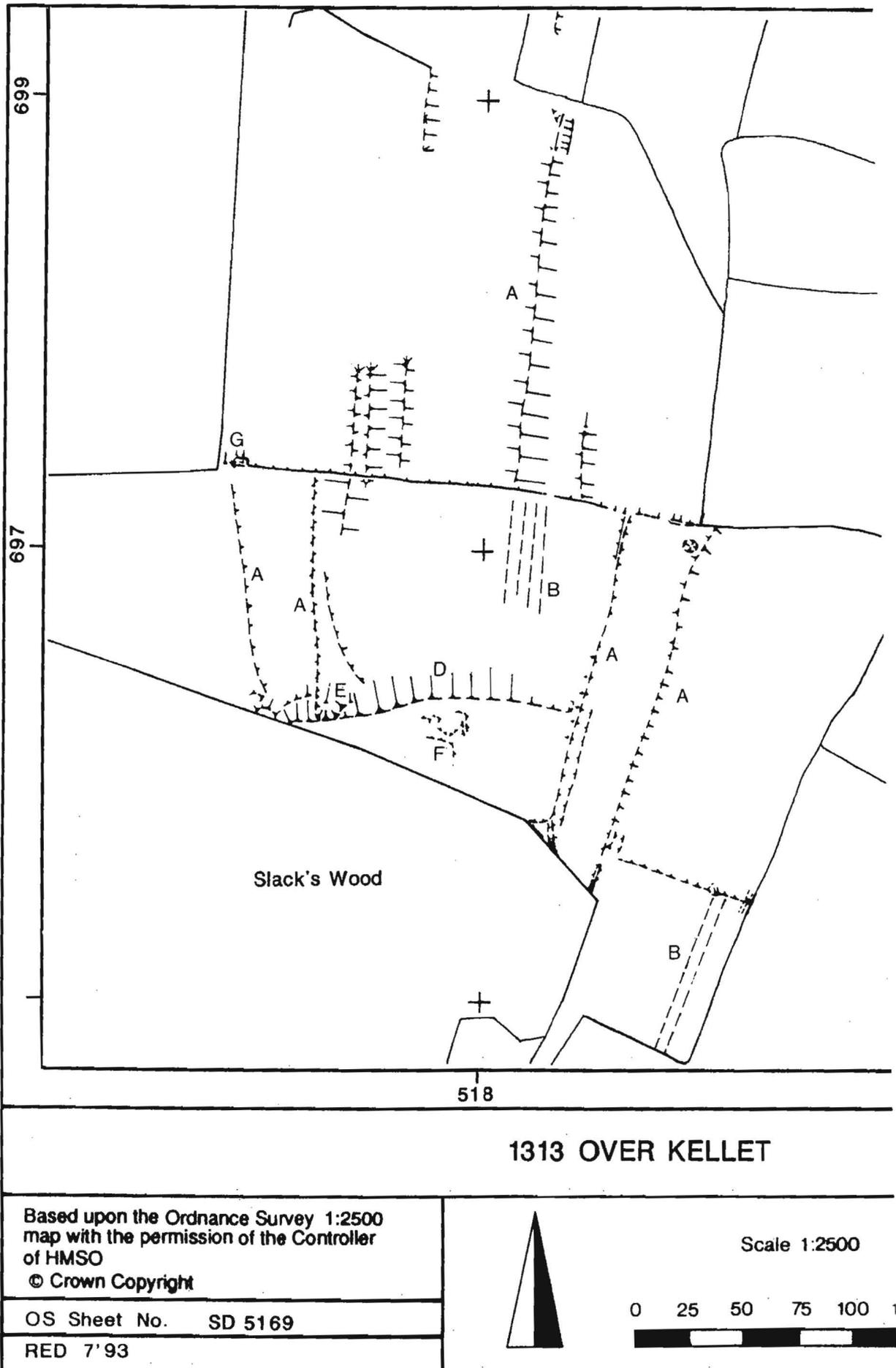


Fig 50 Over Kellet, 1313, topographical survey, 1990

