# EVALUATION PROGRAMME

## SILK WILLOUGHBY TO STAYTHORPE GAS PIPELINE

PHASE 3 - EVALUATION


THE UNIVERSITY of York

Mon L160813 PEN 60813
L182434 61954
L182448 60375
L182455 61962
L182457 61964
L182460 35519
L182462 35521
L182464 35522
L182472 35527
L182473 35528
L182476 35531
L182477 35532
L182478 35533
L182479 35534

Event L12670 - TOPOGRAPHIC
L12671 - WB
L12672 - TT

Sourse L47291
L47292

NB: See overleaf for Mon List

# EVALUATION PROGRAMME

## SILK WILLOUGHBY TO STAYTHORPE GAS PIPELINE

## PHASE 3 - EVALUATION

SITE CODE: SSP01

NGR: SK 7638 - TF 0845 4367

## REPORT

April 2001

LCNCC 252 '99


*On behalf of:*

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## Summary

This evaluation programme forms the third phase of an archaeological project designed to locate, assess and evaluate any archaeological remains within the development area of the proposed Silk Willoughby to Staythorpe gas pipeline. The aim of the project is to assist BG Transco in the selection of a pipeline route which causes the minimum amount of damage to the archaeological resource and to formulate an effective archaeological mitigation strategy for the construction programme.

The evaluation programme has been undertaken in accordance with a specification accepted by Lincolnshire County Council and agreed by Transco, and which follows the Institute of Field Archaeologists Code of Conduct, standards and guidance.

The evaluation programme was carried out in three stages: Stage 1 consisted of magnetometer area survey; Stage 2, topographic survey, to map upstanding and visible earthworks; and Stage 3 evaluation trenches excavated to assess the results of Phase 2 (reconnaissance) in areas of high potential.

On completion of Phase 3 (Evaluation) the results were assessed in order to identify which fields will require pre-construction archaeological mitigation.

## Acknowledgements

Field Archaeology Specialists gratefully acknowledge the support and help provided by BG Transco, RSK Environment and Nottinghamshire and Lincolnshire County Council Archaeology Sections. We are also grateful for the assistance provided by Alan Vince, Jane Young, and Margaret Darling during the production of this report.

## 1.0 INTRODUCTION

This report presents the results of an evaluation programme undertaken by Field Archaeology Specialists (FAS) for RSK Environment acting on behalf of Transco. The evaluation programme (Phase 3 - Pre-construction Evaluation) was carried out along the route of a proposed gas pipeline between Silk Willoughby, near Sleaford (Lincolnshire) and Staythorpe Power Station, Newark (Nottinghamshire).

### 1.1 LOCATION AND LAND USE

From the start of the pipeline at Silk Willoughby AGI (NGR TF 0845 4367) the route runs westwards between the villages of Silk Willoughby and Quarrington crossing the valley of the river Slea and the north side of the Ancaster Gap towards Normanton (Fig.1). From Normanton the route passes Hough-on-the-Hill and crosses the main east coast railway line. It continues past Dry Doddington, crosses the River Witham and the Great North Road, and passes through Bennington Fen before it reaches Cotham. From here the route changes to a northwesterly direction heading towards the River Trent. Beyond the village of Cotham it crosses the River Devon and continues past the village of Thorpe before reaching the Fosse Way and shortly the River Trent. The route changes direction again at the River Trent and runs north, before terminating at Staythorpe Power Station (NGR SK 7638 5326).

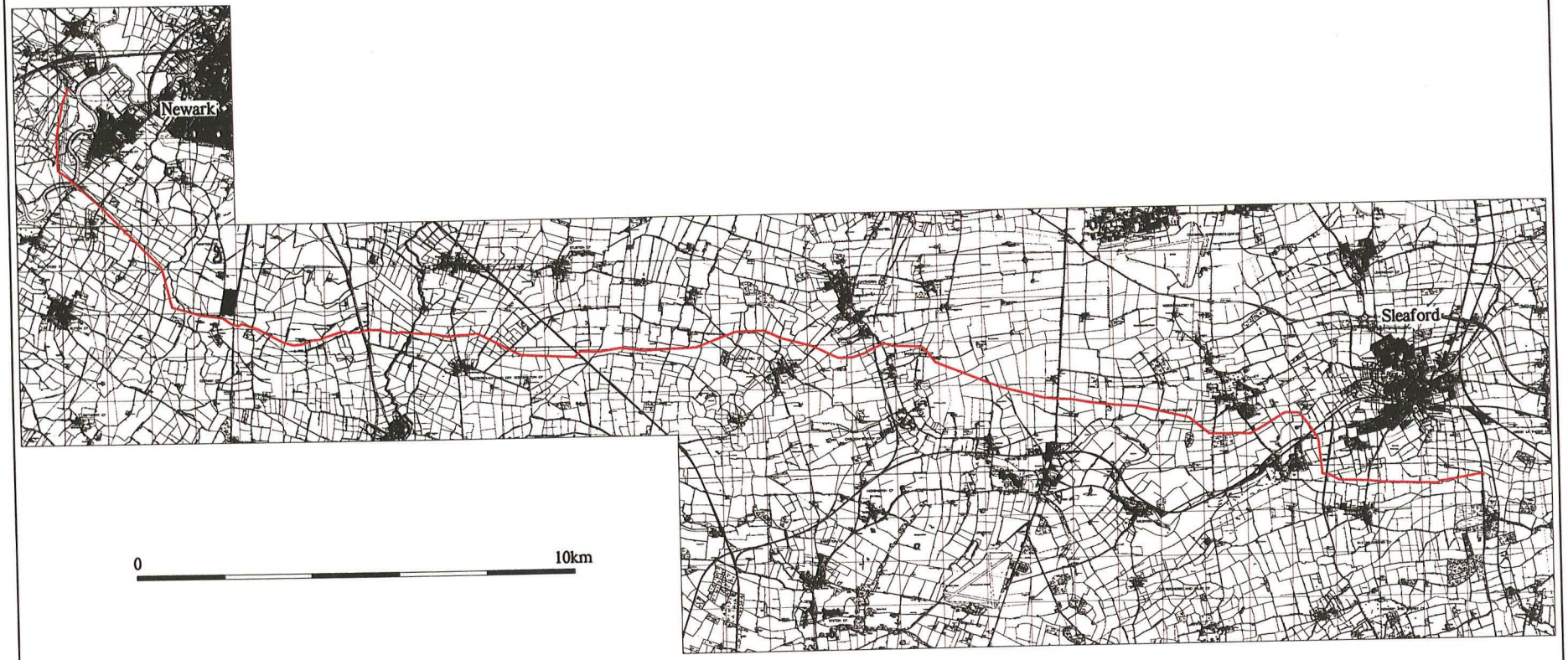
The pipeline covers a total distance of 38.48km, traversing 130 fields and 21 road crossings (RDX). Fields 1 to 97 lie within the county of Lincolnshire while Fields 98 to 130 lie within the county of Nottinghamshire.

Along the route of the pipeline the land is generally low-lying, situated between the 10-50m contour. The topography is characterised by broad, flat , shallow river valleys separated by undulating higher ground. Many of the villages along the route are situated on the higher ground. The highest point on the route, at 110m AOD, is reached on the Lincolnshire Edge escarpment at Normanton Hill.

The geology consists of both Superficial and Solid Deposits which include alluvium and river sands and gravels, clays and mudstones, sand and limestone. Consequently, much of the route is covered with calcareous clay soils which are well drained, fertile and suitable for cereal cultivation, although locally liable to seasonal waterlogging. The lighter sandier soils also support root crops and other vegetable crop cultivation. Very shallow soils cover the limestone bedrock, particularly in one area between South Rauceby and Normanton.

### 1.2 EVALUATION STRATEGY

The pre-construction evaluation forms part of a structured programme of investigation designed to locate and investigate archaeological sites along the route of the pipeline with the aim of providing an adequate archaeological mitigation strategy for the construction programme (Table 1).






Location of the pipeline route

Figure 1

Table 1 Phases of Archaeological Investigation

| | Procedure | Purpose | Coverage |
|---|---|---|---|
| **Phase 1** | **(Review)** | | |
| | Desk-Based Assessment | locate archaeological sites or find spots from public records or archive sources (eg. SMR, NMR, RCHME, CUCAP) | pipeline corridor 1km wide |
| **Phase 2** | **(Reconnaissance)** | | |
| Stage 1 | Walkover survey (Intervention 1) | identify and report on the condition of earthworks, describe field conditions | pipeline route, field width |
| | Fieldwalking (Intervention 2) | recover finds distributions and identify areas of archaeological interest | pipeline route, 40m corridor |
| | Magnetic Susceptibility survey (Intervention 3) | locate areas of archaeological potential | pipeline route, 40m corridor |
| | Magnetometer scanning (Intervention 4) | locate areas of archaeological potential | pipeline route, 40m wide corridor |
| | Magnetometer line survey (Intervention 5) | locate areas of archaeological potential | pipeline route, 15m wide corridor |
| Stage 2 | Magnetometer area survey (Intervention 6) | to define the extent of, and broadly characterise areas of archaeological potential | pipeline route, 30m wide areas based along centreline |
| **Phase 3** | **(Pre-construction evaluation)** | | |
| | Topographic survey (Intervention 7) | map shape and extent of earthwork features | pipeline route in selected fields determined by Int.1 |
| | Evaluation trenches (Intervention 8 and 9) | evaluate and characterise areas of archaeological potential identified at Phase 2 | pipeline route, trenches located over areas of archaeological potential within 30m wide corridor |
| **Phase 4** | **(Pre-construction mitigation)** | | |
| | Area excavation | excavate and record significant archaeological sites prior to construction | pipeline route, within 30m corridor |
| **Phase 5** | **(Watching Brief)** | | |
| | Sample excavation | excavate and record archaeological remains identified during topsoil stripping and pipe trench excavation | pipeline route, within 30m corridor |
| **Phase 6** | **(Post excavation assessment and archive preparation)** | | |
| **Phase 7** | **(Synthesis and dissemination)** | | |

The Specification for the evaluation programme was prepared by FAS (Appendix A) and has been approved by Lincolnshire County Council. The project's environmental strategy is also included at Appendix B. The evaluation programme was undertaken in accordance with the Lincolnshire County Council Archaeological Handbook, and the Institute of Field Archaeologists Code of Conduct, standards and guidance.

The evaluation programme (Phase 3) was designed to assess and characterise areas of archaeological potential identified during the previous phases of investigation. The evaluation programme was undertaken in four stages:

Stage 1 Magnetometer area survey (Intervention 6) was undertaken in an attempt to define the extent of significant archaeological remains identified in Fields 54-56 during the reconnaissance programme.

Stage 2 Topographic survey (Intervention 7) was carried out to record earthwork features identified during the reconnaissance programme.

Stage 3 Hand excavated trenches (Intervention 8) were undertaken to locate areas of mesolithic activity (not susceptible to geophysics) and to characterise known flint scatters.

Stage 4 Machine excavated trenches (Intervention 9) were undertaken to characterise the extent, condition and significance of potential archaeological remains located by the reconnaissance programme.

Table 2 List of archaeological interventions

| Intervention | Activity | Originator | Date |
|---|---|---|---|
| 6 | Magnetometer area survey | T J Simpson | March 2000 |
| 7 | Topographic survey | A J Copp | Feb 2001 |
| 8 | Hand excavated trenches | A J Copp | Sept - Nov 2000 |
| 9 | Machine excavated trenches | A J Copp | Sept 2000 - March 2001 |

## 2.0 BACKGROUND INFORMATION

Sources of information consulted at Phase 3 include:

i. the Archaeological Desk-Based Assessment Report and constraint maps prepared by Network Archaeology Ltd. (Phase 1, Report No.132, April 1999). This was supplemented with additional notes on cropmarks provided by Transco from Network Archaeology Ltd.

ii. extracts from the geological/geomorphological ground risk assessment study (Weeks) which included geology and soil maps.

iii. strip maps at a scale of 1:2500 and 1:10,000 provided by Transco identifying the current pipeline route.

iv. the Archaeological Reconnaissance Report and constraint maps prepared by FAS (Phase 2, SSP02, March 2000).

## 2.1 REVIEW OF ARCHAEOLOGICAL POTENTIAL

On completion of the reconnaissance programme, fields along the pipeline route were categorised according to their apparent archaeological potential. As a result of the archaeological investigation and in conjunction with non-archaeological constraints, the pipeline route was reviewed by Transco. Consequently, the pipeline route was modified in some areas to avoid potentially significant archaeological remains. Possible settlement sites or field systems were thereby avoided in Fields 96 and 109. The following fields were considered to be of high archaeological potential and as such were the subject of archaeological evaluation.

*Field 1* The Phase 2, Stage 2 geophysical survey in this field defined at least two curvilinear features which appear to be large enclosures. Although the fieldwalking only recovered a few sherds of Roman pottery and a possible knife handle, the presence of a late Iron Age or Romano-British settlement site in the adjacent field suggests that these possible enclosures may also relate to settlement activity.

*Field 18* The fieldwalking recovered a significant concentration of prehistoric flintwork from this field including tools and waste material. The Phase 2, Stage 2 geophysical survey appears to have defined the remains of heavy ploughing which may have seriously disturbed the distribution of the flint assemblage along with any associated features. This field, however, lies within an area of prehistoric activity characterised by pit alignments and barrows.

*Field 19* Same as Field 18.

*Field 20* A concentration of flintwork similar to that recovered from Fields 18 and 19 was also recovered from this field along with a small quantity of Roman pottery. This field also lies within the area of known prehistoric activity. The Phase 2, Stage 2 geophysical survey defined linear and curvilinear features which have been interpreted as enclosures, including a possible entrance.

*Field 31* The Phase 2, Stage 2 geophysical survey defined a series of strong north-south aligned linear anomalies adjacent to the western boundary of this field.

*Field 33* Although this field was under pasture at the time of the reconnaissance programme, a mesolithic flint scatter had been previously recovered in this area. The Phase 2, Stage 2 geophysical survey defined a series of ephemeral anomalies.

*Field 34* Although this field was under pasture at the time of the reconnaissance programme,

a mesolithic flint scatter had been previously recovered in this area. The Phase 2, Stage 2 geophysical survey defined a series of possible enclosures in the centre of the field which may have been focussed around a trackway.

*Field 37* This field lies immediately to the west of a Roman road (Ermine Street). A few sherds of Roman pottery and a scatter of flintwork were recovered from this field during the fieldwalking survey. The Phase 2, Stage 2 geophysical survey defined a series of linear and curvilinear features.

*Field 45* A moderate assemblage of Roman pottery was recovered from this field. The Phase 2, Stage 2 geophysical survey defined a large number of linear and curvilinear anomalies which have been interpreted as enclosures. The geophysical survey results appear to indicate that this area has been heavily plough damaged.

*Field 48* The walkover survey (Phase 2, Stage 1, Int.1) identified the remains of ridge and furrow ploughing in this field.

*Field 49* Fieldwalking recovered an 8th - 11th century high status glass bead from this field. The Phase 2, Stage 2 geophysical survey defined a group of ephemeral circular features. Although the interpretation of the features defined by the geophysical survey is problematic, the presence of the glass bead may indicate that a cemetery site exists within this area.

*Field 54* This field was originally described in the Desk-Based Assessment as containing the remains of ridge and furrow ploughing, although the walkover survey (Phase 2, Stage 1, Int.1) proved that this has now been ploughed out. Two concentrations of finds were recognised from the fieldwalking (Phase 2, Stage 1, Int.2), one group predominantly Roman in date to the east, and one prehistoric to the west. Consequently, two areas were chosen for area geophysics and the results reflected the finds distribution. The eastern area showed a network of very clear rectilinear enclosures, the size, shape and density of which suggest a possible Roman settlement; and the western area contained similar rectilinear enclosures but also showed curvilinear features which may represent earlier, prehistoric activity.

*Field 55* The fieldwalking recovered a scatter of Roman and prehistoric finds from this field. The Phase 2, Stage 2 geophysical survey defined linear and curvilinear anomalies at the eastern end of the field which appear to indicate that enclosures survive within this area. This field also appears to contain ploughed out ridge and furrow along with heavy modern ploughing.

*Field 56* The fieldwalking survey in this field recovered a few flint finds. The Phase 2, Stage 2 geophysical survey, however, clearly defined linear, curvilinear and circular features

which have been interpreted as the remains of settlement activity. These remains also seem to have been damaged by ridge and furrow and modern ploughing.

*Field 75* The Phase 2, Stage 2 geophysical survey defined linear and curvilinear features as well as an area of strong magnetic responses.

*Field 79* The walkover survey (Phase 2, Stage 1, Int.1) identified the remains of ridge and furrow ploughing in this field.

*Field 80* The walkover survey (Phase 2, Stage 1, Int.1) identified the remains of ridge and furrow ploughing in this field.

*Field 81* The walkover survey (Phase 2, Stage 1, Int.1) identified the remains of ridge and furrow ploughing in this field.

*Field 85* The walkover survey (Phase 2, Stage 1, Int.1) identified the remains of ridge and furrow ploughing in this field.

## 2.2 ADDITIONAL RECONNAISSANCE

*Fields 106B - 110B* (New Point-to-Point Course pipeline route)

Further reconnaissance survey was undertaken along a modification to the pipeline route through Fields 106B, 107B and 110B. It was not possible to undertake magnetometer line survey in Field 110B due to recent deep ploughing. Reconnaissance fieldwalking was undertaken as an alternative means of assessing the archaeological potential of this area. The fieldwalking produced a small concentration of Roman pottery which most probably relates to the continuation of the site identified during Stage 2 of the reconnaissance programme in Field 109 (Fig.2).

Intensive magnetometer line survey was undertaken along a new pipeline route in Fields 106B and 107B. Although a few amorphous magnetic anomalies were defined at the southern end of Field 106B, the only anomalies consistent with archaeological features were encountered at the northern end of Field 107B. These curvilinear features coincide with a cropmark site made up of enclosures and a possible ring ditch identified in the Desk Based Assessment.

Based on the results of the fieldwalking in Field 110B and the intensive line survey in the northern part of Field 107B, it was decided that evaluation excavation would be undertaken in these areas.

Due to problems with access caused by late harvests, game shooting and more recently, foot and mouth disease, it has not been possible to carry out further reconnaissance work in areas where access could not be gained during the reconnaissance programme (Fields 8-13) and in Fields 95 and 96 where a recent re-route has successfully avoided an area of significant archaeological remains.

Field Archaeology Specialists Ltd

FAS ssp25203 fig2.dwg

Key for distribution plot

1 find

2-3 finds

Field 110B

Field 107B

Field 106B

Pond

Track

Track

Track

ETL

ETL

Sluice

Drain

River

SK 782 485



Magnetometer line survey and fieldwalking results Fields 106B, 107B, 110B

Scale 1:2500

Figure 2

FAS

## 3.0 EVALUATION FIELDWORK PROCEDURE

Fields along the pipeline route which were the subject of evaluation works are shown on Figures 3 and 4.

### 3.1 MAGNETOMETER AREA SURVEY (Int.6 - Fields 54 to 56)

Additional groups of 50m x 50m survey grids were set out adjacent to the 30m wide strips of magnetometer area survey undertaken during Phase 2, Stage 2 of the reconnaissance programme in Fields 54, 55 and 56. The aim of the additional survey was to define the extent or variations in feature density of the archaeological foci defined in these fields by the reconnaissance programme with a view to undertaking minor modifications to the pipeline route in order to avoid the densest areas of archaeological remains.

The survey was carried out using Geoscan fluxgate gradiometers with digital storage and data transfer facilities (FM36 with ST1 sample trigger). Each 50m x 50m survey grid was undertaken using the parallel traverse method (unidirectionally) to ensure the capture of good quality raw data. Instrument readings were logged at 1.0m x 0.5m intervals. Data from the survey instruments was transferred to a portable computer where it was checked for survey defects.

The raw data was processed using Geoplot version 2.02. This involves the adjustment of any differences in the average background reading between individual survey grids as well as inconsistencies caused by instrument drift, which are removed to facilitate clear presentation of the data set.

### 3.2 TOPOGRAPHIC SURVEY (Int.7 - Fields 48, 79 to 81, 85)

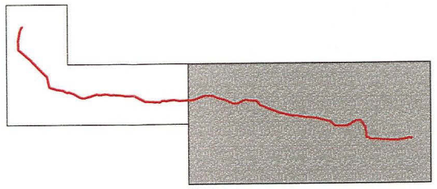
Only five fields of old, well established pasture survived along the pipeline route, representing less than 4% of the total number of fields which illustrates the predominance of arable farming in this part of Lincolnshire. Although more fields have recently been put back under grassland the presence of earthworks in the five fields suggests they are traditional stock fields, which have not been broken for arable crops for some period of time. The Desk Based Assessment indicated that fields of ridge and furrow earthworks, part of medieval or later agricultural regime, were a particular feature of the relic landscape around some of the villages of Lincolnshire and Nottinghamshire. For example north of Dry Doddington a cluster of four enclosed fields contained the remains of such earthworks.

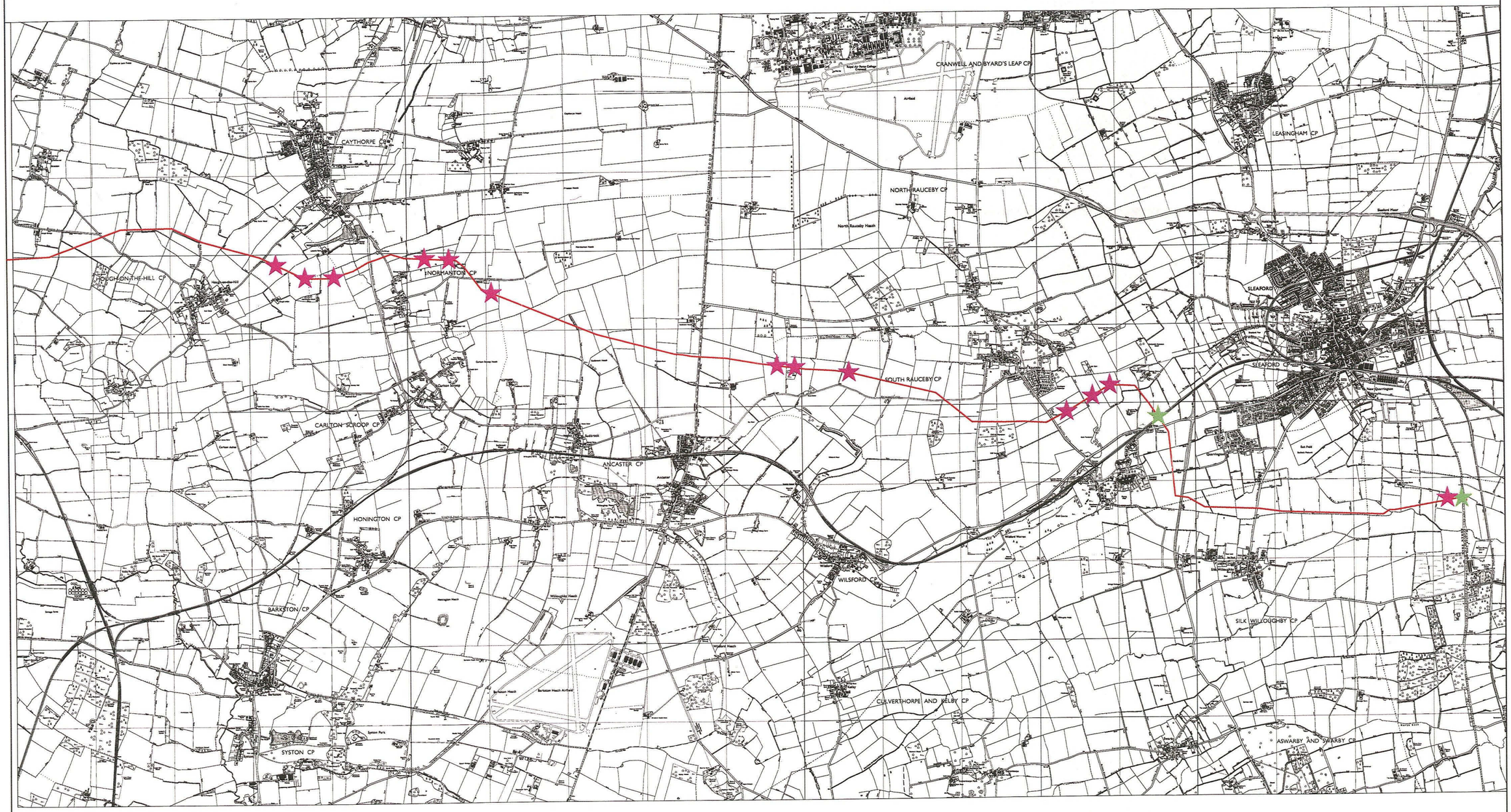
Topographic survey involved mapping both the boundaries and ground surface in each of the five fields. A total station theodolite was used to carry out the survey and the data was processed and presented using Liscad and AutoCAD software packages. The Ordnance Survey grid was used as the control for the survey, identified by control stations provided by Transco at each road crossing. Consequently all heights given are expressed above Ordnance Datum (AOD).

FAS ssp25203 fig3.dwg

evaluation

watching brief







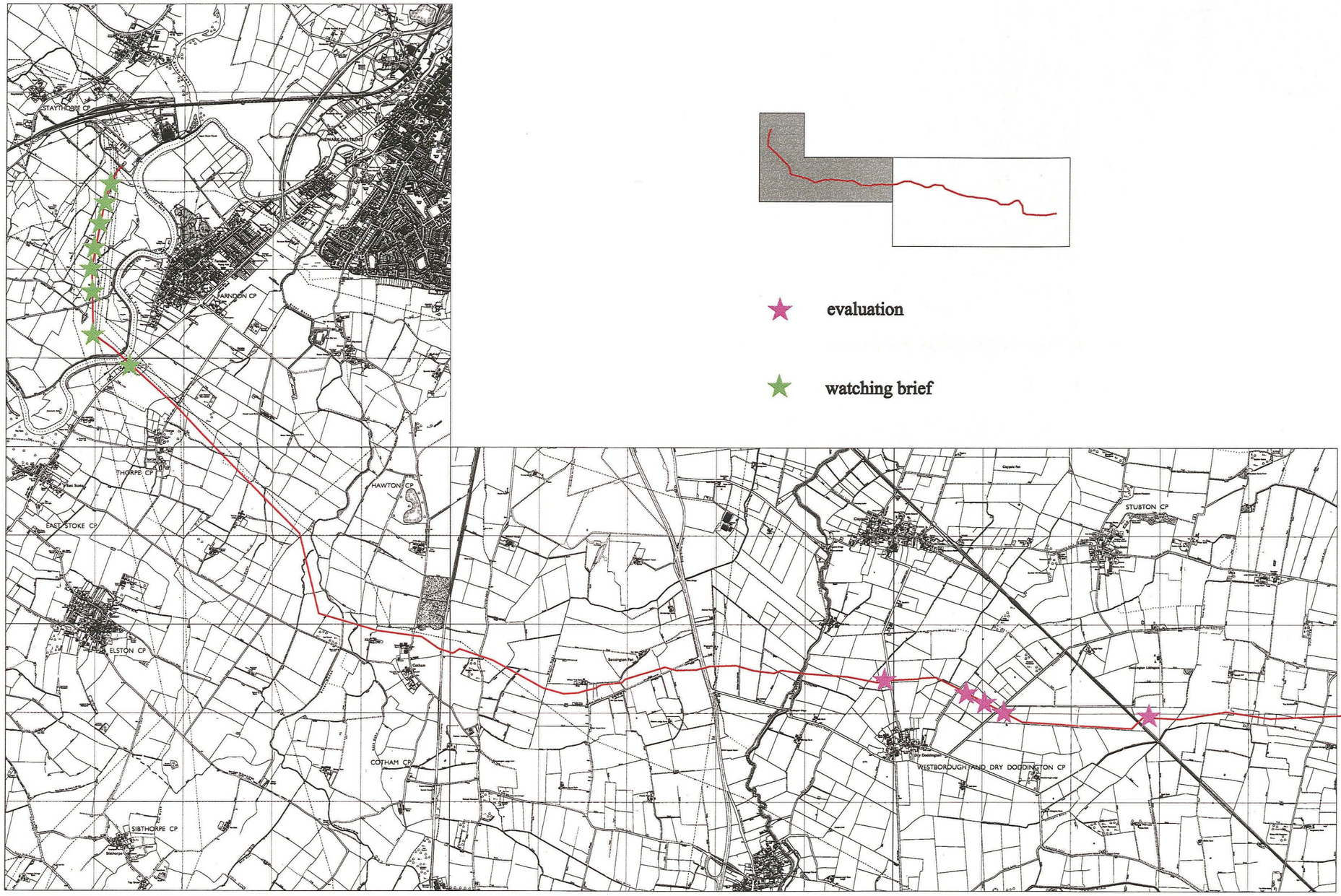



Location of the evaluation and watching brief, Fields 1 to 49

Scale 1:50 000

Figure 3

FAS






Location of the evaluation and watching brief, Fields 75 to 130

Scale 1:50 000

Figure 4

Topographic features which were considered to be man-made earthworks were mapped and illustrated by hachures. The strength of slope is indicated by the spacing of the hachure and the relative size of the hachure head. Broken hachure tails indicate where the slope fades out. Where ridge and furrow type earthworks were present the base of the furrow, where it was distinct, was depicted by a dotted line. The survey data was also used to produce a contour map for each survey area.

Two sets of plans have been presented for each field, a small scale drawing for the report (A4 size) and a set of A1 drawings at a scale of 1:500 or greater (Appendix C).

## 3.3 HAND EXCAVATED TRENCHES (Int.8 - Fields 18 to 20, 33 to 34)

A series of seventeen hand excavated trenches (1m x 1m) were opened in five fields which covered two areas of the pipeline (Fields 18 to 20 and Fields 33 to 34). These trenches were excavated in order to evaluate possible flint scatters identified during the reconnaissance programme and additionally to locate a putative mesolithic flint scatter reported in or near Fields 33 and 34.

