LINDSEY ARCHAEOLOGICAL SERVICES

# Saltfleetby Pipeline

## Howdales, South Cockerington-Theddlethorpe Gas Terminal

*NGR: TF 415 909-487 872*
*Site Code: SFP 99*
*LCNCC Museum Accn. No. 127.99*

## Archaeological Watching Brief and Excavation

**Report prepared for Roc Oil (UK) Limited**

(formerly Candecca Resources Ltd)

by Mark Allen and Geoff Tann

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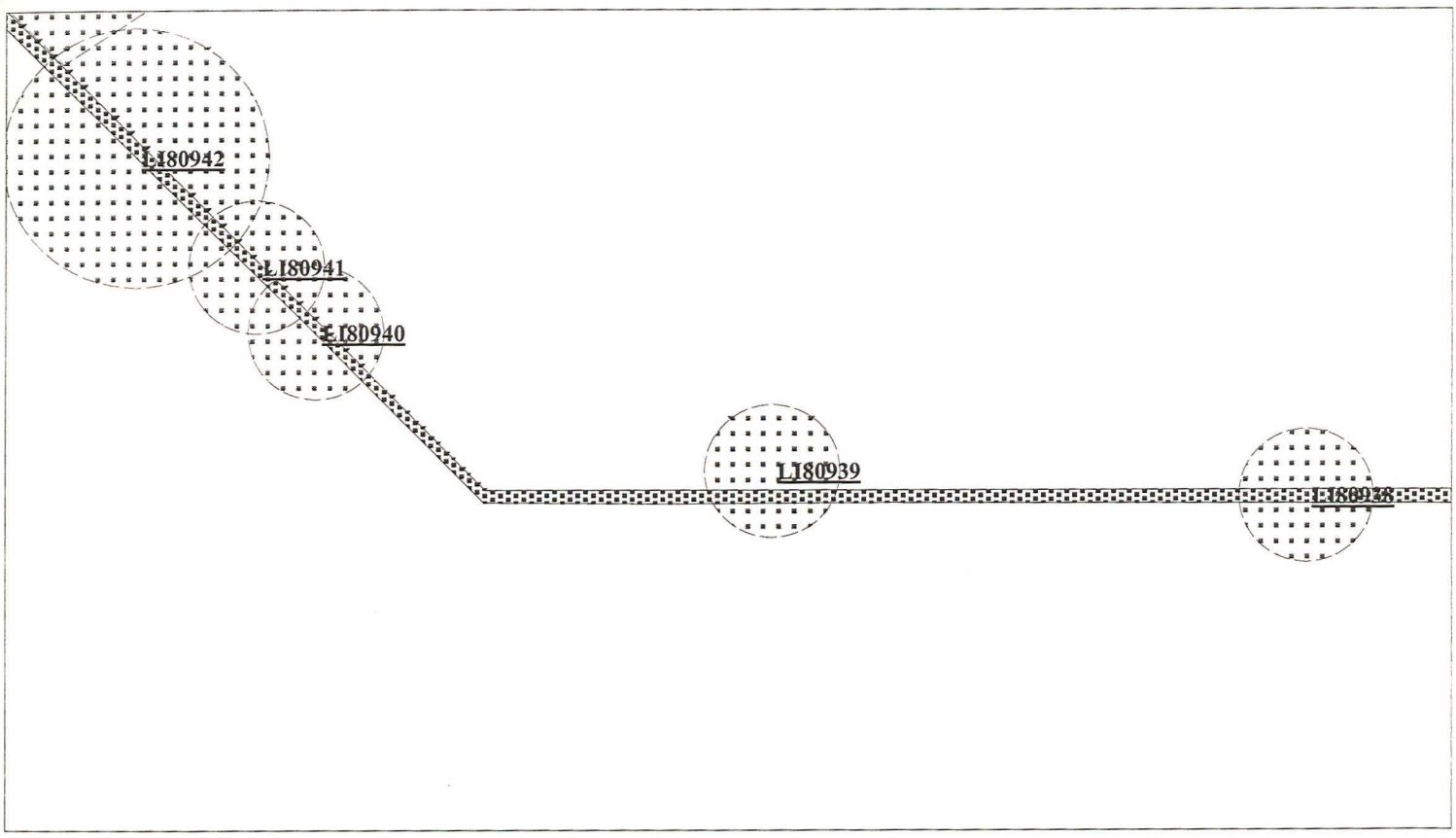
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SOURCES L16124 | L16125

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## *Summary*

*Archaeological monitoring during earthmoving for a new cross-country gas pipeline identified evidence of late eleventh/twelfth century peripheral settlement features in two separated locations on the east side of Theddlethorpe All Saints village. These features were partially excavated and recorded by archaeologists before the trench was excavated. Both areas contained features which produced large quantities of fired clay, burnt straw, chaff and charred cereal grains. Several sherds of pottery were also recovered. This material suggests that a single catastrophic burning event occurred, destroying a wattle-and-daub structure and an unprocessed cereal harvest.*

*Elsewhere along the route, scatters and single sherds of late Saxon and medieval pottery were recovered from the interface between topsoil and underlying silts. Ridge and furrow earthworks and soil marks were recorded in numerous fields crossed by the pipeline.*


## Introduction

Lindsey Archaeological Services was commissioned by Roc Oil (UK) Ltd (formerly Candecca Resources Ltd) in May 1999 to conduct an archaeological watching brief during groundworks for a new gas pipeline. As a result of the watching brief, an archaeological excavation was arranged to investigate features identified near Theddlethorpe All Saints village.

The work was commissioned in response to requirements of the Archaeology Section, Lincolnshire County Council. An archaeological desk-based assessment had been produced by LAS at an earlier stage in the planning process (Field and Tann 1999).

Fieldwork for the watching brief was undertaken by G. Tann and took place between June 14th and August 3rd 1999; fifteen visits were made. The archaeological excavation was supervised by Mark Allen between July 5th and 14th 1999.

### The Pipeline Route

The 9km pipeline route links the Saltfleetby-A and Saltfleetby-B drill sites, at Howdales, South Cockerington with the Conoco Theddlethorpe gas terminal near the coast (Figs. 1 and 2). The route runs close to an existing gas pipeline for part of the route, and along or beside a former railway line course. Much of the pipe trench for the 300mm pipe was excavated as an open-cut trench within a broad easement stripped of topsoil across arable or pasture land, with road and ditch crossings directionally drilled.

## Archaeological Background

The pipeline route is located in the Lincolnshire Marsh, which is covered in post-Roman marine silts. Any archaeological features predating the medieval period are buried below this deposit at depths between c.1m-3m below existing ground level. The area was subject to periodic marine inundation and there is potential for buried salt making sites of Iron Age or Roman date across much of the Marsh; medieval salt workings and other post-Roman remains lie closer to the modern land surface. The route of the pipeline passed close to known medieval and post-medieval settlement remains (Field and Tann 1999).

## The Watching Brief

### Method

The route was divided into plots of land corresponding with field divisions marked on a map of the route (Figs. 2-12). Each plot that the pipeline crossed was assigned a Field Number by LAS for recording purposes, with Field 1 beside the Theddlethorpe terminal, and Field 55 at the Howdales 'A' Drill site. Fields 39-41 were not allocated. Within each field, all archaeological observations and find scatters were allocated a distinct letter code for differentiation (Appendix 1). Each observation and find scatter was marked onto a 1:2,500 copy of the route.

Part of the route was visited on foot before topsoil was stripped. Topsoil was removed by 360° machines fitted with ditching buckets or curved plates (Pl. 1). All the route was visited during topsoil removal, with monitoring varying between continual and intermittent as the archaeological potential appeared to warrant. Fields which produced pottery scatters were inspected more than once between topsoil removal and trench excavation in case further finds were weathered from the stripped surface, but no further features were revealed as a result.

Excavation of the pipe trench was inspected intermittently (Pl. 2). The section past Theddlethorpe village, which was of particular interest after the archaeological investigation of features producing fired clay and eleventh/twelfth century pottery, was trenched without archaeological monitoring, but no features were evident in the trench sides the following day.

### Results

#### *Field 1*

At the SE end of the pipeline route, the topsoil overlay a clay subsoil, 0.3m thick. Five medieval sherds were found after topsoil removal. Beneath the subsoil was a light brown silt with some sand content which was present to a depth of 1.7m below the stripped easement. The pipe trench was excavated to a depth of 1.9m below the easement, and the lowest deposit revealed was a grey/brown silt.

***Field 5***

A north-south aligned feature **5A** was exposed by the topsoil removal. The feature was peat filled, within a clay subsoil. A ceramic land drain had been laid along the feature, which was interpreted as a medieval or later field ditch that had silted naturally before being drained and levelled in the nineteenth or twentieth century.

***A1031 Mablethorpe Road***

The pipe was moled beneath the main road. No trace of archaeological remains was seen either side of the road but ground disturbance here was limited.

***Field 7***

The pipe trench revealed a broad sloping ditch or furrow **7A** extending either side of the existing hedge boundary between Fields 7 and 8 (Pl. 3). This contained peat below the uppermost fill.

***Field 8***

Seventeen sherds of tenth-fifteenth century pottery **8A** were recovered from the surface of the stripped easement within a linear distance of 160m. Four of the sherds were within the date range of tenth-twelfth century (Appendix 2). No archaeological features were observed on the easement or in the pipe trench, but the density of finds suggests that there is the site of at least one late Saxon and medieval dwelling in the close vicinity, possibly west of Orchard House. The only features seen were a recently backfilled field ditch **8B** and a backfilled ditch **8D** of unknown date close to the northern end of the field.

A skeleton **8C** investigated on the eastern edge of the stripped area proved to be of a dog.

***Field 9***

NE-SW aligned ridge and furrow **9A** was visible in this field only after topsoil had been removed.

***Field 10***

A group of irregular shallow features **10A** were identified cut into the subsoil in the central and northern part of the field (Pls. 4-6). Four medieval pottery sherds were found in close proximity, but this was probably coincidental. One pit was excavated; it contained no datable finds, but were all filled with a loose ash and charcoal deposit containing visible grains of wheat and oats. The loose fill was interpreted as probably of post-medieval date (Appendices 3 and 4).

Close to the northern end of the field, a spread of marine shells **10B** was exposed in a shallow depression. This appeared to be a naturally produced layer, probably marking the position of a former creek. It is possible that the archaeological features were associated in an unknown way, but no trace of briquetage or other salt-making debris was present.

***Field 11***

The removed railway line alongside this field, and much of the pipeline, has left several physical traces including bridges over field drainage ditches. The bridges include engineering bricks (Pl. 7).

***Fields 12- 14***

These fields contained slight traces of ridge and furrow, with quantities of fairly recent debris within the levelled furrows in Field 14 (Pls. 8 and 9).

***Field 15***

A spread of fragments of red fired clay with wattle impressions **15A** and **15B** was observed on the stripped surface at the western edge of the easement, 70m from the major drain called The Cut (Pls. 10 and 11). This area was subsequently investigated in greater detail as Excavation Area A and found to be burnt material tipped into a small well, pit or ditch terminal (Appendix 3).

A thin scatter of 27 pottery sherds were recovered from the stripped surface of the field at **15B** and **15C**. These ranged in date from eleventh to eighteenth century, but most were of medieval date. All the sherds were interpreted as domestic waste spread onto fields close to the village.

The pipe trench through this field revealed traces of possible features such as ditches, but these could not be defined or examined closely, and were not associated with visible dating material or further evidence of fired clay.

***Field 16***

The pipeline easement crossed this roadside field on the northern side of a broad depression. A scatter of mostly post-medieval brick rubble **16A** was seen but not collected. A single sherd of fifteenth/sixteenth century Toynton-Bolingbroke ware was found.

***Field 17***

To the north of Station Road, the pipeline easement skirted around the edge of the present Theddlethorpe All Saints village. An area of black soil with charcoal but almost no evident fired clay was seen on the eastern side of the easement close to the ditch marking the rear of the adjacent property. After topsoil removal, this appeared to be a large ovoid area **17A&B**, but further clearing of the ground showed it to be the fill of two joining ditches. This became Excavation Area B (Pls. 12 and 13).

The pipe trench, positioned to the west of the visible archaeological features, revealed no further features that were obviously associated with those examined in the excavation area. A backfilled ditch was seen 10m north of the excavated features, and this ditch continued the alignment of an existing 5m wide water-filled ditch **17C** at the north end of the properties facing on to Station Road. The ditch seemed to have been intentionally partly backfilled before silting had occurred; its primary fill

contained limestone rubble with peatier material and silt above it (Pls. 14 and 15).

***Fields 18-25***

Ridge and furrow earthworks were seen in Fields 18, 19 and 25 (Pls. 16 and 17).

***Field 26***

Ridge and furrow was visible in this pasture field on two alignments, despite the former railway line which had crossed the field. Four medieval pottery sherds were recovered from **26A** close to Lodge Farm, and one from **26B**, to the south.

***Field 27***

NW-SE and SW-NE aligned ridge and furrow was visible after topsoil stripping in this field (Pl. 18). One sherd of medieval pottery **27A** was found on the easement surface opposite Lodge Farm.

***Field 28***

A small bridge across the roadside drain was partly constructed of engineering bricks and had been associated with the former railway. The bridge was accidentally damaged during the groundworks.

***Field 29***

NW-SE aligned ridge and furrow was evident in this field prior to topsoil removal. One sherd of medieval pottery **29A** was found close to the B1200 Louth Road. Three slightly later sherds **29B** were found to the NW.

***Field 30***

One undated micaceous pottery sherd **30A** was found in this field. This may have been within the date range Roman - medieval.

***Field 31***

One fragment of a late medieval pot **31A** was found close to Fishmere Gate Road.

***Fields 33 and 34***

Ridge and furrow, aligned SW-NE, was visible in these fields after the topsoil had been removed. A metal disc **34A** was found on the stripped surface at the southern side of Field 34.

***Field 36***

Ridge and furrow, aligned SW-NE, was visible in this field after the topsoil had been removed.

***Field 37***

The only observations in this field by Long Gate Road were a fragment of clay tobacco pipe stem **37A**, bearing initials, and part of a dog skeleton **37B** (Appendices 5 and 6).

***Fields 38, 42 and 43***

These pasture fields retained earthworks of ridge and furrow. Two sherds of medieval pottery **43A** were found in field 43.

***Field 44***

To the east of Grayfleet Drain, a sherd of shell and quartz-tempered pottery **44A** was found, dating to the tenth/eleventh centuries. A medieval sherd was found in the same area. This field lies at the edge of the parish of South Cockerington.

***Field 46***

A low bank **46A** was seen in the path of the pipeline easement, and was photographed. It lay at the plotted position of a possible archaeological feature seen on air photographs taken in November 1947, which has been identified as a small square ditched platform attached to drains.

A chance conversation with Raymond Adlard of Newfoundland, Howdales produced the explanation for this feature. The bank formed part of a plover catch, operated until about 1947. Mr Adlard recalled that a record of up to 120 plovers had been caught at that trap in one 'pull', and that the trap was one of a pair in the area (the other being some distance north of the pipeline route).

He described the feature as an internal rectangular bank, 22 yards by 6 yards (20m x 5.5m), surrounded by a square shallow depression holding water to a depth of about 0.15m. A short distance away was a small hut, containing a tripod and a winch. The winch held a cable which crossed to the artificial island, with a net on the end. When plovers collected on the island, the net was released and the birds were trapped in the water.

***Fields 47 - 54***

No observations were made between the Howdales B and A Drill Sites.

# The Archaeological Excavations

## Introduction

LAS was commissioned by Roc Oil (UK) Ltd (formerly Candecca Resources Ltd) in July 1999 to undertake archaeological excavation of the two areas of archaeological features east of Theddlethorpe All Saints village, identified by the watching brief (Figs. 1 and 13). The excavations had been requested by the County Archaeological Officer, after a site visit had been made to inspect the remains visible on the easement surface.

## Site Location, Geology and Topography

The two archaeological excavation areas were located in the very flat and low-lying Lincolnshire Outmarsh, less than 5km from the modern coastline. Both sites are at less than 2m above sea-level.

After the late Iron Age and into the post-Roman period, a series of marine transgressions flooded the Outmarsh, covering Roman and earlier material beneath silt deposits (Field and Tann 1999, 3).

The two sites, approximately 150m apart, are very close to the present village of Theddlethorpe All Saints. The earliest certain documented reference to the settlement, *Thedelthorp' Omnium Sanctorum*, is from 1254, but the place-name Theddlethorpe, *Tedlagestorp*, appears in the Domesday Survey of 1086 (Cameron 1998, 124).

## Method

Two separate areas, either side of Station Road, Theddlethorpe All Saints, were investigated by excavation after topsoil stripping had been completed. Each modern field through which the pipeline passed had been assigned a number for recording purposes by LAS during the watching brief. The area for investigation in Field 15 (south of Station Road) was allocated the area code A, with a block of context numbers 1000 - 1025. The area in Field 17, north of Station Road, was assigned the area code B and context numbers 2000 - 2035. Unstratified finds were assigned the watching brief codes of **15A** and **17A** respectively.

Within all areas, access for plant and equipment was needed around the excavation, and this restricted the extent available for investigation.

It was noticeable in both areas that the fills of even modern land drain trenches were not visible on the stripped easement. In preparation for initial definition and recording, the easement in each area was cleaned to remove a hardened upper crust of weathered material. This was mainly achieved with a JCB with ditching bucket, followed by more sensitive cleaning by hand to permit definition of soil differences which might indicate archaeological features. Following definition, each area was planned at 1:50 scale and apparent archaeological features were part-excavated. This provided evidence of their shape, extent, depth, and the nature of the backfill material. Some dateable artefacts were also

recovered. Environmental samples were taken from appropriate deposits for analysis off-site (Appendix 4).

Initial investigation at Area A was by Geoff Tann and Mark Allen, with subsequent work there between July 5th-7th by a team of four archaeologists, under the supervision of Mark Allen. Investigation of Area B was also under the site direction of Mark Allen.

## Excavation Area A (Figs. 13-15; Pl. 19)

This excavation area in Field 15 was a strip of land 22m x 7m along the western side of the pipeline easement, 150m SE of Station Road, and 80m north of a broad drainage ditch called The Cut. The area had been identified during the watching brief when a scatter of fired clay fragments with wattle impressions **15A** had been observed on the easement surface.

**Well 1000** (Pl. 20)

The most prolific part of the fired clay scatter had been partly examined when first identified on 18th June 1999, and it was found to represent a fill of a well, pit or ditch terminal extending beyond the stripped easement into the stubble field to the west. The subsequent excavation of this feature stopped at the edge of the stripped easement as the remainder was not threatened by the pipeline groundworks. As a result, interpretation of this was hampered but a good range of material was recovered from the accessible fills.

The topsoil **1021** was 0.25m - 0.30m deep, and directly overlay a 0.26m thick orange/brown silt **1001.** The silt layer contained a number of fragments of wattle-impressed fired clay and a single sherd of pottery. This body sherd was dated to either the late-ninth/tenth or eleventh/twelfth centuries.

An environmental sample from this layer produced a small number of charred cereal remains (possibly contamination from the underlying fill) and an assemblage of snails normally found within ponds or marshes. **1001** appears to have been produced by localised silting, perhaps caused by rainfall. It does not seem to have been deposited by larger scale flooding of watercourses or by a marine transgression episode (Appendix 4).

Beneath **1001** was **1002**, a 0.2m thick grey/brown silt deposit containing a number of wattle-impressed fragments of fired clay, which had probably been eroded from **1005** on the upper edge of the feature and washed into the depression.