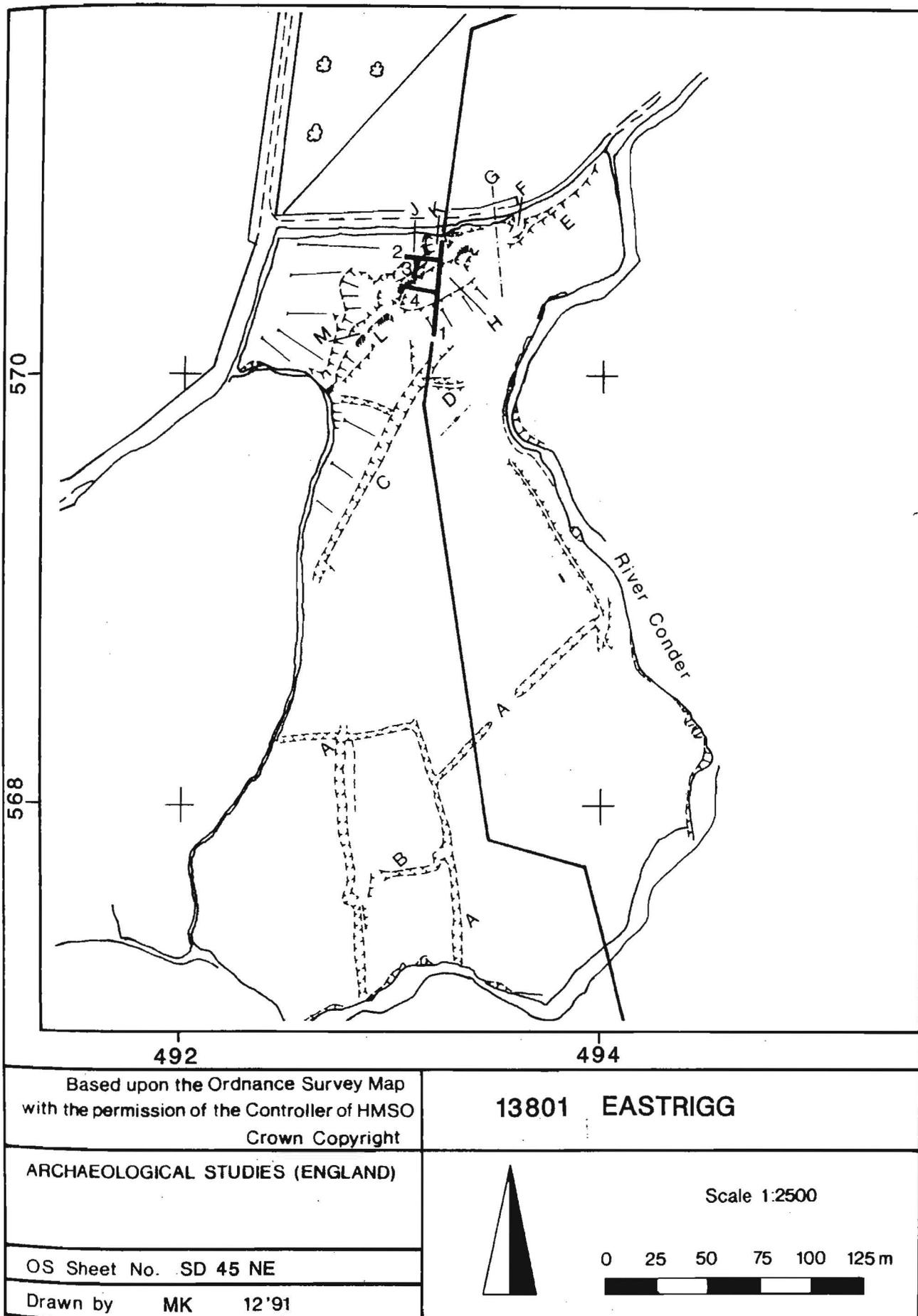
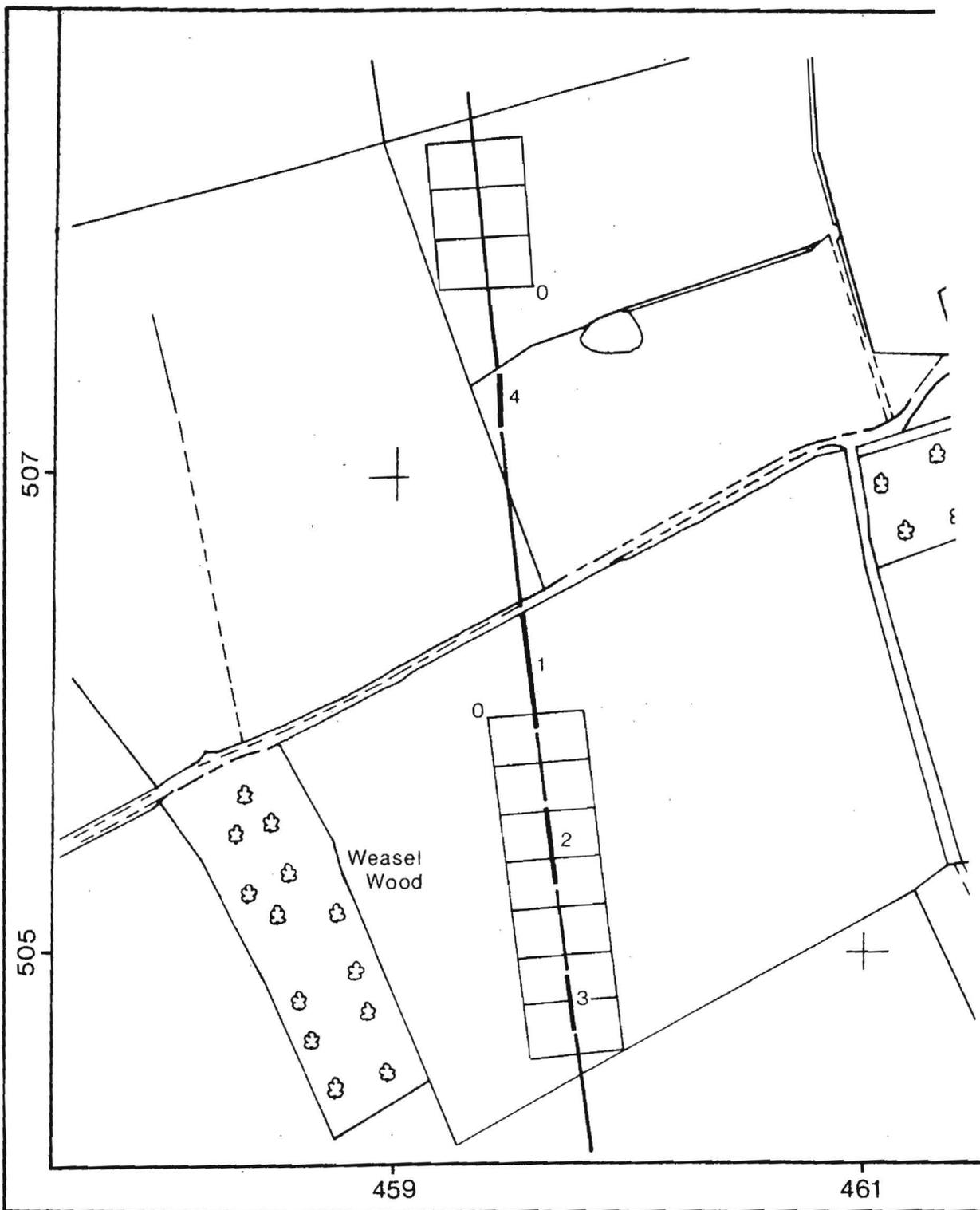