Fields 33 and 34 were under grass in a nitrate sensitive area, a young root crop was growing in Fields 18 to 20.

In each trench the ploughsoil was allocated a context number and excavated in 0.05m spits. The excavated material was then dry sieved through a table sieve fitted with a 10mm mesh. A 10% sample of the excavated material was then passed through a finer hand held sieve with a 1mm mesh. In general the moderate to light sandy soils passed easily through the coarser mesh, however during wet weather it was difficult to sieve material through the finer mesh and on occasions it was necessary to carefully hand sort the sample. All the test pits were backfilled, in Fields 33 and 34 the turf was also replaced.

## 3.4 MACHINE EXCAVATED TRENCHES (Int.9 - Fields 1, 20, 31, 37, 45, 49 and 75)

A total of twelve 12m x 4m trenches were excavated. In each trench the topsoil/ploughsoil was removed using a back acting mechanical excavator fitted with a toothless ditching bucket down onto the first identifiable archaeological horizon (Recovery Level A, Table 3). This surface, Horizon 1, was shovel scraped, hand cleaned by trowel and photographed. Black polythene was laid down on the surface of the opened trench before hand cleaning in an attempt to contain the moisture and improve cleaning at Horizon 1. Any archaeological contexts and features were planned at this horizon and sample segments of each deposit were then hand excavated (Recovery Level C).

Where subsoil was poorly defined in plan a test sondage was dug in the trench to confirm the sequence. The size of this hand excavated trench varied depending upon the character of the strata. Some trenches contained spreads of overburden sealed beneath the ploughsoil, where this was identified it was removed by shovel (Recovery Level B) along one side of the trench down onto the

next archaeological horizon, Horizon 2. At Horizon 2 the surface was re-cleaned by trowel, mapped and sample segments of deposits excavated.

Table 3 Data recovery levels

| LEVEL | OPERATION | FIND | COMPONENT | CONTEXT | FEATURE | STRUCTURE |
|---|---|---|---|---|---|---|
| A | Machining | *Plot 2-D* | (not recovered) | *Outline plan* | *Outline plan* | *Outline plan* |
| | Fieldwalking | *Plot 2-D* | (not recovered) | (not recovered) | Inferred from density plot | Inferred from density plot |
| | Geophysics | (not recovered) | (not recovered) | (not recovered) | Inferred from density plot | Inferred from density plot |
| | Topographics | (not recovered) | (not recovered) | (not recovered) | Inferred from map | Inferred from map |
| B | Shovel scraping (definition) | *Plot 2-D* | (not recovered) | *Short description, outline plan* | *Short description, outline plan* | *Short description, outline plan* |
| | Shovel excavation | Recover by context | Optional sampling | *Short description, outline plan* | *Short description, plan* and *profile* | *Short description, plan* and *profile, photograph* (post-exc) |
| C | Coarse trowelling (definition) | *Plot 2-D* | (not recovered) | *Description, outline plan* | *Description, outline plan* | *Description, outline plan* |
| | Excavation | Recover by context. Optional sieving | Optional sampling | *Full description, outline plan* | *Full description, plan, section, photograph* (post-exc) | *Full description, plan, section, photograph* (post-exc) |
| D | Fine trowelling (definition) | *Plot 3-D* | (not recovered) | *Full description, outline plan, photograph* | *Full description, detailed plan, photograph* | *Full description, detailed plan, photograph* |
| | Excavation | *Plot 3-D. Sample sieving* | Selective sampling | *Full description, outline plan, section, photograph* (pre-exc) | *Full description, detailed plan, section, photograph* (pre/post exc) | *Full description, detailed plan, section, photograph* (by phase) |
| E | Detailed excavation | *Plot 3-D. Describe attitude. Sieve all* | *Keep all* | *(as LEVEL D)* Optional colour plan/section | *(as LEVEL D) Full photographic record* | *(as LEVEL D) Full photographic record* |
| F | Block removal for controlled dissection | (as above) *Photograph* and *draw* in situ | *Keep all* | *(as LEVEL E) Full photographic record* | *(as LEVEL E)* | *(as LEVEL E)* |

The recording system employed followed *Field Research Procedures* (Carver 1990), the standard operating system employed by FAS in which contexts were numbered from C1000 and features from F1.

The Ordnance Survey national grid was adopted as the site grid and each trench was located according to this grid, all heights refer to Ordnance Datum. A written, drawn and photographic record was made of all archaeological remains and retained materials were appropriately processed

and recorded in accordance with Lincolnshire County Council guidelines.

Usually in each trench one of the long sections was drawn to represent the principal deposit sequence. However, where a similar sequence was noted for trenches from one field then only one of the sections was drawn.

## 4.0 EVALUATION RESULTS

Table 4 below shows a summary of the results of the evaluation programme.

Table 4 Phase 3 evaluation programme - summary of investigations

| Fld | Int | Cat. (2) | Method | Size | Location (NGR) | Stage2 results | Stage 3 results |
|---|---|---|---|---|---|---|---|
| 1 | 9 | A | Trench A | 12x4 | 508350/343749 | geophysical anomalies, finds spot | Modern field drains (x2) |
| | | | Trench B | 12x4 | 508288/343737 | geophysical anomalies, finds spot | Sterile |
| 18 | 8 | A | Trench A | 1x1 | 503895/345215 | flint scatter | |
| | | | Trench B | 1x1 | 503859/345196 | flint scatter | |
| | | | Trench C | 1x1 | 503826/345176 | flint scatter | |
| 19 | 8 | A | Trench A | 1x1 | 503761/345137 | flint scatter | |
| | | | Trench B | 1x1 | 503692/345082 | flint scatter | |
| | | | Trench C | 1x1 | 503623/345041 | flint scatter | |
| 20 | 8 | A | Trench A | 1x1 | 503501/344978 | flint scatter | |
| | | | Trench B | 1x1 | 503399/344915 | flint scatter | |
| | | | Trench C | 1x1 | 503329/344873 | flint scatter | |
| | 9 | | Trench A | 12x4 | 503218/344820 | geophysical anomalies | F1, overburden 1005, IA pottery |
| | | | Trench B | 12x4 | 503444/344944 | geophysical anomalies | Overburden 1008, cremated human bone, IA pottery |
| 31 | 9 | D | Trench A | 12x4 | 500546/345433 | geophysical anomalies, finds spot | F2, overburden 1012 |
| 33 | 8 | C | Trench A | 1x1 | 499886/345496 | none (Desk based Assessment) | |
| | | | Trench B | 1x1 | 499864/345498 | none (Desk based Assessment) | |
| | | | Trench C | 1x1 | 499842/345501 | none (Desk based Assessment) | |
| | | | Trench D | 1x1 | 499819/345503 | none (Desk based Assessment) | |
| 34 | 8 | C | Trench A | 1x1 | 499794/345506 | none (Desk based Assessment) | |
| | | | Trench B | 1x1 | 499771/345509 | none (Desk based Assessment) | |
| | | | Trench C | 1x1 | 499750/345512 | none (Desk based Assessment) | |
| | | | Trench D | 1x1 | 499728/345515 | none (Desk based Assessment) | |
| 37 | 9 | A | Trench A | 12x4 | 498470/345670 | geophysical anomalies, find spot | (Sterile) |
| 45 | 9 | A | Trench A | 12x4 | 496459/346324 | geophysical anomalies, finds spot | (Sterile) |
| | | | Trench B | 12x4 | 496209/346425 | geophysical anomalies, finds spot | (Sterile) |
| | | | Trench C | 12x4 | 495924/346546 | geophysical anomalies, finds spot | F6-F9, ? cremation, IA pottery |
| 48 | 7 | B | Topog. survey | 0.76ha. | 495516/346898 | ridge and furrow earthworks | |
| 49 | 9 | A | Trench A | 12x4 | 495083/346930 | geophysical anomalies, finds spot | F3 (not dug), 11thC pottery |
| | | | Trench B | 12x4 | 495049/346931 | geophysical anomalies | (Sterile) |

| Fld | Int | Cat. (2) | Method | Size | Location (NGR) | Stage2 results | Stage 3 results |
|---|---|---|---|---|---|---|---|
| 54 | 6 | A | Mag Area Survey | 1.25ha. | 494101/346715 | geophysical anomalies, finds spots | geophysical anomalies, |
| 55 | 6 | A | Mag Area Survey | 0.5ha. | 493718/346698 | geophysical anomalies, finds spots | geophysical anomalies, |
| 56 | 6 | A | Mag Area Survey | 2.0ha | 493332/346862 | geophysical anomalies, finds spots | geophysical anomalies, |
| 75 | 9 | B | Trench A | 12x4 | 487845/346955 | geophysical anomalies | F4, F5 |
| 79 | 7 | B | Topog. survey | 2.98ha. | 486228/346990 | ridge and furrow earthworks | |
| 80 | 7 | B | Topog. survey | 3.77ha. | 486028/347139 | ridge and furrow earthworks | |
| 81 | 7 | B | Topog. survey | 4.76ha. | 485798/347202 | ridge and furrow earthworks | |
| 85 | 7 | B | Topog. survey | 2.60ha. | 484902/347367 | ridge and furrow earthworks | |
| 96 | 9 | A | | | | geophysical anomalies, finds spot | N/A - pipeline re-routed |
| 107B | 9 | A | | | | geophysical anomalies | Not available for study |
| 110B | 9 | A | | | | find spot | Not available for study |

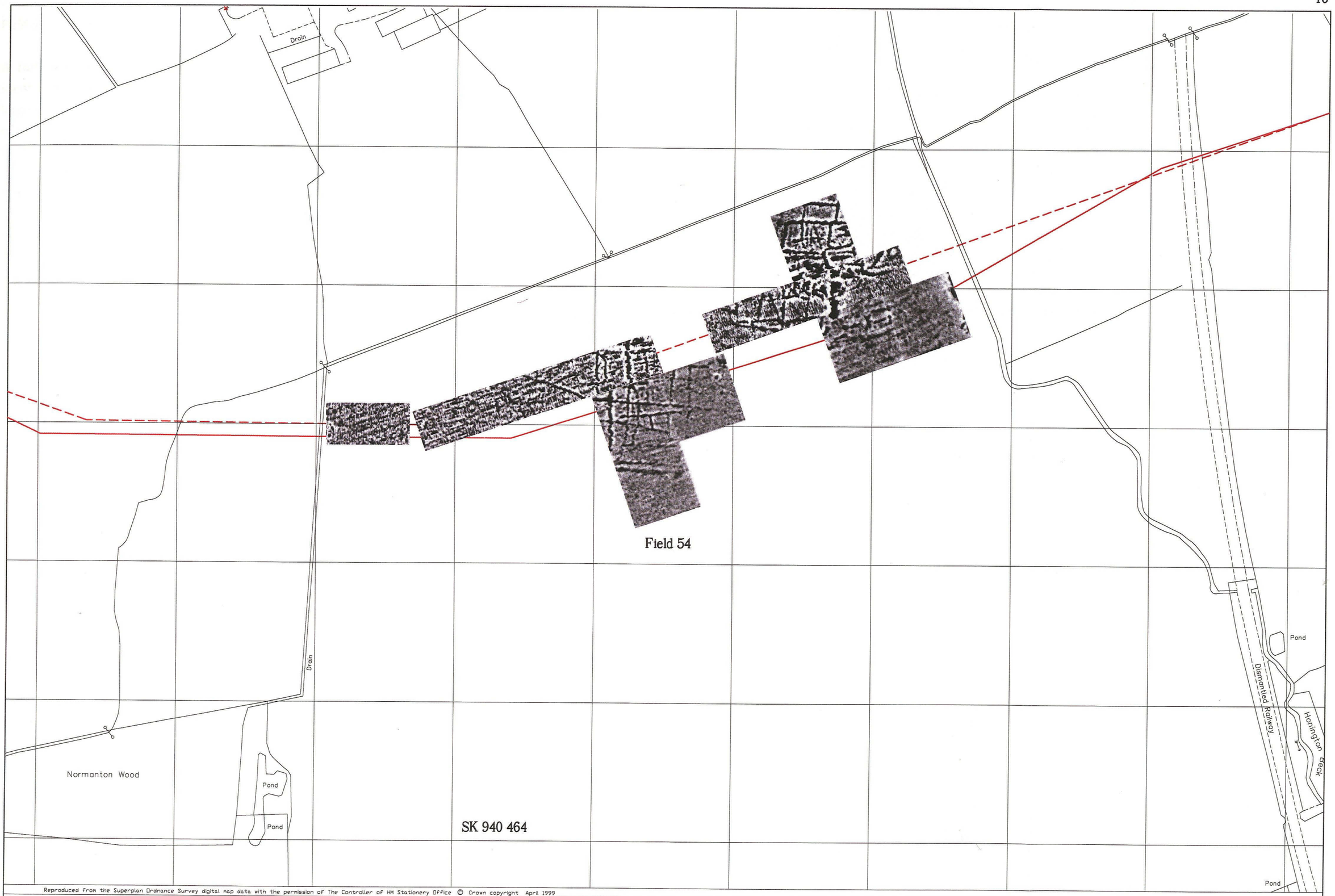
## 4.1 MAGNETOMETER AREA SURVEY (Table 4)

*Field 54*

A further 1.5 ha of magnetometer area survey was carried out in Field 54 in order to define the extent of two concentrations of archaeological features identified during the reconnaissance programme. The major concentration of features on the eastern side of the field was interpreted as settlement remains (Fig.5) and the results show that features continue to the north of the current pipeline corridor and most probably beyond the northern boundary of Field 54. As predicted, this probable settlement concentration appears to end approximately 20m to the south of the current pipeline corridor.

The western concentration of features defined by the reconnaissance programme appears to continue approximately 70m to the south of the current pipeline corridor. The apparent southern limit of this group of features appears to consist of a double ditch boundary. This group also continues to the east, where they seem to fade out rather than terminate.

The results of the additional survey have confirmed that this archaeological site continues to the north of the current pipeline route. Although the results suggest that the area to the south of the current route contains a lower density of archaeological features, this conclusion should be treated with caution. The 'fading out' of features strongly suggests that the area to the south of the current corridor contains alluvial or colluvial deposits which potentially mask well preserved archaeological remains.






Results of magnetometer area survey Field 54

Scale 1:2500

Figure 5

*Field 55*

A further 0.5ha of area survey was undertaken in Field 55 to investigate a curvilinear feature identified during Stage 2 of the reconnaissance programme (Fig.6). The additional survey defined a large (*c.*28m diameter) circular feature. This feature has been tentatively interpreted as the remains of a burial mound or barrow as it is located in a prominent topographic position and is of a size and form consistent with such features.

*Field 56*

Two hectares of additional area survey was undertaken in Field 56 (Fig.7) in an attempt to define the extent of probable settlement activity identified during Stage 2 of the reconnaissance programme. Further circular features interpreted as the ring ditches of round houses are present within the area to the north of the current pipeline corridor. Although linear features which appear to be part of an enclosure system are present within the area to the south of the current corridor the feature density appears to be lower and no ring ditches are evident.

The large NE-SW aligned linear features in the south-eastern part of the survey areas may be associated with this probable settlement activity, although it is equally possible that they represent a headland associated with the ridge and furrow ploughing.

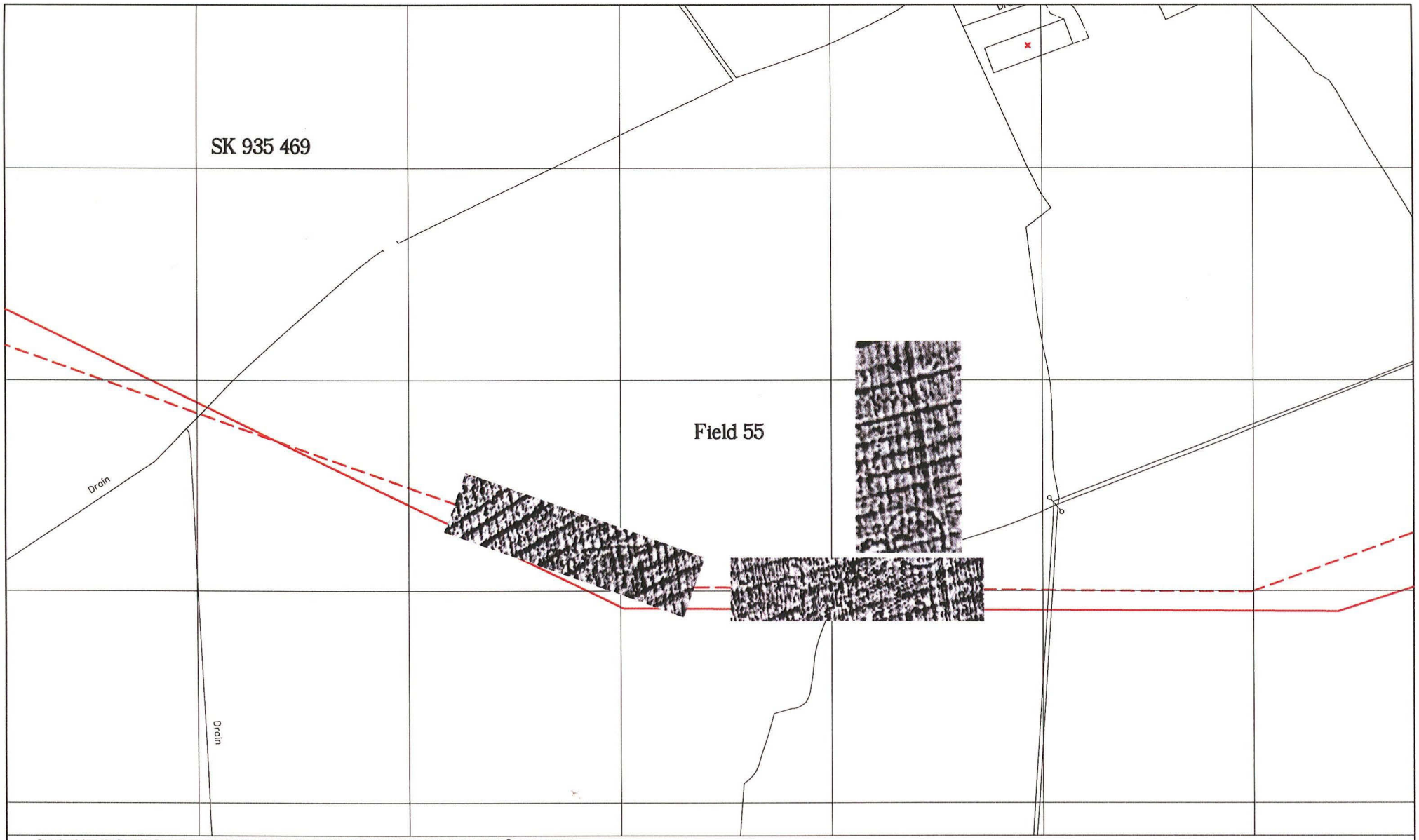
The pipeline route through Fields 54, 55 and 56 was slightly modified as a result of the additional area magnetometer survey in order to avoid the densest and potentially most significant areas of archaeological remains. Although the pipeline route through these fields had originally been included in Stage 4 of the evaluation programme, it was decided that this area should be subject to pre-construction excavation at the earliest possible date and for this reason the planned evaluation excavation was abandoned.

## 4.2 TOPOGRAPHIC SURVEY (Table 4)

*Field 48* (Fig.8)

The field rises steeply onto the Lincolnshire ridge between the 74 to 93m contour, above the village of Normanton. At the bottom of the field were the truncated earthworks of a ridge and furrow field system. It appears from the Desk Based Assessment that such earthworks were more common around the village until relatively recently.

None of the ridges extended above the 85m contour and most were situated below 81m. The poor condition of the remains is reflected in the variation in the width of the ridges and the irregular distance between the furrows. A few artificial terraces crossed the contours, at the lower levels it was clear some had cut the ridge and furrow. Two small spoilheaps on the south side also indicated ground disturbance.

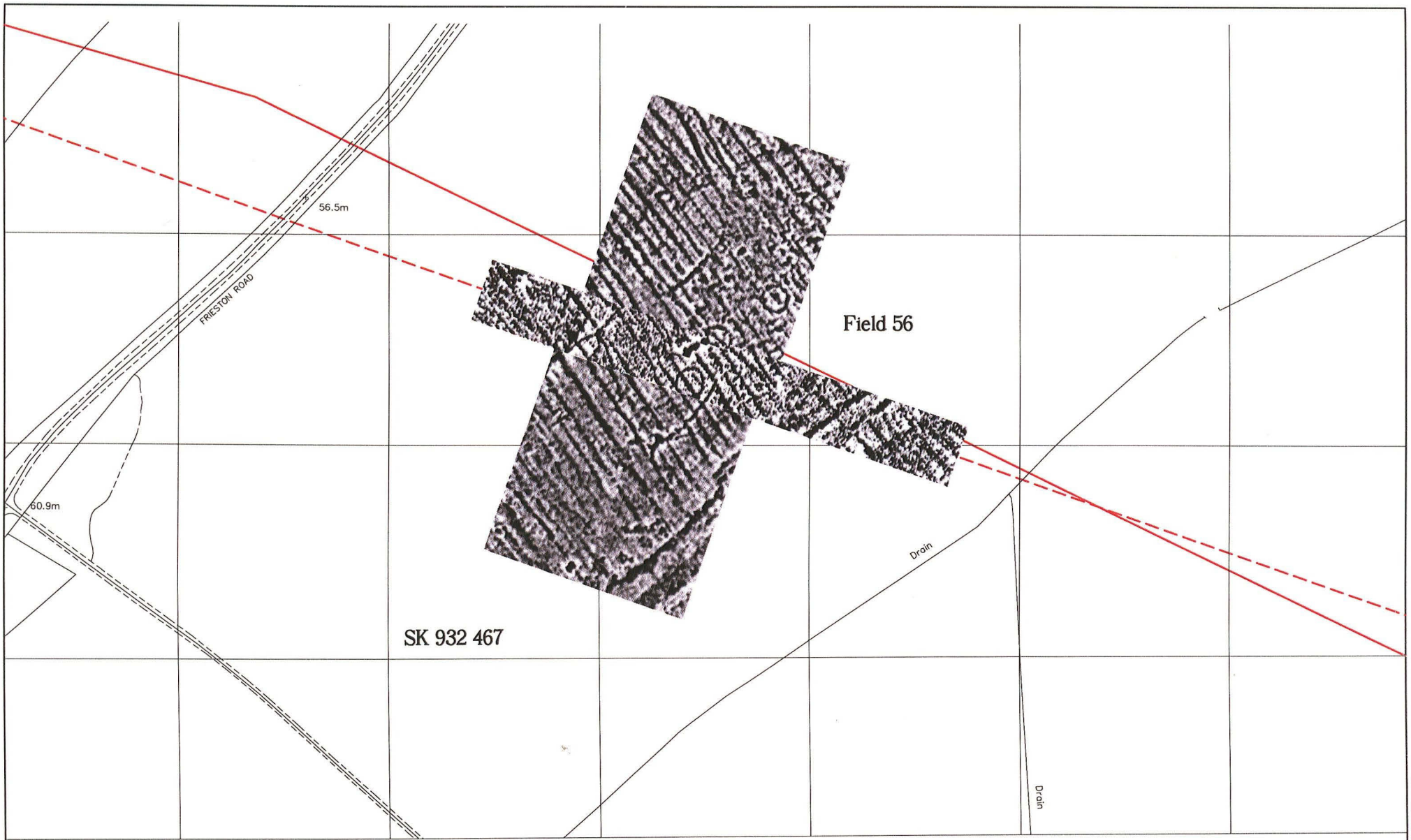





Results of magnetometer area survey Field 55

Scale 1:2500

Figure 6

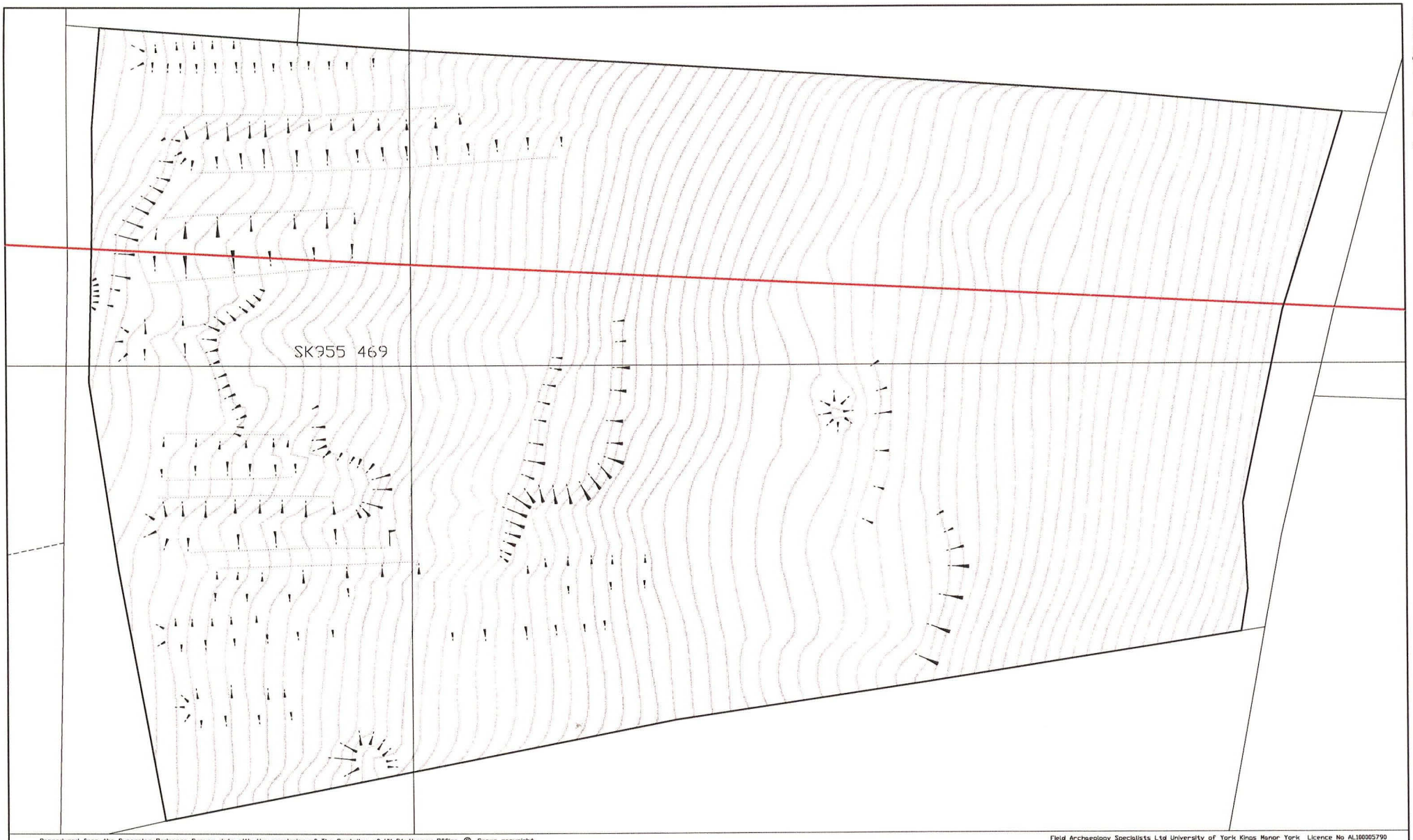





Results of magnetometer area survey Field 56

Scale 1:2500

Figure 7








**Field 48 map of topographic features (contour intervals 0.25m)**

Scale 1:500

Figure 8

*Field 79* (Fig.9)

Ridge and furrow earthworks covered the southern side of the field above the 34m contour which were separated into two groups by a blank area devoid of any remains. Both groups were on the same basic NW/SE alignment and had been cut by later features. In the case of the southern group a small dew pond had cut the earthworks but two furrows from the northern group were overlain by a relatively prominent, short embankment of unknown function.

A thin sinuous gully to the north of the earthwork appears to be a narrow drain, now disused, that does not appear to be related to the ridge and furrow.

*Field 80* (Fig.10)

Field 80 is situated on relatively undulating ground above the 23m contour, the western side drops down to a narrow drain marking the edge of the field. A large, growing heap of manure obscured a small area of the field in the south-eastern corner.

Two parcels of ridge and furrow were present in the field. At the eastern end a group of relatively prominent ridges, up to 50m long ran up to a low terrace. The second group, which continued from the terrace were less prominent and irregular but crossed the field. Occasionally these could only be identified as faint shadows in low sunlight. At the eastern end of the south side a low circular mound with a shallow depression at its centre appears to overlay the second group. This feature is covered with grass which suggests that it is not the result of very recent landscaping. Although this mound may simply represent the remains of a backfilled pond, which frequently occur in this area, or a relatively recent spoil heap, the possibility that this feature is in fact a plough damaged and robbed burial mound cannot be ignored.