Beneath **1002** was a 0.06m thick spread of fired clay fragments **1005**, some up to 0.1m diameter, with hand impressions and wattle grooves (Appendix 3). This spread was found to surround the edge of the deeper feature and to form the last deliberate fill. There was no evidence that the material had fallen or collapsed into this position, and it was interpreted as a rubbish deposit tipped into the abandoned feature, or possibly used to consolidate the ground around its edge.

After removal of the fired clay layer, the underlying feature **1000** was revealed more clearly and was subsequently termed a 'well'. It contained a primary fill, 0.42m thick, of waterlogged silt **1003**, containing burnt cereal grains, some small fragments of fired clay, and a piece of wood which may have been part of a plank. Analysis of an environmental sample showed that **1003** was extremely rich in charred cereal remains, with grains, chaff, seeds and straw forming the main bulk of the sample. Other notable finds included beans and a small amount of small roundwood charcoal.

Fill **1003** covered a slump **1004** of the southern edge of the upper well side, giving the well shaft a concave profile in this position.

Well **1000** was approximately 2.0m NW-SE, with steep, irregular sides and a flat base 1.1m below the base of topsoil **1021** (Fig. 15). It had been excavated into an extensive natural deposit **1022**, a mid-orange/brown silt approximately 0.8m thick. This layer had apparently been deposited by a marine transgression during the Roman and post-Roman periods.

**Other Features**

Cleaning of the easement surface around **1000** revealed a small number of other archaeological features and spreads of fired clay.

A single possible tree bole **1007** was identified towards the middle of the excavated area. The tree bole was sub-circular in plan, with gradually sloping sides and an irregular base, measuring 1.4m long, 1.3m wide and 0.16m deep. The single fill, **1008**, contained a number of fragments of fired clay.

Of the seven remaining features, six (**1006**, **1009**, **1011**, **1013**, **1015** and **1019**) proved to be natural depressions which had subsequently been filled by burnt material containing wattle-impressed fired clay.

Feature **1009**, a sub-oval depression measuring 2.1m by 1.7m and 0.1m deep, also contained a single fragment of pottery from a bowl of unknown date.

At the northern end of the excavated area there appeared to be a furrow **1017**, aligned east-west. The furrow was 3.1m wide and 0.3m deep with a single fill **1018**.

A number of unstratified pottery fragments were recovered from Area A during machining, and also from the topsoil spoilheap. These included two fragments which proved to be fifteenth/sixteenth century in date and a single piece which was twelfth century in date.

## Area A Discussion

Although the majority of the investigated features proved not to be archaeological in origin, the fired

clay and the presence of the well, pit or ditch terminal **1000** show that activity occurred here in the past. Some indication of the nature of this activity can be seen through the large quantity of fired clay that was recovered from across the site.

## Excavation Area B (Figs. 15-18; Pl. 21)

The excavation area in Field 17 was a strip of land 15.5m x 11.5m, along the northern side of the pipeline easement, 50m north of Station Road. The area had been identified during the watching brief when a scatter of fired clay fragments, charcoal and black soil **17A** had been observed on the easement surface (Pl. 13). This had originally appeared to be the fill of a single large ovoid feature. The area selected for investigation formed a constriction of the pipeline easement on a bend, and this limited the extent which could be excavated whilst allowing contractors continuing access to a large part of the route. The site was prepared in the same way as Area A.

The topsoil **2000** was approximately 0.3m deep and directly overlay a number of archaeological features that cut through the natural mid-brown silt **2001** (a similar deposit to that in Area A).

### Ditches

Two ditches were identified, at 90° to each other and forming a 'T'-shape. Three sections were excavated through these ditches (**2010**, **2020** and **2021**).

A 1m section was excavated through the western butt-end of the WSW-ENE ditch **2010** (Pl. 22). At this point the ditch was 2m wide and 1m deep, with vertical edges and a flat base. The butt-end itself reflected this profile, having a very rectangular shape. Within the ditch were three main fills, **2011**, **2012** and **2013**. The primary fill **2013** was a thin lens (approximately 0.05m thick) of burnt vegetation, mainly straw or chaff, which appeared to coat the base and part of the southern side of the ditch. The secondary fill, **2012**, was a mixture of lenses of clay and thin bands of burnt vegetative matter, with occasional small fragments of fired clay. This fill appears to be a series of backfill deposits of redeposited clay interspersed with lenses of burning. Tertiary fill **2011**, a demolition deposit, consisted of a dark brown/grey clay with frequent fragments of fired clay and flecks of charcoal.

A 2m by 1m slot was excavated through the southern end of the NNW-SSE ditch **2021** (Pl. 23). The ditch had a steep, convex north-eastern edge, becoming vertical towards the base, measuring 0.8m deep and approximately 2.7m wide. Four fills were present within the ditch, **2032**, **2033**, **2034** and **2035**. The primary fill **2035**, a thin lens of burnt straw or chaff, and charcoal was only 0.02m deep. Secondary fill **2034**, a band of redeposited clay, was a dark grey silty clay with very few flecks of fired clay, measuring 0.28m deep. The tertiary fill **2033** also appeared to be a backfill deposit of natural clay, similar to **2034** below, and measuring 0.2m deep. The final fill, **2032**, a very dark grey/black silty clay contained numerous fragments of fired clay and charcoal flecking. This deposit differs from the others within the ditch and is more likely to represent a demolition deposit, rather than a backfill of natural clay. It produced part of a whetstone, possibly of Scandinavian origin, not found in this country

until after the late ninth century (Appendix 6).

A second section was excavated through the northern end of the large NNW-SSE ditch **2020** (Pl. 24). At this point the ditch had a steep convex profile, becoming vertical towards the base. Within the excavated slot there was a large depression approximately 0.3m deep in the base of the ditch with vertical edges and an irregular-flat base. Five fills were present within the ditch. The primary fill **2022**, a black silty clay, was wet and contained a high volume of burnt straw or chaff and charcoal. Two pieces of waterlogged wood were also recovered, one of which is possibly the remains of a wooden peg from an implement (Small Finds Nos. 2 and 3, Appendix 4). Secondary fill **2025**, a backfill of mid-dark grey silty clay, contained frequent flecks of charcoal and some fragments of fired clay. The third fill **2026** was essentially the same event as **2025** below, although it contained less charcoal flecking and no fired clay fragments. Fill **2027**, overlying **2026**, was a mid-dark grey silty clay with frequent charcoal flecking and a large number of small-large fragments of fired clay. A number of pieces of animal bone were also recovered, including part of the skull of a horse and the jawbone of a ~~dog~~ pig (Appendix 5). Two fragments of pottery, a rim sherd and a body sherd, both from jars, were also found dating to either the late-ninth/tenth or eleventh/twelfth centuries. A large amount of soot was present on the outer surface of both pieces of pottery. The latest fill, **2028**, a mix of mid brown and light-mid grey silty clay, was similar in artefact content to **2027** which was below it, with a large amount of charcoal flecking and pieces of fired clay. Two pottery fragments, both from the base of a single jar, were also uncovered. These proved to be from the same vessel as the body sherd from **2027**.

Ditches **2010** and **2020/2021** converged to form a 'T'-shape, which, along with the similarity in fills, suggests that they were contemporary. This was confirmed by the excavation of a small slot through the junction between the two ditches. From the fills of both ditches it is possible to highlight three main events that occurred during the time they were left open. The first event, immediately after the ditches were dug, related to a period of burning of mainly straw or chaff. Part of the waste formed by this activity was then deposited into the base of both ditches and on the side of ditch **2010**, forming a thin lens of burnt straw and charred grains. The burnt spread was then sealed by a number of dumps of clay that had been deliberately backfilled into the ditches. This material contained further lenses of similar burnt material, and it is possible that the clay had originally been extracted from the ditches, before being used for some unknown activity, and then dumped back into the ditches. The final event was the deliberate back-filling of the ditches with a deposit representing a period of demolition. This material contained a large amount of fired clay with some wattling and corner pieces present, suggesting a walled structure with corners.

Ditch **2020/2021** was truncated at the point that it joined ditch **2010** by a later furrow, possibly of medieval date. Furrow **2005** had fairly gradually sloping, concave sides, and a slightly concave base, measuring 2.6m wide and 0.15m deep.

At the southern end of the site there was a curvilinear ditch **2017/2023**, which had been truncated by a later furrow **2014/2024**).

The earlier, curving ditch **2017/2023**, was shallow, with concave edges and a fairly flat base (Pls. 25 and 26). Two fills were present within both excavated sections, with **2017** containing **2018** and **2019**, and **2023** containing **2029** and **2030**. The primary fills **2018** and **2030**, a black silty clay with a large amount of charred grains, burnt straw and fragments of fired clay, appeared to be very similar in composition to the fills of other features across the site. The secondary fills **2019** and **2029** were formed through natural silting processes and contained only occasional flecks of charcoal and very few fragments of fired clay.

The later furrow, **2014/2024**, following a similar NE-SW alignment to furrow **2005** further to the north, had an irregular shape, varying in width from 0.6m to 1.3m, with shallow, concave edges and a flat base (Pl. 25).

**Postholes** (Fig. 17)
Several shallow postholes that had probably been truncated by later ploughing were also excavated in Area B.

Posthole **2002** was located approximately 1m to the south of the junction between ditches **2010** and **2020/2021**. The feature was roughly sub-circular in shape, with near vertical edges and a flat base, measuring 0.45m long, 0.3m wide and 0.13m deep. The primary fill **2004** was a mix of light grey and orange/brown silty clay with a moderate amount of charcoal flecking and very occasional flecks of fired clay. The upper fill **2003**, a black fine silty clay, had a high concentration of charcoal and occasional flecks of fired clay. From the fills, it seems likely that the post was removed and the hole allowed to silt up naturally, with a later deposit of demolition material finally filling the remaining hollow.

Posthole **2007**, located approximately 2m west of curvilinear ditch **2023**, was 0.62m long, 0.5m wide and 0.09m deep, with fairly steep, concave edges and a flat base. The fill, **2008**, a very dark grey silty clay with frequent charcoal flecking and some pieces of fired clay appeared to be a demolition deposit deliberately backfilled into the void after the post had been removed.

## Area B Discussion

All of the features in Area B, save the two furrows **2005** and **2014/2024**, appear to relate to a single phase of activity dating to either the late-ninth/tenth or eleventh/twelfth centuries. This activity is characterised by the digging of a number of features, a large amount of burning, and the deposition of a large quantity of fired clay with straw or grass impressions.

Due to the limited extent of the excavated area it is not possible to indicate the function of the ditches.

However it is possible to tell that very soon after the ditches were dug, a large amount of charred plant material, including straw, chaff and cereal grains, was deposited in their bases.

## Conclusion

No previous work had been carried out on this area of the Outmarsh, and the discovery of the sites represented an opportunity to examine the early development of the adjacent village.

The pottery, fired clay and environmental material are similar from both the excavation areas, indicating that Areas A and B relate to a single archaeological site.

The fired clay recovered from within the well and from a number of the depressions in Area A, and from the ditches in Area B, all appears to be from a single structure. The structure was of wattle-and-daub construction and is likely to have been rectangular, as several fragments of the fired clay appeared to be corner pieces. As no evidence of the building itself was present within the easement it is difficult to establish the function of the structure. The most plausible explanation is that the structure had an agricultural function, possibly as a barn. It is evident that the structure was destroyed by fire as the fired clay fragments recovered all show a single phase of burning occurred. This catastrophic event appeared to have been concentrated within the structure, as the fired clay showed burning from the inside outwards.

The two excavated areas, both dating to either the late-ninth/tenth or eleventh/twelfth centuries, provide evidence for the earliest known settlement at Theddlethorpe All Saints.

## Acknowledgements

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Specialist analysis and identification of finds was by Jen Mann (City of Lincoln Archaeology Unit, metal and other registered finds), Richard Moore (animal bones), James Rackham (Environmental Archaeology Consultancy, environmental samples), Dr. Alan Vince (fired clay), and Jane Young (post-Roman pottery).

Archaeological monitoring and liaising with the contractors was undertaken by Geoff Tann. The archaeological excavation team (Pete Barnes, Simon Bailey and Bryan Saunders) was directed on site by Mark Allen, with project management by Naomi Field. Illustrations were prepared by Mark Allen and Mick McDaid; the report was collated and produced by Jane Frost.

Mark Allen and Geoff Tann
Lindsey Archaeological Services
20th April 2000

## References

Cameron, K. 1998. *A Dictionary of Lincolnshire Place-Names*. English Place-Name Society.

Field, N. and Tann, G. 1999. *Saltfleetby-Theddlethorpe. (Saltfleetby B Pipeline: Howdales, South Cockerington - Theddlethorpe Gas Terminal). Archaeological Desk-Based Assessment.* LAS Report No. 344, February 1999.

## Archive Summary

Correspondence

Developer's plans

Annotated copies of developer's plans

Field section drawings and plans

Field sketch sections

Archaeological finds: pottery, tile, animal bone, coin, clay tobacco pipe stems, stone, shell, iron nail, slag, worked flints, coal, fired clay

Specialists' archive lists: pottery, fired clay, registered finds

Photographs:

Watching Brief: 99/74/0-4,7,17-20; 99/76/0-37; 99/82/19-36; 99/89/00-3; 99/95/10-37

Excavations: 99/74/21-36; 99/80/1-31; 99/81/3-24

including those used in this report

APPENDIX 1

# Context Summary

# APPENDIX 1

## Context Summary

| Context No. | Type | Relationship | Description |
|---|---|---|---|
| **Area A (Field 15)** | | | |
| **1000** | Well | Sealed by 1004, cuts 1025 | Sub-circular ?well, 0.9m deep |
| **1001** | Fill of 1000 | Sealed by 1022, seals 1002 | mid orange/brown silty clay, 0.26m thick |
| **1002** | Fill of 1000 | Sealed by 1001, seals 1003 | mid grey/brown silty clay, 0.2m thick |
| **1003** | Fill of 1000 | Sealed by 1005, seals 1004+C19 | Black silty clay with burnt organic material, 0.4m thick |
| **1004** | Fill of 1000 | Sealed by 1003, seals 1000 | Light grey clay with burnt organic material, 0.04m thick |
| **1005** | Fill of 1000 | Sealed by 1002, seals 1003 | Wattle-impressed fired clay dump |
| **1006** | Natural depression | Sealed by 1022, cuts 1025, filled by 1024 | Sub-circular depression, 1.2m x 0.8m, 0.05m deep |
| **1007** | Treehole | Sealed by 1022, cuts 1025, filled by 1008 | Sub-circular depression |
| **1008** | Fill of treehole | Sealed by 1022, fill of 1007 | sandy yellow clay |
| **1009** | Natural depression | Sealed by 1022, cuts 1025, filled by 1010 | 2.85m x 3.05m x 0.17m deep |
| **1010** | Fill of natural depression | Sealed by 1022, fill of 1009 | very dark grey silt with charcoal |
| **1011** | Natural depression | Sealed by 1022, cuts 1025, filled by 1012 | 1.1m wide, 0.05m deep, gradually sloping sides |
| **1012** | Fill of natural depression | Sealed by 1022, fill of 1011 | brown and black silt, some fired clay |
| **1013** | Natural depression | Sealed by 1022, cuts 1025, filled by 1014 | 0.51m x 0.65m x 0.05m, sub-circular |
| **1014** | Fill of natural depression | Sealed by 1022, fill of 1013 | very dark grey silt with charcoal |
| **1015** | Natural depression | Sealed by 1022, cuts 1025, filled by 1016 | 0.57m x 0.33m x 0.06m deep |
| **1016** | Fill of natural depression | Sealed by 1022, fill of 1015 | brown clay, with some fired clay |
| **1017** | Furrow | Sealed by 1021, cuts 1025, filled by 1018 | 3m wide, 0.65m deep, NW-SE aligned |
| **1018** | Fill of furrow | Sealed by 1021, fill of 1017 | blue/grey and brown silt |
| **1019** | Natural depression | Sealed by 1022, cuts 1025, filled by 1020 | oval depression |
| **1020** | Fill of natural depression | Sealed by 1022, fill of 1019 | very dark grey silt with charcoal |
| **1021** | Topsoil | Seals all | grey silty clay, 0.25m thick |
| **1022** | Layer | Sealed by 1021, seals 1025 | alluvial layer, grey/brown silt, 0.1m thick |
| **1023** | Fired clay concentration | Sealed by 1022, seals 1025 | 0.3m x 0.4m x 0.1m thick; some wattle impressions |
| **1024** | Fill of natural depression | Sealed by 1022, fill of 1006 | very dark brown silt |
| **1025** | Natural silt | cut by all archaeological features | orange/brown silt |
| | | | |

| Context No. | Type | Relationship | Description |
|---|---|---|---|
| **Area 2 (Field 17)** | | | |
| **2000** | Topsoil | Seals 2001 | 0.3m thick, grey silty clay |
| **2001** | Natural silt | Natural silt, below archaeological features | orange/brown silt |
| **2002** | Post-hole | Filled by 2003, 2004; sealed by 2004, cuts 2001 | 0.3m diam., 0.13m deep; vertical edges, flat base |
| **2003** | Fill of post-hole 2002 | Sealed by 2000, seals 2004 | black silt with much charcoal and some fired clay |
| **2004** | Fill of post-hole 2002 | Sealed by 2003, seals 2002 | grey silt, little charcoal |
| **2005** | ?Plough furrow | Sealed by 2006 | 2.6m wide, 0.15m deep, NE-SW aligned |
| **2006** | Fill of 2005 | seals 2005 | dark grey silt |
| **2007** | Post-hole | Sealed by 2008, cuts 2001 | 0.6m diam, 0.09m deep |
| **2008** | Fill of 2007 | Sealed by 2000, seals 2007 | very dark grey silt |
| **2009** | not used | | |
| **2010** | Ditch | Sealed by 2013, cuts 2001 | 2m wide, 1m deep, steep sides and flat base |
| **2011** | Fill of 2010 | Sealed by 2000, seals 2012 | dark brown silt, some charcoal |
| **2012** | Fill of 2010 | Sealed by 2011, seals 2013 | mix of brown silt and grey silty clay, with charcoal |
| **2013** | Fill of 2010 | Sealed by 2012, seals 2010 | charcoal and blue silty clay |
| **2014** | Plough furrow | Sealed by 2015, cuts 2019 | 1.07m wide, 0.2m deep, NE-SW aligned |
| **2015** | Fill of 2014 | Sealed by 2000, seals 2014 | grey silt |
| **2016** | not used | | |
| **2017** | Ditch | Sealed by 2018, cuts 2001 | 1.9m wide, 0.2m deep, sloping sides |
| **2018** | Fill of 2017 | Sealed by 2019, seals 2017 | black silt with much charcoal and some fired clay |
| **2019** | Fill of 2017 | Cut by 2014, seals 2018 | grey silt, little charcoal |
| **2020** | Ditch | Sealed by 2022, cuts 2001 | steep sides, flat base. Same as 2021 |
| **2021** | Ditch | Sealed by 2035, cuts 2001 | flat base. Same as 2020 |
| **2022** | Fill of 2020 | Sealed by 2025, seals | black silt with much burnt straw and wood fragments |
| **2023** | Ditch | Sealed by 2030, cuts 2001 | 0.75m wide, 0.3m deep. |
| **2024** | Plough furrow | Sealed by 2031, cuts 2029 | 3m wide, 0.2m deep. NE-SW aligned |
| **2025** | Fill of 2020 | Sealed by 2026, seals 2022 | dark grey silt, charcoal and some fired clay |
| | | | |

| Context No. | Type | Relationship | Description |
|---|---|---|---|
| **Area 2 (Field 17)...** | | | |
| **2026** | Fill of 2020 | Sealed by 2027, seals 2025 | mix of brown silt and grey silty clay, with charcoal |
| **2027** | Fill of 2020 | Sealed by 2028, seals 2026 | dark grey silt, charcoal and some fired clay |
| **2028** | Fill of 2020 | Sealed by 2001, seals 2027 | mix of brown silt and grey silty clay, with charcoal |
| **2029** | Fill of 2023 | Cut by 2024, seals 2030 | light brown silt |
| **2030** | Fill of 2023 | Sealed by 2029, seals 2023 | silt, much charcoal |
| **2031** | Fill of 2024 | Sealed by 2000, seals 2024 | light grey silt, a little burnt clay |
| **2032** | Fill of 2021 | Sealed by 2001, seals 2033 | black silt, fired clay and charcoal |
| **2033** | Fill of 2021 | Sealed by 2032, seals 2034 | mix of brown silt and grey silty clay, with charcoal and fired clay |
| **2034** | Fill of 2021 | Sealed by 2033, seals 2035 | dark grey silt, a little fired clay |
| **2035** | Fill of 2021 | Sealed by 2034, seals 2021 | black silt with burnt straw and charcoal |