Fig 51 Eastrigg, 13801, topographical survey, trial trenches, 1990



1421 CRIMBLES

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 RD/MK 7'93

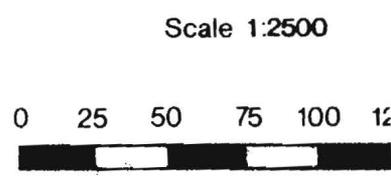
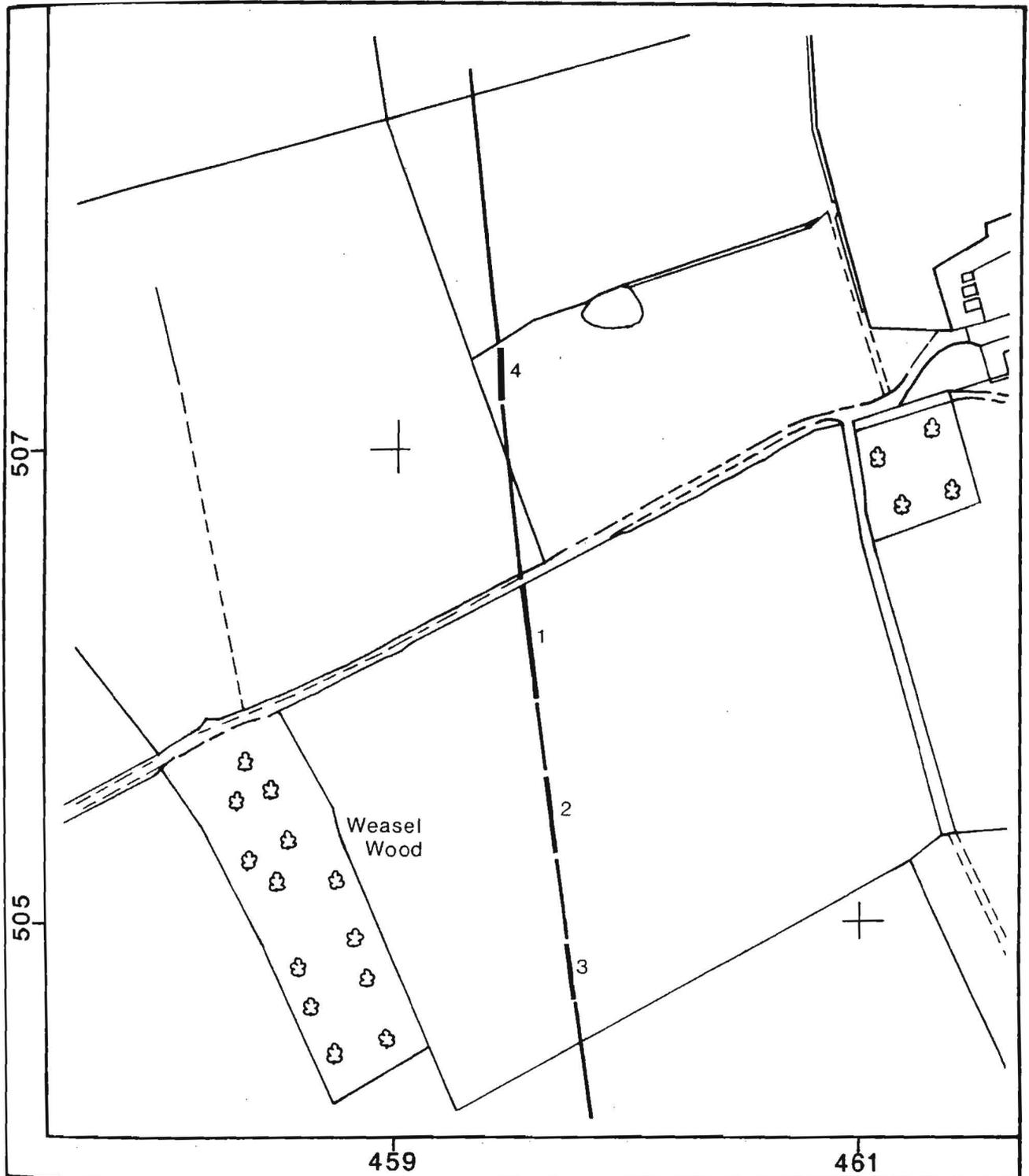