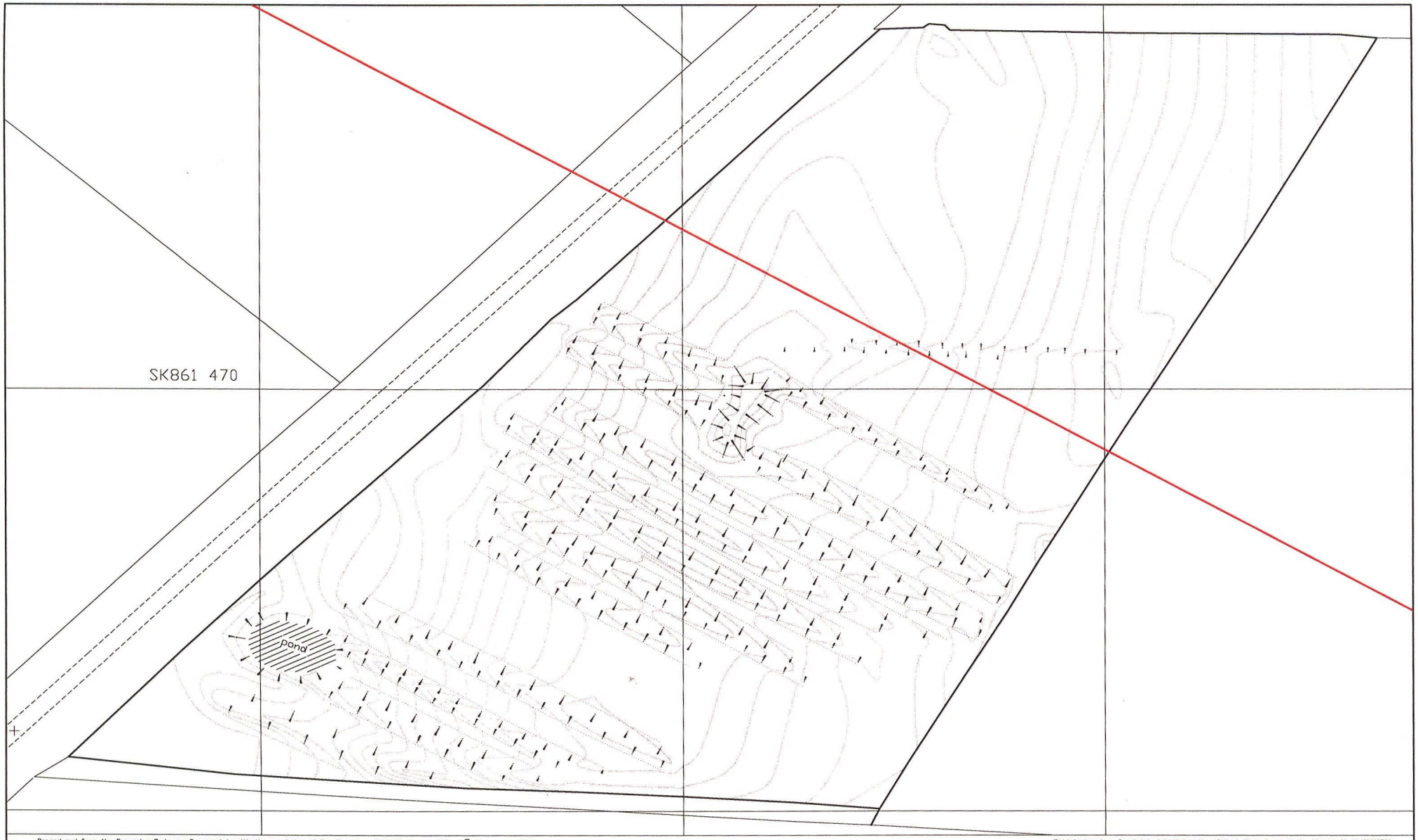
*Field 81* (Fig.11)

Only the northern side of the field was surveyed, the southern side being well beyond the pipeline corridor and not covered by any prominent earthworks. A relatively substantial bank on the southern side of the surveyed area provided a convenient boundary to the survey.

Within the surveyed area a series of faint ridges from a ridge and furrow cultivation system were mapped above the 29m contour. These were apparently part of the same system from Field 80 that extended toward the boundary drain. Low ridges crossed the field on a NW/SE alignment, although they were absent at the eastern end.

*Field 85* (Fig.12)

Ridge and furrow earthworks were situated on higher ground at the eastern side of the field, above the 23m contour and overlooking an area of wet, marshy ground along the line of the Sike Drain (no

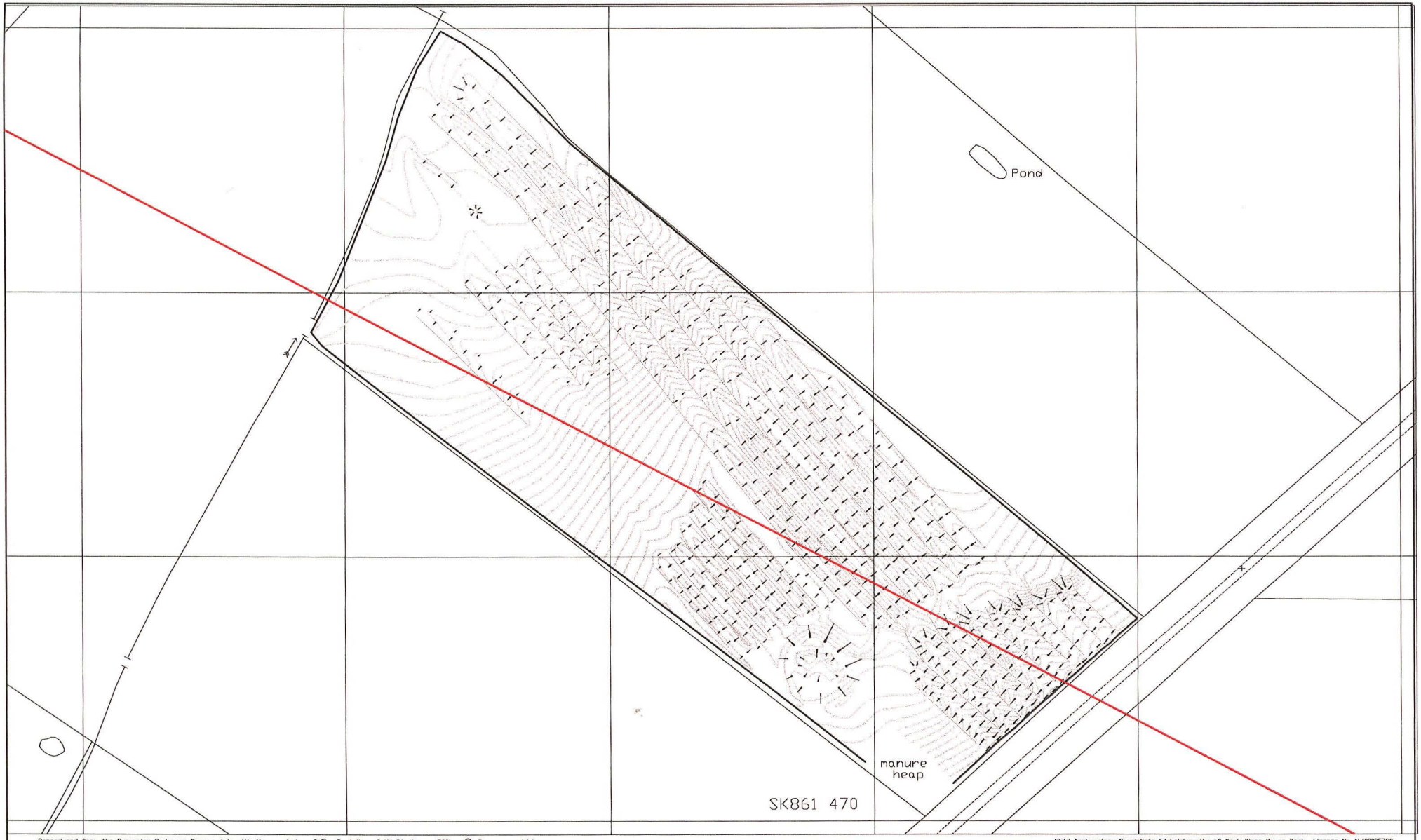





**Field 79 map of topographic features (contour intervals 0.10m)**

Scale 1:1250

Figure 9



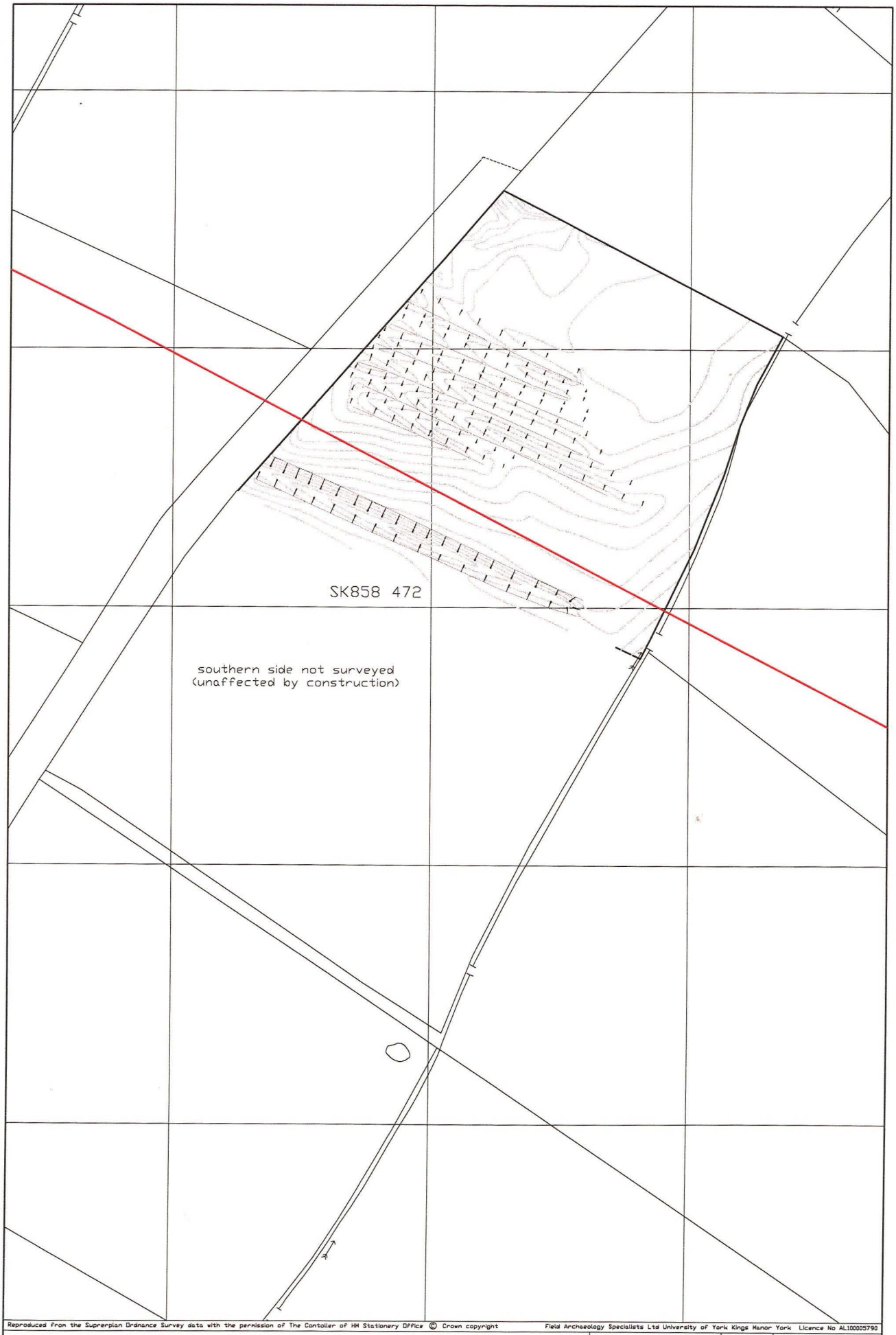





**Field 80 map of topographic features (contour intervals 0.10m)**

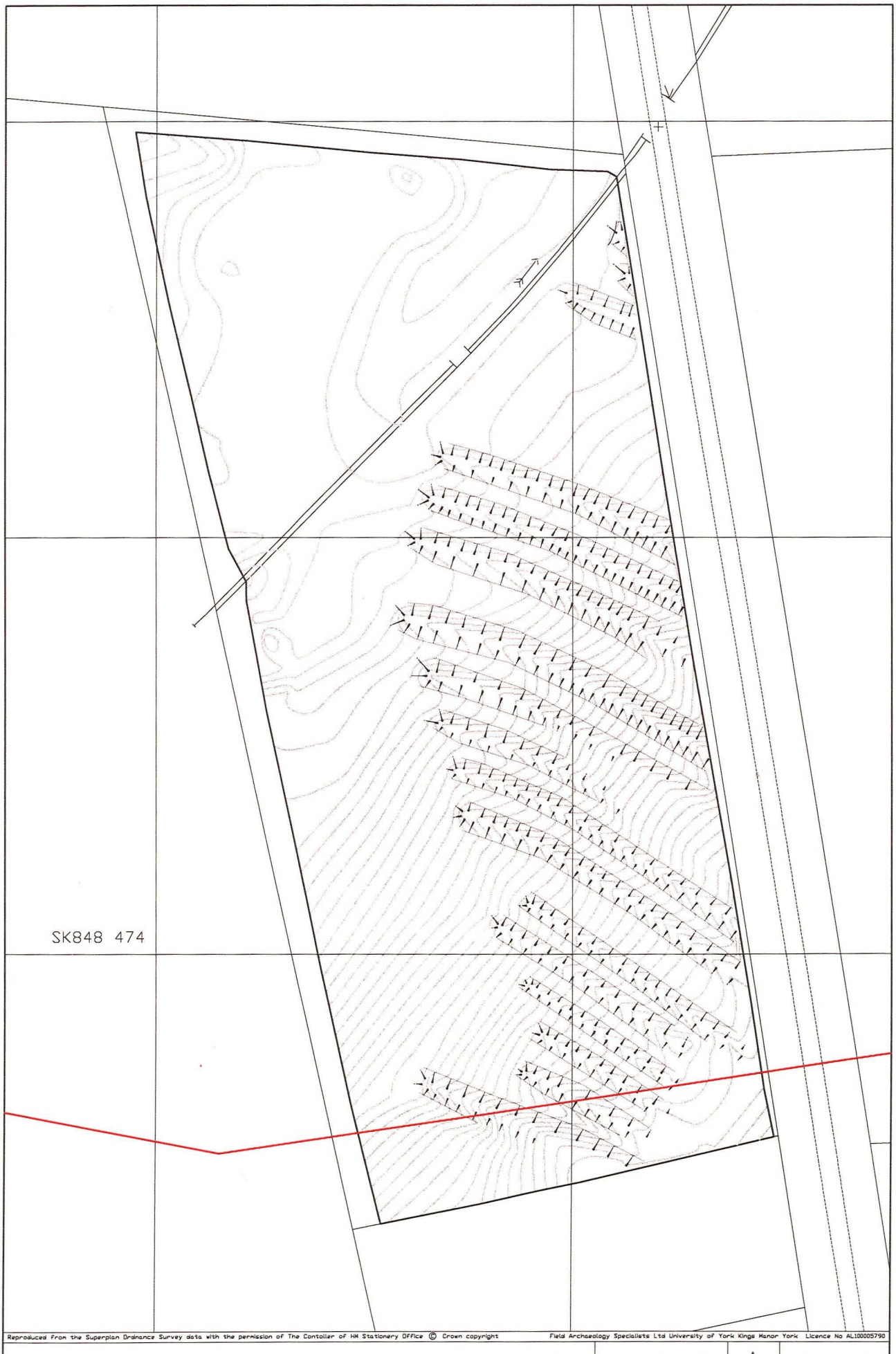
Scale 1:2000

Figure 10






**Field 81 map of topographic features (contour intervals 0.10m)** | **Scale 1:2000** | **Figure 11**






**Field 85 map of topographic features (contour intervals 0.10m)** | **Scale 1:1250** | **Figure 12**

longer visible as a topographic feature).

The ridges, aligned in a WNW/ESE direction were generally in good condition and some of the longer ridges retained a characteristic curving profile at the western end which would indicate they were the original ridge terminals.

## 4.3 HAND EXCAVATED TRENCHES (Table 4, Figs.13 to 15)

A very small assemblage of 21 items of material was recovered from the trenches, the largest collection was recovered in Field 34 (Table 5). No features of archaeological interest were discovered at the base of the trenches, although a substantial land drain was observed cut into subsoil in Trench D, Field 33. All the trenches were abandoned at the surface of subsoil, although the results of the later evaluation in Field 20 suggested that the red brown silty sand interface may have represented the surface of a spread of overburden rather than the true subsoil surface. Table 6 presents a summary of the records.

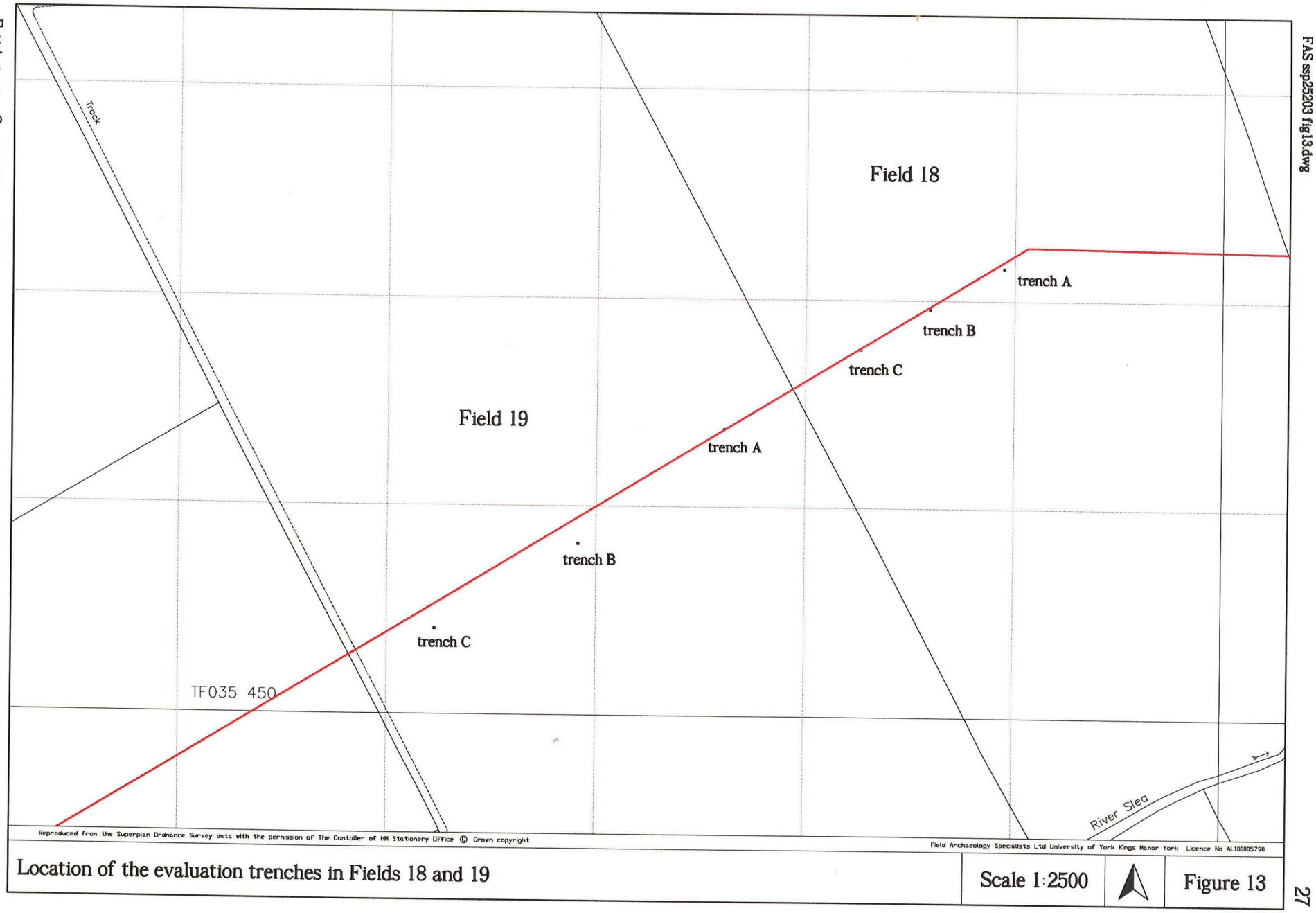
The assemblage consisted of both flint and ceramic material spread unevenly between the fields, for example flint was not present in Field 18 while ceramic was not present in Field 33. The sparse distribution does not reveal any significant patterns, although it is possible that in Field 20 the overburden may have buried or contained a more representative assemblage.

Little information can be drawn from the structure or distribution of the small flint assemblage (Appendix D). There were no diagnostic pieces present and the distribution appears to represent no more than general background activity that would be expected in any field.

Prehistoric pottery was not represented in the ceramic assemblage which consisted of Roman, medieval or post-medieval material (pottery, tile and clay pipes), (Appendix E). Some of the groups appear to represent no more than material outcast with manuring scatters during the medieval period (eg. Field 18). Field 19 (B) and Field 20 (A and C) produced a scatter of Roman pottery similar to the material recovered during fieldwalking but not significant in themselves; while trenches in Field 34 contained medieval material (pottery and clay pipe) and one piece of modern animal bone.

Table 5 Finds distribution by context (Int.8)

| Fld | Pit | C no | Flint | Ceramic | Other |
|---|---|---|---|---|---|
| 18 | A | 1004 | - | - | - |
| | B | 1006 | - | 3 | - |
| | C | 1007 | - | - | - |
| 19 | A | 1010 | - | - | - |
| | B | 1009 | - | - | - |
| | C | 1008 | 2 | 1 | - |
| 20 | A | 1000 | - | 2 | - |

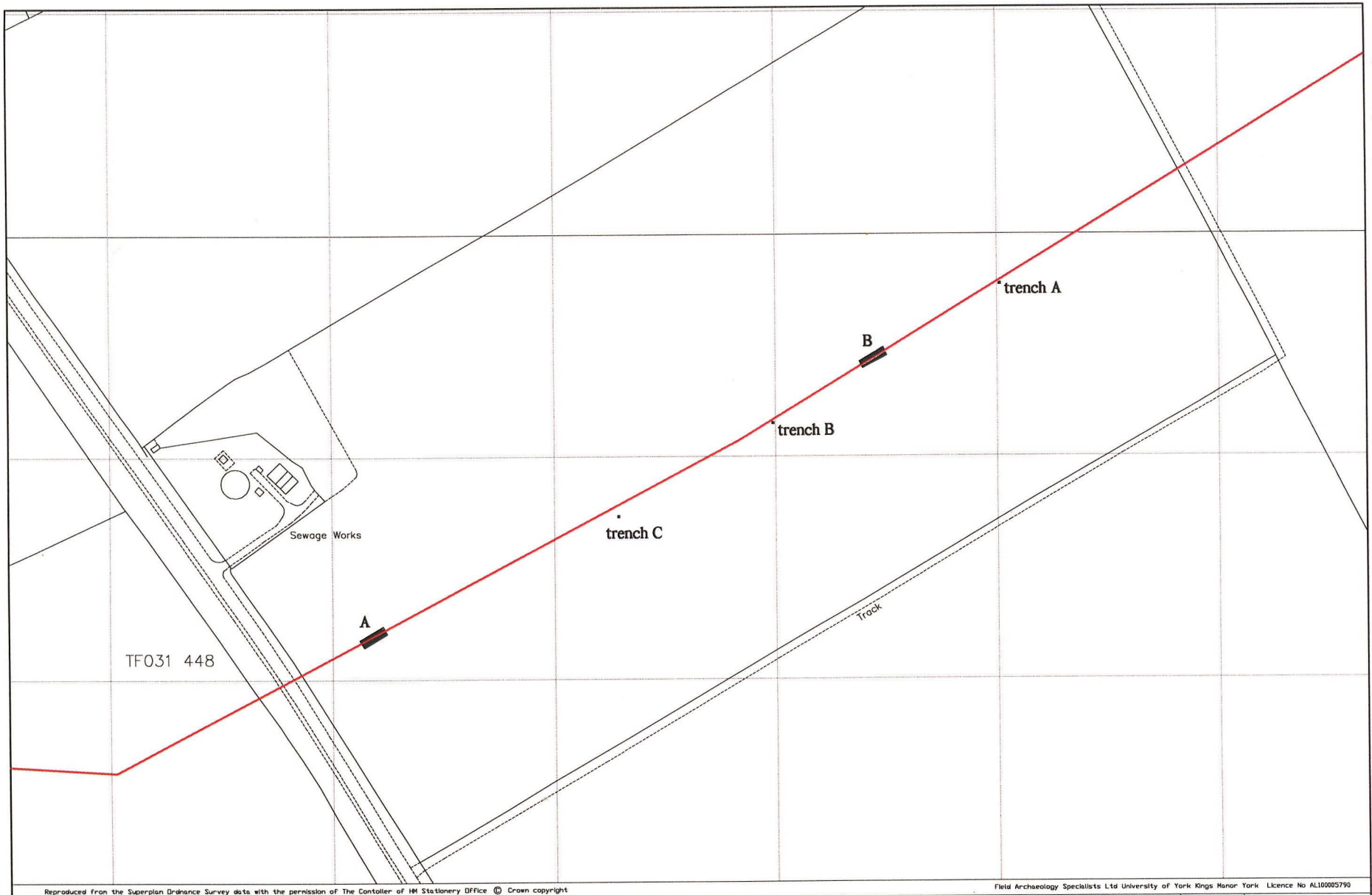





Location of the evaluation trenches in Fields 18 and 19

Scale 1:2500

Figure 13



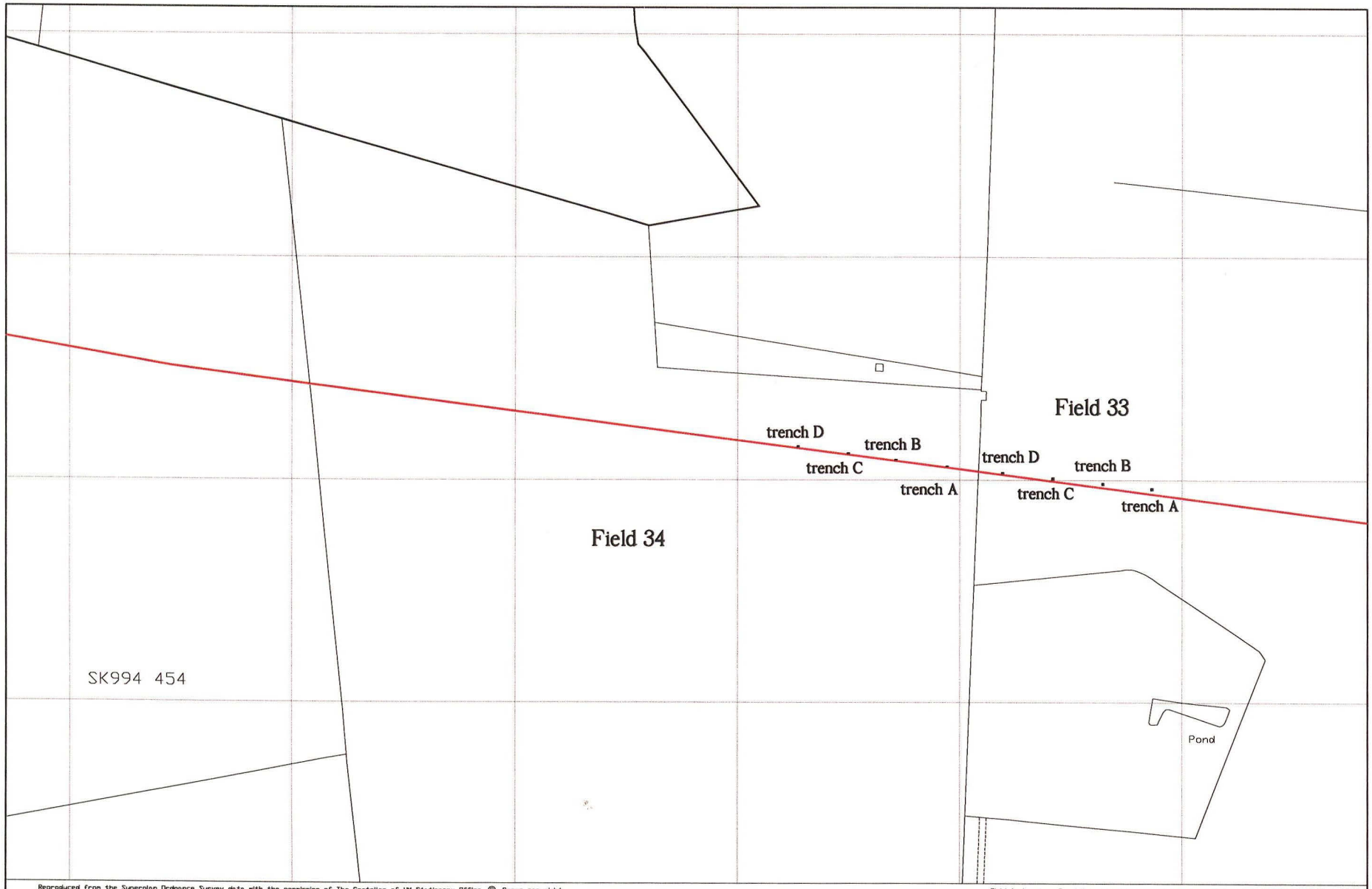





Location of evaluation trenches in Field 20

Scale 1:2500

Figure 14








Location of evaluation trenches in Fields 33 and 34

Scale 1:2500

Figure 15

| Fld | Pit | C no | Flint | Ceramic | Other |
|---|---|---|---|---|---|
| | B | 1002 | 2 | 1 | - |
| | B | 1003 | 1 | 1 | - |
| 33 | A | 1012 | 1 | - | - |
| | B | 1013 | - | - | - |
| | C | 1014 | - | - | - |
| | D | 1015 | - | - | - |
| 34 | A | 1017 | - | - | - |
| | B | 1018 | 2 | 2 | 1 bone |
| | C | 1019 | - | 1 | - |
| | D | 1020 | - | 1 | - |
| **Totals** | | | **8** | **12** | **1** |

Table 6 Summary of contexts (Int.8)

| C no | Fld | Pit | Identity | Description |
|---|---|---|---|---|
| 1000 | 20 | A | Ploughsoil | Firm brown to orange brown sandy silty clay, 0.30m thick with occasional gravel |
| 1001 | 20 | all | SUBSOIL | Orange brown sandy natural with fine to coarse limestone gravel (Belton Sand And Gravel) |
| 1002 | 20 | B | Ploughsoil | (see C1000) |
| 1003 | 20 | C | Ploughsoil | (see C1000) |
| 1004 | 18 | A | Ploughsoil | Firm brown sandy silty clay with occasional gravel, 0.30m thick |
| 1005 | 18 | all | SUBSOIL | Bedded limestone with a brown silty clay infill (Weathered Lincolnshire Limestone Formation) |
| 1006 | 18 | B | Ploughsoil | (See C1004) |
| 1007 | 18 | C | Ploughsoil | (See C1004) |
| 1008 | 19 | C | Ploughsoil | Firm brown sandy silty clay with occasional gravel, 0.35-0.40m thick |
| 1009 | 19 | B | Ploughsoil | (see C1008) |
| 1010 | 19 | A | Ploughsoil | (see C1008) |
| 1011 | 19 | all | SUBSOIL | Orange to red brown clayey silty oolitic sand with occasional limestone gravel (Head Deposit) |
| 1012 | 33 | A | Ploughsoil | Dark brown silty sand with occasional limestone gravel, 0.30m thick |
| 1013 | 33 | B | Ploughsoil | (see C1012) |
| 1014 | 33 | C | Ploughsoil | (see C1012) |
| 1015 | 33 | D | Ploughsoil | (see C1012) |
| 1016 | 33 | all | SUBSOIL | Orange brown clayey medium to coarse sand with occasional limestone gravel (Head Deposit) |

| C no | Fld | Pit | Identity | Description |
|---|---|---|---|---|
| 1017 | 34 | A | Ploughsoil | Dark brown clayey silty sand, 0.30m thick |
| 1018 | 34 | B | Ploughsoil | Firm brown sandy silty clay with occasional gravel, 0.30m thick |
| 1019 | 34 | C | Ploughsoil | (see C1018) |
| 1020 | 34 | D | Ploughsoil | (see C1018) |
| 1021 | 34 | all | SUBSOIL | Brown and orange brown gravelly clayey sand becoming clayey with fragments of light grey and brown limestone (Weathered Lincolnshire Limestone Formation) |

## 4.4 MACHINE EXCAVATED TRENCHES (Table 4)

The results of the fieldwork presented below is described in the order of the fields and not according to the sequence in which the trenches were excavated. No evaluation excavation was undertaken in Fields 107B and 110B, near to the village of Thorpe because of adverse ground conditions caused by heavy rain during the winter months and the consequent late harvest of a root crop in Field 110B. Tables 7 and 8 (below) summarise the written record.