**APPENDIX 2**

# Post-Roman Pottery Archive List

(Jane Young)

# pottery archive sfp99

| trench | context | cname | form type | sherds | vessels | decoration | part | description | date |
|---|---|---|---|---|---|---|---|---|---|
| | 1001 | LSLOC | jar | 1 | 1 | | BS | shell fabric;worn;? ID as very faint possibility WEMS | late 9th-10th [or 12th] |
| | 1002 | LSLOC | jar | 1 | 1 | | BS | shell fabric;worn;? ID as very faint possibility WEMS | late 9th-10th [or 12th] |
| | 1002 | LSLOC | jar | 1 | 1 | | BS | shell fabric;worn;? ID as very faint possibility WEMS | late 9th-10th [or 12th] |
| | 1010 | MISC | bowl | 1 | 1 | | BS | post breakage soot;very fine micaceous fabric with occ large FE;? Date | ? Date |
| | 1018 | HUM | jug | 1 | 1 | | BS | | 14-16th |
| | 1018 | HUMB | jug | 1 | 1 | | BS | | 13-15th |
| | 1018 | RAER | jug | 1 | 1 | | BS | | late 15-16th |
| | 1022 | HUMB | jug | 4 | 1 | | BS | fine fabric splashed glaze | 12-early 13th |
| | 1022 | HUMB | jug | 1 | 1 | | base | very worn;quartz fabric | 13th? |
| | 2019 | WEMS | jar | 1 | 1 | | rim | sample 10;very thin walled;int & ext soot | late 11th? To 12th |
| | 2021 | WEMS | jar | 2 | 1 | | rim | heavy int & ext soot;very thin walls | late 11th? To 12th |
| | 2027 | WEMS | small jar | 2 | 1 | | rim | shelly fabric | late 11th? To 12th |
| | 2027 | WEMS | bowl | 1 | 1 | | rim | sandy fabric | late 11th? To 12th |
| | 2027 | WEMS | jar | 1 | 1 | | rim | shell fabric;EVERB1 rim;soot;thin walled;? ID very faint possibility WEMS | late 9-10th [or 12th] |

| trench | context | cname | form type | sherds | vessels | decoration | part | description | date |
|---|---|---|---|---|---|---|---|---|---|
| | 2027 | WEMS | jar | 1 | 1 | | BS | shell fabric;soot;thin walled;? ID very faint possibility WEMS;same vessel 2028 | late 9-10th [or 12th] |
| | 2028 | WEMS | jar | 2 | 1 | | base | shell fabric;soot;thin walled;? ID very faint possibility WEMS;same vessel 2027;flat base | late 9-10th [or 12th] |
| field 10A | | MEDLOC | jug? | 1 | 1 | | BS | very worn | 14-15th |
| field 10A | | MEDLOC | jug? | 1 | 1 | | BS | worn | 13-15th |
| field 10A | | MEDX | jug? | 2 | 1 | white slip | BS | abundant poorly sorted quartz common fine black ?fe common tiny round chalk? Mostly leached | 13-15th |
| field 15A | | TB | jug | 1 | 1 | | base | | 15-17th |
| field 15A | | HUMB | jug | 1 | 1 | | BS | worn | 13-15th |
| field 15A | | MEDX | jar? | 1 | 1 | | BS | quartz + fine muscovite fabric | 11-14th |
| field 15A | | TOY | jug | 1 | 1 | | BS | worn | 13-14th |
| field 15A | | MEDLOC | jug | 1 | 1 | | BS | worn | 13-15th |
| field 15A | | MEDLOC | jug | 1 | 1 | | BS | worn | 13-15th |
| field 15A | | MEDLOC | jug | 1 | 1 | | BS | worn | 13-15th |
| field 15A | | MEDLOC | jug | 1 | 1 | | BS | worn | 13-15th |
| field 15A | | TOY | jug | 1 | 1 | thumbed? | base | | 13-14th |
| field 15A | | BEVO | jug | 2 | 1 | | BS | worn | 13-14 |
| field 15B | | MEDX | bowl/jar | 2 | 1 | | BS | soot part int & ext;common FE poorly sorted quartz | 13-16th |
| field 15B | | UNGS | jar/jug | 1 | 1 | | BS | | medieval? |
| field 15B | | BL | hollow | 1 | 1 | | BS | | 17/18th |

| trench | context | cname | form type | sherds | vessels | decoration | part | description | date |
|---|---|---|---|---|---|---|---|---|---|
| field 15B | | TB | ? | 1 | 1 | | BS | | 15/16th |
| field 15B | | EMLOC | jug? | 1 | 1 | | BS | subround quartz + occ ooliths/rounded chalk;splashed glaze | 12th |
| field 15B | | HUM | jug | 1 | 1 | | BS | | 15/16th |
| field 15B | | TOY | jug | 1 | 1 | | BS | worn | 13-14th |
| field 15B | | MEDLOC | bowl? | 1 | 1 | | base | int glaze | 13-14th |
| field 15B | | TOY | ?jug | 1 | 1 | | BS | flake;? ID | 13-14th |
| field 15B | | BEVO | ?jug | 1 | 1 | | BS | very worn ? iD | 13-14th |
| field 15C | | UNGS | jar | 1 | 1 | | BS | trimmed to a disc | 11-13th |
| field 15C | | TOY | jug | 1 | 1 | | rim | collared rim | 13-14th |
| field 15C | | HUM | jug | 1 | 1 | | BS | | 14-16th |
| field 15C | | TOY | jug | 1 | 1 | | BS | | 13-14th |
| field 15C | | TB | jug | 1 | 1 | | BS | | 14-15th |
| field 16A | | TB | jug | 1 | 1 | | base | worn | 15-16th |
| field 17A | | TB | jug | 1 | 1 | | BS | | 14-16th |
| field 17A | | TOY | jar | 1 | 1 | | BS | worn | 13-14th |
| field 17A | | TOY | jug | 1 | 1 | | BS | worn | 13-14th |
| field 17A | | TOY | ? | 1 | 1 | | BS | worn | 13-14th |
| field 17A | | MEDLOC | ? | 1 | 1 | | BS | scrap | 13-16th |
| field 17A | | UNGS | ? | 1 | 1 | | BS | worn | 11-13th |
| field 17B | | MEDLOC | ? | 1 | 1 | | base | subround quartz | 13/14th |

| trench | context | cname | form type | sherds | vessels | decoration | part | description | date |
|---|---|---|---|---|---|---|---|---|---|
| field 17B | | TOY | jug | 2 | 1 | fe vert strips | BS | | 13/14th |
| field 17B | | ECHAF | ? | 1 | 1 | | BS | | Anglo-Saxon |
| field 18A | | TB | jug? | 1 | 1 | | base | | 15-16th |
| field 19A | | MEDLOC | jug? | 1 | 1 | | BS | worn | 13-14th |
| field 19A | | MEDX | jug | 1 | 1 | | BS | thin walled;occ large quartz | 12-13 |
| field 19A | | TB | jug | 1 | 1 | | BS | | 13-14th |
| field 1A | | MISC | ? | 1 | 1 | | BS | tiny frag;quartz fabric;oxid | medieval? |
| field 1A | | HUMB | jug | 4 | 1 | | BS | | 13-14th |
| field 26A | | TOY | jug | 1 | 1 | | BS | worn | 13-15th |
| field 26A | | LSW1 | jug? | 1 | 1 | | BS | tiny frag;? ID | 12-13th |
| field 26A | | TOY | jug | 2 | 1 | | handle | chipped but fresh | 13-14th |
| field 26B | | TOY | bowl | 1 | 1 | | rim | worn | 13-14th |
| field 27A | | MEDLOC | jug | 1 | 1 | | BS | no glaze;subround quartz common FE | 12-14th |
| field 29A | | TOY | jug | 1 | 1 | | BS | | 13-14th |
| field 29B | | TB | jar/jug | 3 | 1 | | BS | very hard semi vitr bright orange fabric;?? ID | 14-16th |
| field 30A | | MISC | ? | 1 | 1 | | BS | worn;oxid micaceous fine subround quartz | Roman to medieval |
| field 31A | | TB | bowl | 1 | 1 | | base | | 13-16th |
| field 33A | | TB | jug | 1 | 1 | | LHJ | worn | 14-17th |
| field 43A | | TOY | jug | 1 | 1 | | BS | | 13-14th |
| field 43A | | TOY | jug | 1 | 1 | | BS | | 13-15th |

| trench | context | cname | form type | sherds | vessels | decoration | part | description | date |
|---|---|---|---|---|---|---|---|---|---|
| field 44A | | MEDLOC | jar/jug | 1 | 1 | | base | ?? TOY | 12-14th |
| field 44A | | LSLOC | jar? | 1 | 1 | | BS | soot; leached shell + quartz | 10-11th |
| field 8A | | MEDLOC | jug | 1 | 1 | | BS | very worn | 13-15th |
| field 8A | | TOY | jug | 1 | 1 | | BS | worn | 13-14th |
| field 8A | | MISC | ? | 1 | 1 | | BS | shell temper;very worn;compl leached | 10-12th |
| field 8A | | LSLOC | ? | 1 | 1 | | rim | leached;? ID | 10th or 11/12th |
| field 8A | | LSLOC | ? | 1 | 1 | | base | leached;? ID | 10th or 11/12th |
| field 8A | | MISC | ? | 1 | 1 | | BS | unglaze;quartz fabric;Roman or med | Roman or medieval |
| field 8A | | MEDLOC | bowl? | 1 | 1 | | rim | everted rim;unglaze | 12-14th |
| field 8A | | MEDLOC | jug | 1 | 1 | | BS | very worn | 13-15th |
| field 8A | | TOY | jug | 1 | 1 | | BS | worn | 13-14th |
| field 8A | | MEDLOC | ? | 5 | 1 | | BS | very worn | 12-15th |
| field 8A | | TB | bowl | 1 | 1 | | BS | int glaze | mid 15-17th |
| field 8A | | MEDLOC | jug | 1 | 1 | | BS | very worn | 13-15th |

| cname | full name | period | earliest date | latest date |
|---|---|---|---|---|
| BEVO | Beverley Orange ware | med | 1150 | 1500 |
| BL | Black-glazed wares | pmed | 1500 | 1750 |
| ECHAF | Early to mid Anglo-Saxon chaff-tempered | emsax | 450 | 800 |
| EMLOC | Local Early Medieval fabrics | med | 1150 | 1250 |
| HUM | Humberware | med | 1250 | 1500 |
| HUMB | Humber Basin fabrics | med | 1250 | 1500 |
| LSLOC | Late Saxon Local Fabrics | lsax | 850 | 1050 |
| LSW1 | 12th century Lincoln Glazed ware | emed | 1100 | 1200 |
| MEDLOC | Medieval local fabrics | med | 1150 | 1350 |
| MEDX | Non Local Medieval Fabrics | med | 1150 | 1350 |
| MISC | Unidentified wares | nk | | |
| RAER | Raeren stoneware | pmed | 1450 | 1600 |
| TB | Toynton/Bolingbroke wares | pmed | 1500 | 1650 |
| TOY | Toynton Medieval Ware | med | 1250 | 1500 |
| UNGS | Unglazed Greensand-tempered fabrics | med | 1150 | 1250 |

**APPENDIX 3**

# Report on the Fired Clay

(Dr Alan Vince)

# Fired clay from the Saltfleetby gas pipeline: Assessment Report

by Alan Vince, 25 West Parade, Lincoln LN1 1NW. Tel: 01522 589992

## Introduction

Two excavations and preliminary fieldwalking along the route of a new gas pipeline between South Cockerington and the Conoco terminal in Theddlethorpe produced some quantities of fired clay. The two largest assemblages (totalling 450 sherds), both from Theddlethorpe All Saints village, appear to have been produced during a single conflagration. The material from these assemblages could be classified as wattle and daub but is atypical in many ways. No conclusions were drawn as to the nature of the burnt structure, but it was clearly not identical to the wattle and daub dwellings and outhouses that gave rise to the majority of daub usually found in archaeological contexts. The much smaller assemblages from elsewhere along the pipeline route represent other activity.

### Aims and Objectives

The aims of the assessment were

- to identify and record all the material
- to provide a date-range for the finds
- to use these to infer previous land use
- to recommend and justify any further necessary work on the finds
- to identify any aspects of the site's archaeology recognisable from the ceramic finds which require further study or preservation

### Method

All items were recorded to common name and form level and any significant details of manufacture, decoration or use were recorded as comments. Quantification was by sherd/fragment count alone and the data was entered into a MS Access 7 database.

## Description

The fired clay was all of similar composition, containing abundant quartzose silt. Firing was mainly intense enough to completely oxidise the fabric, burning out any organic matter in the clay. Rarely, however, a carbon-rich dark core was present. The surface of the fragments was often of a pinkish or purplish tinge with lighter coloured areas. This colouration is often found on briquetage from Lincolnshire sites but is apparently due to the use of briny water and a calcareous clay rather than an indication of the function of the fired clay. A few fragments were fired at such a high temperature that an ash glaze had formed on the surface and in rare pieces this vitrification was sufficient to distort the surface of the fragment. The appearance of these fragments is closer to that found on metallurgical and other industrial ceramics, subjected to sustained temperatures in excess of 1000 degrees rather than the 600-700 degrees typically found in domestic hearths and accidental fires. This suggests that the firing of the clay took place in an oxygen-rich, fuel-rich environment, possibly aided by a high wind.

The fired clay from Theddlethorpe All Saints had clearly been burnt whilst still part of a structure. Those fragments with wattle impressions showed that the structure was coated on one side only with a thick layer of daub (never less than 20mm and in some cases as much as 40mm). This daub was pressed onto a wattle framework consisting of at least two sizes of hurdle (Fig 1, Pl. 1 ). The larger hurdles had horizontal members c.20mm diameter and the smaller ones had horizontal members c.10mm. Neither is a typical domestic wattle diameter, where almost invariably the horizontal members are c.15mm diameter. Fragments of both sizes of wattle occur in the same contexts and there is no indication that we are dealing with two structures. In at least one case a thin slab of clay was clearly formed by daub being squeezed between two horizontal members, c.10mm apart. The subsequent firing of this fragment indicates that the horizontal members in this case were c.20mm diameter and that the daub stood proud of them for c.30mm and this part of the slab had been subjected to a fiercer heat than that protected by the wattles. One fragment of daub had evidence for a thick

vertical stake and a narrow horizontal member. The vertical stake stood proud of a rounded horizontal face. Several other fragments with rounded faces were found.

It is difficult to reconstruct any structure which might have produced fired clay of this character. It would have to have incorporated two sizes of wattling and to have had a rounded upper surface. One possibility would be a sub-rectangular container, coated with daub on its outer surface, but it is unlikely that daub slabs extending 30mm into such a container could survive its use. Another possibility would be that the fragments came from a stalled barn, with the smaller wattles being used for the stalls which would not have extended to the top of the structure.

Numerous fragments of fired clay bore no wattle impressions at all. Almost all of these had one or more faces which showed that they had been in contact with a straw or grass-covered surface (Pl. 00/5/2, 00/5/00). In one or two cases these fragments were coated on several faces but these faces were neither flat nor regular. They do not, therefore appear to have been mud bricks. There is no evidence that the clay itself was tempered with straw or other organic matter. A few of these featureless fragments showed evidence for laminations and might have been formed by natural silting but most had clearly been worked, either by human agency or perhaps by being trodden underfoot by animals.

## Recommendations

Normally, it is recommended that large quantities of daub are sampled and the remainder discarded. In this case, however, the collection ought to be retained in its entirety since it is possible that the discovery of further burnt structures of similar type will shed light on the nature of the Theddlethorpe All Saints site.

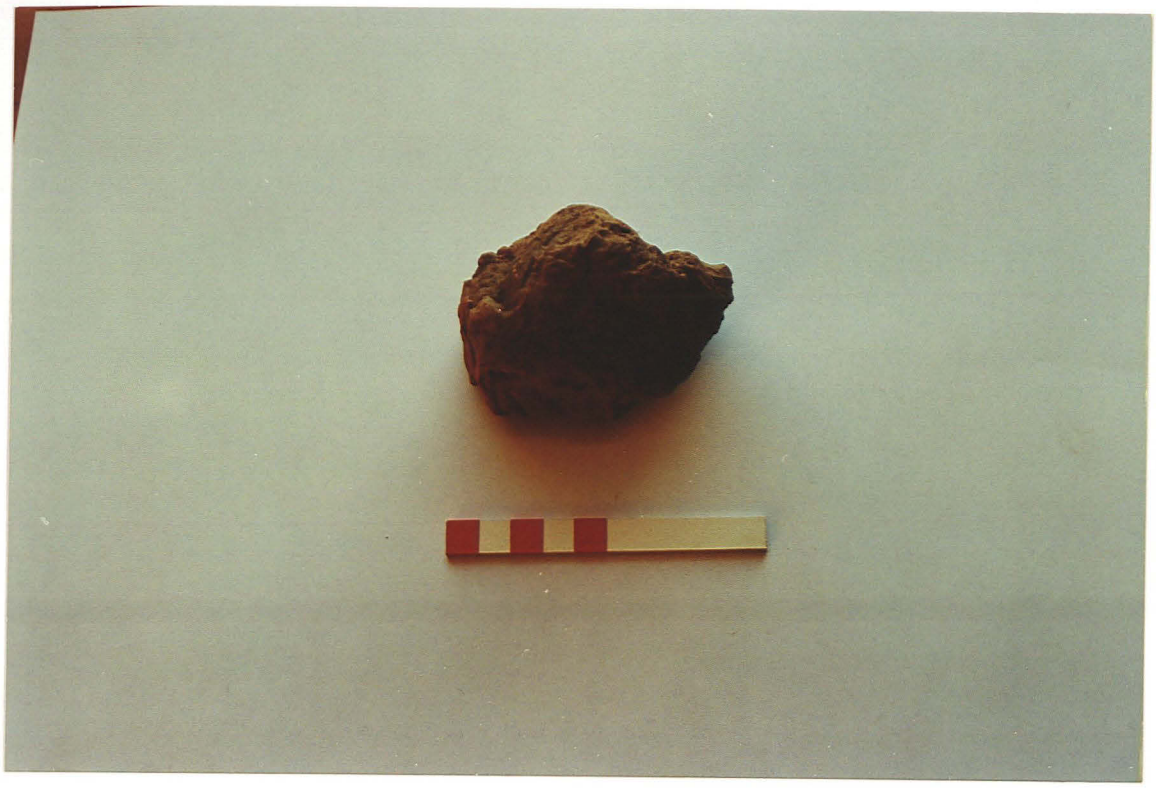
## Acknowledgments

Claire Angus recorded the daub and Naomi Field provided the photographs.