Fig 52 Crimbles, 1421, geophysical survey, 1990



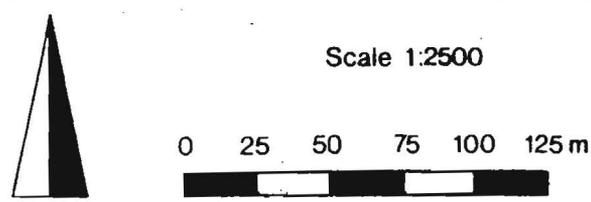
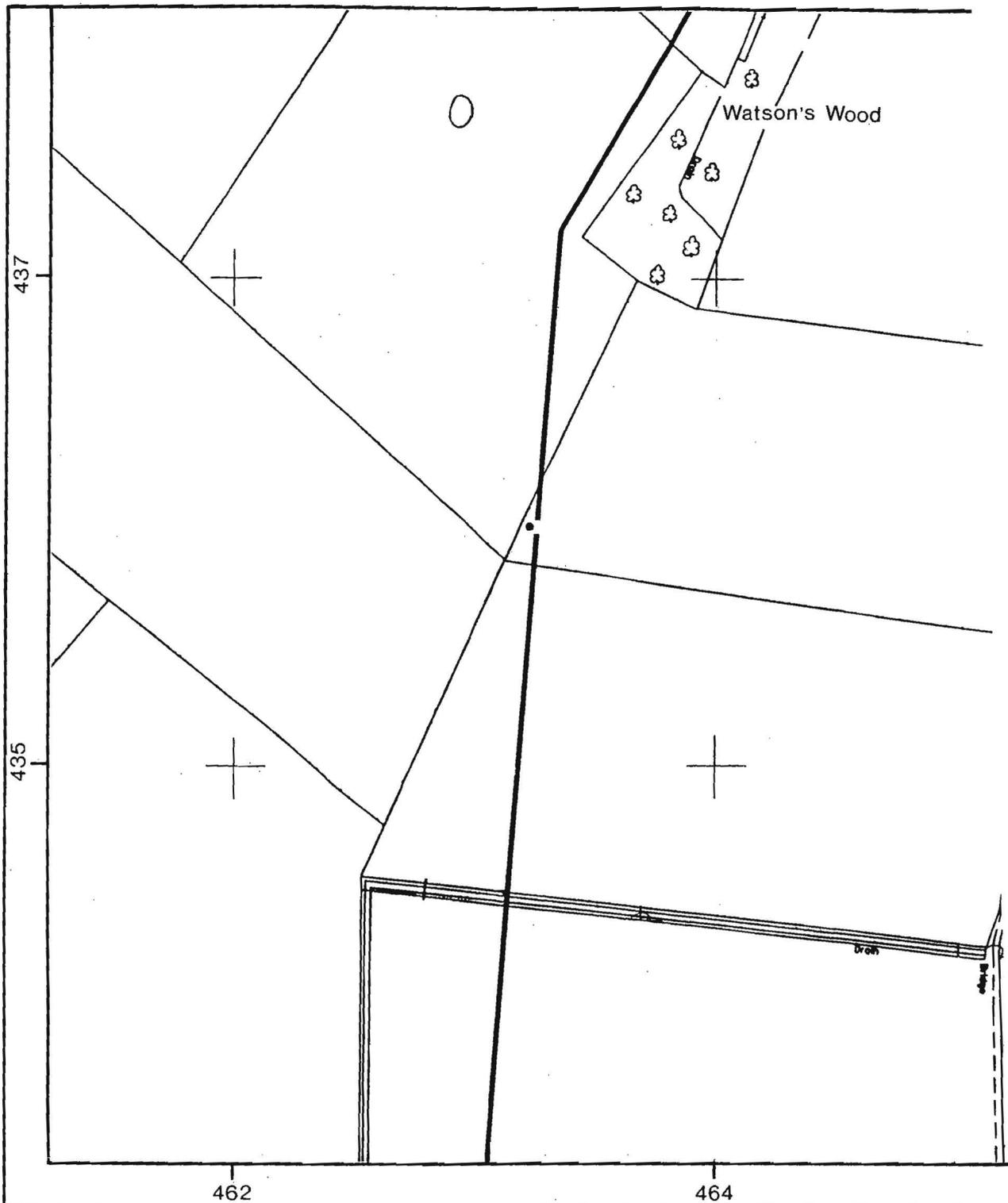
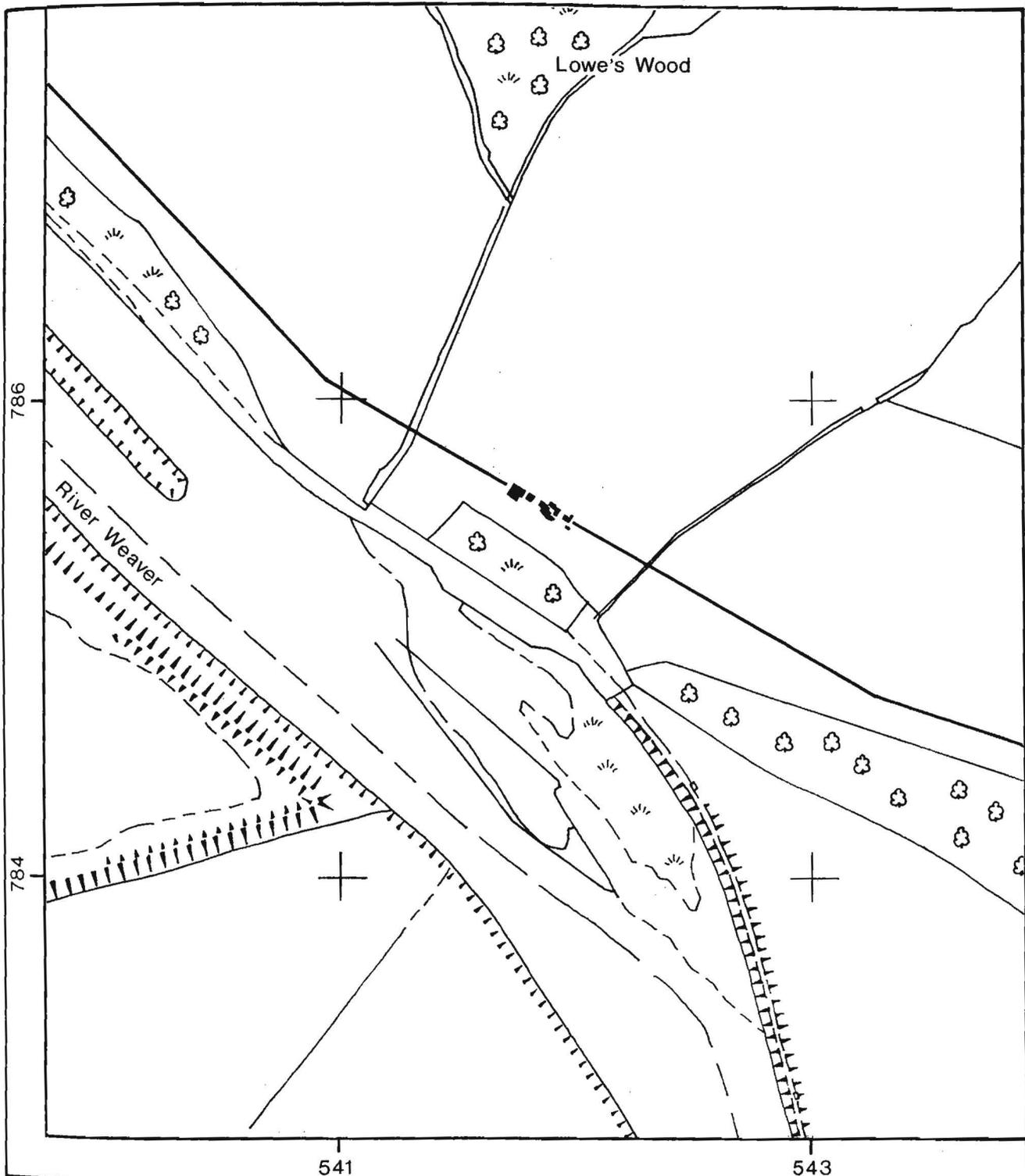
<p>Based upon the Ordnance Survey Map with the permission of the Controller of HMSO Crown Copyright</p>	<p>1421 CRIMBLES</p>
<p>ARCHAEOLOGICAL STUDIES (ENGLAND)</p>	<p>Scale 1:2500</p>
<p>OS Sheet No. SD 45 SE</p>	<p>0 25 50 75 100 125 m</p>
<p>Drawn by MK 12'91</p>	