*Field 1* (Fig.16)

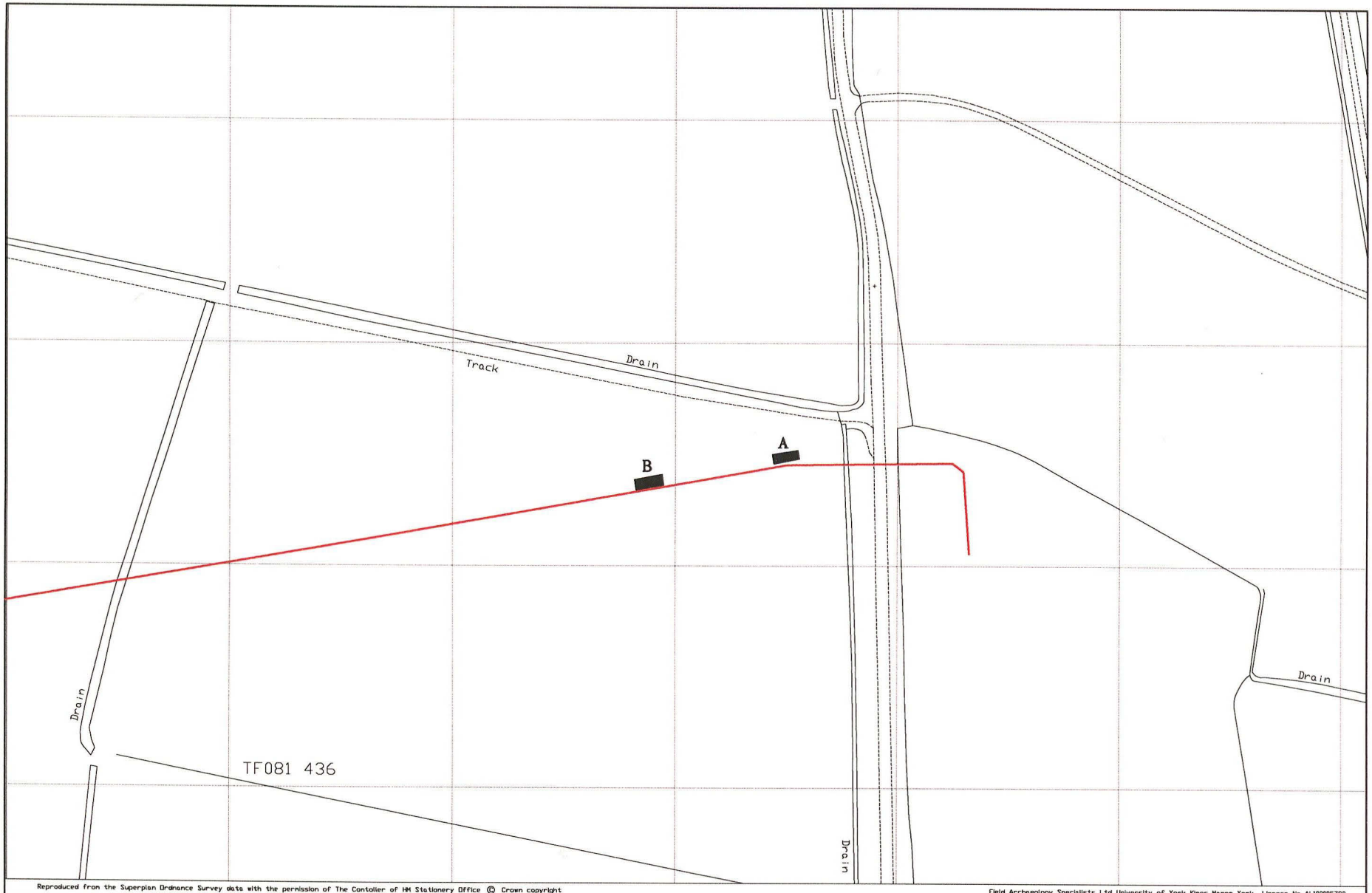
Two trenches at the eastern end of Field 1 were located over faint geophysical anomalies and adjacent to find spots which had produced finds of Roman date. However, archaeological remains were absent from both trenches. Two field drains were mapped at Horizon 1 in Trench A but were left undisturbed.

*Field 20* (Fig.14)

Two trenches, A at the western end and B just east of centre of the field were located over faint geophysical anomalies and adjacent to find spots which had produced finds of Roman and prehistoric date respectively.

Both trenches produced a similar deposit sequence. It consisted of a ploughsoil (C1004 and C1009) overlying a spread of red brown sandy silt overburden (C1005 and C1008) which overlay the subsoil. The overburden was excavated, at Recovery Level C along the northern side of both trenches. C1005 and C1008 produced a few sherds of hand made vessels of mid- to late Iron Age date. An abraded fragment of tile, probably Roman, also came from C1005 (Appendix F). A significant amount of cremated bone (156.4g) was collected by hand from C1008 along the length of Trench B and consisted of relatively large fragments in a good state of preservation which were later identified as human bone (Appendix G).

No features were discovered along the trench to account for the quantity of human bone and its good condition, but it is possible that it may have been disturbed from a local burial context. The source






Location of evaluation trenches in Field 1

Scale 1:2500

Figure 16

of the overburden is difficult to explain since there are no earthworks present in the field, however on analogy with discoveries made elsewhere along the pipeline (Field 54 and Field 55) it is likely that C1005 and C1008 are the remains of a former ridge and furrow cultivation system. Careful study of the long sections from both Trench A and B could not establish a pattern to the shape of the overburden, and no furrows were identified at Horizon 2. It would however help explain the incorporation of well preserved cremated bone into the plough zone.

At the eastern end of Trench A the corner of a small (?) sub-circular pit , F1, was excavated (Fig.17) (see Appendix H) but produced no finds material. This too could be associated with the Iron Age activity since it was sealed by the overburden (C1005).

*Field 31* (Fig.18)

Trench A at the western edge of the field was situated over strong linear geophysical anomalies and adjacent to finds of Roman date. At Horizon 1 a shallow ditch (F2) was mapped, crossing the trench (Fig.19). It produced no finds material but ran north-south approximately parallel to the nearby, modern field boundary. It was necessary to lower the northern side of the trench in order to test the character of the strata and confirm the subsoil. The western side was shallow and consisted of bedrock or broken limestone (C1014 and C1015), further east a spread of overburden (C1012) up to 0.50m thick overlay the stone and produced one abraded sherd of Roman pottery. C1012 could represent a deposit of colluvium built up in a narrow gully, although no other archaeological horizons were visible in this strata to suggest the date of this process.

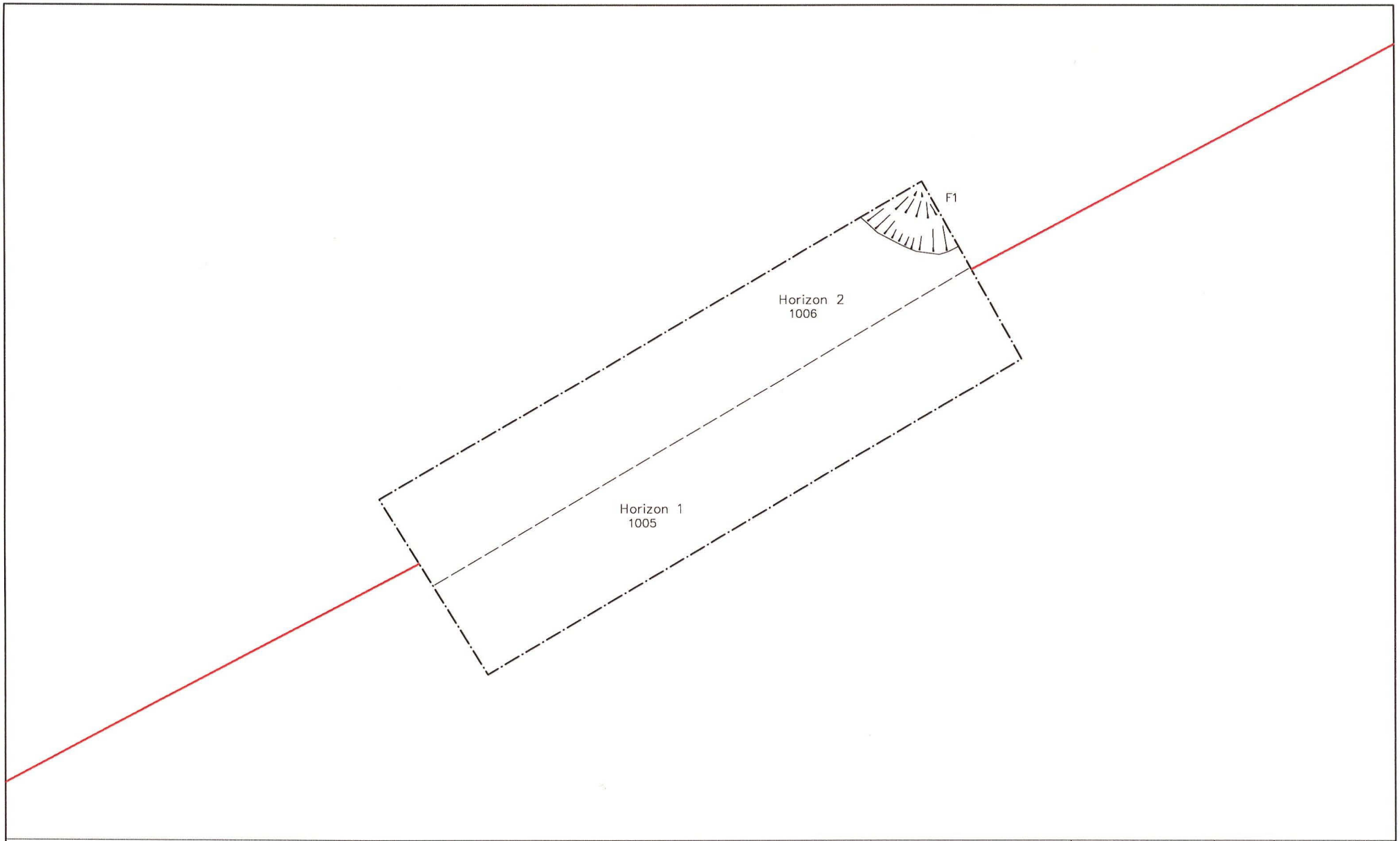
*Field 37* (Fig.20)

A trench (A) at the western edge of the field was situated over faint geophysical anomalies and adjacent to finds of Roman date. A relatively shallow, brown stoney ploughsoil (C1016) covered a stoney subsoil with patches of clay (C1017). C1016 produced a sherd of abraded Roman pottery and the only features noted at Horizon 1 (not planned) were a series of nine modern plough furrows scored through the surface of C1017.

*Field 45* (Fig.21)

Three trenches were opened over faint geophysical anomalies and adjacent to find spots of Roman date. Trenches A and B at the eastern end of the field contained no archaeological remains, although C1028, the ploughsoil from B produced a few abraded pieces of Roman grey ware and some post-medieval pottery, two sherds of Nottingham Stoneware ($18^{th}$ - $19^{th}$ century), a black glazed cup of Cistercian ware ($16^{th}$ - $17^{th}$ century) and a flint flake.

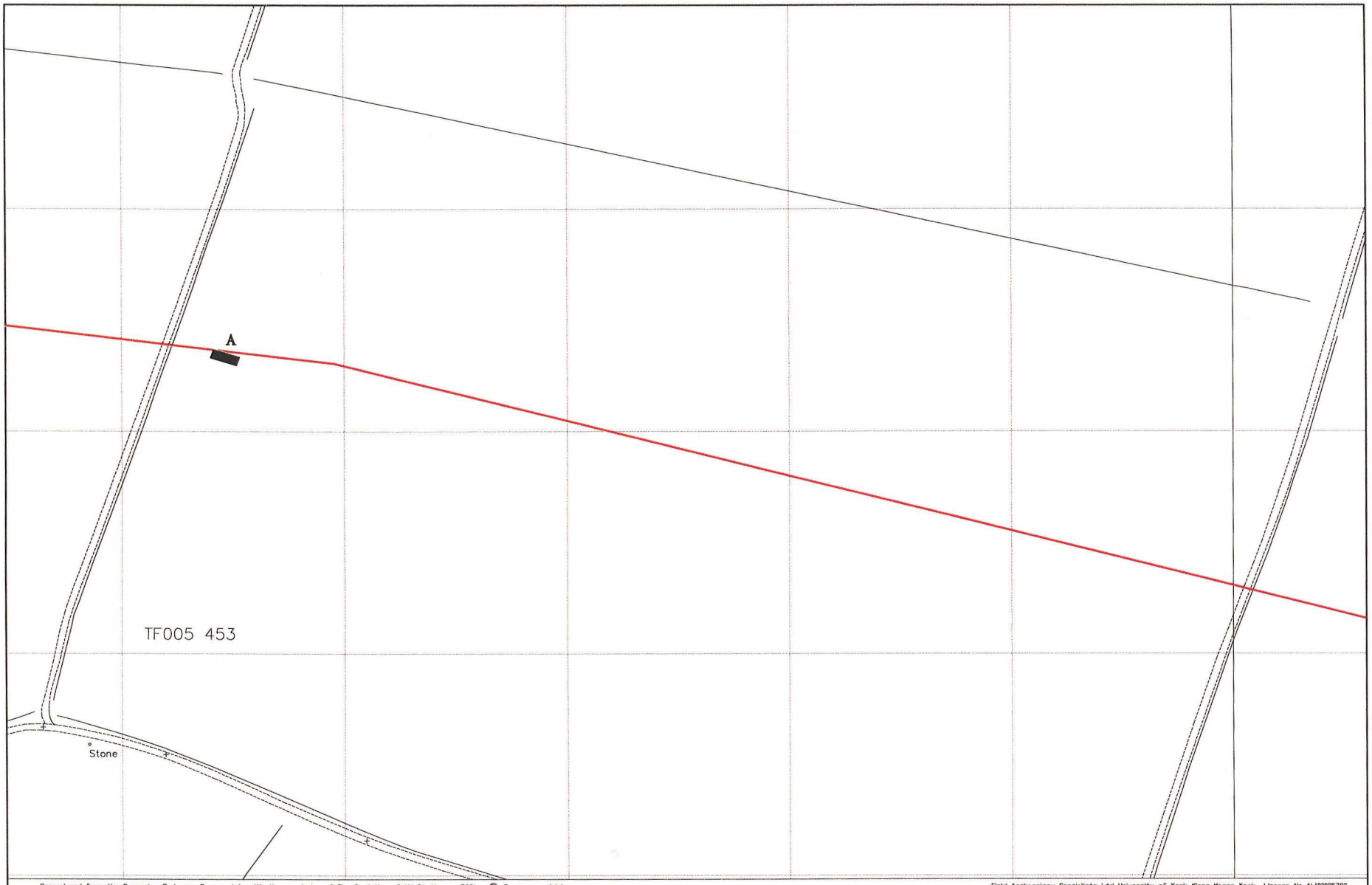
In contrast, Trench C on the western side produced a scatter of features of archaeological interest (F6-F9). F6 and F7 were two small pits which extended beneath the trench edges (Fig.22). The fill of these pits (C1033 and C1034 respectively) were significantly sandier and less stony than the adjacent




Field 20 Trench A, F1

Scale 1:100

Figure 17

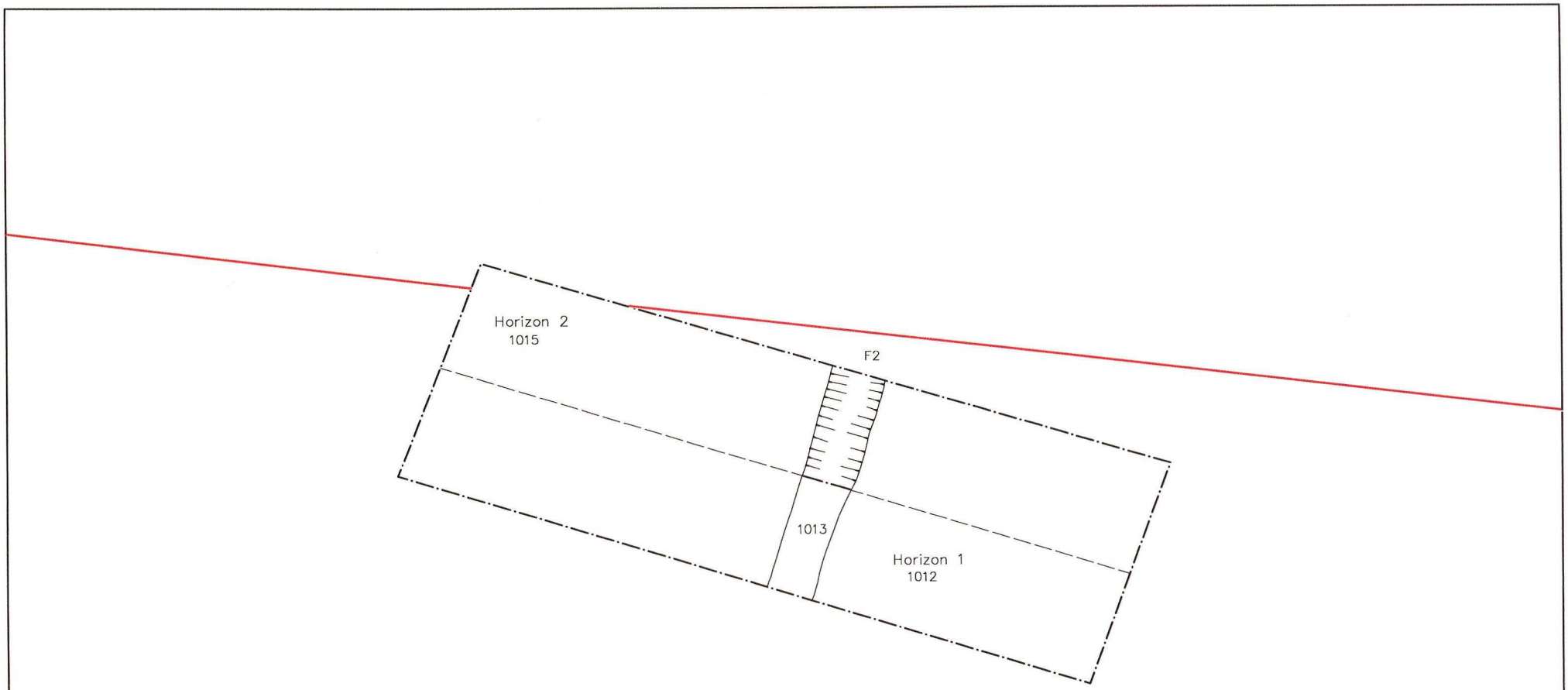





Location of the evaluation trench Field 31

Scale 1:2500

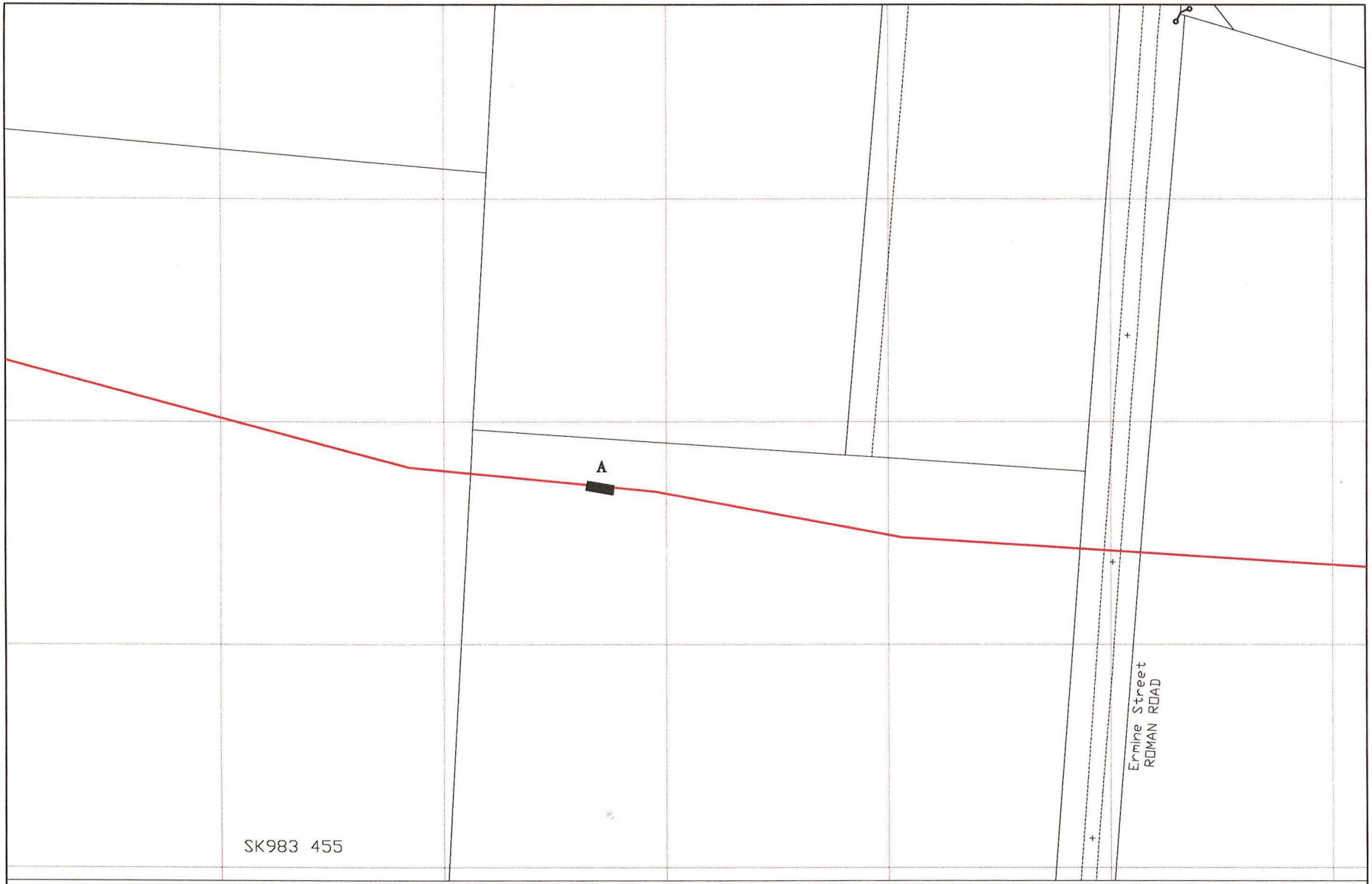
Figure 18




**Field 31 Trench A, F2**

**Scale 1:100**

**Figure 19**








Location of the evaluation trench Field 37

Scale 1:2500

Figure 20

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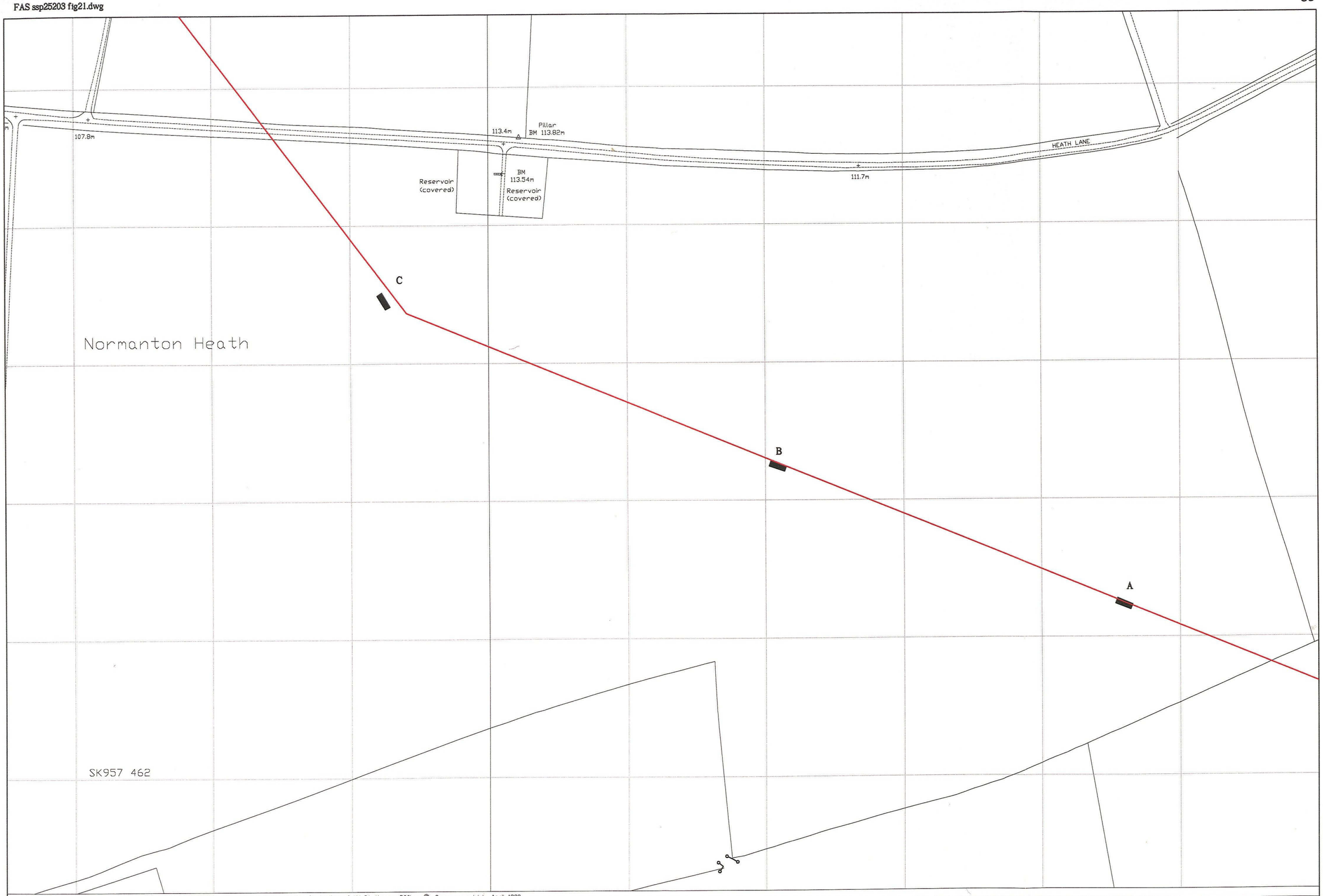
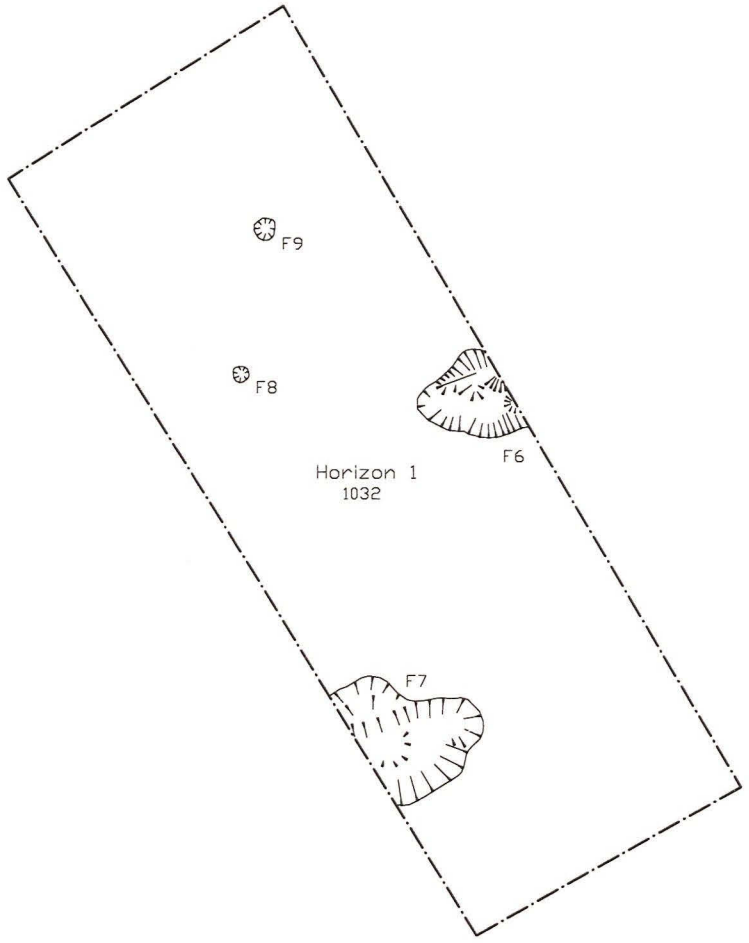





Location of evaluation trenches Field 45

Scale 1:2500

Figure 21




Field 45 Trench C, F6-F9 | Scale 1:100 | Figure 22

subsoil. Neither feature contained any finds and the fills appeared to be quite sterile. It is tempting to characterise these as natural, geological features but the absence of similar fills elsewhere in the field suggests that they are archaeological.