| Context | No.sh | Weight |
|---|---|---|
| 1005 | 24 | 1413 |
| 1006 | 3 | 7 |
| 1008 | 24 | 118 |
| 1010 | 1 | 4 |
| 1016 | 6 | 22 |
| 1018 | 31 | 1100 |
| 1023 | 65 | 2241 |
| 2011 | 54 | 1933 |
| 2018 | 12 | 134 |
| 2025 | 15 | 2028 |
| 2027 | 1 | 235 |
| 2028 | 122 | 3977 |
| 2033 | 12 | 44 |
| 2034 | 11 | 152 |
| 15B | 20 | 430 |
| 15C | 2 | 156 |
| 17B | 2 | 38 |
| 17C | 5 | 40 |
| u/s Area 1 | 25 | 869 |
| u/s Area 2 | 15 | 736 |
| | | |
| 8A | 3 | 3 |
| 10A | 19 | 589 |
| 25A | 3 | 33 |
| 31A | 2 | 21 |
| 38A | 1 | 4 |

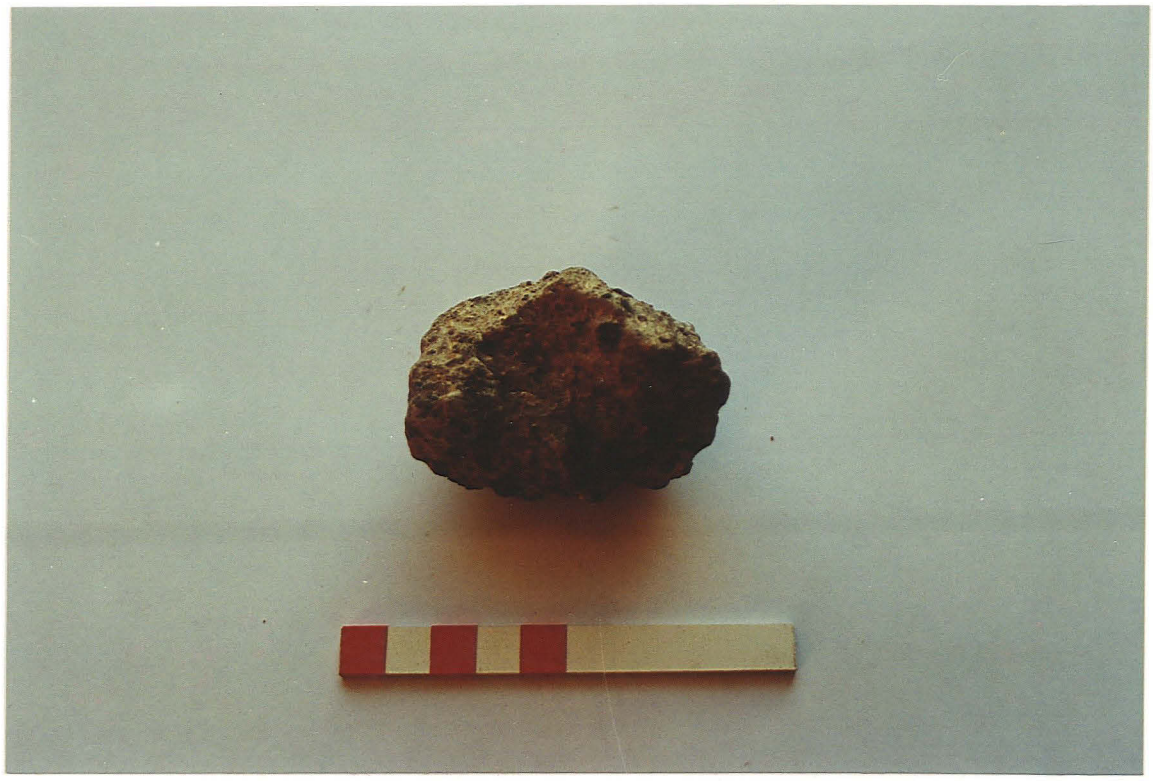
**Table 1: Quantities of fired clay recovered.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 17 | sfp99 | 1008 | clay fired | 24 | 118 | | | | small frags |
| 18 | sfp99 | 1010 | clay fired | 1 | 4 | 9mm | | | small frag |
| 19 | sfp99 | 1016 | clay fired | 6 | 22 | | | | |
| 20 | sfp99 | 1018 | clay fired | 1 | 293 | | | | overfired |
| 21 | sfp99 | 1018 | clay fired | 30 | 807 | 9;10;12;15;11;11 | | | |
| 22 | sfp99 | 1023 | clay fired | 44 | 1018 | 11mm;11mm | | on several faces | |
| 23 | sfp99 | 1023 | clay fired | 21 | 1223 | 9;15;12;10;28;18;16 | | on several faces | |
| 24 | sfp99 | u/s Area 2 | clay fired | 15 | 736 | 11;15;15;15 | | on several faces; some on all faces | |
| 25 | sfp99 | 2011 | clay fired | 54 | 1933 | 13mm | 1 | freq; on several faces | burnt |
| 26 | sfp99 | 2018 | clay fired | 12 | 134 | | | | small frags |
| 27 | sfp99 | 2025 | clay fired | 8 | 957 | 14mm | | freq; on several faces | |
| 28 | sfp99 | 2025 | clay fired | 7 | 1071 | | | | from single brick; large square indentation |
| 29 | sfp99 | 2027 | clay fired | 1 | 235 | | | on several faces | |
| 30 | sfp99 | 2028 | clay fired | 122 | 3977 | 15mm | | freq; on several faces | |
| 31 | sfp99 | 2033 | clay fired | 12 | 44 | | | | small frags |
| 32 | sfp99 | 2034 | clay fired | 11 | 152 | | | occ; on several faces | |
| 33 | sfp99 | 1001 | clay fired | | | 13;12;22;15;17;15;20;15;15;15;17;17;16;17;13;15;17 | | | |



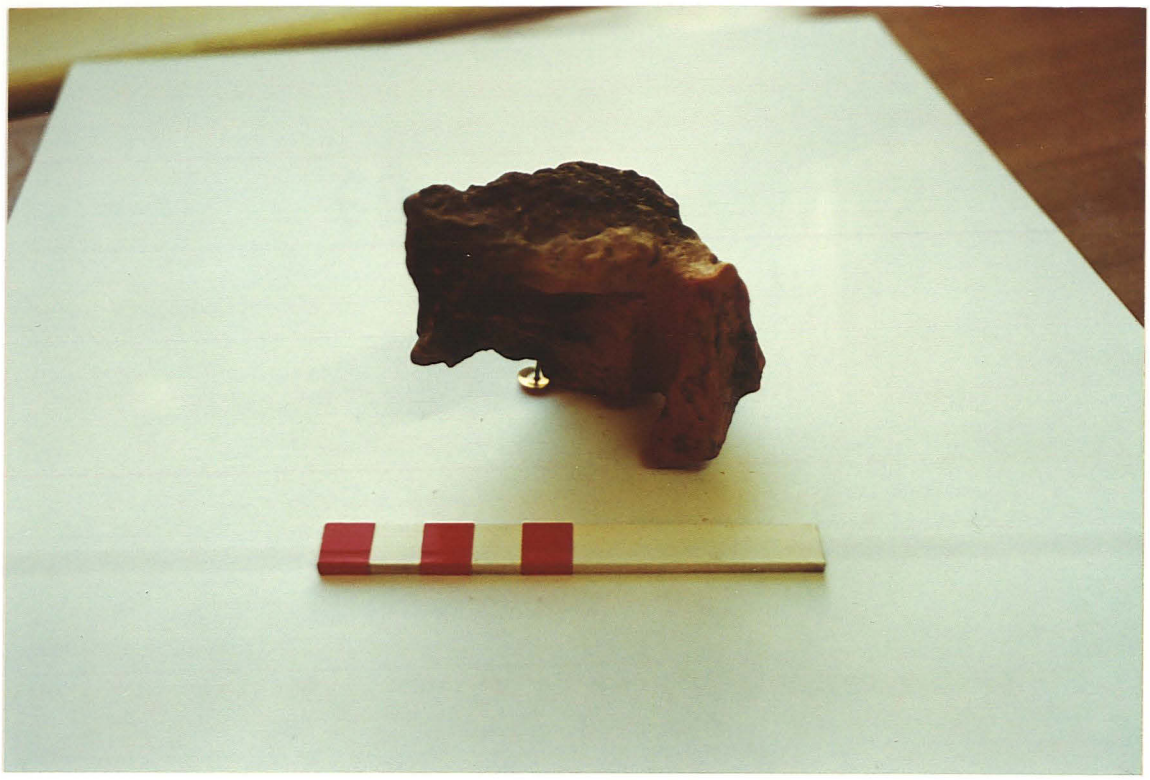
Pl. 1 Fragment of fired clay from context 1023 with 'grass-marking' on several faces (scale 10cm).

Pl. 2 Fragment of burnt daub from context 1023 with impressions from large horizontal wattles (scale 10cm).



Pl. 3 Fragment of burnt daub from context 1002, vitrified and with fuel ash on several faces (scale 10cm).

Pl. 4 Fragment of burnt daub from context 1018 with impressions of small horizontal wattles (scale 10cm).



Pl. 7 Fragment of burnt daub from context 1002 with one ?vertical wattle impression and rounded face (scale 10cm).

Pl. 8 Fragment of daub from context 1002 with horizontal wattle impressions (not visible in this photograph) and one vertical wattle impression. The rounded face indicates a rounded horizontal edge (scale 10cm).

Pl. 5 Fragment of burnt daub from context 1001 with impressions of large horizontal wattles (scale 10cm).

Pl. 6 Fragment of daub from context 1001 formed by squeezing clay between two horizontal wattles about 10mm apart (scale 10cm).

**APPENDIX 4**

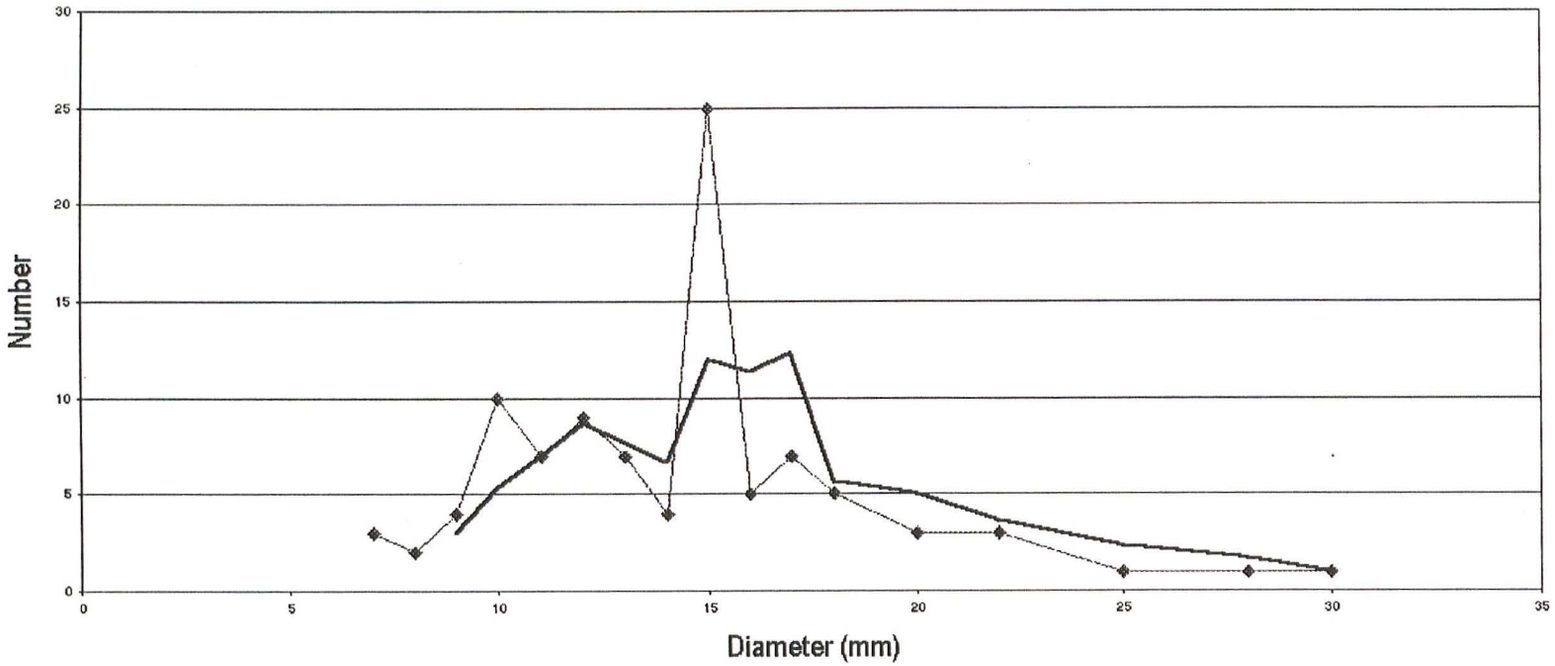
# Environmental Archaeology Report

(James Rackham)

## Catalogue of Fired Clay

| ID | sitecode | Context | cname | subfabric | no.sh | weight | vertical wattle diam | horizontal wattle diam | rounded face? | grass-marked surfaces | other features |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | sfp99 | 8A | fired clay | | 3 | 3 | | | | | |
| 2 | sfp99 | 10A | fired clay | | 19 | 589 | | 25mm; 15mm | | on several faces | |
| 3 | sfp99 | 15B | fired clay | | 20 | 325 | | 15mm; 10mm; 8mm; 8mm | ?1 | occ | |
| 4 | sfp99 | 15B | fired clay | | small frags | 105 | | | | | very small fragments |
| 5 | sfp99 | 15C | fired clay | | 2 | 156 | | 15mm; 18mm | | on sevaral faces | |
| 6 | sfp99 | 17B | fired clay | | 2 | 38 | | | | on 1 face | |
| 7 | sfp99 | 17C | fired clay | | 5 | 40 | | | | on 1 surface | |
| 8 | sfp99 | 25A | fired clay | | 3 | 33 | | 12mm | | | |
| 9 | sfp99 | 31A | fired clay | | 2 | 21 | | | | on 2 faces | |
| 10 | sfp99 | 38A | fired clay | | 1 | 4 | | | | | |
| 11 | sfp99 | u/s Area 1 | fired clay | | 25 | 869 | | 15mm; 18mm; 15mm; 13mm; 20mm; 16mm; 10mm; 14mm | ?1 | on several faces | ?thumb print |
| 12 | sfp99 | 1001 | fired clay | | 56 | 3453 | 25mm;25mm | 15;22;18;30;16;17;18;17;15;25;15;13;15;11;15;13;12 | ?1 | on several faces | |
| 13 | sfp99 | 1002 | fired clay | | 3 | 210 | | 10mm | | | overfired; ?pushed through wattle |
| 14 | sfp99 | 1002 | fired clay | | | | 26 | 20;9;14;7;12;10;11;10;13;15;16;7;12;22;10;14;15 | 1 | on several faces | ?thumb print; 1 frag partially overfired |
| 15 | sfp99 | 1005 | fired clay | | 24 | 1413 | | 15;12;10;12;15;10;12;7 | | on several faces | |
| 16 | sfp99 | 1006 | fired | | 3 | 7 | | | | | small frags |

Horizontal Wattle Diameter



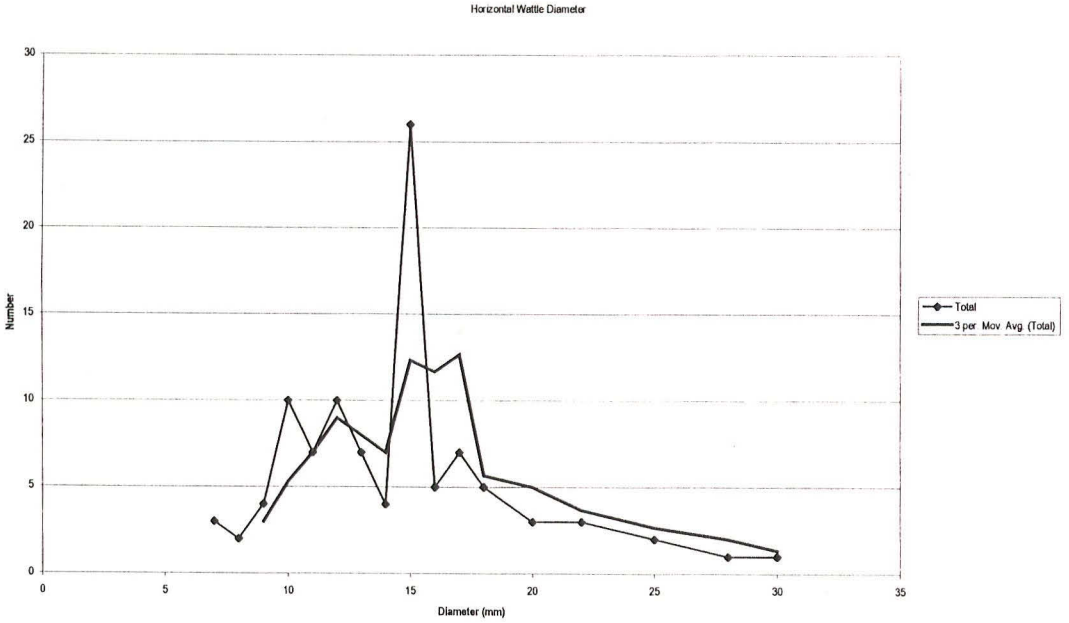



**Fig. 1 Diameter of measured horizontal wattles (N=100) and moving average.**

## Saltfleetby Pipeline, SFP99

## Environmental Archaeology Report

### Introduction

Excavations conducted by Lindsey Archaeological Services on the Saltfleetby Pipeline uncovered features of twelfth century date at Theddlethorpe, and thirteen soil samples were taken for environmental assessment (Table 1) and subsequent post-excavation analysis. These samples ranged in size from 1.4 to 24 litres and were recovered from a range of contexts (see Table 1). In addition two pieces of wood were small finded. At a different location several hundred metres away a spread of burnt debris in a possible post-medieval context was also sampled (10A - Table 1).

**Table 1**: List of soil samples submitted for analysis

| sample | context | feature | sample vol. lt | sample wt kg | date |
|---|---|---|---|---|---|
| 1 | 1002 | silting in well 1000 | 7 | 8 | 12th C |
| 2 | 1003 | waterlogged deposit in well 1000 | 20 | 22 | 12th C |
| 3 | 2011 | clay and burnt clay in ditch 2010 | 24 | 29 | 12th C |
| 4 | 2012 | blue clay and burnt material in ditch 2010 | 17 | 19 | 12th C |
| 5 | 2013 | burnt material and straw? in ditch 2010 | 9.5 | 10.5 | 12th C |
| 6 | 2022 | mainly burnt material in ditch 2020 | 3 | 3 | 12th C |
| 7 | 2021 | grey clay material in ditch 2020 | 4.5 | 5.5 | 12th C |
| 8 | 2020 | dark clay material in ditch 2020 | 4 | 4.5 | 12th C |
| 9 | 2019 | dark clay and fired clay in ditch 2017 | 5 | 6.5 | 12th C |
| 10 | 2019 | dark clay and fired clay in ditch 2017 | 5 | 6 | 12th C |
| 11 | 2034 | fired dark grey clay in ditch 2021 | 3 | 4 | 12th C |
| 12 | 2034 | fired dark grey clay in ditch 2021 | 3 | 3.5 | 12th C |
| 13 | 1001 | upper fill of well 1000 | 1.4 | 1.7 | post 12th C |
| 14 | 10 A | burnt debris | 3 | 2.2 | post-med? |

### Methods

The soil samples were processed in the following manner. Sample volume and weight was measured prior to processing. The samples were washed in a 'Siraf' tank (Williams 1973) using a flotation sieve with a 0.5mm mesh and an internal wet-sieve of 1mm mesh for the residue. Both residue and float were dried, and the residues subsequently re-floated to ensure the efficient recovery of charred material. The dry volume of the flots was measured, and the volume and weight of the residue recorded. A total of 109.4 litres of soil was processed in this way.