Fig 53 Crimbles, 1421, trial trenches, 1990



<p>Based upon the Ordnance Survey Map with the permission of the Controller of HMSO Crown Copyright</p>	<p><b>1451 WATSON'S WOOD</b></p>
<p>ARCHAEOLOGICAL STUDIES (ENGLAND)</p>	<p>Scale 1:2500</p>  
<p>OS Sheet No. SD 4643</p>	
<p>Drawn by RED 12'91</p>	

Fig 54 Watson's Wood, 1451, trench, 1991



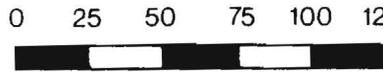
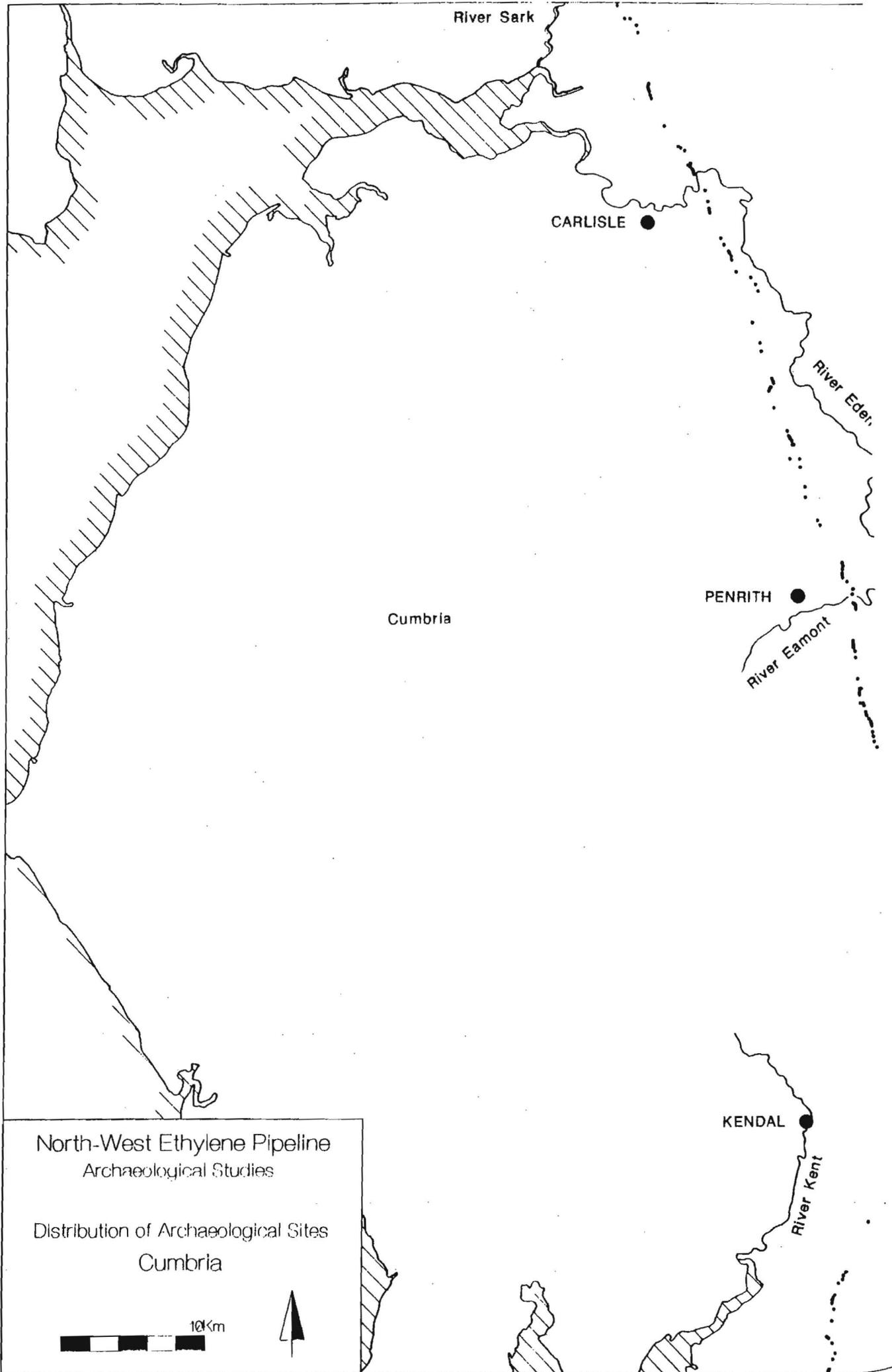
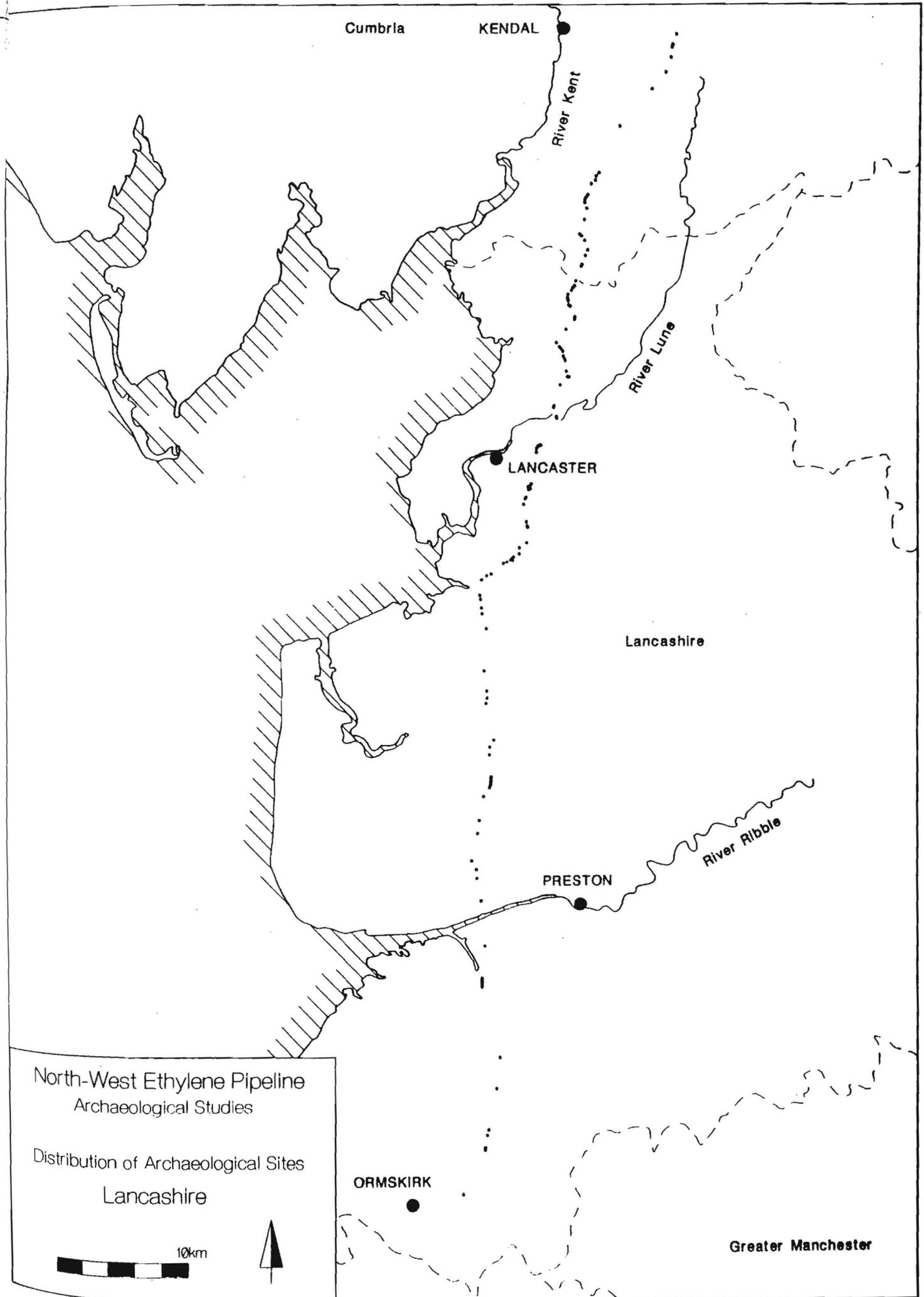
<p>Based upon the Ordnance Survey Map with the permission of the Controller of HMSO Crown Copyright</p>	<p><b>1957 BECKETT'S WOOD</b></p>
<p>ARCHAEOLOGICAL STUDIES (ENGLAND)</p>	<div style="text-align: right;"> <p>Scale 1:2500</p>   </div>
<p>OS Sheet No. SJ 5478</p>	
<p>Drawn by RED 12'91</p>	