At Horizon 1, after careful hand cleaning, two small concentrations of pottery were noted at the northern end of the trench. These were investigated and two small pits were defined and excavated (F8 and F9). Although it was difficult to identify these small features in the stoney subsoil, they appear to be isolated features rather than part of a larger composite structure. C1036 (F9) also produced a small fragment of cremated bone, too small to identify as human (Appendix G) and a burnt pebble, however, the condition of the pottery suggested that it too had been in a fire.

F9 (C1036) contained the larger group of pottery, but Trench C produced hand made vessels in oolitic and shell gritted fabrics (Appendix F). One sherd came from the ploughsoil (C1029), the remainder of the small assemblage coming from the pits (F8 and F9). Ten sherds from at least two vessels in C1036 (F9) were in a shell gritted ware. One rim sherd had a burning flame mark on the rim and was similar to a non-joining body sherd from the same context. Marks on other oolitic gritted sherds also in C1036 show evidence that the burning occurred post-fracture.

Oolitic ware is not common in Lincolnshire and these discoveries are a valuable addition to the distribution of this material during the Iron Age. Taking the evidence of the burnt pottery and cremated bone it is tempting to identify F9 as the remains of a cremation burial, heavily truncated or dispersed into this pit from nearby.

*Field 49* (Fig.23)

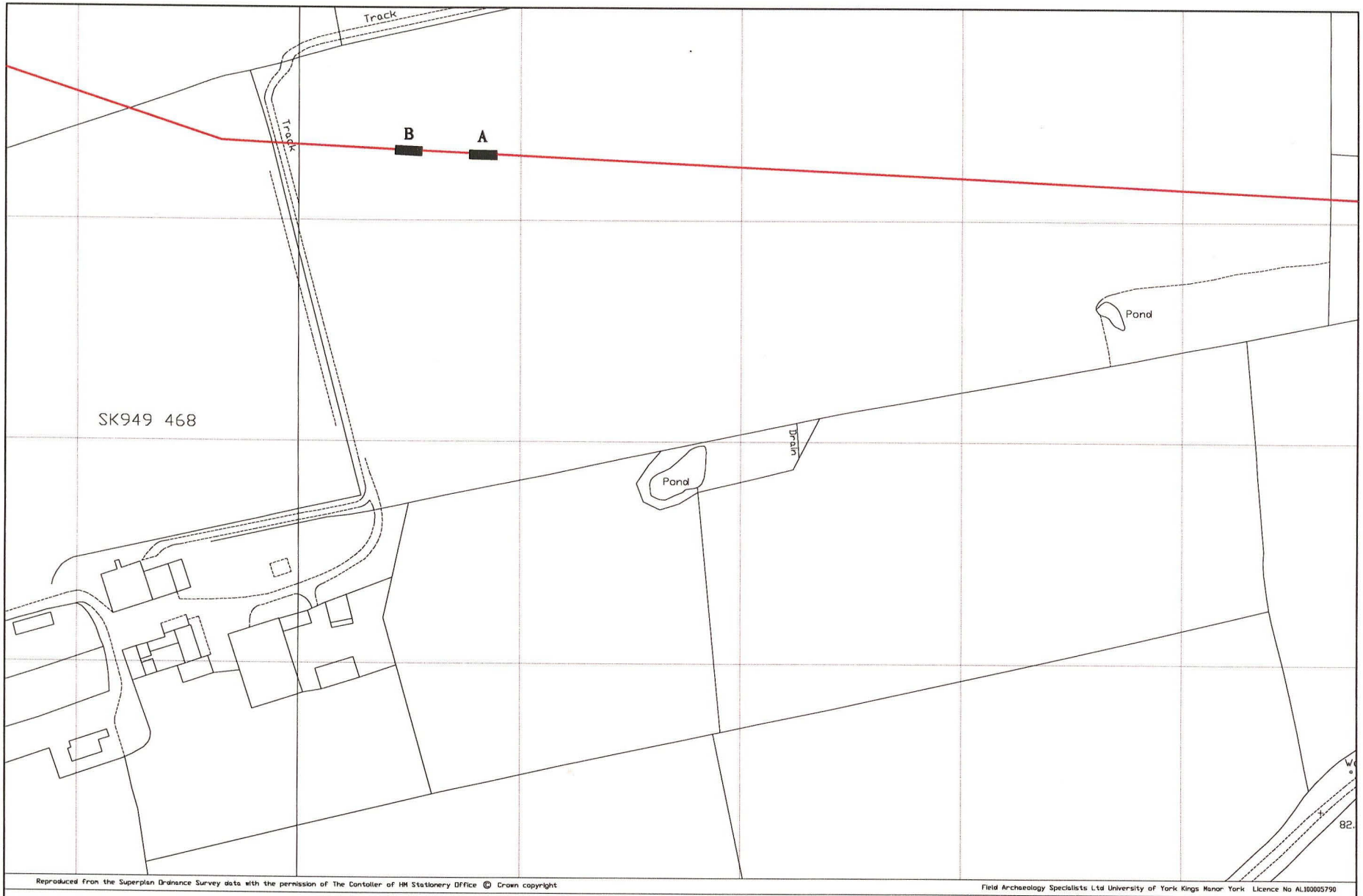
Trenches A and B situated at the western end of the field were excavated under waterlogged conditions. Both trenches were located over faint geophysical anomalies, Trench A also being adjacent to the find spot of the fine polychrome glass bead.

The sequence of deposits was similar in both trenches, a wet clayey ploughsoil (C1018 and C1020) overlay a sticky, saturated clay subsoil (C1019 and C1021). Archaeological remains from Trench A consisted of finds from the ploughsoil (C1020) and a ditch (F3), mapped but not excavated because of the wet conditions (Fig.24). The pottery from C1020 included an unabraded sherd of Stamford ware, from the 11th century.

*Field 75* (Fig.25)

Field 75 is situated in an area rich in cropmarks. Strong geophysical targets and other anomalies in the area are probably from modern ground disturbance, but may have masked archaeological features.

The ploughsoil (C1022) produced a sherd of medieval pottery (12th to 14th century), no material was






Location of evaluation trenches Field 49

Scale 1:2500

Figure 23

Field Archaeology Specialists Ltd

FAS ssp25203 fig24.dwg

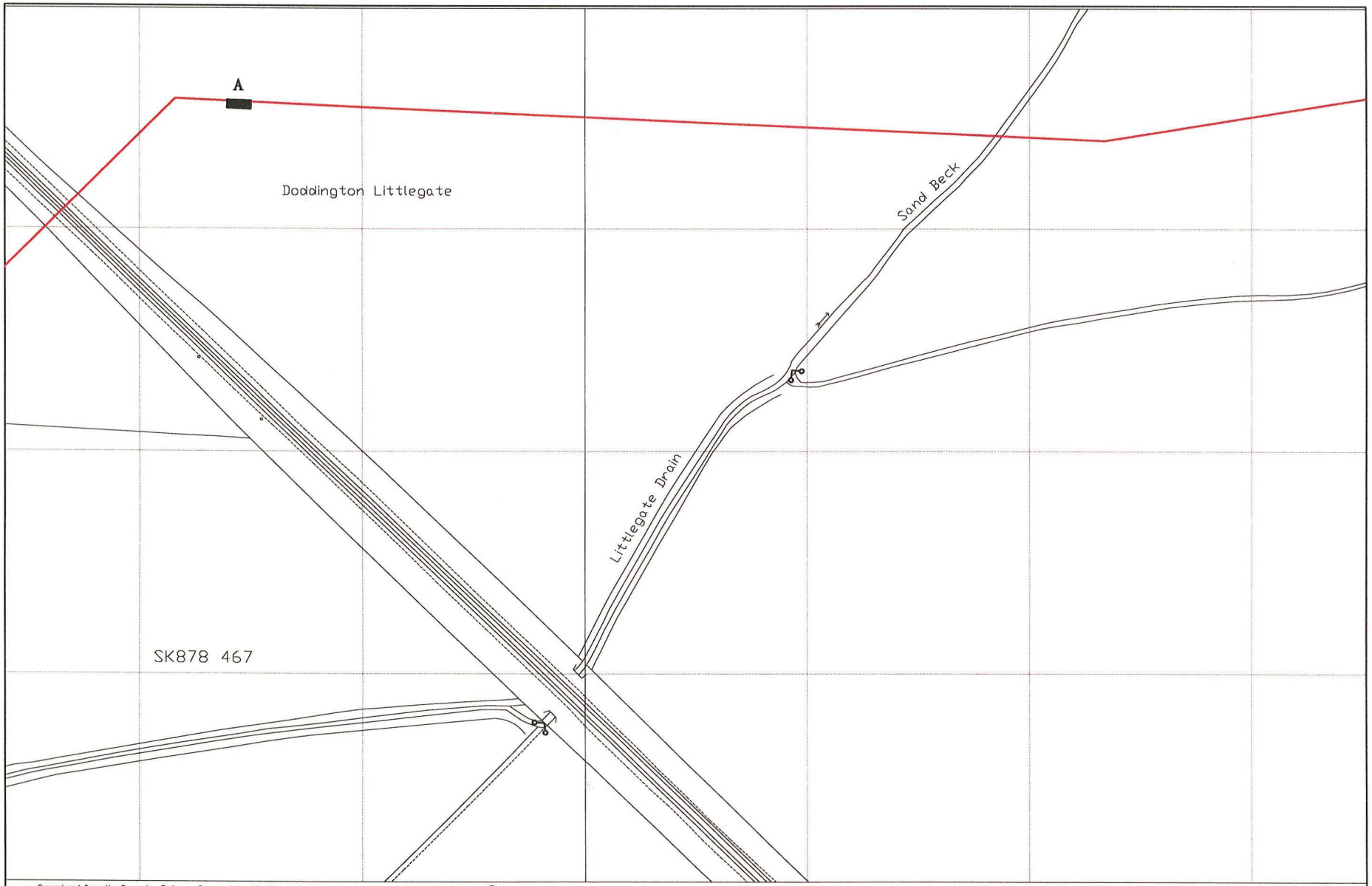



FAS

Field 49 Trench A, F3

Scale 1:100

Figure 24






Location of evaluation trench Field 75

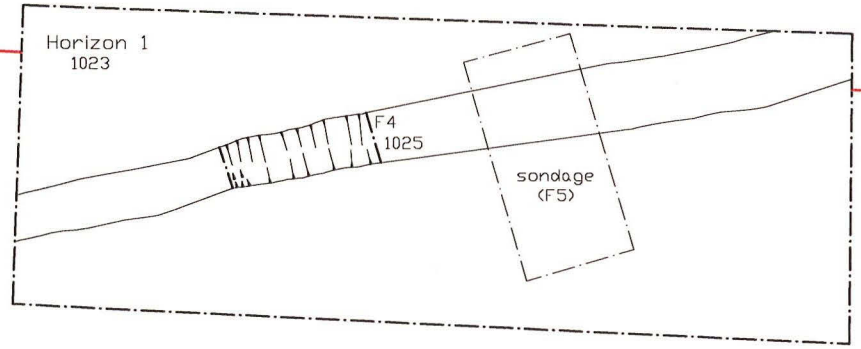
Scale 1:2500

Figure 25

recovered from a small ditch (F4) mapped and excavated at Horizon 1. F4 extended across the trench but had cut a disturbed looking subsoil (C1023), (Fig.26). A rectangular sondage (F5 C1026) was hand dug in order to test the character of the subsoil, although it was abandoned at a depth of only 0.30m when it became clear that C1023 represented the subsoil.

Table 7 Intervention 9 - Summary of contexts

| C no | Fld | Trench | Identity | F no | Munsell | Description |
|---|---|---|---|---|---|---|
| 1000 | 1 | A | Layer | - | 10YR4/2 | A firm brown sandy silty clay ploughsoil 0.30m thick with occasional gravel components |
| 1001 | 1 | A | SUBSOIL | n/a | 7.5YR5/4 | A stiff orange brown sandy silty clay natural with local patches of gravel |
| 1002 | 1 | B | Layer | - | - | Ploughsoil 0.30m thick (see C1000) |
| 1003 | 1 | B | SUBSOIL | n/a | - | Natural strata (see C1001) |
| 1004 | 20 | A | Layer | - | 7.5YR4/3 | Firm brown sandy silty clay ploughsoil 0.30m thick with occasional gravel |
| 1005 | 20 | A | Layer | _ | 5YR4/4 | A distinctive red brown clayey silty sand with some limestone gravel 0.40m thick |
| 1006 | 20 | A | SUBSOIL | n/a | 10YR7/8 | Orange brown sandy natural with fine to coarse limestone gravel (Belton Sand And Gravel) |
| 1007 | 20 | A | Fill | 1 | 5YR4/4 | A soft red brown silty sand |
| 1008 | 20 | B | Layer | - | 5YR4/4 | Red brown silty sand 0.50m thick, surface scored with modern ploughmarks |
| 1009 | 20 | B | Layer | - | 7.5YR4/3 | Brown sandy silty clay ploughsoil, max. 0.50m thick, with stone components |
| 1010 | 20 | B | SUBSOIL | n/a | 10YR7/8 | Orange brown sandy natural with fine to coarse limestone gravel (Belton Sand And Gravel) |
| 1011 | 31 | A | Layer | - | 10YR4/3 | Brown silty sand ploughsoil 0.30m thick with occasional gravel components |
| 1012 | 31 | A | Layer | - | 7.5YR4/4 | Brown silty sand 0.50m thick |
| 1013 | 31 | A | Fill | 2 | 7.5YR4/4 | Brown silty sand, some sorting of limestone toward the base |
| 1014 | 31 | A | SUBSOIL | n/a | 5YR4/6 | Firm silty sand natural with limestone components |
| 1015 | 31 | A | Bedrock | n/a | n/a | Angular and tabular cobble and gravel sized fragments of shelly, coarse limestone (Limestone Formation) |
| 1016 | 37 | A | Layer | - | 7.5YR4/3 | Ploughsoil 0.25m thick, a brown sandy silty clay with gravel and pebble sized limestone |
| 1017 | 37 | A | SUBSOIL | n/a | 7.5YR4/6 | Soft to firm grey brown silty sandy clay with sub-angular to sub-rounded limestone gravel and cobbles (Weathered Lincolnshire Limestone Formation) |
| 1018 | 49 | B | Layer | - | 10YR4/3 | Firm, brown sandy silty clay ploughsoil 0.30m thick |




Field 75 Trench A, F4 F5

Scale 1:100

Figure 26

| C no | Fld | Trench | Identity | F no | Munsell | Description |
|---|---|---|---|---|---|---|
| 1019 | 49 | B | SUBSOIL | n/a | 10YR5/6 | Brown sandy clay natural, stiff and locally very sticky, currently saturated |
| 1020 | 49 | A | Layer | - | 10YR4/3 | Ploughsoil (see C1018) |
| 1021 | 49 | A | Subsoil | n/a | 10YR5/6 | Natural (see C1019) |
| 1022 | 75 | A | Layer | - | 10YR3/2 | Stiff grey brown sandy clay ploughsoil 0.30m thick |
| 1023 | 75 | A | SUBSOIL | n/a | 10YR4/4 | A brown sandy clay natural with occasional gravel |
| 1024 | 49 | A | Fill | 3 | n/a | (not excavated, probably variation in natural subsoil) |
| 1025 | 75 | A | Fill | 4 | 10YR4/2 | Firm grey brown sandy silty clay |
| 1026 | 75 | A | Makeup | 5 | 10YR4/4 | Sticky brown sandy clay natural, the content of a sondage test pit |
| 1027 | 45 | A | Layer | - | 7.5YR4/2 | Brown clayey silty sand ploughsoil, max. 0.30m thick, with limestone components |
| 1028 | 45 | B | Layer | - | 7.5YR4/2 | Ploughsoil (see C1027) |
| 1029 | 45 | C | Layer | - | 7.5YR4/2 | Ploughsoil (see C1027) |
| 1030 | 45 | A | SUBSOIL | n/a | 7.5YR5/4 | Stiff brown natural sandy silty clay with abundant angular and sub-angular gravel to cobble sized fragments of pale grey limestone |
| 1031 | 45 | B | SUBSOIL | n/a | 7.5YR5/4 | Natural (see C1030) |
| 1032 | 45 | C | SUBSOIL | n/a | 7.5YR5/4 | Natural (see C1030) |
| 1033 | 45 | C | Fill | 6 | 7.5YR4/6 | A strong brown silty sand become stonier with gravel sized sub-angular limestone toward the base |
| 1034 | 45 | C | Fill | 7 | 7.5YR4/6 | A strong brown clayey sand , virtually stone free. Cleaner coarse sand at lowest level |
| 1035 | 45 | C | Fill | 8 | 10YR4/4 | Dark brown sandy silt with occasional and scattered flecks of charcoal |
| 1036 | 45 | C | Fill | 9 | 10YR4/4 | Dark brown sandy silty clay with occasional, scattered flecks of charcoal, one small fragment of cremated bone |

Table 8 Intervention 9 - Summary of features

| F no | Fld | Trench | Identity | C no | Dimensions (m) | Profile |
|---|---|---|---|---|---|---|
| 1 | 20 | A | Pit | 1007 | (W 1.40) x D 0.40 | U-shaped |
| 2 | 31 | A | Ditch | 1013 | W 0.75 x D 0.20 | U-shaped |
| 3 | 49 | A | (Ditch) | 1024 | (not excavated) | |
| 4 | 75 | A | Ditch | 1025 | W 0.65 x D 0.20 | U-shaped |
| 5 | 75 | A | Sondage | 1026 | L 3.50 x W 1.50 x D 0.30 | n/a |
| 6 | 45 | C | Pit | 1033 | W 1.10 x D 0.40 | Irregular |
| 7 | 45 | C | Pit | 1034 | W 1.65 x D 0.30 | U-shaped |

| F no | Fld | Trench | Identity | C no | Dimensions (m) | Profile |
|---|---|---|---|---|---|---|
| 8 | 45 | C | Pit | 1035 | Dia. 0.21 x D 0.12 | U-shaped |
| 9 | 45 | C | Pit | 1036 | Dia. 0.30 x D 0.24 | U-shaped |

## 5.0 ASSESSMENT (PHASE 3)

Substantial archaeological remains were absent from the evaluation trenches, although Fields 107B and 110B did not form part of this investigative programme. It is likely that the geophysical anomalies identified during reconnaissance were caused by variations in the character and makeup of the topsoil, overburden or underlying geology. However, in most fields, the few finds recovered from the ploughsoil were similar to material recovered during fieldwalking. Notwithstanding these results, significant remains were discovered in Fields 20, 45 and 49.

Ploughed out prehistoric burial mounds from the Neolithic and Bronze Age are situated either side of the pipeline route and the cremated human bone from Trench B, Field 20, could come from a similar burial, disturbed when the ridge and furrow system was created, or from satellite or later secondary burials put into the makeup of the burial mounds. The Iron Age activity, represented by a scatter of pottery was not characterised.

Field 20 and possibly the fields to the east contain extensive spreads of overburden as a result of earlier ridge and furrow cultivation. Where archaeological remains exist they are likely to be relatively well preserved since they will be protected from the effects of modern ploughing by the overburden. Localised overburden from Field 31 appears to be geological in origin, reflecting the local topography. The inclusion of one sherd of Roman pottery in this layer suggests it may have been disturbed.

Although Trenches A and B contained no archaeological remains, the siting of Field 45 on the edge of the prominent limestone ridge and the concentration of Roman finds suggest extensive occupation of the area during the Roman period. The presence of small isolated pits in Trench C some with burnt pottery and cremated bone (too small to identify as human), may indicate burial activity during the Iron Age.

The fine polychrome glass bead from Field 49, (8$^{th}$ to 11$^{th}$ century), probably manufactured in Ireland, was an exceptional discovery during field walking. It can now be matched by a roughly contemporary sherd of pre-conquest Stamford ware (11th century) from the ploughsoil of Trench A, although the quality of these finds is not matched by any further evidence for early medieval activity.

The earthworks identified in the topographic survey are mainly derived from a medieval or post-medieval agricultural system. In some fields the ridge and furrow was covered by later earthworks (ponds and banks), but in general the features represent an open field system which is pre-enclosure

in date. The only possible exception to this is the circular mound defined in Field 80. The size (*c.*30m in diameter) and form of this feature is not inconsistent with that of a plough damaged and robbed burial mound. The Desk Based Assessment did not produce any evidence for the presence of barrows in this area, however, nor did it produce evidence for the presence of ridge and furrow in Field 80. Although this topographic feature is not threatened by the construction programme, it may indicate that the ploughed out remains of other barrows survive in the immediate area.

## 6.0 PRELIMINARY RESULTS OF PRE-CONSTRUCTION EXCAVATION (PHASE 4)

Geophysical survey during Reconnaissance identified significant archaeological remains in Fields 54 to 56. Excavation in these fields between RDX10 and 11 revealed a number of important sites covering a period of over 3000 years. The remains consisted of features (pits, ditches and postholes) cut into the subsoil surface and buried by overburden and ploughsoil. A significant quantity of finds, mainly bone and pottery were recovered during excavation which will help to establish the sequence of activity.

Field 54 contained a substantial Roman field system and domestic Roman settlement. A range of pottery types, discovered in the backfill and the re-alignment of ditches in different phases suggests the occupation was long lived.

The sediment history of the field was also interesting. At the western end the shallow topsoil overlay a weathered marlstone and then weathered mudstone, but down slope features disappeared as the clay was covered by a deepening deposit of silty sand. Machine excavation to a depth of 0.50m within the head layer revealed numerous features and large fragments of pottery, these were cut into more silty sand but it was difficult to establish whether the features were buried by the silty sand or the cuts were simply not detectable at the base of the ploughsoil. On balance the evidence gathered during the excavation suggests that the features were not visible due to post-depositional processes.

The hand auger records identify up to 1.5m of alluvium at this location (over Belton sands and gravel). The age of the alluvium is uncertain, field observations suggest it is pre-Roman, although the Belton sand and gravel is late glacial or earlier and therefore the alluvium could be Holocene of any date and it may cover prehistoric archaeology.

Furrows from a later, possibly medieval field system, covered the top of Field 55 and were mapped at the northern end of Field 56. The earliest evidence for land boundaries is represented by a pit alignment which crossed the top of Field 56. On analogy with similar large scale structures elsewhere it can be dated to the mid-Bronze Age (1500BC).

A later ring ditch structure was built over the pit alignment (Plate 1). It consisted of a substantial penannular ditch, re-cut a number of times. Inside the ditch, a random scatter of small pits probably represents the postholes of a large domestic circular building or farmstead. Extensive geophysical

survey beyond the pipeline corridor located a nearby cluster of these structures over the hilltop. The absence of Roman pottery from the excavated features suggest it belongs to the pre-Roman Iron Age (6th - 1st century BC), although further study of the finds assemblage will clarify the sequence.

Plate 1 Excavated features in Field 56

During the later early medieval period (8th -10th century AD), another small domestic building was constructed across the entrance to the roundhouse. It consisted of a typical large sub-rectangular pit and a number of post holes. The sunken building contained a useful finds assemblage which included a finely decorated bone comb and pottery.

## 7.0 PRELIMINARY RESULTS OF WATCHING BRIEF (PHASE 5) (Figs.3 and 4)

*Field 1* (RDX1)

A stretch of well preserved Roman Road was discovered during groundworks, situated just inside Field 1 (Plate 2). Preserved in a slight hollow and covered by alluvium it appears to be part of the Roman Road listed as Mareham Lane, at RDX1 which continued into Sleaford.

Kerb stones set to form the edge of the road were cut from large blocks of limestone, the main body of the road consisted of smaller cut stones laid on edge. It appears from the rubble infill that at least one side of the road was cut into subsoil, however there was no indication of extensive ground preparation, the road apparently being built on the subsoil surface. Cutting through the road makeup were a number of prominent later field drains.

To the north and slightly offset from the projected line of the road was a small pit which contained cremated bone accompanied by small iron nails, possibly hob nails. Although the material has not yet been processed it is possible that the feature represents a cremation burial.

Plate 2 Roman road discovered in Field 1

*Field 14* (RDX4)

Part of an Anglo-Saxon cemetery was excavated in Field 14 during preliminary groundwork at RDX4. It contained a number of inhumation burials some of which were accompanied by grave goods. However, the remains of other burials consisted of no more than scatters of disturbed human bone defined on the subsoil surface.

Although most of the burials were in poor condition, as a result of plough damage, there was some evidence to suggest that some of the burials had been robbed. For example the disarticulated remains of one body appeared to have been re-buried in a pit, although stains on some bone suggests that metal objects were originally part of the burial. During the fieldwork, when the bodies were still *in situ*, security cover was provided throughout the night to ensure the site was not the subject of any further damage.

Eight inhumations all in shallow graves were excavated, of which six contained grave goods. The richest burial was accompanied by the remains of a shield boss, a spear, a bronze buckle and a knife; others were simply buried with a pottery vessel or were unaccompanied (Plate 3). Six discrete scatters of human bone were recorded lying on the subsoil which suggest that some burials were ploughed out or robbed.

This group of burials appears to be associated with the Anglo-Saxon cemetery discovered in the 19th century along the Grantham Road, approximately 100m to the south. Further study is necessary to establish whether the excavated group represents an extension of this cemetery or relates to an earlier burial ground which was re-located at a later date.

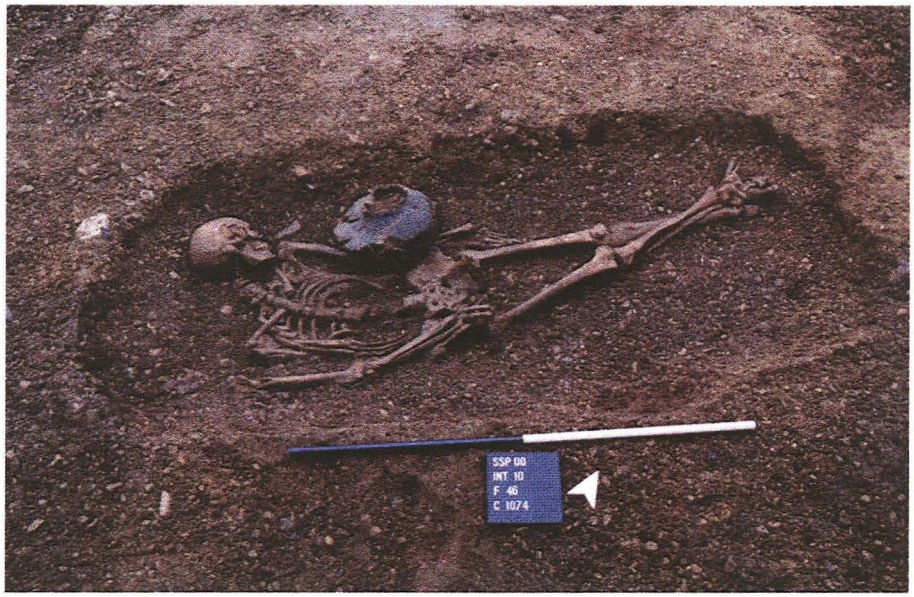



Plate 3 Burial with pottery vessel excavated in Field 14

*Fields 119-130*

In the summer of 2000 the first stage of the pipeline was constructed between the A46 and Staythorpe power station between Field 119 and Field 130. The watching brief located a few linear features crossing the pipeline spread, identified as field boundaries; islands of gravel within alluvium with no archaeology; and buried palaeochannels, sealed by alluvium.

## 8.0 RECOMMENDATIONS

The recommendations outlined below are based upon the results of a programme of investigative archaeological work along most of the pipeline route - Review (Phase 1), Reconnaissance (Phase 2) and Evaluation (Phase 3). It also takes into account discoveries made during Pre-construction Excavation (Phase 4) in Field 54 to 56, and Watching Brief work (Phase 5) at RDX 1 and 4, carried out in the Autumn of 2000, in advance of major construction scheduled to start mid-April 2001.