The residue was sorted by eye, and environmental and archaeological finds picked out, noted on the assessment sheet and bagged independently. A magnet was run through each residue in order to recover magnetised material such as hammerscale and prill. The residue was then discarded. The float of each sample was studied under a low power binocular microscope. The presence of environmental finds (ie snails, charcoal, carbonised seeds, bones etc) was noted and their abundance and species diversity recorded on the assessment sheet. The float was

then bagged. The float and finds from the sorted residue constitute the material archive of the samples.

The individual components of the samples were then preliminarily identified and after assessment some were submitted for post-excavation analysis.

**Results**

All the samples were composed of fine clayey marine silts with the result that the residues consisted of only concreted and fired sediment, with archaeological and charred material. A minimum level of waterlogging had resulted in the survival of some uncharred organic material including plant seeds, vegetative matter and degraded fragments of wood and twig (see below). It is possible that the bulk of the surviving waterlogged seeds in the samples (Tables 3 and 4) are contemporary with the deposits rather than intrusive.

Archaeological finds are limited (Table 2). Two samples produced shell tempered, wheel thrown pottery sherds, a few produced small fragments of unidentifiable mammal bone and all produced fired silt/clays in various quantities. The bulk of the residue in many of the samples is comprised of small fragments of fired clay and in a number of the samples the larger clay fragments are organic tempered with intact surfaces. A number of the fired earth lumps have impressions of finger thick wood in them, possibly some sort of support or wattling for the mud walls of a structure.

**Table 2**: Saltfleetby Pipeline - SFP99. Archaeological finds from the samples

| sample | context | sample vol. lt | Res.wt. g. # | Fired clay wt. g. $ | Pot * | Bone wt g. |
|---|---|---|---|---|---|---|
| 1 | 1002 | 7 | 360 | 32 | | 2 |
| 2 | 1003 | 20 | 150 | 94 | | |
| 3 | 2011 | 24 | 900 | 215 | | 5 |
| 4 | 2012 | 17 | 1425 | 608 | | |
| 5 | 2013 | 9.5 | 290 | 71 | | 1 |
| 6 | 2022 | 3 | 20 | 20 | | |
| 7 | 2021 | 4.5 | 50 | 11 | 3/14 | 1 |
| 8 | 2020 | 4 | 60 | 16 | | 2 |
| 9 | 2019 | 5 | 280 | 51 | | 1 |
| 10 | 2019 | 5 | 500 | 27 | 1/9 | 1 |
| 11 | 2034 | 3 | 15 | + | | |
| 12 | 2034 | 3 | 15 | 3 | | |
| 13 | 1001 | 1.4 | 31 | 2 | | |
| 14 | 10 A | 1 | 338 | 126 | | |

# in most samples much of the residue was composed of small fragments of fired clay
+ present; $ picked out of >7mm fraction only
* fragment or sherd no/weight in grammes

The environmental material from the samples is dominated by charcoal and the charred remains of cereals and weed seeds. The assessment recommended that these were submitted for detailed analysis and the results are reported below. The other environmental finds are summarised by feature (Table 6).

## The Charred Plant Remains

by John Giorgi

### *Introduction*

Charred plant remains from rural sites can answer a range of questions on agricultural activities at a settlement from simply the range of crops grown to more detailed information on crop husbandry, for instance the type of soils cultivated and crop-processing activities based on the composition of the individual plant assemblages. The richness of the samples from this 12th century site clearly indicated that such questions could be addressed.

### *Sampling, recovery and identification methods*

Charred plant remains were present in all the samples, although sample 13, the upper fill of well 1000 was not submitted for botanical analysis. The exceptionally large plant assemblages from well fill 1003 and ditch fills 2013 and 2022 were subsampled using a rifflebox. Just over 3% of the plant remains from the well fill, sample 2, and 25% from the ditch fills, samples 5 and 6, were sorted and quantified. A further 25% of sample 2 and all of the remaining flot from samples 5 and 6 were scanned for additional species. Three of the smaller flots from samples 1, 3 and 9 were completely scanned because of a shortage of time although plant remains from at least one sample from each feature were sorted and the material quantified.

Most of the grains, chaff and weed seeds were sorted from the samples and quantified. Material that was not sorted included cereal fragments smaller than 2mm, charcoal, stem and indeterminate fragments, although an estimate of the frequency of these items was made on the basis of the following code: + = 1-10; ++ = 11-50; +++ = 51-150; ++++ = 150 items (see Tables 3 and 4). Identification of the material was carried out using a binocular microscope together with modern and charred reference material and reference manuals.

### *Results*

The results are tabulated in Tables 3 and 4. This shows that all the samples produced identifiable charred plant remains with large quantities being recovered from most of the samples but in particularly from the well and ditch samples 2, 5 and 6. Cereal grains were particularly plentiful although chaff fragments and weed seeds were also fairly well represented in most of the samples. A small number of pulses were found in most of the samples. Waterlogged plant remains were identified in a number of the samples representing mainly wild plants, particularly of wetland habitats. There follows a discussion of the different categories of charred plant material. i.e. cereals, legumes and wild plants, and the waterlogged remains.

#### *Cereals*

Cereals were represented mainly by grains although chaff fragments and stems provided additional evidence for their presence. The condition of the grains was not particularly good and many of those distorted and fragmented could not be identified although the majority of these fragments probably belong to barley (*Hordeum sativum*) grains.

Barley was by far the best represented grain in the samples, easily dominating virtually all the charred plant assemblages. The well preserved barley grains were enclosed in their husks (enveloped by the palea and lemma) and both straight and twisted grains were identified; this evidence points to the presence of six-row hulled barley. This was further confirmed by the presence of a number of barley spikelets in 2022 (sample 6) with a triad of grains fused

together by charring. Barley rachis internodes were also recovered in variable quantities from ten of the samples.

**Table 3**: The charred plant remains from Saltfleetby Pipeline (SFP99)

| | | Well 1000 | Well 1000 | Ditch 2010 | Ditch 2010 | Ditch 2010 | Ditch 2020 | Ditch 2020 | Ditch 2020 |
|---|---|---|---|---|---|---|---|---|---|
| | context | 1002 | 1003 | 2011 | 2012 | 2013 | 2022 | 2021 | 2020 |
| | sample | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | vol.soil (l) | 7 | 20 | 24 | 17 | 9.5 | 3 | 4.5 | 4 |
| | flot vol (ml) | 40 | 1000 | 25 | 38 | 120 | 130 | 18 | 5 |
| | % sorted | SCAN 100% | 3.1% (SCAN 25%) | SCAN 100% | 100% | 25% (SCAN 75%) | 25% (SCAN 75% | 100% | 100% |
| **Cereal grains** | | | | | | | | | |
| *Triticum aestivum* s.l.. | free-threshing wheat | ++(+) | (++) | | | 7 (++) | | | 2 |
| *T.*cf. *aestivum* s.l.. | ?free-threshing wheat | ++ | 5 (++) | | 1 | 8 (++) | | 3 | 3 |
| *Triticum* spp. | wheat | + | 4 (++) | | | 16 (++) | | | 5 |
| cf. *Secale cereale* | ?rye | | | | | 1 (+) | 1 | | |
| *Hordeum sativum* L. | barley | ++++ | 156 (++++) | +++ | 16 | 86 (++++) | 148 (++++) | 41 | 6 |
| cf *H. sativum* | ?barley | +++ | 53 | ++ | 14 | 72 | 74 | 33 | 31 |
| *Avena* sp(p). | oat | ++ | 9 (++) | ++ | 8 | 8 (++) | 10 (++) | 9 | 3 |
| cf *Avena* sp(p). | ?oat | ++(+) | 27 (+++) | | 3 | 8 (++) | 6 (++) | 7 | 5 |
| indeterminate cereals | fragments > 2mm | +++ | 334 (+++) | ++ | 52 | 280 (++++) | 179 (+++) | 128 | 107 |
| indeterminate cereals | fargments < 2mm | +++ | ++++ | +++ | ++ | ++++ | +++ | +++ | ++ |
| **Cereal chaff** | | | | | | | | | |
| *Triticum* sp. | hexaplod wheat rachis frag | | (+) | | 1 | 8 (++/+) | (+) | | |
| *Triticum* sp(p). | free-threshing wheat rachis frag | | (+) | | | 4 (++) | 2 (+) | 5 | |
| cf. *Secale cereale* | ?rye rachis frag | | | | | | 3 | | |
| *Hordeum sativum* L. | barley rachis frags | + | 25 (+++) | + | | 25 (+++) | 55 (+++) | 32 | |
| *Avena* sp(p). | oat floret base | | | | | (+) | 3 | | |
| Indeterminate | cereal rachis frags | | 1 (+) | + | | 15 | 3 (++) | | |
| Indeterminate | stem frags | + | +++ (+++) | | ++ | +++ (+++) | +++ (+++) | +++ | + |
| **Other plants** | | | | | | | | | |
| *Ranunculus acris/repens/bulbosus* | buttercups | | (+) | | | 1 | | | 1 |
| *R.sardous* Crantz | hairy buttercup | | | + | 2 | (+) | | | |
| Brassicaceae | - | | | | 1 | | | 2 | |
| cf. *Lychnis flos-cuculi* | ?ragged robin | | | | | (+) | | | |
| *Atriplex* spp | oraches | ++ | (+) | ++ | | 10 (++) | 4 (+++) | 13 | |
| *Chenopodium/Atriplex* spp. | goosefoots /oraches | | | | 5 | | | | 4 |
| *Vicia .faba* L. | celtic bean | + | (++) | | | | 3 (+) | | |
| *V.* cf.*faba* | ?celtic bean | | (+) | | | | 1 | 1 | |
| *Vicia* spp.. | vetch/tare | | (++) | | | | | | |
| *Vicia/Lathyrus* sp(p). | vetch/tare/vetchling | | 1 (+) | | | | | | |
| *Vicia/Lathyrus/Pisum* spp. | vetch/vetchling/pea | | | | | (+) | | | |
| *Medicago/Trifolium* sp(p). | medick/trefoil | | | + | 2 | | | | |
| Fabaceae indet. | indet. legumes | | 1 (++) | ++ | | 5 (++) | 1 (+) | | 2 |
| *Polygonum persicaria* L. | persicaria | + | | + | | (+) | 2 | | |
| *Rumex* sp(p). | dock | | | + | | 1 | | 2 | |
| Polygonaceae | - | ++ | 1 (+) | ++ | | 2 | 3 | | |
| *Menyanthes trifoliata* L. | bogbean | | | | | (+) | 1 | | |
| *Euphrasia/Odontites* sp. | euphrasia/red bartsia | | | | | | (+) | | |
| *Plantago major* L. | greater plantain | + | (+) | | 1 | 1 (+) | | | |
| *P. lanceolata* L. | ribwort | | | | | | | 1 | |
| *Anthemis cotula* L. | stinking mayweed | + | | + | 1 | 1 (+) | | 2 | 1 |
| *Leontodon* spp. | hawkbit | | | | | (+) | 4 | 3 | |
| *Eleocharis* sp(p). | spike-rush | | | + | 1 | (+) | | 1 | |
| *Scirpus maritimus* L. | sea club-rush | + | 4 (+) | + | | 5 (++) | (+) | | |
| cf. *S. maritimus* | ?sea club-rush | + | | | | 5 | | | |
| *Carex* sp(p). | sedge | | | | 2 | 1 | (+) | 1 | 1 |
| Cyperaceae | - | | 1 (+) | | 6 | 6 (++) | 2 (+) | 4 | |
| *Bromus* sp(p). | brome | | 1 (+) | | 1 | 1 | | | |
| Poa spp | | | | + | 3 | | (+) | | |
| Poaceae | indet grasses | + | (+) | + | | 4 (++) | 12 (+) | 2 | 2 |
| indet. | stem frags (thin) | | ++ (+) | ++ | + | ++ (++) | ++ (+++) | ++ | |
| indet plant items(charred) | - | ++ | (+) | + | ++ | ++ | ++ | ++ | ++ |
| charcoal fragments | - | ++ | +++ | +++ | +++ | +++ | +++ | ++ | ++ |

**Key**: Frequency: +=1-10 items; ++=11-100 items; +++=101-250 items; ++++=251+

Wheat (*Triticum* spp.) and oat (*Avena* spp.) were also represented by almost equal quantities of grains in most samples although by significantly smaller numbers of grains than barley. The short, squat and rounded morphology of the wheat grains resembled free-threshing wheats; these may be either hexaploid (eg. bread wheat -*Triticum aestivum* s.l) or tetraploid wheats (eg. rivet wheat -*T. turgidum* and/or durum wheat -*T. durum*), with the two being distinguishable by their rachis fragments. Wheat rachis fragments were recovered from seven samples with the better preserved specimens being identified as hexaploid wheat rachis fragments pointing to the presence of bread wheat. Many of the rachis fragments, however, could not be identified. Oat grains were present in all the samples. Floret bases are the only reliable means of distinguishing wild (*Avena fatua*) from cultivated (*A. sativa*) oats although the recovery of these items in several samples confirmed the presence of the cultivated species. A few grains of rye (*Secale cereale*) were present in three samples although two of the three grains were only tentatively identified; possible rye rachis fragments were also recognised in one sample. Finally, two grains of ?emmer/spelt (*Triticum* cf. *dicoccum/spelta*) were tentatively identified in the samples from ditch fill 2034.

Stem fragments were present in virtually all the samples and in large quantities in the four rich well and ditch fill samples 2, 5, 6 and 7. The majority of these stem fragments were large, round, ribbed and hollow and included both nodes and internode fragments. It is difficult to distinguish between the straw of cereals and large wild grasses (van der Veen 1991, 353) although their association with rich charred grain assemblages suggests that they are probably from cereals. Thinner stem fragments were also present, albeit in much smaller quantities, in almost half of the samples; these could not be identified although they could belong to some of the wild plants represented in the samples (see below).

*Pulses*

Pulses were represented by a small number of seeds in the majority of the samples although few of these remains could be identified to species; the only definite cultivated species was celtic bean (*Vicia faba*) which was present in six samples. The poor condition of the remaining pulses meant that they could not be reduced to species although some of the seeds classified as vetch/vetchling/pea (*Vica/Lathyrus/Pisum* spp.) in three of the samples could represent cultivated legumes. Indeterminate leguminous seeds were found in five samples and included many small seeds which were probably wild species, possibly imported onto the site as cereal weeds (see below).

*Wild plants*

The remaining charred botanical material represented by fruits and seeds in the assemblages came from a fairly wide range of wild plants. Many of these seeds, however, could not be identified to species, which limits ecological interpretation because species within a genus or family may have significantly different habitat requirements. The habitat information has been taken from the *Flora of the British Isles* (Clapham *et al,* 1962).

The seeds that were identified to species showed a predominance of plants characteristic of disturbed, cultivated ground and waste places and wetland habitats. Typical arable weeds included stinking mayweed (*Anthemis cotula*), a weed especially of heavy calcareous soils, while weeds of damp cultivated ground and waste places included hairy buttercup (*Ranunculus sardous*) and two *Polygonum* species, pale persicaria (*P. Lapathifolium*) and persicaria (*P. persicaria*), both of which grow on cultivated ground, waste places and beside

ponds. Another potential arable weed was ribwort (*Plantago major*), which grows in disturbed habitats including cultivated ground.

**Table 4**: The charred plant remains from Saltfleetby Pipeline (SFP99)

| | feature | Ditch 2017 | Ditch 2017 | Ditch 2021 | Ditch 2021 | |
|---|---|---|---|---|---|---|
| | context | 2019 | 2019 | 2034 | 2034 | 10A |
| | sample | 9 | 10 | 11 | 12 | 14 |
| | vol.soil (l) | 5 | 5 | 3 | 3 | 1 |
| | flot vol (ml) | 10 | 11 | 5 | 7 | 150 |
| | sorted | SCAN 100% | 100% | 100% | 100% | 100% |
| **Cereal grains** | | | | | | |
| *Triticum* cf *dicoccum/spelta* | ?emmer/spelt wheat | | | 1 | 1 | |
| *T. aestivum* s.l.. | free-threshing wheat | | 4 | | | 4 |
| *T.*cf. *aestivum* s.l.. | ?free-threshing wheat | + | 1 | 1 | | 8 |
| *Triticum* sp(p). | wheat | + | | 1 | | 2 |
| *Secale cereale* L. | rye | | | | 1 | |
| *Hordeum sativum* L. | barley | ++ | 37 | 21 | 9 | |
| cf *H. sativum* | ?barley | +++ | 28 | 17 | 9 | |
| *Avena* sp(p). | oat | + | 4 | 1 | 1 | 2 |
| cf *Avena* sp(p). | ?oat | + | 8 | 2 | | |
| Indeterminate cereals | fragments > 2mm | +++ | 349 | 41 | 72 | 24 |
| Indeterminate cereals | fragments < 2mm | +++ | ++ | ++ | ++ | +++ |
| | | | | | | |
| **Cereal chaff** | | | | | | |
| *Triticum* sp. | hexaploid wheat rachis | | | | | 8 |
| *Triticum* spp. | free-threshing wheat rachis | | | | 3 | 37 |
| *Hordeum* sp. | barley rachis frag | + | 1 | 2 | 4 | |
| Indeterminate | cereal rachis frags | | | 5 | | |
| Indeterminate | stem frags | | + | + | + | ++ |
| | | | | | | |
| **Other plants** | | | | | | |
| *Ranunculus acris/repens/bulbosus* | buttercup | | 1 | | | |
| *R.sardous* Crantz | - | | | 2 | | |
| Brassicaceae | - | + | | 1 | | |
| *Chenopodium/Atriplex* spp | goosefoots etc./oraches | + | 2 | 7 | 3 | |
| *Vicia faba* L. | celtic bean | + | | | | |
| *V.* cf *faba* | ?celtic bean | | 1 | | | |
| *Vicia/Lathyrus* sp(p). | vetch/tare/vetchling | + | | | | |
| *Medicago/Trifolium* spp. | medick/trefoil | | | 2 | | |
| *Polygonum lapathifoilum* L. | pale persicaria | | 1 | 1 | | |
| *Rumex* sp(p). | dock | + | | 1 | | |
| Polygonaceae | - | + | 1 | | | |
| *Plantago major* L. | great plantain | + | | | | |
| *Anthemis cotula* L. | stinking mayweed | + | 2 | | 2 | |
| *Anthemis* spp | - | + | | | | |
| *Eleocharis* sp. | spike-rush | + | | | | |
| *Scirpus maritimus* L. | sea club-rush | | | 5 | | |
| *Carex* spp. | sedge | | | 2 | | |
| Cyperaceae | - | | 1 | | | |
| *Lolium/Festuca* spp. | rye-grass/fescue | + | | | | |
| Poaceae | indet grasses | + | 4 | 3 | | |
| indet thin stems | | | | | | ++ |
| indet plant items | - | ++ | ++ | ++ | + | + |
| charcoal fragments(small) | - | ++ | + | ++ | ++ | |

Key: Frequency: +=1-10 items; ++=11-100 items; +++=101-250 items; ++++=251+

Wetland species included aquatic plants, with sea-club rush (*Scirpus maritimus*), a plant that grows in shallow water at the muddy margins of tidal rivers and in ditches and ponds near the sea, and bogbean (*Menyanthes trifoliata*), which is found in ponds, the edges of lakes and in the wetter parts of bogs and fens. Other Cyperaceae besides sea-club rush, were also identified and included sedges (*Carex* spp.) and spike-rush (*Eleocharis* spp.), characteristic of bankside/marshland habitats. Some of the sedges may have been growing in wet grassland

environments along with ?ragged robin (cf. *Lychnis flos-cuculi*) and two other grassland species, hawkbits (*Leontodon* spp.) and ribwort (*Plantago lanceolata*); the latter grows on neutral or basic soils.