Fig 55 Beckett's Wood, 1957, excavation, 1991





Cumbria

KENDAL

River Kent

River Lune

LANCASTER

Lancashire

PRESTON

River Ribble

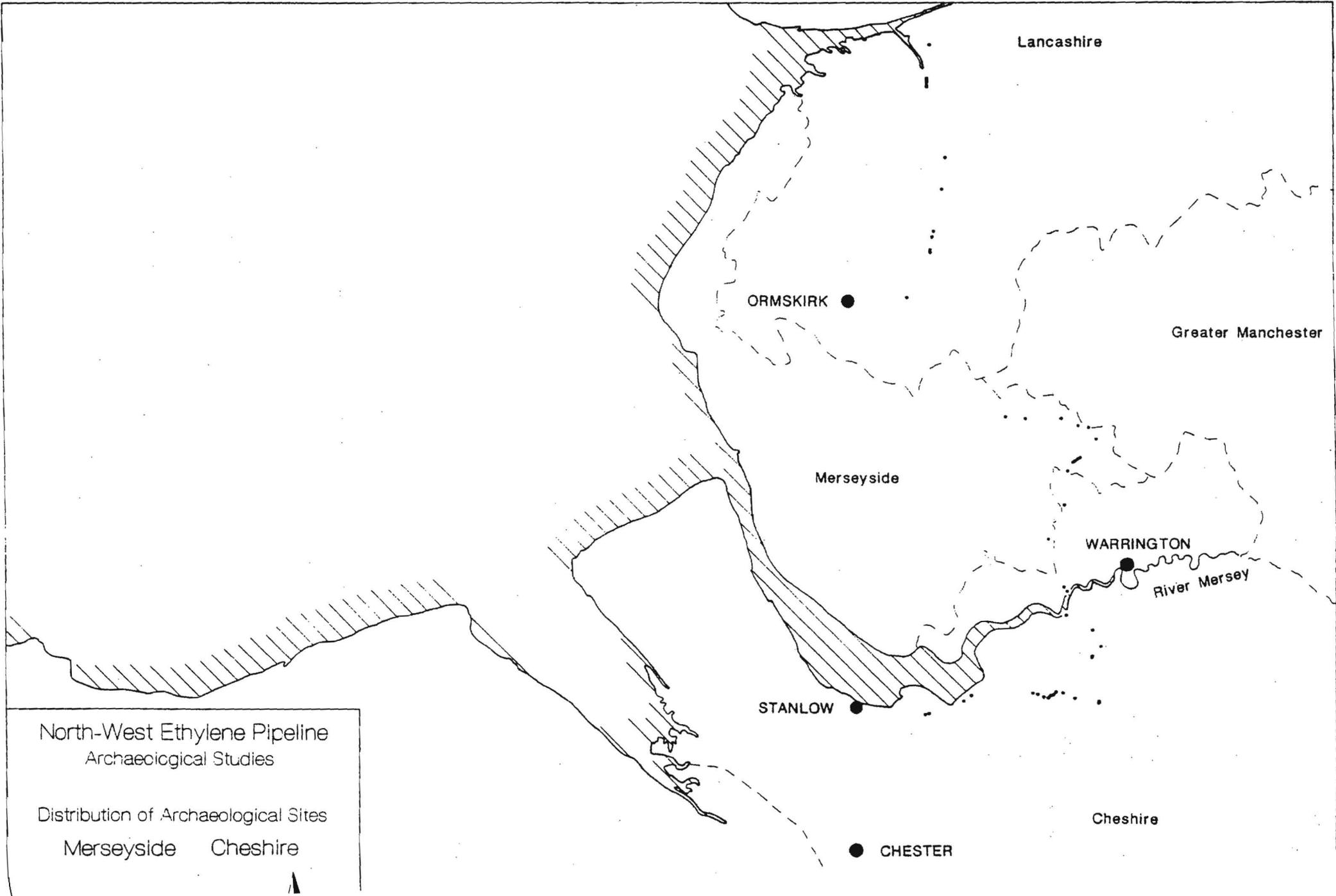
ORMSKIRK

Greater Manchester

North-West Ethylene Pipeline  
Archaeological Studies

Distribution of Archaeological Sites  
Lancashire

10km



North-West Ethylene Pipeline  
Archaeological Studies

Distribution of Archaeological Sites  
Merseyside Cheshire



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## APPENDIX 3 - ARCHIVE DEPOSITION

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On completion of the North Western Ethylene Pipeline project, the original documentation will be deposited with the County Record Offices at Carlisle, Kendal, Preston, and Chester, copies will be sent to the National Archaeological Record, and a summary will be produced for the County Sites and Monuments Records. Artefacts will be deposited with museums approved by English Heritage, or registered by the Museums and Galleries Association. The project gazetteer and final report will be deposited with the County Sites and Monuments Records for each county, and the National Monuments Record.

### Repositories

#### Cumbria

Cumbria Record Office (Carlisle)  
The Castle, Carlisle, Cumbria CA3 8UR

Cumbria Record Office (Kendal)  
County Offices, Stricklandgate, Kendal, Cumbria LA9 4RQ

Tullie House Museum, Carlisle

Kendal Museum of Natural History and Archaeology  
Station Road, Kendal, Cumbria

#### Lancashire

Lancashire Record Office  
Bow Lane, Preston, Lancashire PR1 2RE

Lancashire County Museum Service, Human History Department  
Stanley Street, Preston, Lancashire PR1 4YP

Lancashire Sites and Monuments Record  
Heritage Planning Consultancy, Furness College, Lancaster University, Lancaster LA1 4YG

#### Merseyside

Merseyside Record Office  
4th Floor, Cunard Building, Pier Head, Liverpool L3 1EG

#### Cheshire

Cheshire Record Office  
Duke Street, Chester, Cheshire CH1 1RL

Cheshire Museums Service  
162 London Road, Northwich, Cheshire CW9 8AB



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