The aim of the archaeological work is to:

1. define the extent of any archaeological remains;

2. characterise archaeological remains by sample excavation in order to recover dating material, environmental samples and an adequate record of the remains themselves;

3. establish the deposit sequence to understand the growth and development of the site;

4. assess the nature and value of any archaeological remains encountered.

## 8.1 PRE-CONSTRUCTION EXCAVATION (PHASE 4)

Where highly significant archaeological sites cannot be avoided through modification to the pipeline route, pre-construction area excavation is required to adequately investigate and record any such sites. This approach may also reduce the risk of delays to the construction programme caused by necessary archaeological mitigation work. A detailed specification for the pre-construction excavation, including an appropriate environmental sampling strategy, should be prepared in consultation with the relevant archaeological curators.

The fields listed below have been identified for pre-construction mitigation.

*Field 20* Cremated human remains from Trench B discovered in overburden buried beneath ploughsoil. There is a strong possibility that *in situ* burials and prehistoric funerary structures exist sealed beneath the overburden.

**ACTION**: Machine excavation of topsoil, to be stripped using a back-acting excavator fitted with a toothless ditching bucket. Test pits (1m x 1m) to be excavated by hand, and sieved, through overburden at intervals of 10m along the centre line across the entire length of the field to locate spreads of cremated human bone. One hot spot already identified in Trench B (extent not yet known). A Home Office burial licence is required for any further work. The remaining head layer should then be excavated under archaeological supervision using a back acting excavator fitted with a toothless ditching bucket down to the subsoil horizon. Once all archaeological features crossing the centre line have been investigated the remainder of the head layer could then be excavated.

*Field 45* The presence of a potential Iron Age cremation cemetery at the +ve (western) end of the field and the density of Roman pottery scattered along the pipeline, together with its prominent topographic situation indicate that the whole field should be subject to pre-construction excavation at the earliest opportunity.

**ACTION**: Apply for Home Office burial licence. Priority strip ploughsoil with a back acting excavator fitted with a toothless ditching buckets. An area 20m either side of Trench C along the centreline of the pipeline should be hand cleaned within the width of the head layer in order to locate small burial pits containing cremations or cremation vessels. If the cemetery is located extend the hand cleaning to define the extent of the burial ground. If cremated remains are discovered (urned or un-urned) they may be lifted intact and dissected under controlled conditions.

*Field 53* At the -ve end of Field 54 the concentration of archaeological features and structures showed no sign of running out, it is therefore anticipated that remains will exist at the +ve end of Field 53.

**ACTION**: Topsoil strip using a back acting excavator fitted with a toothless ditching bucket. Map and sample excavate features.

*Field 107B* No evaluation to assess strong geophysical anomalies at the northern end of the field.
**ACTION**: Topsoil strip using a back acting excavator fitted with a toothless ditching bucket. Map and sample excavate features.

*Field 110B* No evaluation to assess results of field walking
**ACTION**: Topsoil strip using a back acting excavator fitted with a toothless ditching bucket. Map and sample excavate features.

## 8.2 WATCHING BRIEF (PHASE 5)

A permanent presence watching brief should also be maintained during the construction programme. All groundworks including topsoil stripping, head layer and pipe-trench excavation should be archaeologically monitored. A detailed specification for the watching brief, including an appropriate environmental sampling strategy, should be prepared in consultation with the relevant archaeological curators.

The fields listed below have been identified for early work during the watching brief.

*Field 1* A length of Roman road was discovered during preliminary watching brief (Autumn 2000), buried beneath alluvium in a slight hollow. The recording of the structure is complete, it is fenced off and is not threatened by the pipe trench.
**ACTION**: Cover with protective layer of sand, 0.20m thick and carefully cover and reinstate with topsoil.

*Fields 8-13* Limited reconnaissance, not available for full survey.
**ACTION**: Priority for early topsoil stripping.

*Field 14* Early medieval cemetery and prehistoric settlement discovered during preliminary watching brief (Autumn 2000). Burials and human remains excavated, deposits and features of prehistoric date excavated from centre line. Further burials exist under access ramp sealed by ground sheet, no further threat from construction. Across the road ploughsoil pulled off the +ve end of Field 13 revealed no further burials (RDX4).
**ACTION**: Apply for an extension to the burial licence as a precaution against further burials, but no action required so long as reinstatement is carried out sympathetically.

*Field 49* Evaluation trenches were abandoned in poor working conditions (F3 not excavated), however, preliminary evaluation indicates archaeological remains possibly from early medieval activity.
**ACTION**: Priority for early topsoil stripping using a back acting excavator fitted with a toothless ditching bucket.

*Field 54* As a result of the pre-construction excavation carried out in 2000, significant

archaeological features are currently exposed in some areas of this field.
**ACTION:** These features should be covered with protective matting during construction.

*Field 75* Archaeological remains discovered in evaluation, desk assessment suggests further linear features, probably ditches of a field system, geophysics response poor due to recent ground disturbance.
**ACTION**: Priority for early topsoil stripping using a back acting excavator fitted with a toothless ditching bucket.

*Field 80* Possible burial mound identified adjacent to the pipeline route during topographic survey. This may indicate that further ploughed out burial mounds are present.
**ACTION**: Priority for early topsoil stripping using a back acting excavator fitted with a toothless ditching bucket.

*Fields 96-100* New pipeline route. From Field 96B to RDX18, no reconnaissance undertaken
**ACTION**: Priority for early topsoil stripping.

## 8.3 ALLUVIUM

A large proportion of the pipeline route contains alluvial deposits (*c.*28%). These deposits effectively mask archaeological remains from detection by non-invasive investigative techniques. The archaeological potential of the areas covered by alluvial deposits should not be underestimated as alluvium has often been found to conceal exceptionally well preserved archaeological remains and valuable environmental data.

As there is no effective method of identifying significant archaeological structures and features prior to construction or avoiding them during construction archaeological mitigation within the alluvial areas should be dealt with during construction. The archaeological team would undertake an intensive Watching Brief. The excavation of the pipe-trench would be carried out using back-acting rather than trenching machinery. All excavation would be monitored during the Watching Brief. Adequate provision for excavating and recording archaeological remains should be made within the construction timetable. An archaeo-environmental recording and sampling strategy should be agreed prior to the construction programme.

## 8.4 GENERAL CONSIDERATIONS

Archaeological work will be carried out in accordance with FAS Health and Safety regulations; staff will have passed the relevant GINTO Pipeline Health, Safety and Environment course.

All archaeological remains identified during the watching brief will be recorded according to the relevant County Council guidelines using the standard recording procedures employed by FAS.

All remains will be located on the Ordnance Survey grid against temporary control stations located at each site from survey stations already located at road crossings. All heights expressed on our records will refer to Ordnance Datum.

The Environmental Consultant will advise the Senior Archaeologist on appropriate sampling and enhanced recovery strategies where deposits with environmental potential are discovered or where an understanding of the formation processes is necessary. The general policy for environmental sampling is set out in Appendix B.

If substantial or significant archaeological remains are discovered it will be necessary to protect such remains from damage by tracked or wheeled vehicles and machines along the running track. If such remains are uncovered and in consultation with Transco or their representative it will be necessary to protect these remains using a suitable and appropriate material or cover.

Within the spread the topsoil will be mechanically stripped and the head layer removed along the centreline. At this time all visible archaeological remains should be mapped and selected segments of deposits or layers excavated and if necessary hand cleaned. Where possible excavation will be restricted to the centreline of the pipe, but where it is appropriate and necessary excavation may be undertaken on either side, so long as the areas are clearly marked and protected. If archaeological remains are discovered further clearance or mechanical cleaning with a back acting excavator fitted with a toothless ditching bucket may be required to define the extent of the remains; the extent and depth of the cleaning will be determined by the supervising archaeologist in consultation with Transco or its representative.

Monitoring of the watching brief will be carried out by Transco staff, in order to check progress and standards. With the agreement of Transco site visits may also be undertaken by representatives of Lincolnshire and Nottinghamshire County Council Archaeology Section.

# APPENDIX A EVALUATION PROGRAMME SPECIFICATION (PHASE 3)

Justin Garner-Lahire

## SUMMARY

This Evaluation Programme forms the third phase of an archaeological project designed to locate, assess and evaluate any archaeological remains within the development area of the proposed Silk Willoughby to Staythorpe pipeline. The aim of the project is to assist Transco in the selection of a pipeline route which causes the minimum amount of damage to the archaeological resource and to formulate an effective archaeological mitigation strategy for the construction programme. Further phases of this project may include area excavation of archaeological sites, and watching brief during construction.

Details of location, description, planning background and archaeological background are contained within the Archaeological Desk-based Assessment Report - Phase I (Network Archaeology Limited, Report No.132, April 1999) and the Reconnaissance Programme Report - Phase II (Field Archaeology Specialists Limited, SSP02, March 2000).

This Evaluation Programme will be undertaken in accordance with the Lincolnshire County Council Archaeological Handbook, and the Institute of Field Archaeologists Code of Conduct, standards and guidance.

## 1. OBJECTIVES

The objectives of the Evaluation Programme are:

i. to record earthworks identified during Stage 1 of the Reconnaissance Programme.
ii. to define the extent of archaeological remains in areas where minor modifications to the pipeline route are feasible.
iii. to characterise the state of preservation of apparently significant archaeological sites/remains identified by the Desk-Based Assessment and Reconnaissance Programme.
iv. to assess the nature and value of apparently significant archaeological sites/remains identified by the Desk-Based Assessment and Reconnaissance Programme.
v. to assess the environmental potential of apparently significant archaeological sites/remains identified by the Desk-Based Assessment and Reconnaissance Programme.
vi. to provide information for the design of site specific mitigatory measures.
vii. to produce a report that addresses the above.

## 2. FIELDWORK METHODOLOGY

### 2.1 PROJECT GRID

The projects survey grid will be that of the Ordnance Survey National Grid. Survey stations will be set out at road crossings by the projects surveyors using GPS. Intermediate survey stations will then be set out using total station theodolites.

## 2.2 STAGE 1 - GEOPHYSICAL SURVEY

Further to the geophysical survey undertaken as part of the Reconnaissance Programme in Fields 54, 55 and 56, additional magnetometer area survey will be carried out in these Fields. This additional survey is required to assess the viability of modifying the pipeline route in order to avoid areas of high density and seemingly highly significant archaeological remains.

The survey will be undertaken in accordance with *Geophysical survey in archaeological field evaluation* (English Heritage - Research and Professional Services Guideline No.1 1995)

## 2.3 STAGE 2 - TOPOGRAPHIC SURVEY

Stage 1 of the Reconnaissance Programme identified five fields which contained ridge and furrow earthworks (Fields 48, 79, 80, 81, 85). The full extent of the surviving earthworks in these Fields will be the subject of a topographic survey using a total station theodolite. A hachure plan and a contour map will be produced for each field at an appropriate scale and interval.

## 2.4 STAGE 3 - EVALUATION TRENCHES

Areas in 11 Fields were selected, in consultation with the Lincolnshire County Council Archaeological Curator, for evaluation by trial excavation. These areas were considered to be of high archaeological potential based on the results of the Desk-Based Assessment and Reconnaissance Programme.

### 2.4.1 Hand excavated trenches

A series of 1m x 1m trenches will be hand excavated in 5 fields to evaluate areas where flint scatters were identified by the Desk-Based Assessment and Reconnaissance Programme. Topsoil/ploughsoil will be excavated in spits with all excavated material being dry sieved through a 10mm mesh. A 10% sample of excavated material will also be dry sieved through a 1mm mesh in order to recover microliths. Any archaeological deposits which are defined beneath the topsoil will be recorded and excavated. 1m x 1m trenches will be excavated in the following fields:

| | |
|---|---|
| Field 18 | x3 trenches |
| Field 19 | x3 trenches |
| Field 20 | x3 trenches |
| Field 33 | x4 trenches |
| Field 34 | x4 trenches |

### 2.4.2 Machine excavated trenches

A series of 12m x 4m trenches will be excavated in 7 fields to evaluate areas where possibly significant archaeological features were defined by the Desk-Based Assessment and Reconnaissance Programme. Overburden will be excavated under strict archaeological supervision using a mechanical excavator fitted with a broad toothless ditching bucket. The first archaeological horizon will then be hand cleaned and all archaeological features and deposits will be photographed and planned. Appropriately sized samples of archaeological deposits will then be excavated and recorded in order to meet the objectives of the evaluation

programme.

12m x 4m trenches will be excavated in the following fields:

| | |
|---|---|
| Field 1 | x2 trenches located over geophysical anomalies and finds concentrations |
| Field 20 | x2 trenches located over geophysical anomalies |
| Field 31 | x1 trench located over linear geophysical anomalies |
| Field 37 | x1 trench located over geophysical anomalies and Roman find spots |
| Field 45 | x3 trenches located over geophysical anomalies and Roman find concentration |
| Field 49 | x2 trenches located over geophysical anomalies and find spot |
| Field 75 | x1 trench located over cropmark and geophysical anomalies |

2.4.3 Environmental strategy

The Environmental Consultant will advise the Senior Archaeologist on appropriate sampling and enhanced recovery strategies where deposits with environmental potential are encountered or a fuller understanding of formation processes is required.

## 3. POST-EXCAVATION METHODOLOGY

### 3.1 FINDS AND SAMPLES

All artefacts will be cleaned, marked, counted, weighed, identified, catalogued, conserved (if appropriate) and packaged in accordance with the guidelines of the Lincoln City and County Museum.

### 3.2 EXCAVATION RECORDS

All excavation records and indices will be checked for consistency. Drawn records will be digitised and written records transferred to a data base. Environmental samples will be processed.

### 3.3 ASSESSMENT

Artefacts and environmental samples will be assessed for their potential for further analysis. The excavation record will be assessed and reviewed in relation to the objectives of the Evaluation Programme.

## 4. REPORTING

The report will combine the results of the Geophysical survey, topographic survey, hand excavated trenches and machine excavated trenches. The report will:

i. describe the evaluation methodologies
ii. provide an objective statement of the results
iii. assess the reliability of the excavation and survey data
iv. assess the significance of the archaeological areas evaluated
v. reassess the overall impact of the proposed pipeline route on the archaeological resource
vi. recommend an appropriate archaeological mitigation strategy for pipeline construction

Illustrations will include:

i. location plan showing the pipeline route
ii. greyscale plots, trace plots and interpretative plans of geophysical survey data
iii. hachure and contour maps of topographic data
iv. trench location maps at 1:2,500
v. trench plans at appropriate scales (1:50, 1:100)

## 5. MONITORING

The Evaluation Programme will be monitored by BG Transco staff to check progress, standards and to ensure that work satisfies the Specification.

Monitoring of the Evaluation Programme may also be undertaken by Lincolnshire County Council Archaeology Section.

## 6. ARCHIVE

On completion of the Project, landowners will be encouraged to donate any finds to the City and County Museum.

The archive will be deposited with the Lincoln City and County Museum and will be prepared in accordance with the Museum's requirements.

## 7. DISSEMINATION

Copies of all reports produced as a result of the Evaluation Programme along with a copy of the digital archive will be deposited with the Lincolnshire County Council Sites and Monuments Record.

The results of the project will be disseminated in an appropriate manner which will be agreed with Lincolnshire County Council Archaeology Section on completion of the project.

## 8. TIMETABLE

The timetable for the Evaluation Programme cannot be fixed as it will be dependent upon flexible access arrangements with arable farmers. The fieldwork will be carried out between October 2000 and January 2001. A full report on the Evaluation Programme will be completed by March 2001.

## 9. STAFF

| | |
|---|---|
| Project Manager: | Justin Garner-Lahire BA |
| Senior Archaeologist: | Andrew Copp MA AIFA |
| Surveyor: | Toby Simpson HND BA |
| Site Assistants: | Luigi Signorelli HND BA MA |
| | Nichola Watts BA MA |

| | |
|---|---|
| | Richard Jackson BA |
| Environmental Consultant: | Stephen Carter BSc PhD MIFA |
| Project Specialists: | Stephen Carter (Soils)<br>Tim Holden (Paleoecology)<br>Alan Vince (Pottery)<br>Sandra Garside-Neville (CBM)<br>Hilary Cool (Glass)<br>YAT Artefact Research (metal)<br>Lorrain Higby (vertebrate)<br>YAT Conservation |

All fieldwork will be undertaken by FAS.

## 10. HEALTH & SAFETY

All fieldwork will be carried out in accordance with the FAS Health & Safety Policy as well as specific requirements set out in the programmes Risk Assessment.

## 11. INSURANCE

| | |
|---|---|
| Public Liability: | £5,000,000 |
| Employers Liability: | £5,000,000 |
| Professional Indemnity: | £1,000,000 |

## 12. COPYRIGHT

FAS retains the copyright to the written and graphical material produced as a result of the Evaluation Programme subject to matters of confidentiality and copyright of other organisations.

Lincolnshire County Council will be granted a full licence for the City and County Museum to research, display, publish and provide public access to all information and finds contained within the deposited archive.

## APPENDIX B ENVIRONMENTAL STRATEGY

Andrew Copp, Stephen Carter

The archaeological potential of areas of alluvium was highlighted in the Phase 2 Survey Report (FAS_SSP02), presented on completion of the reconnaissance programme for the proposed pipeline.

The hand auger survey identified seven areas of alluvial deposition (labelled A-G on the Archaeological Constraint Maps) which have occurred on the flood plains of the principle river systems (Rivers Slea, Witham, Devon and Trent), their tributary streams and drains and across areas of low lying peat fenland (Bennington Fen).

Alluvium may cover well preserved archaeological remains which since they are likely to be protected from modern agricultural practice, could contain important archaeological deposits and horizons (eg. earthworks, buried soils, occupation surfaces etc.). Apart from archaeological remains the alluvium may also contain a history of sediment accumulation and deposition. Where these remains or layers of strata have survived under waterlogged conditions it is likely that organic material is preserved within these deposits. This material may contain important environmental data or sequences which can also be dated by absolute methods.

The total length of alluvium is approximately 11.02km or c.28% of the entire route and varies in depth from 0.20m to over 3.00m

Where alluvium is present and it contains important archaeological remains or rich palaeo-environmental sequences the aim of the environmental sampling programme is

i. to investigate the contribution of alluvium to the landscape, particularly the processes of sediment formation and the history of environmental changes in the Holocene.

ii. to assess the potential for environmental study at each site

iii. to characterise the vegetation and landuse before, during the growth of and following the abandonment of each site

The studies presented below should help answer the above questions.

1 Pedological study of buried soils (including micromorphology). The presence of buried soil horizons (eg. under earthworks) which can be dated will provide information on ecological change over time. This study would be expected to provide information relating to the status of the soil beneath the earthwork at the time of burial and should also be able to detect and characterise some aspects of previous phases of landuse. It will also provide information on erosion and on the contribution of aeolian material to the soil.
It will be necessary to collect undisturbed samples both within the structure of the earthwork and from the buried soils.

2 Micro and macro fossil analysis of primary fills of archaeological deposits or good accumulating sediments (eg. peat).
Sampling for these studies will have to be systematic and may be extensive.

3 Detailed wet sieving/flotation of bulk samples from primary fills of archaeological deposits. Carbonised cereal grains and weed seeds and any surviving macros fossil remains would provide interpretable evidence of environment and economy.

4 The study of organic waterlogged deposits. Palaeo-ecological analyses (eg. pollen, diatoms and plant macro remains) of organic rich layers and sediment sequences to define possible modes of formation, processes of sediment in-filling, water depths and water quality at times of sediment in-filling or accumulation, local vegetational and landuse history. If deposits cannot be dated by find spots, C14 assays of sediments at critical depths will be required in order to define the age of formation and the time span covered by the accumulation of the deposits. Samples which may contain organic matter will be kept in a cool store at 4°C.

5 Mapping of buried surfaces. The accumulation of alluvial sediments will tend to mask slight topographic changes in the ground surface which may cover former occupied land surfaces (eg. 'dry' islands and palaeo-channels). The recording of sediment depths at intervals along the pipe section will identify such areas of variable potential within the alluvium. Where necessary it will be supplemented by detailed recording and sampling in order to clarify and date the sequence.

Archaeological sites will usually be investigated in plan but where along the route they are buried by alluvium they may only be exposed in the deep cutting of the pipe trench itself. Under these conditions the observation and the recording of archaeological remains or sequences of alluvial sediments will only be possible from the surface of the cutting unless on the recommendation of the supervising archaeologist (with advice from the environmental consultant) and with the agreement of the BG Transco access is required in order to study or remove samples from the section. If access is required the pipe trench will be cut back with regard to Health and Safety considerations, to an acceptable width and depth depending upon the stability of the local strata. If for any reason it is not possible to study the section, samples may be taken by hand from an adjacent area.

All samples will be recorded with regard to the site grid and Ordnance Datum (OD).

# APPENDIX C TOPOGRAPHIC MAPS INTERVENTION 7

# APPENDIX I MAGNETOMETER AREA SURVEY RESULTS AND INTERPRETATION MAP

| | | | |
|---|---|---|---|
| F1 | Road | WB | L160813<br>PRN60813 |
| F1 | Possible Cremation/Burial | WB | L182434<br>PRN61954 |
| F1 | Roman Pottery | FW | L182435<br>PRN61955 |
| F11 | Flint Scatter | FW | L182436<br>PRN 61956 |
| F11 | Medieval Pottery | FW | L182437<br>PRN 61957 |
| F13 | Flint Scatter | FW | L182439<br>PRN 61958 |
| F14 | Anglo-Saxon Cemetery | WB | L182448<br>PRN 60375 |
| F18 | Flint Scatter | FW | L160623<br>PRN 60623 |
| F19 | Flint Scatter | FW | L182452<br>PRN 61961 |
| F20 | Flint Scatter | FW | L182452<br>PRN 61961 |
| F20 | Iron Age | MGS<br>TT | L182455<br>PRN 61962 |
| F31 | Flint Scatter | FW | L182456<br>PRN 61963 |
| F31 | Undated Ditch | MGS<br>TT | L182457<br>PRN 61964 |
| F37 | Flint Scatter | FW | L182458<br>PRN 35517 |
| F37 | Roman Pottery | FW | L182459<br>PRN 35518 |
| F38 | Flint Scatter | FW | L182458<br>PRN 35517 |
| F38 | Roman Pottery | FW | L182459<br>PRN 35518 |
| F45 | Iron Age/Roman Site | FW<br>MGS<br>TT | L182460<br>PRN 35519 |
| F45 | Flint Scatter | FW | L182461<br>PRN 35520 |

NB all L1 no should be wood on Li

| | | | |
|---|---|---|---|
| F48 | Ridge and Furrow | TS<br>OF | L182462<br>PRN 35521 |
| F49 | Medieval Glass Bead | FW<br>TT | L182464<br>PRN 35522 |
| F54 | Roman Enclosure | FW<br>MGS | L182465<br>PRN 35523 |
| F54 | Flint Scatter | FW | L182466<br>PRN 35524 |
| F55 | Burial Mound | MGS | L182467<br>PRN 35525 |
| F55 | Flint Scatter | FW | L182468<br>PRN 35526 |
| F56 | Iron Age Ditch | TT<br>MGS | L182472<br>PRN 35527 |
| F56 | Medieval Building | TT | L182473<br>PRN 35528 |
| F75 | Medieval Sherd | FW | L182474<br>PRN 35529 |
| F76 | Roman Pottery | FW | L182475<br>PRN 35530 |
| F79 | Ridge and Furrow | FO<br>TS | L182476<br>PRN 35531 |
| F80 | Ridge and Furrow | FO<br>TS | L182476<br>PRN 35531 |
| F80 | Mound | TS | L182477<br>PRN 35532 |
| F81 | Ridge and Furrow | FO<br>TS | L182478<br>PRN 35533 |
| F85 | Ridge and Furrow | TS<br>FO | L182479<br>PRN 35534 |
| F87 | Roman Pottery | FW | L182480<br>PRN 35535 |
| F93 | Roman Pottery | FW | L130162<br>PRN 30162 |
| F93 | Flint | FW | L182481<br>PRN 35536 |

# APPENDIX D ASSESSMENT OF THE LITHICS MATERIAL (INTERVENTION 8 AND INTERVENTION 9)

Andrew Copp

## INTERVENTION 8

A total of eight pieces of flint were collected from five test pits in Fields 19, 20, 33 and 34. All of the pieces were produced on knapped flint but none exhibited further re-working. The small assemblage represents a group of waste flakes, generally of small size (0.3-6.0g in weight) and in poor condition, both broken and abraded.

On two of the flakes cortex survived, on one it covered most of the dorsal surface (12), but on the other it just covered the small platform. The cortex on both pieces was thin, and dirty cream or brown in colour, which suggests the parent material was a local river gravel or glacial deposit.

Six pieces were patinated, varying from a dense creamy opaque discolouration to a fine bluey-grey tint.

No blades were represented in the group, although one broken piece (11) had both a flat section and parallel sides.

## INTERVENTION 9

Two flint flakes were recovered, one from overburden C1008 (Trench B, Field 20) and the other from the ploughsoil C1028 (Trench B, Field 45). Both pieces were made on poor quality flint, and both exhibit a dense pale grey patina.

The fragment of a small, smooth quartzite pebble (54) was recovered from C1036, F9 (Trench C, Field 45). It appears to be unworked, but had fractured probably as a result of burning.

## ASSESSMENT

There were no diagnostic elements amongst the small lithic group which would suggest a date earlier than the neolithic. The discovery of a broken pebble from a feature in Field 45, which contained pottery and bone also in a burned condition, supports the impression that this deposit had been buried after being exposed to fire.

# APPENDIX E ASSESSMENT OF MEDIEVAL AND POST-MEDIEVAL POTTERY AND CLAY PIPE (INTERVENTIONS 8 AND 9)

Alan Vince and Jane Young

## Summary

Seventy two sherds of pottery and two fragments of clay tobacco pipe were submitted for identification and assessment. All were examined by Alan Vince and Jane Young and those of Romano-British or prehistoric date were submitted to M J Darling for specialist identification and assessment (see separate report).

## Quantity

Thirteen sherds of post-Roman pottery were found (Table 1).

Table 1

| Field | med | pmed | Grand Total |
|---|---|---|---|
| 18 | 3 | | 3 |
| 20 | 2 | | 2 |
| 34 | 2 | 2 | 4 |
| 45 | 0 | 3 | 3 |
| 49 | 2 | | 2 |
| 75 | 1 | | 1 |
| Total | 10 | 5 | 15 |

## Condition

The three sherds from Field 18 were abraded, suggesting that they were derived from ploughsoil. The remaining sherds were either fresh (the post-medieval material and tobacco pipes) or had some surface deterioration but still retained angular breaks. The medieval sherds ranged from 2g to 8g (mean 4.6g), which is small but not remarkably so. The post-medieval sherds were larger, 2g to 47g, but included sherds from vessels of wildly varying size and wall thickness.

*Medieval pottery*

Seven ware codes were assigned to the 10 sherds of medieval pottery but only two were identified: a sherd of Stamford ware jar and a sherd of Nottingham Green-glazed ware. The remainder were too small to identify but are probably not types commonly found in the city of Lincoln.

The material ranges in date from the 10th/12th centuries to the 13th/15th centuries. There are no examples of midlands purple wares which would be expected in this part of the country in the later medieval period and therefore, probably, none of the sherds is later than c.1350 AD. The earliest securely dated sherd is the Stamford ware jar, which is of a fabric found only in the 11th century. However, the jug sherd found in the same context is later.

Table 2

| Cname | No of sherds |
|---|---|
| MEDLOC | 4 |
| MEDX | 1 |
| MISC MED SHELL | 1 |
| MISC QUARTZ & SHELL | 1 |
| NOTG | 1 |
| SNLOC | 1 |
| ST | 1 |
| Grand Total | 10 |

*Post-medieval Pottery*

Three sherds of post-medieval pottery were found, all in the same field and deposit. Two are of Nottingham Stoneware (NOTS) and of forms which probably date to the 18th or 19th centuries (a bowl and a jar). The third sherd is a fragment of black-glazed cup of Cistercian ware. This ware was produced from the 16th into the 17th century.

*Post-medieval Clay Tobacco Pipe*

Two stems from clay tobacco pipes were found. Both come from Field 34. From their bore diameters is it likely that one is of 17th/18th century date and the other of 18th/19th century date.

**Assessment**

The finds from Field 18 are likely to be a manuring scatter, of 13th/14th century date. The finds from Field 45 context 1048 are likely to be present as the result of post-medieval activity on site, or from dumping of this date. The remaining sherds are not sufficiently diagnostic to interpret. However, the sherds from Field 49 include a potentially pre-conquest sherd. They too may be from manuring but the freshness of the sherds suggests that the area should be watched closely during ground disturbance for evidence of early medieval occupation or other activity.