The remaining charred seeds in the assemblages represent a potential range of species that can grow in more than one habitat; for instance, oraches (*Atriplex* spp.), goosefoots etc/oraches (*Chenopodium/Atriplex* spp.), docks (*Rumex* spp.), rye-grass/fescue (*Lolium/Festuca* spp.), brome (*Bromus* spp.), poa (*Poa s*pp.), buttercups (*Ranunculus acris/repens/bulbosus*), medick/trefoil (*Medicago/Trifoilum* spp.) and indeterminate leguminous seeds (*Vicia/Lathyrus/Pisum* spp.). These seeds represent plants of disturbed ground (including arable), waste places and grassland habitats although the association of this charred material with the cereal grains increases the possibility that they were imported onto the site as arable weeds.

*The waterlogged plant remains*

Plant remains preserved by waterlogging were present in the well and all the ditch fills. The nature of these features suggest that these remains are contemporary with the deposits rather than intrusive. Wetland plants were well represented in all these samples and were mainly aquatic species, for instance duckweed (*Lemna* spp.), and crowfoots (*Ranunculus* subgen *Batrachium*), which were present in virtually all these samples, plus pondweeds (*Potamogeton* spp.), celery-leaved crowfoot (*Ranunculus sceleratus*) and water-plantain (*Alisma* spp.). Another aquatic indicator was the presence of water flea eggs (Cladoceran ephippia) in a sample from ditch fill 2020. The remaining seeds were from a smaller range of species, mainly plants of disturbed (including arable) ground and waste places; seeds of goosefoots etc/orache (*Chenopodium/Atriplex* spp.), which were particularly numerous, and hairy buttercup (both of which were also represented by charred remains) and brambles (*Rubus* spp.).

***Discussion***

The internal composition of the individual charred plant assemblages can be examined firstly in order to establish whether or not the material derives from a similar source and secondly to understand the nature of that source. In the assessment of the plant remains, it was suggested that the charred plant remains could represent the accidental burnt residues of an unprocessed crop or the residues of thatch from the destruction of a building. Both hypotheses will be tested using ethnographic studies of traditional crop-processing methods and more recent studies on plant remains from medieval and post-medieval thatch. The following discussion does not apply to sample 14 from burnt deposit 10A which was collected away from the site and which will be discussed separately.

On the first point, there was no significant variation in the composition of the different charred plant assemblages from the 12th century deposits although the quantity and plant item density in individual assemblages varied considerably. On the basis of the quantified items only (which excludes small cereal fragments, stems, charcoal and indeterminate remains), the plant item density was still generally high with an average density of 100 items per litre and a range from seven items to almost 1000 items per litre of soil, the latter in the rich sample from well fill 1003. The two other plant rich ditch fills, 2013 and 2022, produced 252 and 689 items per litre of soil respectively.

All the charred samples produced mixed assemblages of cereal grains, chaff, straw and weed seeds although each was dominated by cereal grains. It is difficult to quantify the proportions

of the different categories of plant material within each assemblage because the stem fragments, small indeterminate cereal grain fragments and unidentified weeds were not counted, while the plant material from some of the samples was only scanned. A count of the quantified remains (cereal grains, rachis fragments and weed seeds) does, however, at least provide some indication of the prevalence of cereal grains in the samples. These made up over 75% of the quantified part of each assemblage. A simple visual examination of the plant assemblages adds further support to the predominance of grains in each flot. There was little variability in the proportions of chaff (rachis) fragments to weed seeds in the quantified assemblages with weed seeds being slightly better represented in some of the samples and *vice-versa*. Short stem fragments were present in ten samples although only in large quantities in the four richest well and ditch fill samples (2, 5, 6 and 7).

Barley was by far the best represented grain in all the plant assemblages with significantly smaller numbers of oat and free-threshing wheat (including hexaploid species) grains and only a few rye and emmer/spelt grains. The predominance of barley is also reflected in the larger number of its rachis fragments while free-threshing (including hexaploid) rachis fragments appeared in fewer samples and in smaller quantities together with several oat floret bases and rye rachis fragments. Pulses, including celtic bean, were represented in most of the samples although only by small amounts of material with the smaller leguminous seeds probably being weeds. The range of wild plants represented in the samples did vary between assemblages but not significantly in terms of the habitats that the species grow in. Thus, all the plant assemblages contained evidence of plants mainly of wetland and disturbed ground species with oraches, stinking mayweed and sea-club rush appearing in all, or virtually all, samples.

To conclude, the composition of the 12th century samples does suggest that the charred material was derived from a similar source although it is not possible to establish whether it was the result of a single event or several events of a similar nature.

The source of the charred remains is the second question that needs to be asked. Previous studies of charred plant remains have tended to concentrate on relating the different types of debris to specific activities (products and by-products) associated with the crop-processing of cereals. More recent studies, however, have questioned the consistent use of such models with the examination of thatch from medieval and post-medieval buildings suggesting an alternative or supplementary source for charred plant remains from archaeological excavations. The study of thatch from a number of medieval and post-medieval buildings has recently been published and provides an indication of the range and character of plant materials that could be expected from a charred assemblage indicative of thatch (Letts 1999). Smoke blackened thatch survives in five forms with uncrushed reed straw and crushed and fragmented threshing waste being the two most frequent forms. The latter type would be the most obvious candidate for comparison with the charred plant assemblages from Theddlethorpe.

The straw of bread wheat, rivet wheat and rye were the main thatching materials found in the late medieval/early post-medieval building samples. Two-row barley did appear in some of the thatch samples, which also contained a large quantity of stubble and roots (Letts 1999, 39); the archaeological samples on the other hand consisted of six-row barley and did not appear to include roots. The threshing waste in the thatch samples also contained a wide range of weeds, not simply the seeds (and pods) but the whole plant with the roots, stems, leaves and flowers, although only seeds were found in the archaeological samples. Initial analysis of the seeds from the thatch samples showed the presence of 35 arable weed species, the most frequent

being cornflower/knapweed (*Centaurea cyanus/nigra*), common hemp nettle (*Galeopsis tetrahit*) and especially stinking mayweed. Only the latter was found in the archaeological samples and was only represented by small numbers of seeds despite this plant being a high seed producer. While some of the more fragile charred material may have been destroyed in the archaeological samples, the general cleanliness of the Saxon plant remains with a large number of grains and relatively smaller number of stem and weed seeds together with an absence of other plant parts does suggest that a thatch origin for the charred plant remains is unlikely.

The ethnographic models of crop-processing presented by Hillman (1984) and Jones (1984) are based on the premise that each product and by-product of the crop-processing sequence is characterised by different proportions of different types of material. A comparison of these models with the Theddlethorpe samples does not however appear to reflect one specific event in the processing sequence. Virtually no plant items larger than the grains were present in the samples which suggests that the crop had passed through a sieve to separate out contaminants coarser than the grain. The presence of rachis fragments and weed seeds smaller than the grain in the samples is indicative of the by-product from fine-sieving although the quantity of such material relative to grain numbers in the samples is not particularly great. Moreover, some of the wild plants represented in the assemblages were indicative of aquatic habitats rather than cultivated ground which may have become incorporated into the deposit other than as weeds of the harvested crop. The stem fragments are more difficult to explain. The coarser stems are removed by raking and during the first sieving with the medium-coarse riddle although stem fragments of a similar size to the cereal grains may have simply passed through the sieve. Another possibility, however, is that they originate from elsewhere. Stems would have been used for a wide range of purposes on a settlement; for example barley straw is used as winter feed for cattle and for bedding because it is more absorbent than wheat straw. Another possibility is that some of the stems may be from plants other than cereals.

To conclude, it is very difficult to precisely define the source of the charred plant assemblages as part of the crop-processing sequence because of the nature and proportions of the different categories of material. A greater amount of small weed seeds and chaff fragments would be expected in a semi-cleaned crop together with fewer stem fragments. The barley grains had yet to be dehusked although the predominance of grains does suggest that the processing of the material was possibly at a more advanced stage than 'the harvest awaiting processing' originally suggested in the assessment report. It is also possible that the stem fragments may have a source other than as part of the processing sequence, eg as building/flooring materials.

*Sample 10A*

This sample was collected from an area several fields away from the main site and produced a different plant assemblage from the 12th century samples, with free-threshing (including hexaploid bread) wheat being the main cereal represented by both grains and rachis fragments. There were few other identifiable plant remains in this sample other than a few oat grains and stem fragments. The presence of silica ash in the flot suggests that it was heated at a high temperature (Robinson and Straker 1991). The cleanliness of this sample with rachis fragments but no weed seeds suggests that weed infestation may not have been such a problem at this time and the assemblage may have a more recent origin than the other samples, possibly from the post-medieval period or even more recently.

**Charcoal and waterlogged wood**
by Rowena Gale

***Introduction***
Charred and waterlogged wood occurred with abundant deposits of burnt cereal residues and other plant remains in various features at the site. Five of the samples were selected for study and four pieces of 'small finded' wood. The samples for study were selected by sieving the sample flots through a 6mm sieve, only that fraction caught on the sieve being submitted for identification. Only the five samples studied produced charcoal fragments of this size. The charcoal and wood were identified to species to indicate whether it could have originated from structural components or was more likely to have been from fuel. Samples were examined from the well (1000), ditches 2010 and 2017, and layer 2022.

***Materials and methods***
The charcoal was well preserved and mostly consisted of narrow roundwood. Samples were prepared for examination using standard methods. Fragments from each sample were fractured to expose fresh transverse surfaces and sorted into groups based on the anatomical features observed using a x20 hand lens. Representative fragments from each sample were selected for detailed study at high magnification. These were fractured to expose the tangential and radial planes, supported in washed sand, and examined using a Nikon Labophot microscope at magnifications of up to x400. The anatomical structures were matched to prepared reference slides.

The wood samples were prepared by removing thin sections with double-sided razor blades in the same orientations as described above. These were mounted in 70% glycerine on glass microscope slides and examined as above using transmitted light.

When possible the maturity (i.e. heartwood/ sapwood) of the wood was assessed and number of growth rings recorded. It should be noted that measurements of stem diameters are from charred material, when living these stems may have been up to 40% wider.

***Results***
The results of the charcoal analysis are summarized in Table 5 and discussed in detail below. The anatomical structure of the charcoal was consistent with the taxa or groups of taxa given below. It should be noted that the anatomical structure of the related taxa *Salix* and *Populus* (Salicaceae) can not be distinguished with any certainty. Classification follows that of *Flora Europaea* (Tutin, Heywood *et al* 1964-80).

Aceraceae. *Acer* sp., maple
Betulaceae. *Betula* sp., birch
Corylaceae. *Corylus* sp., hazel
Fagaceae. *Quercus* sp., oak
Oleaceae. *Fraxinus* sp., ash
Salicaceae. *Salix* sp., willow and *Populus* sp., poplar. These taxa are anatomically similar.

*Well 1000*
The basal fill 1003 contained a large quantity of charred plant material including cereal remains and charcoal. The charcoal sample consisted mainly of narrow hazel (*Corylus*) roundwood, measuring up to 15mm in diameter, mostly with 5 growth rings. The wide early rings were

characteristic of coppiced growth. In addition, fragments of fast-grown roundwood from willow/ poplar (*Salix/ Populus*) (up to 15mm in diameter), and maple (*Acer*) were present, and several pieces of unidentified bark, some of which probably derived from stems in excess of 15mm diameter; also small pieces of collapsed uncharred wood (unidentified). The sample also included burnt herbaceous stems from both dicotyledonous and monocotyledonous plants. The former appeared to be from the same species (although unidentified) and measured up to 5mm in diameter. The monocotyledons were of two types: a) narrow 1mm stems probably straw or grass and b) wider stems (diameter up to 5mm) from a water plant, possibly reeds (e.g.*Phagmites*). Small find no. 4, a fragment of waterlogged oak (*Quercus*) wood was also recovered from the bottom of the well. The wood was abraded and its original size was difficult to assess; although sapwood, it was probably from wood of fairly wide diameter. Sample 1, fill 1002, consisted of fragments of charred hazel (*Corylus*) roundwood.

**Table 5**: Charcoal, wood and burnt plant remains

| Samp | Cont. | Description | *Acer* | *Betula* | *Corylus* | *Fraxinus* | *Quercus* | Salicaceae | Other |
|---|---|---|---|---|---|---|---|---|---|
| **Well 1000** | | | | | | | | | |
| 1 | 1002 | silting | - | - | 7r | - | - | - | - |
| 2 | 1003 | waterlogged deposit | 2 | - | 33r | - | - | 12r | wood bark; stems: dicot & monocot; |
| sf4 | 1003 | waterlogged wood | - | - | - | - | 1s | - | - |
| **Ditch 2010 - charcoal** | | | | | | | | | |
| 3 | 2011 | clay & burnt clay | - | 1 | 2 | - | 1h | 2 | wood bark |
| 4 | 2012 | clay & burnt material | - | - | 21r | 1 | 2h | 3 | Stems: monocot |
| **Ditch 2017 - charcoal** | | | | | | | | | |
| 10 | 2019 | fired clay | - | - | 1r | - | - | - | - |
| **Layer 2022** | | | | | | | | | |
| sf2 | 2022 | charred ?peg | - | - | - | - | 1r | - | - |
| sf3 | 2022 | wood ?plank | - | - | - | - | - | 1 | too degraded |
| sf3 | 2022 | wood | - | - | - | - | - | - | - |

Key. r = roundwood (diameter <20mm); s = sapwood; h = heartwood
The number of fragments identified is indicated; sf-small find no.

*Ditch 2010*

The samples from this feature appeared similar in character to those from the well 1000. The charcoal in sample 4, context 2012, was predominantly hazel (*Corylus*) roundwood (diameter up to 12mm, 5 growth rings) but also included small pieces of oak (*Quercus*) heartwood, willow/ poplar (*Salix/ Populus*) and ash (*Fraxinus*). Narrow cereal or grass stems (diameter 2mm) were also recorded. Sample 3, context 2011, was similar apart from the absence of ash and the addition of birch (*Betula*).

*Ditch 2017*

The ditch contained less charcoal than many of the other features sampled. A single short length of hazel (*Corylus*) roundwood was recorded (diameter 10mm, 5 growth rings). The growth pattern and morphology were indicative of coppice.

*Ditch 2020*

Two pieces of waterlogged wood and one piece of charcoal were small finded from fill 2022 in ditch 2020. Small find no. 3 consisted of 2 pieces, the larger piece was identified as willow/ poplar (*Salix/ Populus*) and could have been from a radially split plank (although the evidence for this origin was by no means conclusive), while the other piece was too degraded to identify.

Small find no. 2 was in much better condition. It consisted of the broken tip (10mm in diameter), possibly from a peg, with faceted sides and a rounded tip, carved from oak (*Quercus*) roundwood. Although the sample appeared to be waterlogged wood, owing to mineral deposits on the outer surface of the artefact, it was, in fact, carbonised (charcoal).

***Discussion***

The charcoal was predominantly hazel (*Corylus*) roundwood although other taxa including willow/ poplar (*Salix/ Populus*), oak (*Quercus*), maple (*Acer*), ash (*Fraxinus*) and birch (*Betula*) were also recorded. The hazel comprised of narrow roundwood, less than 12mm in diameter. The structure and morphology of the stems were characteristic of coppiced rods, and the consistent use of 5 year-old stems suggests an origin from coppice worked on short term management. It was difficult to establish similar origins for the other taxa, although it was clear that oak heartwood was present, indicating the use of wider poles or more mature wood.

Apart from willow/poplar, it seems unlikely that these species would have grown locally in the fens, unless on areas of drier soil, and must, therefore, have been brought to the site for some specific use. The inclusion of worked wood and artefactual material, e.g. the burnt ?peg, small find no. 2, suggests that the charcoal probably represents burnt structural materials or, perhaps agricultural tools, rather than, or in addition to, fuel residues. The frequency of hazel rods could imply an origin from wattle hurdles, baskets etc, while larger structural members (posts, etc) included oak heartwood and willow/poplar. It may be significant that poplar wood has traditionally been used for threshing floors and the floors of carts because it is more fire resistant than other woods (Edlin 1949). The apparent non-use of alder (*Alnus*) stems for hurdle-making is interesting, since alder would have provided an excellent material for this purpose and, given the location of the site, was probably common in the area. If the hazel rods originated from hurdles, it is probable that the hurdles were brought to the site readymade.

The identification of mixed straw/grass stems and ?reeds, although interesting, does little to answer the problematical question as to their origin. Both have traditionally been used for thatching and for fuel (Edlin 1951). Alternatively, both could have been growing at or near the scene of the fire.

**Summary by feature**

*Well 1000*

Three samples, 1, 2 and 13, were taken from the fills of a feature interpreted as a well. The lowest of these fills, 1003, was extremely rich in charred cereal remains with the flot containing several thousand charred grains, with abundant chaff and charred seeds (Table 3). Many of the grains are still in the husk. Charred beans were also present, but not in very large numbers. A small amount of small roundwood hazel and willow/poplar charcoal and a large straw and possibly reed component made up the remainder of the charred material. A spine of stickleback and a small fish vertebra seem likely to be natural elements in the feature. The middle of the three fills, 1002, produced a much smaller assemblage of charred material of very similar character, but with less chaff, and an assemblage of snails including *Vallonia excentrica*, *Planorbis vortex*, *P. leucostoma* and *P. laevis*. *Vallonia* is typical of calcareous grasslands, but the other taxa are aquatic and normally found in ponds or marshes, although *P.vortex* is more typical of a well vegetated running water environment (Macan 1977).

The upper fill, 1001, was sampled because it was thought that the layer might represent a flood deposit. It had small quantities of charred cereal grain, a little comminuted charcoal, fired earth, a tiny piece of 'brick' and some tiny fragments of coal in the flot. Shells of *Vallonia* sp. and a small shell of an aquatic taxa, *Planorbis* sp. were also present. The sediment was a silt. It clearly represents a period of infilling of the feature when there is relatively little activity around and the charred cereals are likely to have been re-worked. The silty character of the sediment suggests that this is probably inwash and natural infilling of a hollow from the surrounding sediments rather than a specific flood event which may be expected to have a finer textured sediment.

The lower two deposits appear to reflect a large dump of charred debris, possibly of mixed origin, including partially cleaned crop products, possible thatching and structural remains. The quantity of grain suggests accidental loss rather than the burning of a waste product.

*Ditch 2010*

Three samples (3, 4 and 5) were collected from a sequence of fills in the butt end of ditch 2010. One of the early fills, 2013, has a large flot (Table 3) rich in charred grain, chaff, weed seeds and straw. The fills above, 2012 and 2011, are similar but somewhat less dense, with relatively less chaff and straw. An eel vertebra and a scallop shell in 2011 may indicate some food waste also entering the ditch at this location.