Appendix One: List of identified pottery

| Field | trench | Context | Cname | subfabric | Form | Nosh | NoV | Weight | Description | Part | ID |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | PIT B | 1006 | MEDLOC | FINE SANDY | JUG | 1 | 1 | 2 | 13TH-15TH C;ABRADED | BS | 17 |
| 18 | PIT B | 1006 | MEDLOC | FINE SANDY | JUG | 1 | 1 | 4 | 13TH-15TH C;ABRADED | BS | 18 |
| 18 | PIT B | 1008 | MEDLOC | | JUG | 1 | 1 | 7 | ABRADED | BS | 19 |
| 19 | PIT C | 1003 | RPOT | GREY;SANDY | JAR | 1 | 1 | 1 | ABRADED | BS | 13 |
| 19 | PIT C | 1008 | RPOT | GREY;SAND WICH FIRED | JAR | 1 | 1 | 2 | ABRADED | BS | 16 |
| 20 | A | 1005 | RPOT | | | 4 | 2 | 74 | SEP REPORT BY MJ DARLING | | |
| 20 | B | 1008 | RPOT | | | 6 | 1 | 5 | SEP REPORT BY MJ DARLING | | |
| 20 | PIT A | 1000 | RPOT | GREY | JAR | 1 | 1 | 1 | ABRADED | BS | 21 |
| 20 | PIT A | 1000 | QUARTZ & SHELL | | JAR | 1 | 1 | 2 | LEACHED;ROM? OR 11-12TH C | BS | 20 |
| 20 | PIT B | 1002 | NOTG | LIGHT FIRING | JUG | 1 | 1 | 8 | | BS | 1 |
| 31 | A | 1011 | RPOT | | | 2 | 1 | 3 | SEP REPORT BY MJ DARLING | | |

| Field | trench | Context | Cname | subfabric | Form | Nosh | NoV | Weight | Description | Part | ID |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | A | 1012 | RPOT | | | 1 | 1 | 3 | SEP REPORT BY MJ DARLING | | |
| 34 | PIT B | 1018 | CTP | | PIPE | 1 | 1 | 1 | 18TH/19TH C | BS | 9 |
| 34 | PIT B | 1018 | SNLOC | MEDIUM SANDY | JAR | 1 | 1 | 5 | 11TH-12TH C | BS | 8 |
| 34 | PIT C | 1019 | MISC MED SHELL | | JAR | 1 | 1 | 3 | 10TH/12TH C | BS | 6 |
| 34 | PIT D | 1020 | CTP | | PIPE | 1 | 1 | 3 | 17TH/18TH C | BS | 3 |
| 37 | A | 1016 | RPOT | | | 1 | 1 | 5 | SEP REPORT BY MJ DARLING | | |
| 45 | B | 1028 | RPOT | | | 2 | 2 | 16 | SEP REPORT BY MJ DARLING | | |
| 45 | C | 1029 | RPOT | | | 1 | 1 | 2 | SEP REPORT BY MJ DARLING | | |
| 45 | C | 1035 | RPOT | | | 3 | 2 | 18 | SEP REPORT BY MJ DARLING | | |
| 45 | C | 1036 | RPOT | | | 36 | 7? | 131 | SEP REPORT BY MJ DARLING | | |
| 45 | TRENCH B | 1028 | CSTN | | CUP | 1 | 1 | 2 | | BS | 9 |
| 45 | TRENCH B | 1028 | NOTS | | JAR | 1 | 1 | 47 | 18TH/19TH C | B | 5 |
| 45 | TRENCH B | 1028 | NOTS | | BOWL | 1 | 1 | 8 | 18TH/19TH C | R | 6 |
| 49 | TRENCH A | 1020 | MEDX | FINE-MED SANDY + IRON | JUG | 1 | 1 | 7 | 13TH/15TH C | BS | 19 |
| 49 | TRENCH A | 1020 | ST | FABRIC A/G | JAR | 1 | 1 | 5 | 11TH C | BS | 18 |
| 75 | TRENCH | 1022 | MEDLOC | MED-COARSE SANDY | - | 1 | 1 | 3 | 12TH/14TH C | BS | 17 |

# APPENDIX F ASSESSMENT OF PREHISTORIC AND ROMAN POTTERY (INTERVENTION 9)

Margaret J Darling

## Quantity and Condition

The total quantity of pottery from 9 contexts amounted to 56 sherds, weighing 0.257kg. This has been archived to the standard recommended by the *Study Group for Roman Pottery*, with sherd count and weight measures. A copy of the archive database is attached, and is available on disk; this will be curated for future research. The condition of the pottery is generally poor, with some sherds very abraded, and most are fragmented; there are no problems for long term storage.

The pottery occurrence by site context is shown in Table 1.

| Cname | No of sherds |
|---|---|
| MEDLOC | 4 |
| MEDX | 1 |
| MISC MED SHELL | 1 |
| MISC QUARTZ & SHELL | 1 |
| NOTG | 1 |
| SNLOC | 1 |
| ST | 1 |
| Grand Total | 10 |

Table 1 Pottery by context

| Cno | Field | Trench | Sherds | % | Weight | % | Vessels |
|---|---|---|---|---|---|---|---|
| 1005 | 20 | A | 4 | 7.14 | 74 | 28.79 | 2 |
| 1008 | 20 | B | 6 | 10.71 | 5 | 1.95 | 1 |
| 1011 | 31 | A | 2 | 3.57 | 3 | 1.17 | 1 |
| 1012 | 31 | A | 1 | 1.79 | 3 | 1.17 | 1 |
| 1016 | 37 | A | 1 | 1.79 | 5 | 1.95 | 1 |
| 1028 | 45 | B | 2 | 3.57 | 16 | 6.23 | 2 |
| 1029 | 45 | C | 1 | 1.79 | 2 | 0.78 | 1 |
| 1035 | 45 | C | 3 | 5.36 | 18 | 7.00 | 2 |
| 1036 | 45 | C | 36 | 64.29 | 131 | 50.97 | 7? |
| | | | 56 | | 257 | | |

Apart from 1036, most contexts consisted of single vessels. The high fragmentation is shown by the average sherd weight overall of only 4.6g. The fabrics are summarised in Table 2.

Table 2 Fabrics

| Fabric | Code | Sherds | % | Weight | % |
|---|---|---|---|---|---|
| Grey | GREY | 6 | 10.71 | 27 | 10.51 |
| Oolitic-gritted | LOOL | 28 | 50.00 | 103 | 40.08 |
| Oolitic-gritted sparse | LOOLS | 2 | 3.57 | 13 | 5.06 |
| Shell-gritted common fine | SHCF | 1 | 1.79 | 13 | 5.06 |
| Shell-gritted common medium | SHCM | 12 | 21.43 | 53 | 20.62 |
| Vesicular | VESIC | 6 | 10.71 | 5 | 1.95 |
| Tile | TILE | 1 | 1.79 | 43 | 16.73 |
| | | 56 | | 257 | |

*Fields 31 and 37*

Contexts 1011, 1012 (Field 31), 1016 (Field 37) all contained very abraded grey quartz-gritted Roman body sherds, with no diagnostic features to enable close dating.

*Field 20*

Contexts 1005 and 1008 from field 20 produced two shell-gritted body sherds, one vesicular body sherd from which the inclusions have been lost (possibly originally shell), and an abraded fragment of tile, probably Roman. All the sherds are hand-made, and are probably of Iron Age date. Although it is impossible to date closely, they could be consistent with a mid- to late-Iron Age date.

*Field 45*

This produced two abraded Roman grey body sherds from context 1028 in Trench B. The largest quantity came from Trench C (contexts 1029, 1035 and 1036), most of the sherds being in oolitic-gritted fabrics, apart from two vessels (10 sherds) in shell-gritted ware (from 1036). These are probably from cooking vessels. All the oolitic and shell-gritted sherds appear to be from hand-made vessels. A single hand-made oolitic-gritted body sherd came from context 1029 (find 2). An oolitic-gritted rim sherd from context 1036 (find 21) appears to be from a possible bowl form with a fairly upright curved everted rim type; there is a burning flame mark on the rim. A body sherd, although non-joining, is probably also from the same bowl (find 35). The fabric of this bowl contains fewer oolitic inclusions, and can be classified as a fine ware.

The other oolitic-gritted sherds from 1036 comprise probably four vessels, three represented solely by indeterminate body sherds, while the bulk of the sherds come from a single vessel, possibly a carinated bowl, with thinner walls, and generally finer oolitic inclusions. This appears to have been burnt, with evidence for some sherds being burnt post-fracture, the fractures having oxidized. The condition of the exterior surface also suggests burning. The fabric of this vessel contained more finely crushed oolitic inclusions.

**Discussion**

The main interest lies in the group from Field 45, Trench C, context 1036, a post-hole, located at Normanton, Lincolnshire. The burning and condition of some of the sherds would be consistent with having been on a cremation pyre, and the finer thinner-walled bowls may have been accessory vessels, so it is possible that this post-hole contains sherds dispersed from a cremation. As a secondary deposit, little can be said about the association of the shell-gritted sherds with the oolitic ware. Shell-gritted wares are common in Lincolnshire throughout the Iron Age. Oolitic-gritted ware is rarer, but there may be no chronological difference in the use of the two wares.

The very sparse evidence for vessel form makes dating within the Iron Age extremely difficult. Simple slack curved rims and carinated vessels occur from the Early Iron Age onwards, and while the use of the wheel for finer vessels occurs in the Late Iron Age, some hand-made vessels were still being made. If the calcined bone is confirmed as being human, indicating cremation, a Late Iron Age date may be more probable. Consultation with an Iron Age specialist in that area of Lincolnshire is recommended.

**Acknowledgements**

I am grateful to David Knight, University of Nottingham, for discussing this pottery with me.

# APPENDIX G ASSESSMENT OF CREMATED BONE (FIELD 20 AND FIELD 45)

Malin R Holst

## 1.0 INTRODUCTION

### 1.1 BACKGROUND

During the archaeological evaluation phase of the Silk Willoughby to Staythorpe Gas Pipeline, two trenches were excavated in Field 20, (Trenches A and B) over geophysical anomalies and find spots identified during reconnaissance. Both trenches contained a deposit of overburden up to 0.50m thick, buried beneath modern plough soil, possibly the remnants of ridge and furrow. The overburden in Trench B (C1008) was excavated by hand along half of the trench, and produced cremated bone scattered throughout the layer. No concentration of bone was identified, the spread representing one or more ploughed out burials.

A second finds spot of cremated bone was located in Field 45 (F9 C1036), although it contained only one fragment (0.1g weight).

### 1.2 AIMS AND METHODS

The primary aim of the analysis of the cremated bone from Field 20 (C1008) was to assess the significance of the discovery, to identify the minimum numbers of individuals (sex, age and pathology) and to assess the condition of the material. A statement on the identification of the bone from Field 45 is given below (2.5).

Initially, the bones were sieved through a stack of 10mm, 5mm and 2mm sieves in order to grade the cremated remains. The bone recovered from each sieve size was subsequently weighed, and identifiable bones were selected and bagged separately. These were split into five different skeletal categories:
- cranial (skull)
- axial (spine, shoulders, ribs, hips)
- upper limb (arm and hand bones)
- lower limb (hand and foot bones)
- long bone (unidentifiable as to upper and lower limb)

These fragments were then weighed, counted and described in further detail, according to standard procedure. An attempt was made to identify the age, sex and pathological conditions of the skeletal material.

## 2.0 PHYSICAL ANTHROPOLOGY

### 2.1 PRESERVATION

The preservation assessment of the remains was carried out subjectively (according to fragment size and erosion) and was based on a comparison of the cremated remains from this site with those from other sites familiar to the author. The bone was in very good condition, especially when considering that the burial(s) was not apparently *in situ*. 72% of the bone was in the 10mm sieve category, while 27% was recovered from the 5mm sieve category; less than 1% was noted in the 2mm category. The results probably reflect the fact that the fragments were hand collected from C1008 at Recovery Level B (shovel scraping). McKinley (1994a, 340) found that most cremation burials contain 50% or more fragments which are larger than 10mm. The higher percentage

of bone over 10mm in size suggests that the larger fragments were collected from the pyre for burial and that these were robust enough to survive post-depositional damage.

The cremated bone from Field 20 was identified as human and the quantity of identifiable remains was substantial, representing 84% (113.7g) of the assemblage. This is particularly high as usually only between 20% to 50% of the bone from a burial is identifiable (McKinley 1989a, 68). Long bone fragments survived particularly well, especially the robust lower limb bones (Table 1). The largest fragment was 71.1mm long and consisted of a humeral shaft fragment. Several other long bone fragments were larger than 50mm.

Table 1 Quantity of skeletal elements

| Skeletal Element | Number of Fragments | Weight (g) | % of Identifiable Remains |
|---|---|---|---|
| Cranium | 26 | 21.1g | 15% |
| Axial | 5 | 11.6g | 8% |
| Upper Limb | 8 | 19.6g | 14% |
| Lower Limb | 16 | 34.4g | 26% |
| Long Bone | 61 | 51.9g | 37% |
| Total Identifiable Remains | 116 | 138.6g | 100% |
| Total Remains | -- | 156.4g | - |

Erosion of cremated bone can occur immediately after burning, when the bone is still hot and brittle, or can be produced by adverse soil conditions and post-depositional movement. Almost no erosion was observed on the cremated bone, suggesting that the bone had either been removed carefully from the pyre, or had been selected from the pyre after a cooling period. Post-depositional processes have had no obvious affect on the bone.

The total weight of the cremated remains was 156.4g. This is much lighter than the weight of a cremated skeleton from a modern crematorium, which can vary from 1,600g to 3,600g (McKinley 1989a, 66). However, archaeological cremation burials tend to weigh less than modern cremated skeletons, as only certain skeletal elements were usually selected from the pyre for the pyre (Wahl 1982; McKinley 1989a, 66). The weight of the bone is also lower than the normal weight range of archaeological cremation burials, which varies between 200g and 2,500g (Wahl 1982, 25). Regardless of whether one or more burials are represented, this weight is particularly low.

The colour of the skeletal fragments showed little overall variation. They were white throughout, with slight bluish discolourations on two small fragments, suggesting that burial temperature was high and that burning carried on for a long period, the organic portion of the bone being lost and the bone salts fusing (Mayne Correia 1997, 276). The bluish colour of two bone fragments is a result of the organic portion of the bone becoming pyrolysed (*ibid*).

Most of the bone fragments were slightly warped and some of the long bone fragments showed repetitive crescentic cracking patterns. It is probable that the bone had shrunk to some extent. According to Wahl (1982), shrinkage does not normally exceed 15%.

## 2.2 MINIMUM NUMBER OF INDIVIDUALS

As it was thought that several burials were represented, identification of the minimum number of individuals recovered was essential. Identification of more than one individual is usually achieved by the identification of two or more identical elements, or by the presence of individuals of different ages or sizes. However, neither individuals of different ages, nor the presence of identical elements was observed. It must therefore be assumed that a minimum number of one individual is represented.

## 2.3 AGE AND SEX ESTIMATION

The age determination of archaeological skeletons relies on the development and degeneration of certain characteristics of the skull and pelvis (Buikstra and Ubelaker 1994; Lovejoy et al 1985). Unfortunately in this assemblage, none of the skeletal elements essential for age and sex determination survived. The size of the fragments present suggests that the individual represented is most likely to be an adult, rather than a juvenile. However, this is a subjective assessment based on an unreliable ageing method.

## 2.4 PALAEOPATHOLOGY

The only evidence for palaeopathology observed was a moderate bone excavation on a clavicle for the costoclavicular ligament. Bone excavation result when particular stress is placed on certain muscles or ligaments. Bone excavations on the medial clavicle for the costoclavicular ligament are relatively common in archaeological skeletons.

## 2.5 FIELD 45

The small bone fragment (0.1g) from Field 45 was calcined, but slightly eroded. It was not possible to identify whether this was human or animal bone.

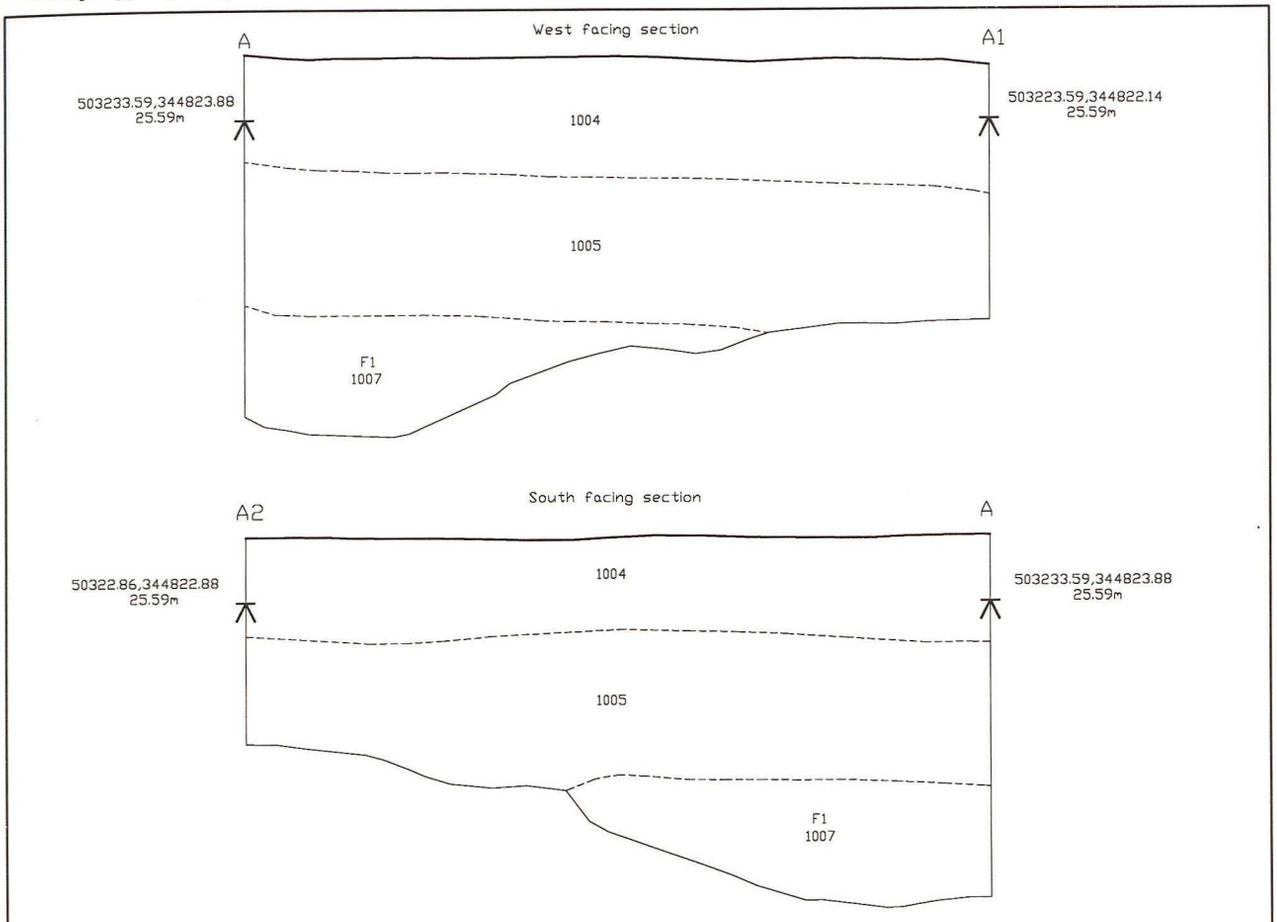
# 3.0 ASSESSMENT

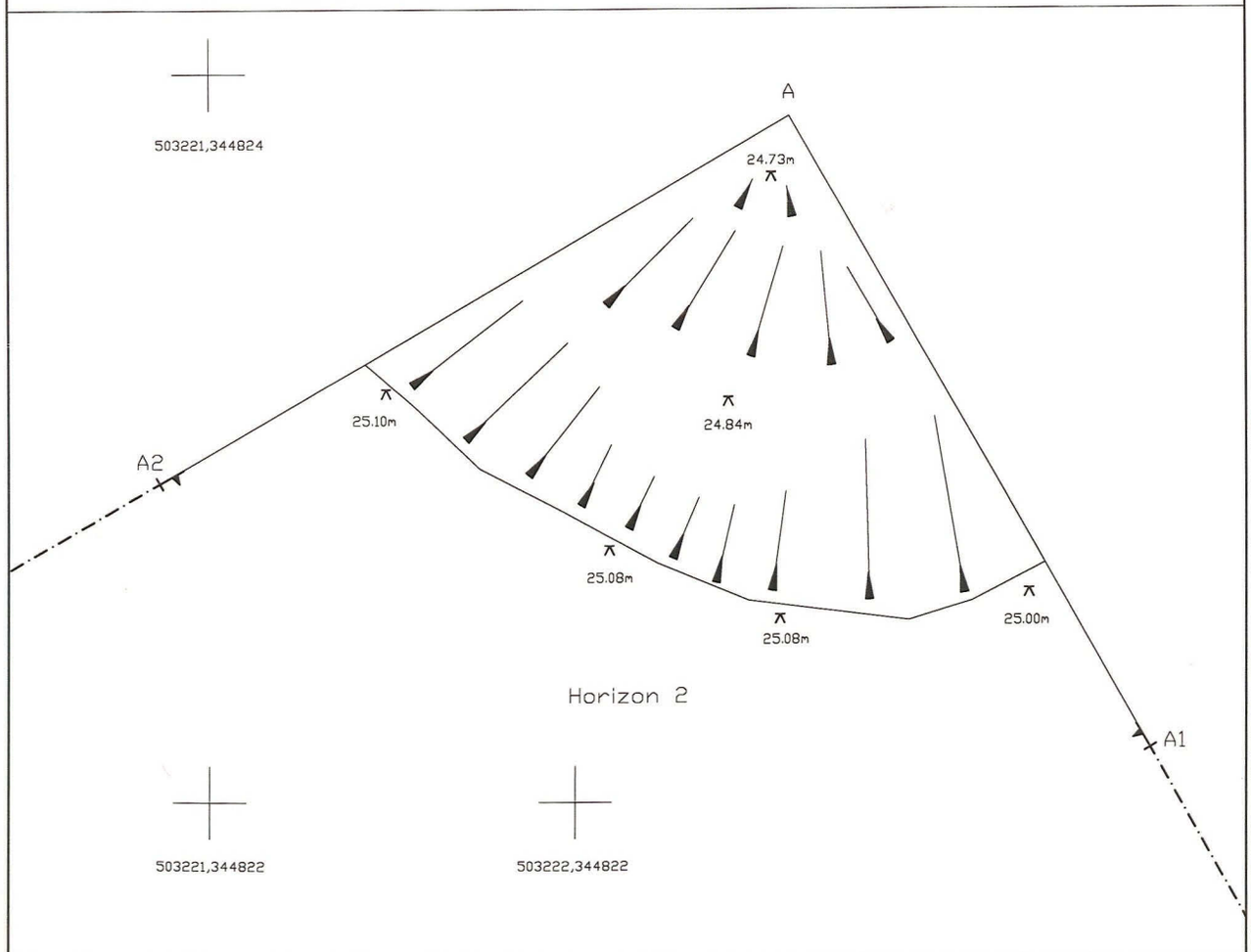
Little is known about the context from which the cremated remains were recovered from Field 20, although fragments of pottery also recovered from C1008 indicates activity during the later Iron Age (3rd to 1st century BC).

The results from the analysis suggest that the remains from Field 20 consist of at least one individual. The condition of the bone indicates that they were probably collected after the pyre had cooled. Very little erosion was observed on the bone, despite the likelihood of considerable post-depositional movement. The presence of a bone excavation at a ligament insertion may suggest that heavy physical work was carried out by the individual.

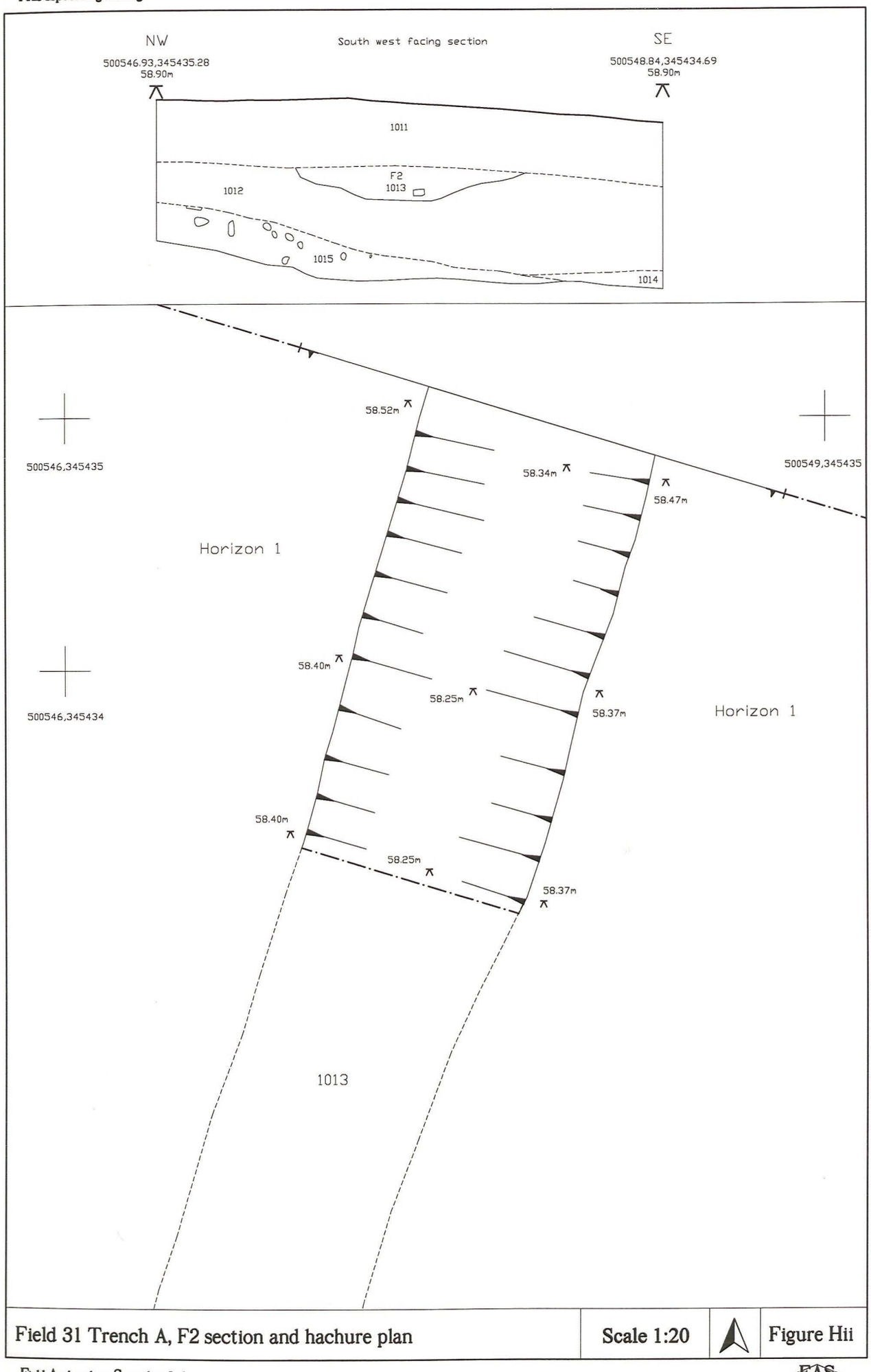
The cremated bone fragment from Field 45 could not be identified.