**Table 6**: Saltfleetby Pipeline - SFP99. Summary of environmental finds from the samples

| sample | cont. | feature | flot vol | char-coal * | comments |
|---|---|---|---|---|---|
| 1 | 1002 | well 1000 | 40 | 2 | barley, free-threshing wheat, oats, bean, hazel small roundwood charcoal, water vole, weed seeds, grasses, aquatic snails |
| 2 | 1003 | well 1000 | 1000 | 3 | barley, free-threshing wheat, oats, bean, hazel and willow/poplar small round-wood charcoal, maple, oak, stickleback, weed seeds, grasses, straw? and possible reed stems |
| 3 | 2011 | ditch 2010 | 25 | 3 | barley, oats, weed seeds, aquatic plants, birch, hazel and willow/poplar roundwood, oak, bark, field vole, water vole, frog/toad, eel, small fish, scallop, |
| 4 | 2012 | ditch 2010 | 38 | 3 | barley, ?free-threshing wheat, oat, weed seeds, grasses, sedges, aquatic plants, straw?, hazel and willow/polar rounwood, ash, oak, straw? |
| 5 | 2013 | ditch 2010 | 120 | 3 | barley, free-threshing wheat, oats, rye, weed seeds, sedges, aquatic plants, straw? |
| 6 | 2022 | ditch 2020 | 130 | 3 | barley, free-threshing wheat, oats, rye, bean, weed seeds, grasses, sedges, straw?, small roundwood charcoal |
| 7 | 2021 | ditch 2020 | 18 | 2 | barley, ?free-threshing-wheat, oats, bean?, weed seeds, grasses, sedges, aquatic plants, straw?, frog/toad |
| 8 | 2020 | ditch 2020 | 5 | 2 | barley, free-threshing wheat, oat, weed seeds, grasses, sedges, chicken, frog/toad |
| 9 | 2019 | ditch 2017 | 10 | 2 | barley, ?free-threshing wheat, oats, bean, legume, weed seeds, grasses, aquatic plants, mouse (?house), frog/toad |
| 10 | 2019 | ditch 2017 | 11 | 1 | barley, free-threshing wheat, oat, bean?, weed seeds, grasses, frog/toad, fish, hazel small roundwood charcoal |
| 11 | 2034 | ditch 2021 | 5 | 2 | barley, emmer/spelt?, ?free-threshing wheat, oats, weed seeds, grasses, sedges |
| 12 | 2034 | ditch 2021 | 7 | 2 | barley, emmer/spelt?, rye, oats, weed seeds |
| 13 | 1001 | well 1000 | 7 | 2 | *Vallonia* sp, aquatic snail |
| 14 | 10 A | | 150 | | free-threshing wheat, oats, straw?, lots fuel ash slag in flot |

* frequency of items: 1=1-10; 2= 11-50; 3=51-150; 4=151-250; 5=>250; 5+ = >1000 - only charcoal fragments >6mm submitted for identification

The charred plant assemblages are similar to those from the well and suggest accidental burning with perhaps a mixture of origins. The basal layer may reflect a largely primary deposit with the progressively lower concentrations of charred remains in the fills above perhaps an indication of re-working of material from surface deposits as the ditch was filled. This is suggested by the archaeological interpretation that the ditch was deliberately backfilled. It cannot, however, be excluded that the assemblages in each of the fills derive from different

events, which would indicate a repetition of the same activities at this location, presumably over a period of time.

*Ditches 2020 and 2021*
These cuts represent the butt end (2021) and a section across (2020) a NNW-SSE aligned ditch that meets 2010 approximately at right angles. Excavation suggested that these were contemporary ditches.

Samples 6, 7 and 8 were taken from the fills of this ditch at cut 2020. Sample 6, 2022, is the basal fill of the ditch, which contains a very large flot and a charred assemblage that, superficially, is remarkably similar to that from the base of the butt end 2010 (sample 5). Samples 7 and 8 above show a similar, although reduced density of, charred assemblage.

Samples 11 and 12 taken from fill 2034 adjacent to the butt end of this NNW-SSE ditch show a further reduction in the density of the charred remains, but again a similar composition.

Two pieces of wood and a charcoal object were recovered from layer 2022. One of these, sf3, a somewhat degraded piece of willow/poplar measuring 21x10x2.5 cm has evidence for working but is in such poor condition that its function cannot be determined although it may have been part of a plank. A second piece possibly from the same timber, measuring 14x5x1.5 cm, is similarly degraded but carries no evidence for working. The third, sf2, is a small worked point with a rounded tip, and a shaft that shows the working facets. The end opposite the rounded point has been broken. This object has been carbonised and is made from oak rounwood, possibly a structural peg.

*Ditch 2017*
Two samples (9 and 10) were taken from the fills of a curvilinear ditch to the east of the other sample locations. These two samples were taken from the secondary fill of cut 2017, located above a layer with large amounts of charred material and burnt clay, and described as natural silting. Densities of charred material were relatively low, by comparison with other samples from the site, and this probably reflects the incorporation of material being re-worked, perhaps blown around, from other deposits on the site.

*Sample 14, context 10 A*
This sample was collected from a feature several hundreds of yards and fields from the 12th century site. It was one of a group of burnt deposits with no dating evidence but provisionally allocated to the post-medieval period. A sub-sample of 1 litre of this sample was processed and produced a residue entirely of fired sediment with no evidence of wedging and probably indicative of burning *in situ* on the natural silts at the site. The flot from the sample is dominated by burnt straw, chaff and the siliceous remains of the cereal plants, with a few charred grains, comprising largely of free-threshing wheat with a few oats.

**Conclusions**
The charred plant remains from the 12th century site show that barley was an important cereal grain on the site. The presence of the other cereals, free-threshing (including hexaploid) wheats, oats and possibly rye, may also have been used at the site although their recovery in the samples dominated by barley grains, suggest that in this particular crop they were contaminants from previous harvests. The same may also apply to the beans. The glume wheats, emmer/spelt, are rarely found in post-Roman samples therefore the few grains in the

Saxon plant assemblages are probably relics from previous harvests. The similarity in the composition of the plant assemblages suggests the same origin for the material. The predominance of cereal grains points to a fairly well cleaned crop although the presence of the grain and small weed seeds, rachis and straw fragments cannot be ascribed to just one stage of the crop-processing sequence, suggesting that some mixing of products (grain) and by-products (rachis fragments, weed seeds, straw) may have taken place. The barley had not been dehusked but the general cleanliness of the grains suggests that the cereals were intended for human consumption. The quantity and density of grains in the samples suggest that the cereals were accidentally burnt rather than being a deliberate part of the processing sequence. The wild plants in the samples suggest a damp environment including arable weeds that would have been imported with the cereal grains onto the site and wetland (including aquatic) plants preserved both as charred and waterlogged material, being indicative of conditions on the field margins and within the ditches and well from which the samples were recovered.

The cereals represented in the samples, barley, free-threshing wheat, oat and rye, are the four main grains found on Saxon sites in England (Grieg 1991, 315). Barley was both a spring and autumn sown crop. Oat was a spring sown crop, while wheat and rye were autumn-sown grains. Barley is a shallow rooted crop and can grow in a range of light as well as heavy soils. It does not grow well in areas where the Ph is below 6 or there is poor drainage, suggesting it was grown on the better drained areas around the site although the presence of wetland arable species suggests that this may have included some damp areas as well. The other wetland species may have been incorporated into the assemblages from ditches on the field margins.

Barley has a range of potential uses as human food for bread and ale and beer and as animal fodder. It is difficult to know what the barley was destined for in the case of the site because it had not been dehusked although the relative cleanliness of the grain suggests that it was probably intended for human rather than animal consumption. The other cereals in the samples, wheat and rye, were important bread grains while all the cereals may have been used on their own for bread (with the exception of oats) or as mixes for bread. Oats were also used as fodder. Another use of the cereals could have been in pottage, a type of stew. The only identified cultivated legume from the site, celtic bean, has been recorded from other medieval sites although they are much less frequently found than cereal grains (Greig 1991, 317). Pulses, including beans, may have been used in stews and for peasant bread in times of bad harvests as well as for fodder. Another important use was for restoring nitrogen to the soil.

The charcoal study identified a range of taxa from amongst the debris of the fire. Hazel (*Corylus*) roundwood predominated, and was probably from coppiced stems grown on a 5-year rotation. Other taxa included willow/ poplar, oak, ash, maple and birch, of which. the last four (and hazel) are unlikely to have grown on fenland. Artefactual material including charcoal and waterlogged wood was also recorded. Unsuitable environmental conditions for the local growth of these trees suggests that the wood was brought to the site, possibly for construction (given the artefactual components), some elements of which may have been transported readymade.

Other debris is limited. The features included little domestic rubbish (Table 6) such as broken pottery, food bones or shellfish, although soil conditions may have influenced the survival of bone and shell.

**Interpretation**

The quantity of fired clay in all the samples from the 12th century site when combined with the charcoal analysis suggests that this debris derives from a structure or building. The presence of considerable quantities of charred grain suggests that this firing was probably accidental rather than intentional, although it is possible that the structural debris might derive from an oven or corn dryer.

The consistency of the charred remains across the four features sampled at this site, including the well in Area 1, suggests that they probably do derive from one event, with material in later backfills and fills being re-deposition of debris from the same event. This cannot of course be proved. The high concentration of grain, much of it still in the husks in this debris suggests that this was an accident or action that destroyed a partially cleaned crop, possibly in store, and other material.

Interestingly the density of this material in the primary fills, particularly samples 5 and 6, where the deposits lie on the floor of the flat bottomed ditches, indicates that the event that occasioned all this debris must have taken place very soon after the ditches were dug, since there are no earlier infilling deposits. This may also be true of the well in Area 1, where sample 2 from 1003 is the richest of all the samples collected, and suggests that the 'one event' hypothesis is plausible.

This evidence suggests a major fire that may have destroyed a structure or building and stored partially cleaned crop. If the quantities of grain found in the samples is extrapolated across all the fills then this represents a substantial amount of grain. This event appears to have taken place shortly after the digging of the T-shaped ditches, and probably also the well and curvilinear ditch. The backfilling of the flatbottomed T-shaped ditch suggests that the site may have been levelled after the fire, with the debris from it being backfilled into all the available open features. Only the upper fills of the curvilinear ditch, which were described as having naturally silted up, contain low densities of charred remains and relatively little chaff and straw. This is the material which would blow away first, and therefore perhaps suggests that this ditch remained open for a greater length of time after this postulated fire. Whether this fire was accidental or intentional is open to speculation.

**Acknowledgments**

I should like to thank Alison Foster and Jeremy Dubber for the sample processing.

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**APPENDIX 5**

# Report on the Animal Bones

(Richard Moore)

# Report on the Animal Bones

(Richard Moore)

The assemblage consists of 1855g of animal bone. Preservation is reasonably good, although the material tends to be fragmentary. Domestic cattle, sheep, horse and pig were all positively identified.

Ditch fills (2027) and (2028) contained the remains of a horse skull. The bones were fragmented, but the pre-molar and molar teeth from both sides of the upper jaw were present, suggesting that the skull was substantially complete when it was buried. It may have been butchery waste, but it is more likely to have come from an unwanted carcase disposed of in a convenient ditch.

The lower jaw of a pig was also present in fill (2027). The second molars on each side were erupting, but not yet in wear. In modern pigs, this tooth erupts between 7 and 13 months of age (Hillson, 209). This would be a fairly normal age of slaughter for pigs, which produce useful quantities of meat while still immature.

A cattle humerus, together with fragments of rib and long-bone shafts, in the same context come from prime meat-bearing parts of the animal body and are likely to have been food waste. Overall, the assemblage is typical of the detritus from domestic-scale production and consumption.

The cattle mandible in context 17B (2017??) came from a relatively old animal. The state of wear of the teeth indicates that it was at least four years old, and probably older. It may have been a draught or diary animal that had come to the end of its useful or productive life. Several bones in the assemblage, including this mandible, show signs of having been gnawed which suggests that they were exposed for some time before being buried.

Two articulating vertebrae, and probably a third, in context (1005) are from the neck of a sheep. The only other positively identified sheep bone was the shaft of a tibia in context (1010). These bones are commonly found with the shaft cut or broken. Its survival here may suggest that the animal was not butchered for food, and may have been a victim of disease or accidental death.

The unstratified finds from area 2 include an unidentified toe-bone, probably from a bird. It is longer than the equivalent chicken-bone, and may be from a species of duck or goose. It could have come from a wild bird and been accidentally incorporated in the fill rather than occurring as a result of deliberate disposal.

## Bone List

The table lists all the bones found. The species of animal has been given where there is reasonable confidence about its identification. An indication of the general size and robustness of bones is given in uncertain cases, as, for instance, 'cow-sized'. Small fragments that defy even this level of identification are listed as 'unidentified'. Uncertain identifications are generally indicated in the comments column. This is also used to record the parts of the bone present where it is incomplete, its size where this is significant, and also whether there are signs of burning or of butchery marks. Teeth, including those in place in mandibles and maxillae, are listed using the following abbreviations: i - incisor, c - canine, pm - pre-molar, m - molar, d - deciduous or 'milk tooth'. The

degree of wear of mandibular teeth is indicated by a letter, based on those given in Hillson (1986, pages 327-330, after Grant, 1982). For example, 'dpm4(g)' should be read as fourth deciduous pre-molar with wear to stage g.

| Context | Animal | Bone | Side | Comments |
|---|---|---|---|---|
| 1005 | Sheep | Cervical vert. | | Complete, centrum epiphyses fused, anterior fairly recently. |
| 1005 | Sheep | Cervical vert. | | Posterior articular surface of centrum, articulates with above. |
| 1005 | ?Sheep | Vertebra | | Dorsal part of neural arch, may be same bone as above. |
| Weight (1005): 40g | | | | |
| 1006 | Sheep | Tooth | Right | Upper molar, ?m3. |
| Weight (1006): 5g | | | | |
| 1010 | Cow-sized | Shaft | | Fragment, possibly of metacarpal. |
| 1010 | Cow-sized | Shaft | | 2 fragments. |
| 1010 | unidentified | | | 4 shaft fragments. |
| 1010 | unidentified | | | Fragment of articular surface, possibly distal end of cattle tibia. |
| Weight (1010): 45g | | | | |
| 1018 | Cattle | Tooth | Left | Upper ?dpm4, heavily worn crown. |
| Weight (1018): <5g | | | | |
| 2011 | Sheep | Tibia | Left | Shaft. |
| 2011 | Cow-sided | Rib | | Blade fragment. |
| 2011 | ?Cattle | Mandible | Left | Articular region, badly eroded. |
| 2011 | ?Sheep | | | Fragment of ?metapodial shaft. |
| Weight (2011): 110g | | | | |
| 17B | Cattle | Mandible | Right | Region including pm3, pm4(f), m2(k), (m1 missing). |
| Weight (17B - ?should be 2017): 120g | | | | |
| 2027 | Cattle | Humerus | Right | Distal end and part of shaft. |
| 2027 | Horse | Maxilla | Right | Region with pm2, pm3, pm4, m1. |
| 2027 | Horse | Teeth | Left | Upper pm2, pm3, pm4, m1, m2, matching above. |
| 2027 | ?Horse | Skull | | At least 11 fragments of skull, probably with above. |
| 2027 | Pig | Mandible | Left | From base of ramus forward, c, m1(e), m2 erupting. |
| 2027 | Pig | Mandible | Right | Same bone as above, m1(e), m2 erupting, loose canine. |
| 2027 | Cow-sized | Shaft | | Fragment possibly of cattle humerus above, but not re-fitting. |
| 2027 | Cow-sized | Ribs | | 4 fragments. |
| 2027 | Cow-sized | | | 3 fragments of unfused diaphysial surfaces, vertebrae or long-bones. |
| 2027 | unidentified | | | 22 fragments of skull or mandible, most probably from horse or pig above. |
| 2027 | unidentified | | | 6 shaft fragments. |
| 2027 | unidentified | | | 7 tiny fragments. |
| Weight (2027): 1135g | | | | |
| 2028 | Horse | Teeth | Right | Upper m2, m3, match those in (2027). |
| 2028 | Horse | Tooth | Left | Upper m3, match those above and in (2027). |
| 2028 | ?Horse | Skull | | 19 fragments, possibly with above. |
| 2028 | Sheep-sized | | | Rib fragment. |
| Weight (2028): 230g | | | | |
| 2034 | Sheep-sized | Rib | | Articular end. |
| Weight (2034): <5g | | | | |
| U/S, 2 | Cattle | Mandible | Right | Fragment with m3(j). |
| U/S, 2 | Cattle | Mandible | Right | Fragment with pm2, similar appearance to above, ?same bone. |
| U/S, 2 | Cattle | Cervical vert. | | Unfused epiphyses missing, otherwise mostly complete. |
| U/S, 2 | ?Bird | Pedal phalanx | | Complete, ?chicken-sized or larger. |
| Weight (U/S, Area 2): 160g | | | | |

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**APPENDIX 6**

# Metal and Registered Finds Report and Archive List

(Jen Mann)

# Metal and Registered Finds Report and Archive List

(Jen Mann)

Six finds were recorded to basic CLAU archive level and the data entered onto the computer using the CLAU thesaurus of finds codes. A single copper alloy find was X-rayed by the Lincoln City and County Museum Conservation Laboratory.

The finds are almost certainly all of post-medieval or modern date although none - with the exception of a single marked clay tobacco-pipe stem - is closely datable. A copper alloy disc on excavation was thought to be a coin but the X-ray suggests that it is almost certainly a button from which the (soldered) shank has broken; it probably dates to the 18th or 19th century.

Part of a fine-grained hone (whetstone) is almost certainly 'purple' phyllite of northern European (possibly Scandinavian) origin; hones of this material do not occur in this country until after the late 9th century, continuing in use until the post-medieval period.

*The Marked Tobacco Pipe*

The pipe stem bears the incuse mark 'SV' together with several lines of impressed, square rouletting that spiral round the stem, two of them crossing, with one partially superimposed over the mark. The latter is that of an unknown maker (or makers); the positioning of the letters, however, with the S surmounting the V, probably indicates that the S represents a surname and that the mark should properly be read as 'VS' (*cf* Oswald & Wells 1974, 36).

Pipes with this form of marking occur both in London and Lincolnshire; the distribution of the earlier and later examples of dated pipes suggests that production began in London during the early part of the 17th century and moved to Lincolnshire some time in the middle of the century (pipes were also exported to America: Oswald 1975, 88).

A recent survey of the Lincolnshire examples of this mark (in excess of 100), dated *c.* 1650-1750, showed that all but one were found north of a line between Lincoln and Boston, all save two within a twenty-eight mile radius of Horncastle (the majority within twenty miles) and including a group of almost 40 from excavations in Horncastle itself. From this, it was tentatively suggested (Wells 1979, 163) that a Horncastle maker was responsible.

Simple forms of stem marking may have been intended to indicate the balance-point of the pipe but could have been purely decorative; they are rarely found before the early 18th century. The presence of such rouletting on this piece in conjunction with the maker's mark suggests that it belongs to the latter part of production.