# APPENDIX H HACHURE PLANS AND SECTIONS INTERVENTION 9

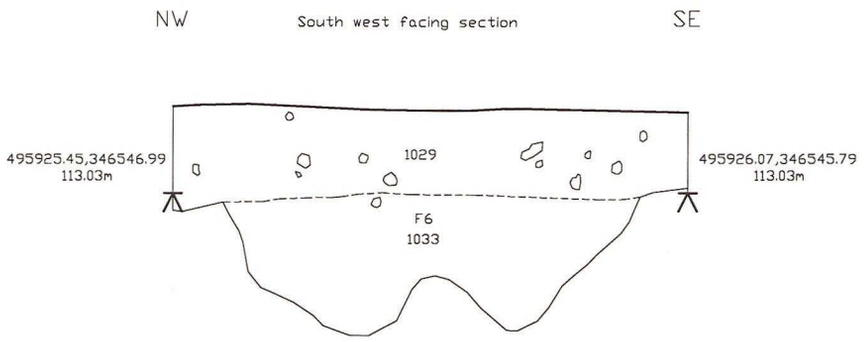


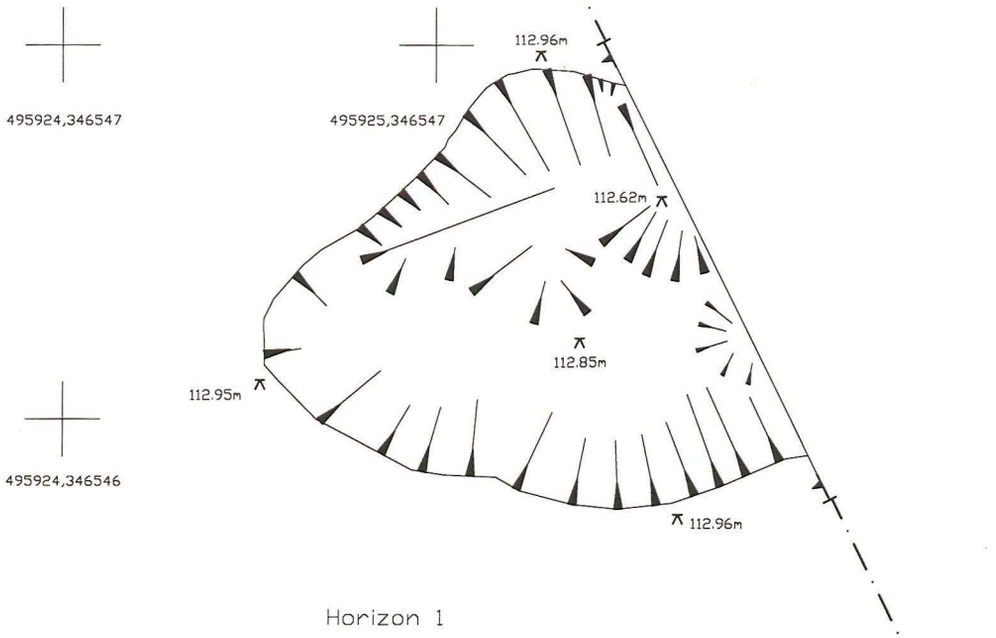




| Field 20 Trench A, F1 sections and hachure plan | Scale 1:20 | Figure Hi |
|---|---|---|

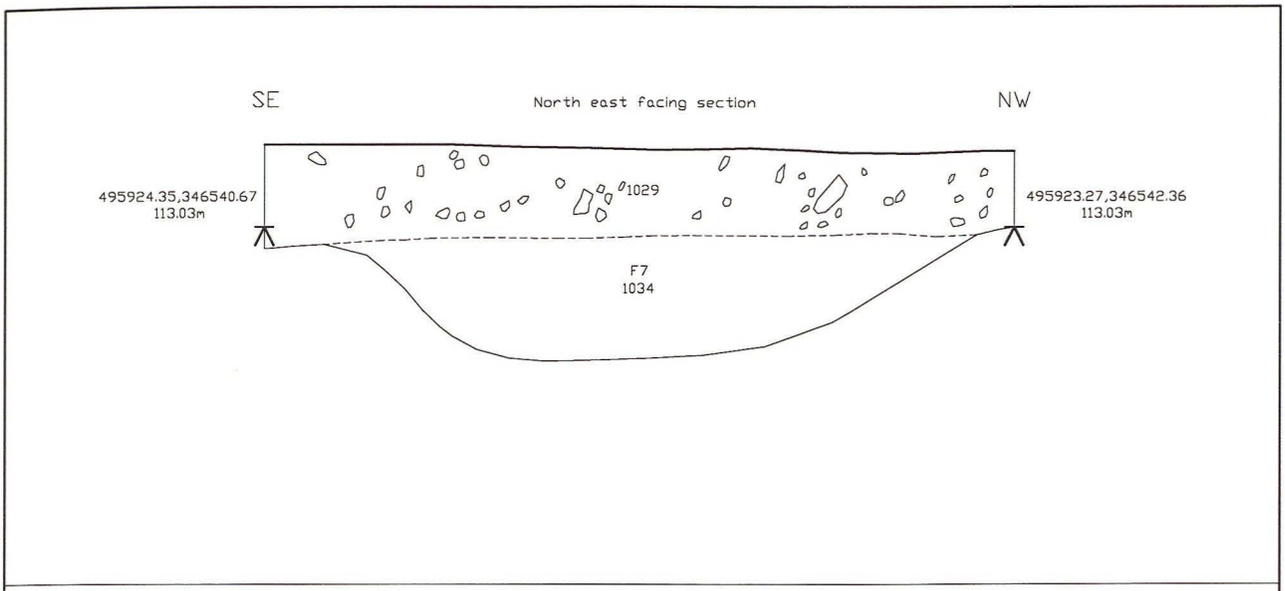


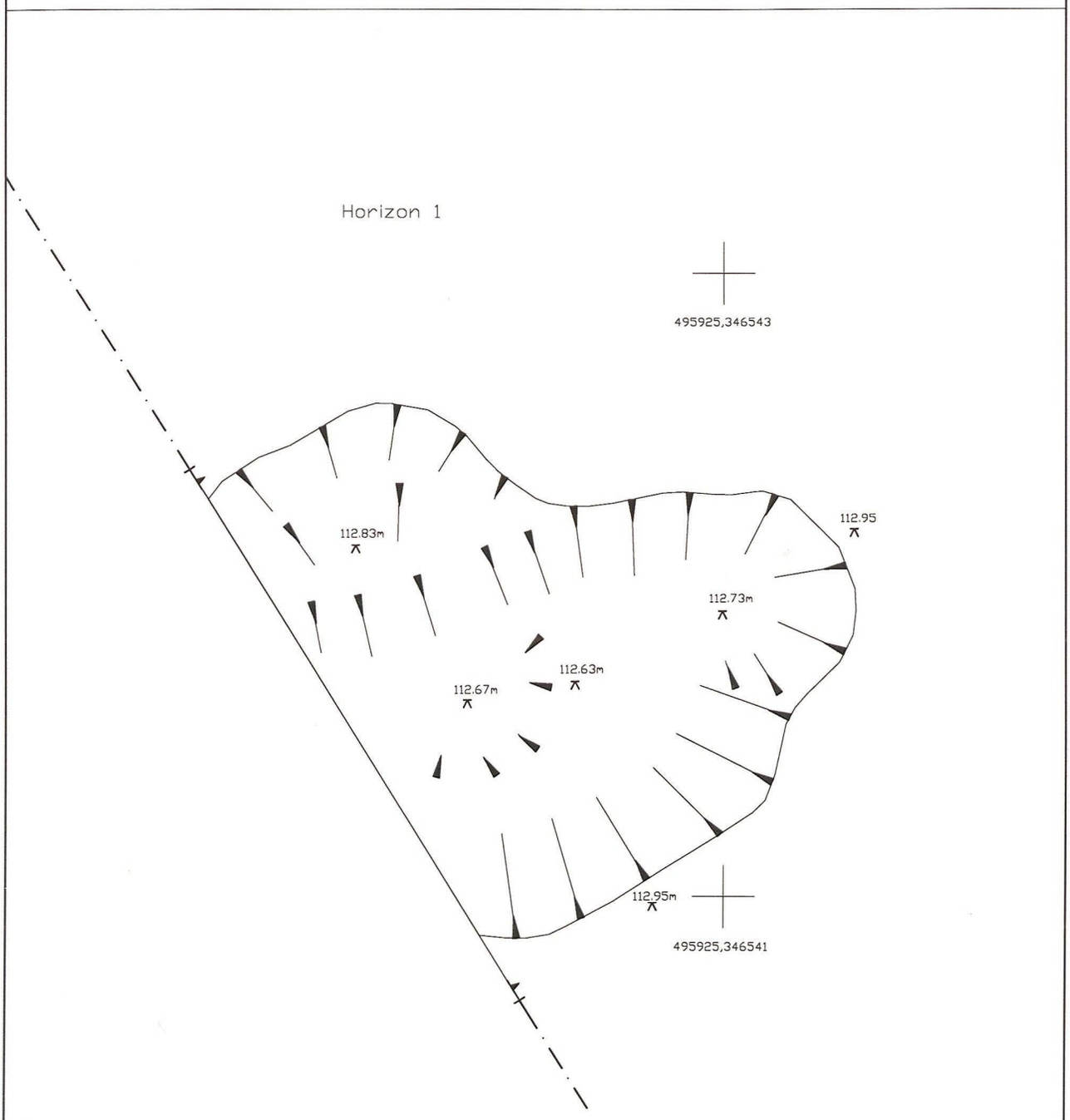

Field 31 Trench A, F2 section and hachure plan | Scale 1:20 | Figure Hii



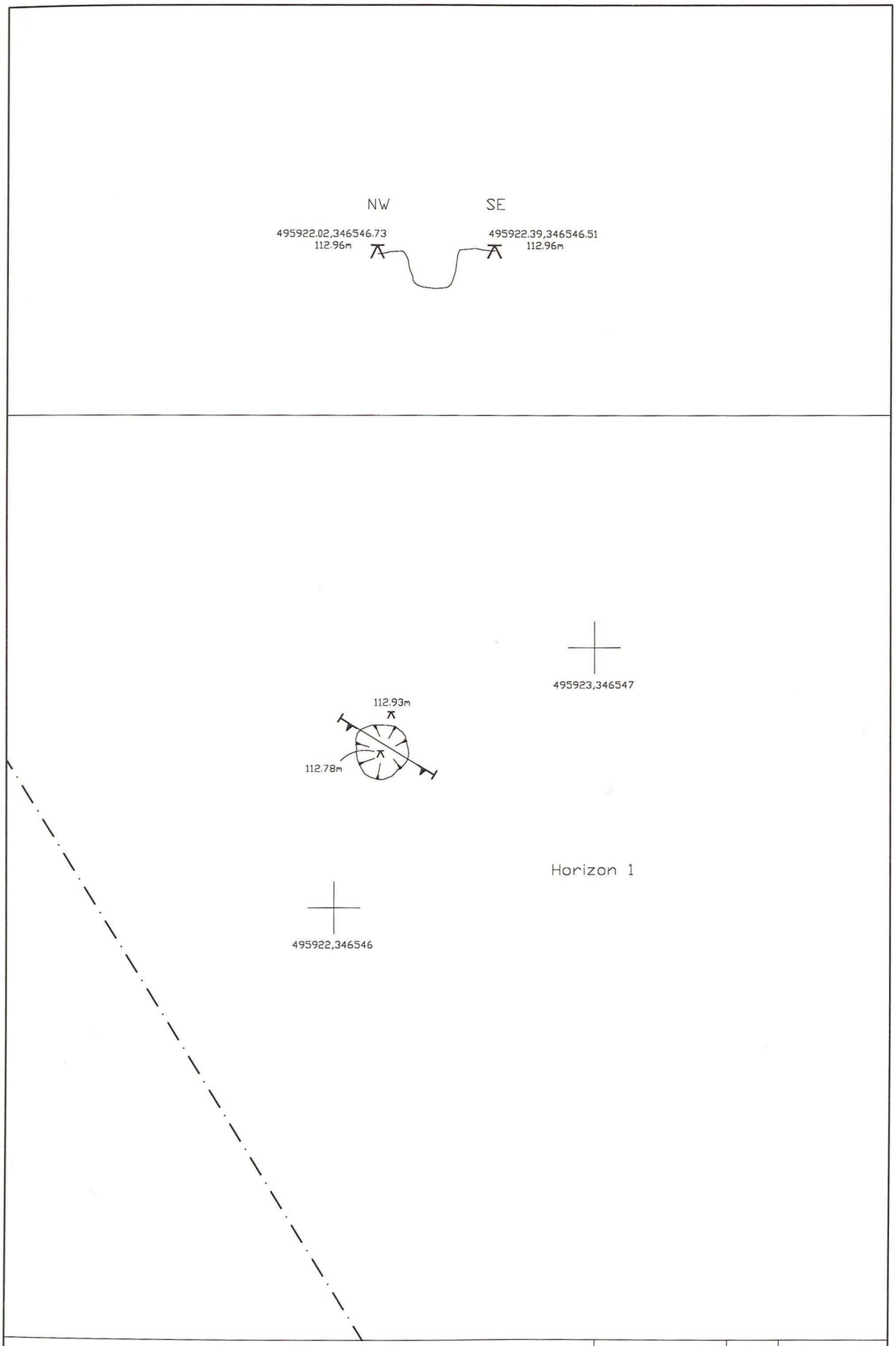




Field 45 Trench C, F6 section and hachure plan | Scale 1:20 | Figure Hiii

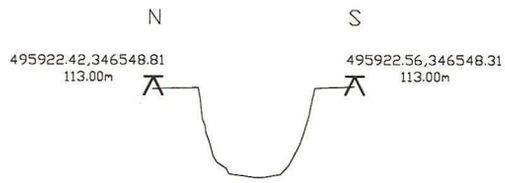


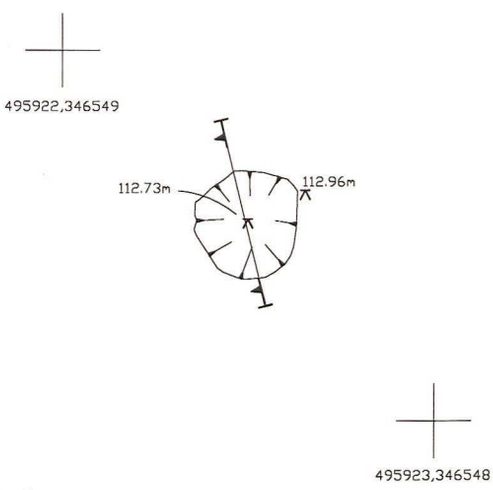




| Field 45 Trench C, F7 section and hachure plan | Scale 1:20 | Figure Hiv |
|---|---|---|

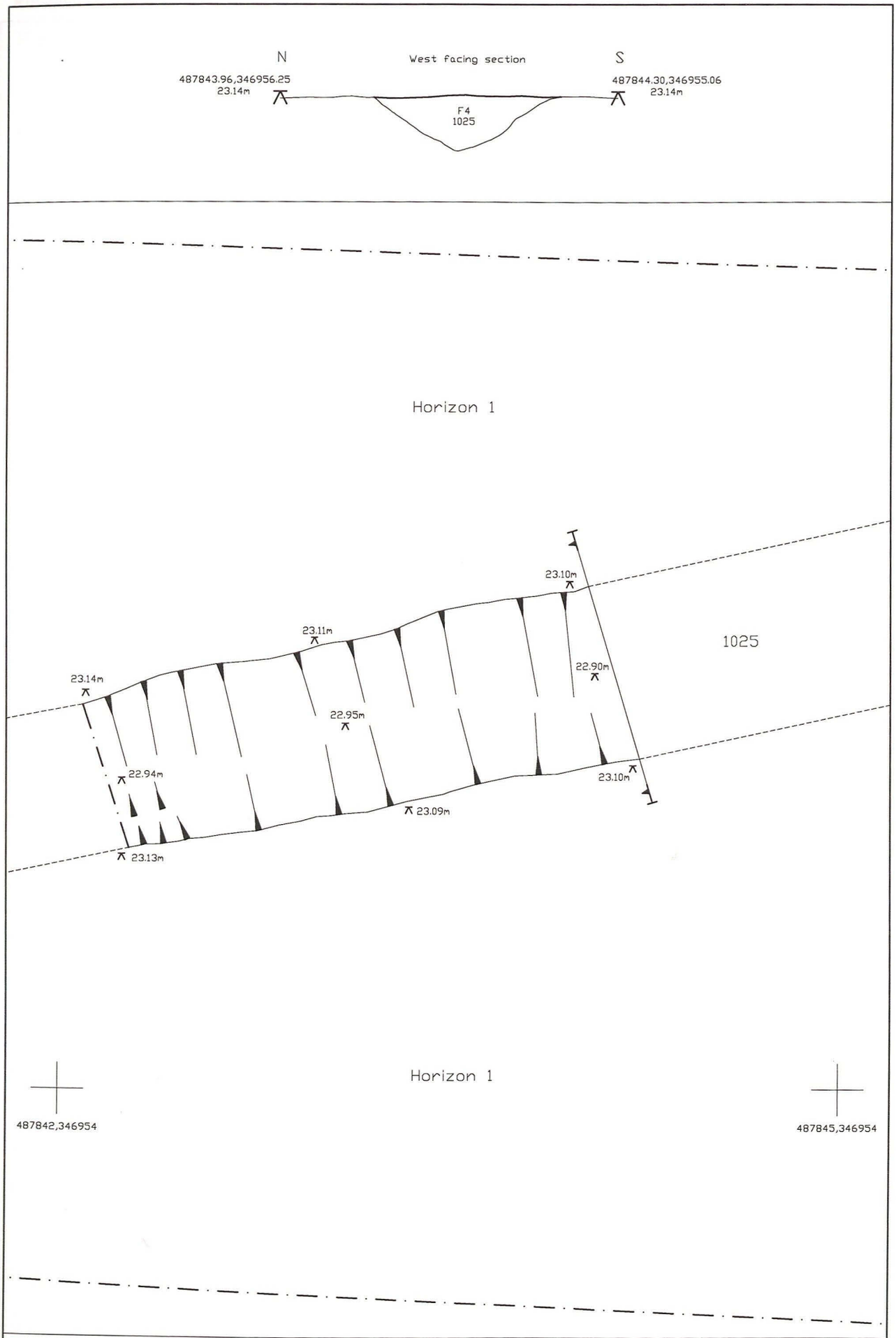



Field 45 Trench C, F8 profile and hachure plan | Scale 1:20 | Figure Hv



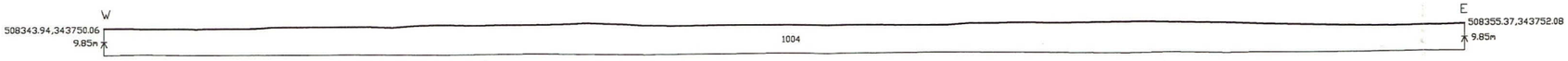

| Field 45 Trench C, F9 profile and hachure plan | Scale 1:20 | Figure Hvi |
|---|---|---|



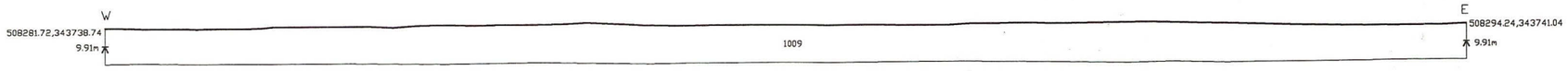

Field 75 Trench A, F4 section and hachure plan | Scale 1:20 | Figure Hvii

Field 1

Trench A

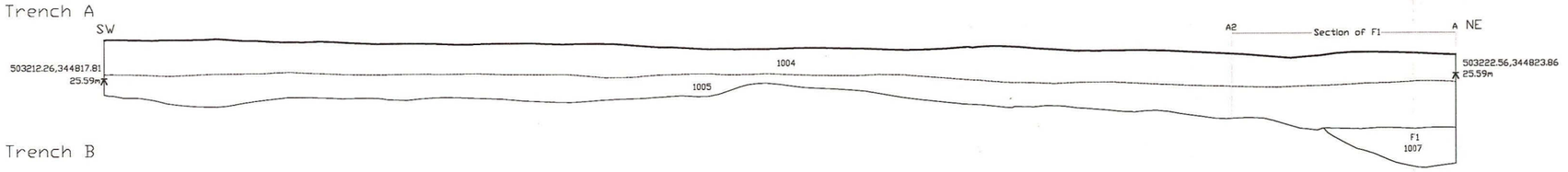



Trench B

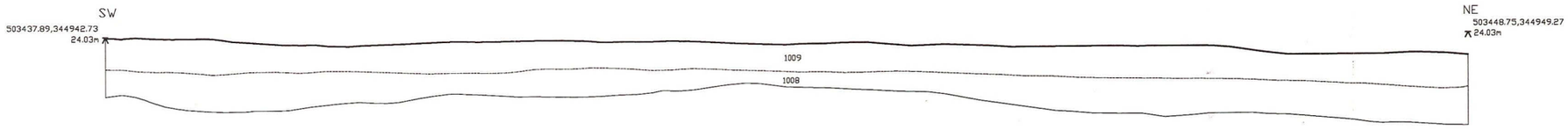



Field 20

Trench A

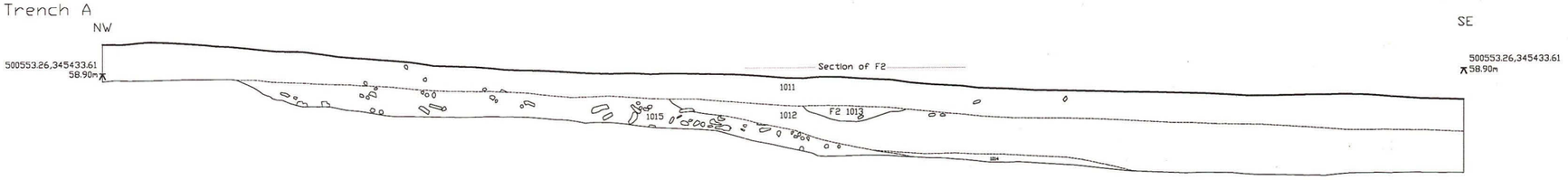



Trench B




Field 31

Trench A



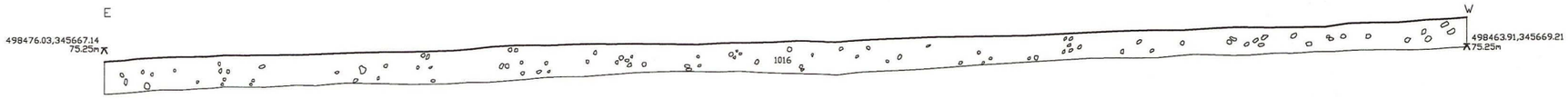

Principal sections along evaluation trenches

Scale 1:50

Figure Hviii

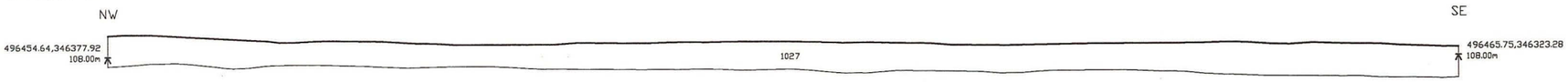
## Field 37

Trench A



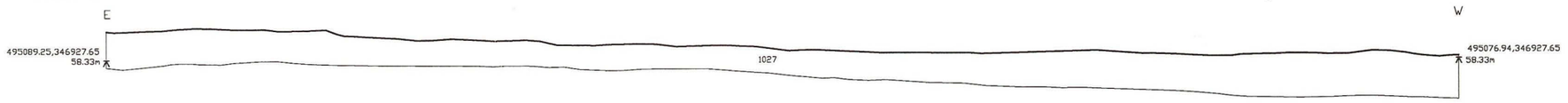

## Field 45

Trench A

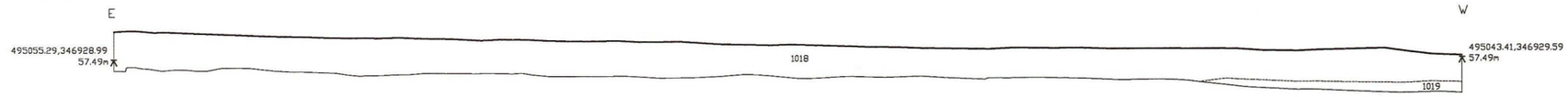



## Field 49

Trench A

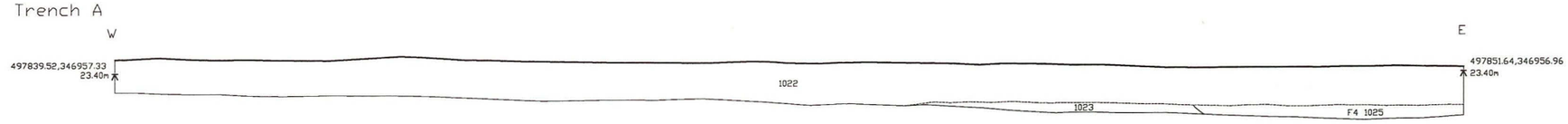



Trench B




## Field 75

Trench A



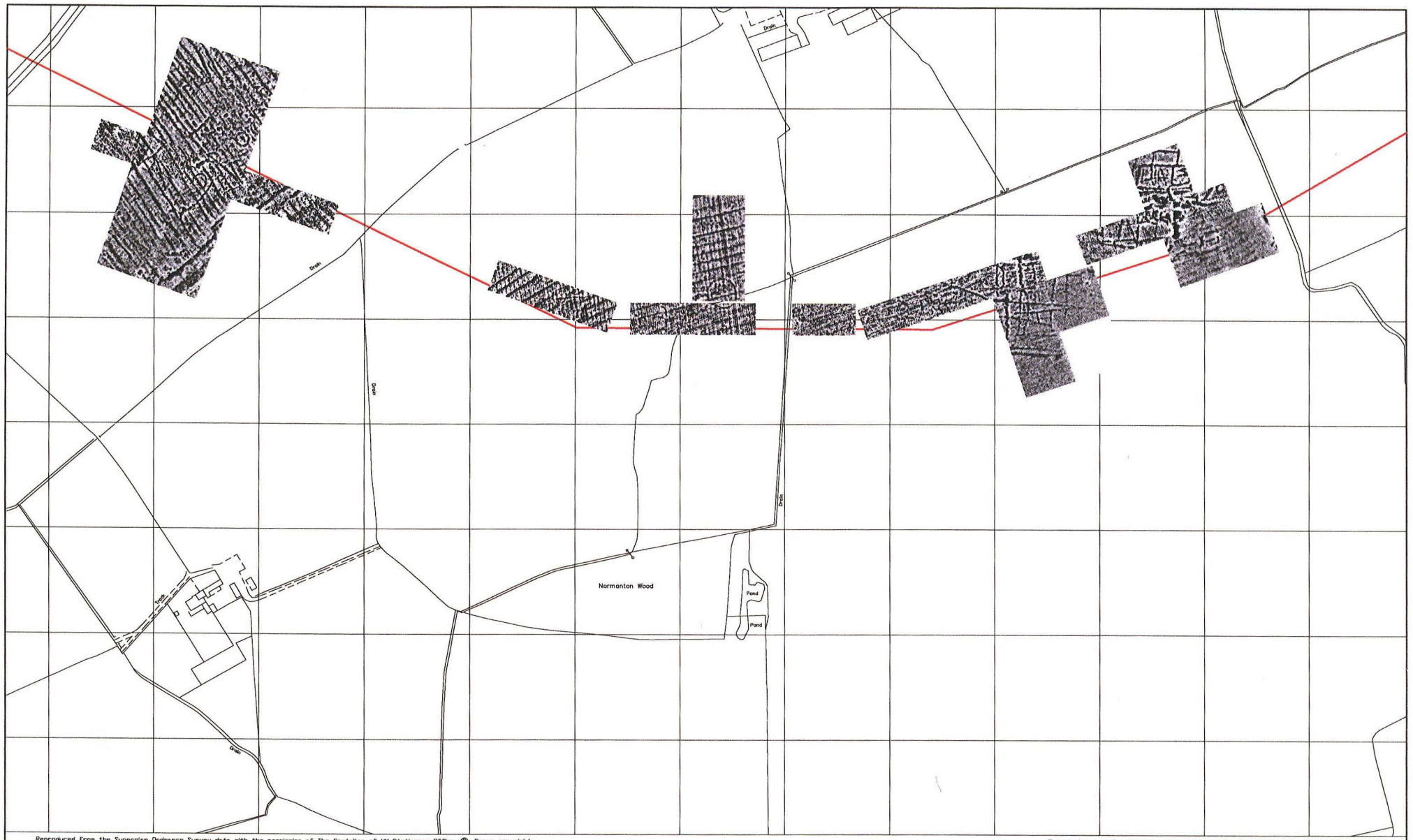

Principal sections along evaluation trenches

Scale 1:50

Figure Hix

# APPENDIX I MAGNETOMETER AREA SURVEY RESULTS AND INTERPRETATION MAP

Field Archaeology Specialists Ltd





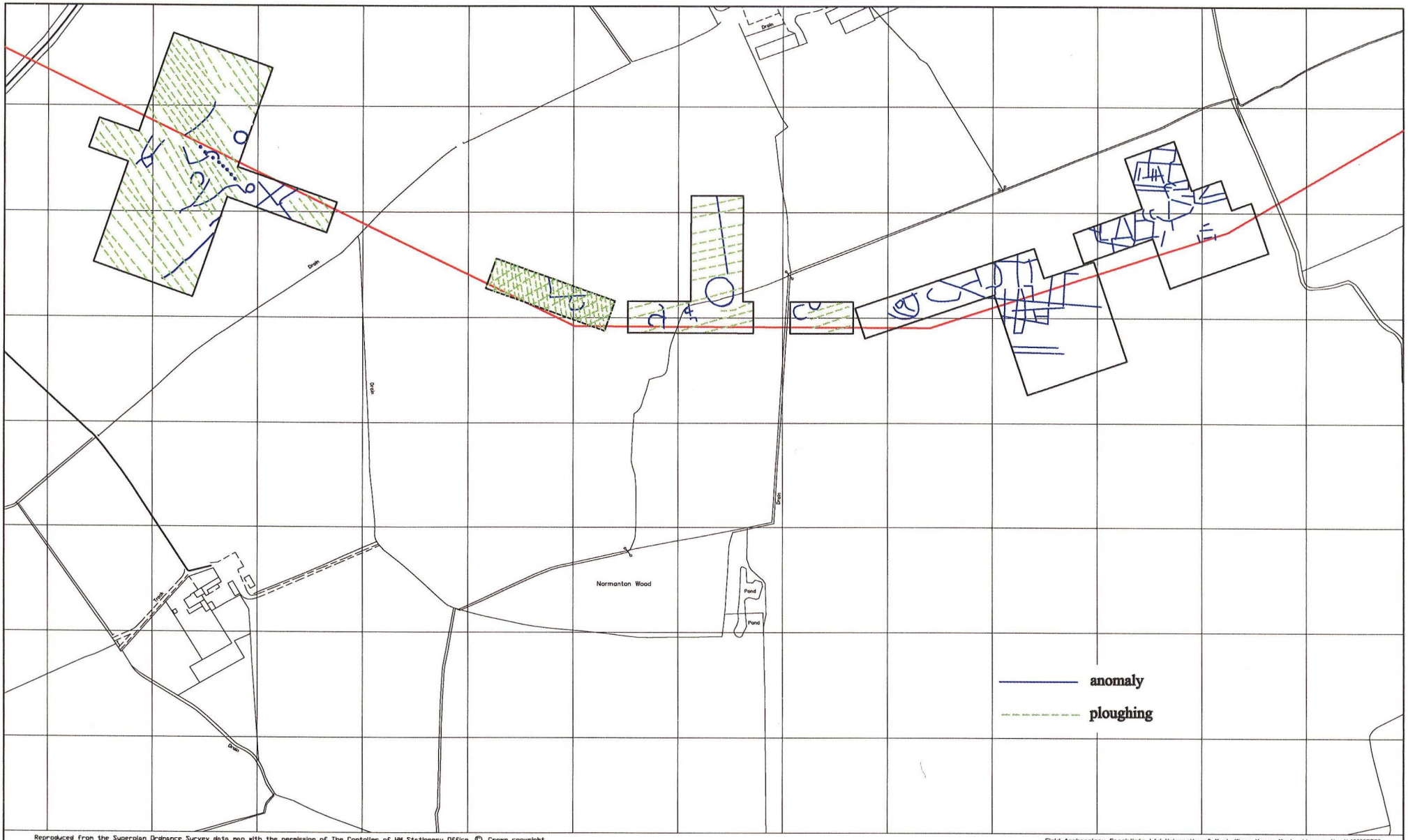



**Results of magnetometer survey Field 54 Field 55 Field 56**

Scale 1:5000

Figure Ii

FAS ssp25203 figIi.dwg








**Interpretation map of geophysical anomalies Field 54 Field 55 Field 56**

**Scale 1:5000**

**Figure Iii**