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**SFP99: FINDS ARCHIVE LIST**

| Area | Context | Finds No | Material | Object | Date/Comments |
|---|---|---|---|---|---|
| | | | | | |
| | 34A | 5 | COPP | DISC | PMED-MOD;18-19;BUTT? |
| 2 | 2032 | 6 | STON | HONE | PPHY WORN |
| | 10A | 7 | IRON | NAIL | PMED-MOD |
| | 37A | 8 | CERA | PIPE | PMED;E18;MARK SV + DEC |
| | 25A | 9 | CERA | PIPE | PMED;M17-L18;X2 STEM |
| | 15B | 10 | STON | | X3 NAT;BASALT? + FAS;BALLAST? |

**Key**

BUTT = button
CERA = ceramic
COPP = copper alloy
DEC = decoration
FAS = fuel-ash slag
NAT = natural
MOD = modern
PMED = post-medieval
PPHY = 'purple' phyllite
STON = stone

# The Figures

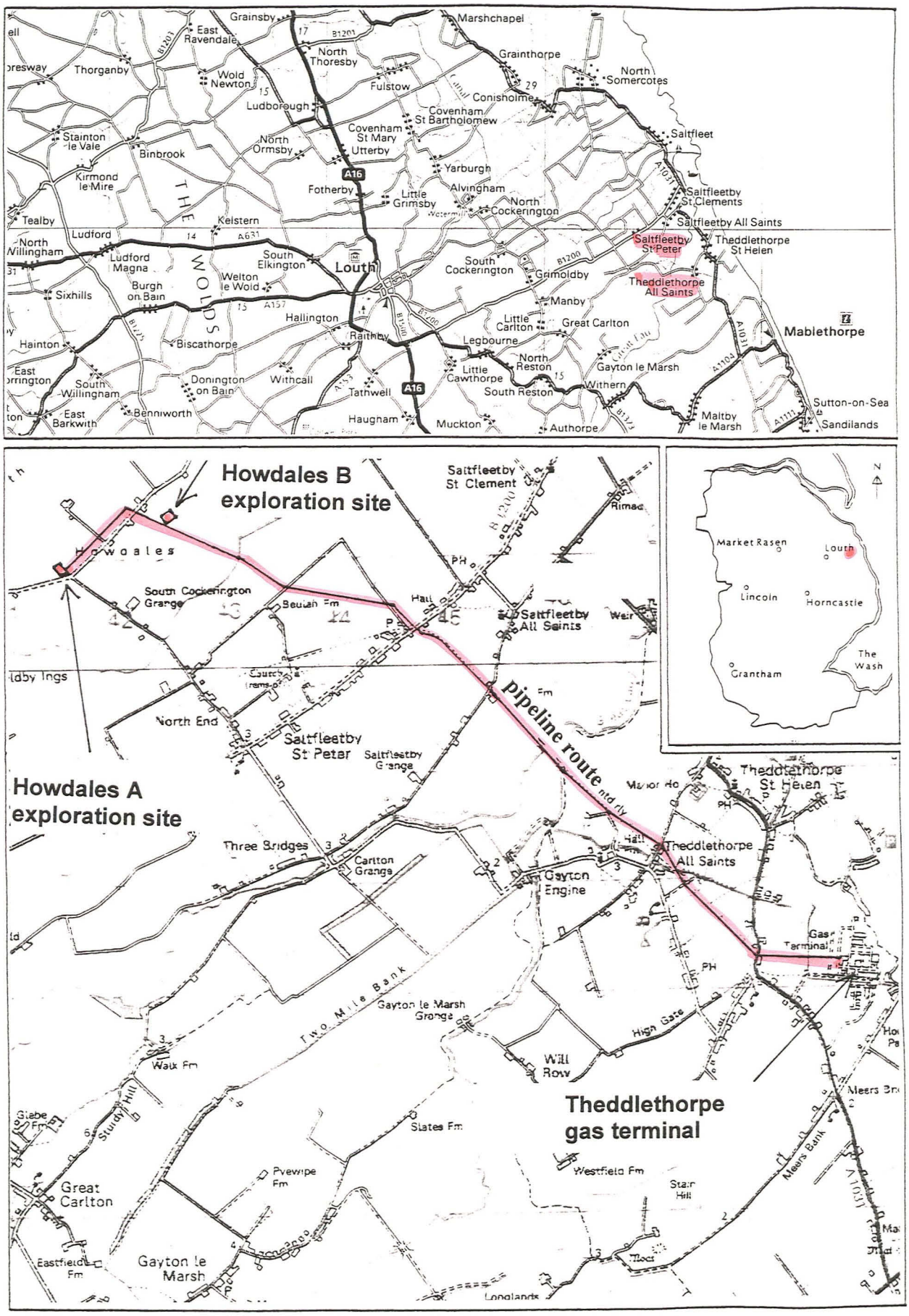



**Fig. 1 Location of South Cockerington, Saltfleetby, Theddlethorpe All Saints and Theddlethorpe, showing the route of the monitored pipeline. (C based on the 1992 1:50,000 Ordnance Survey Landranger map, Sheet 113 © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).**

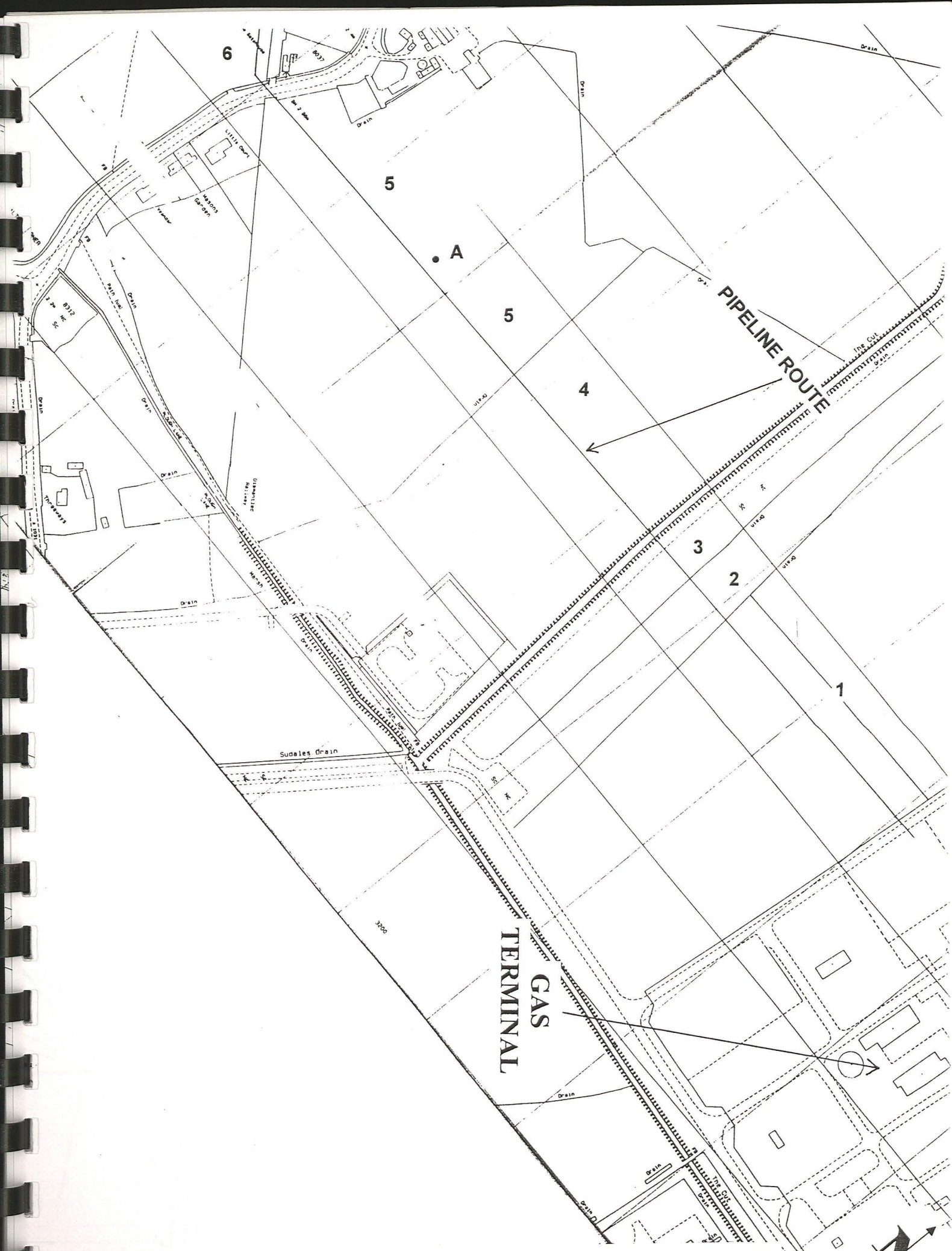



Fig. 2 The pipeline route, showing LAS field numbers 1-6 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).

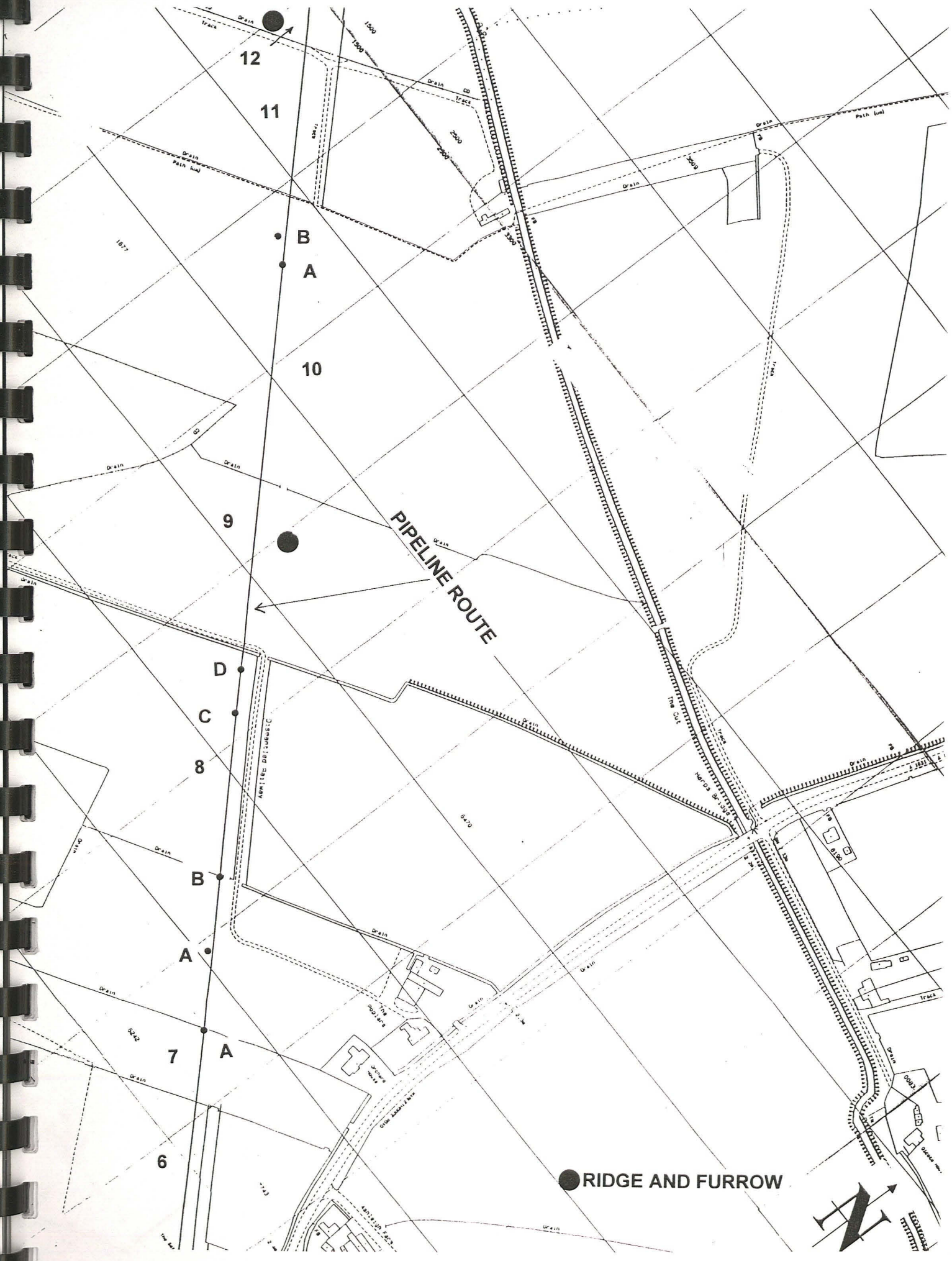



**Fig. 3 The pipeline route, showing LAS field numbers 6-12 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).**

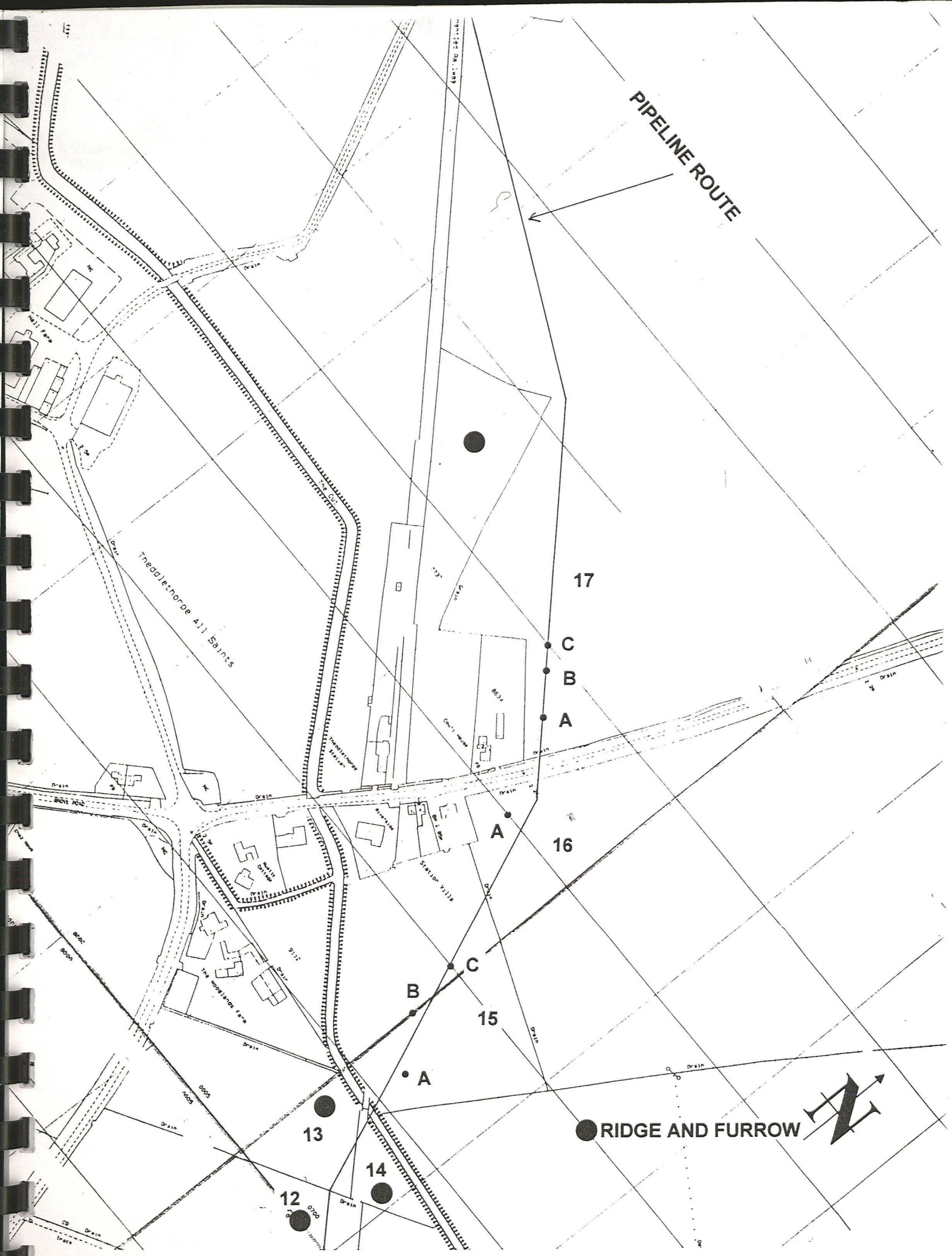



**Fig. 4 The pipeline route, showing LAS field numbers 12-17 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).**

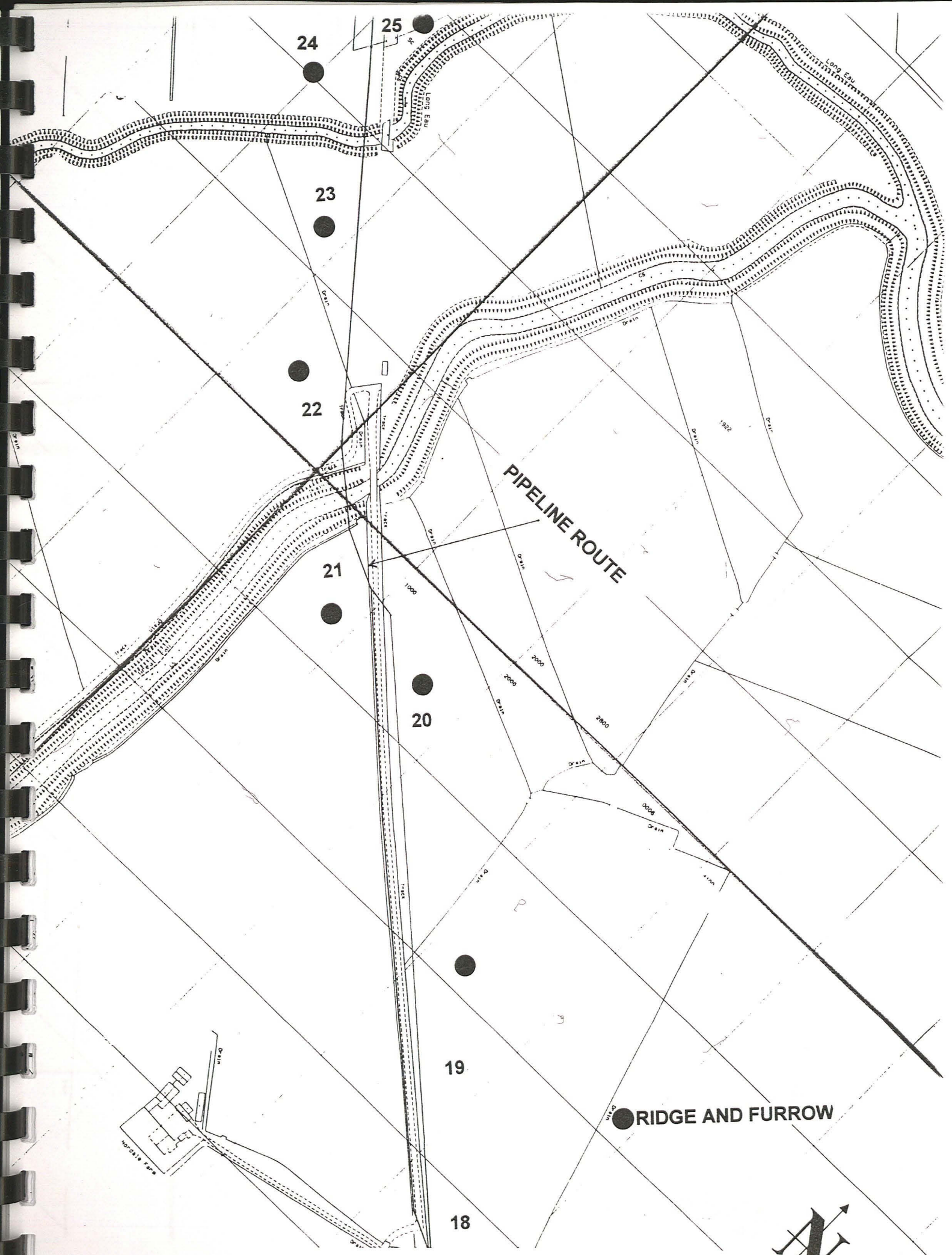



Fig. 5 The pipeline route, showing LAS field numbers 17-25 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).

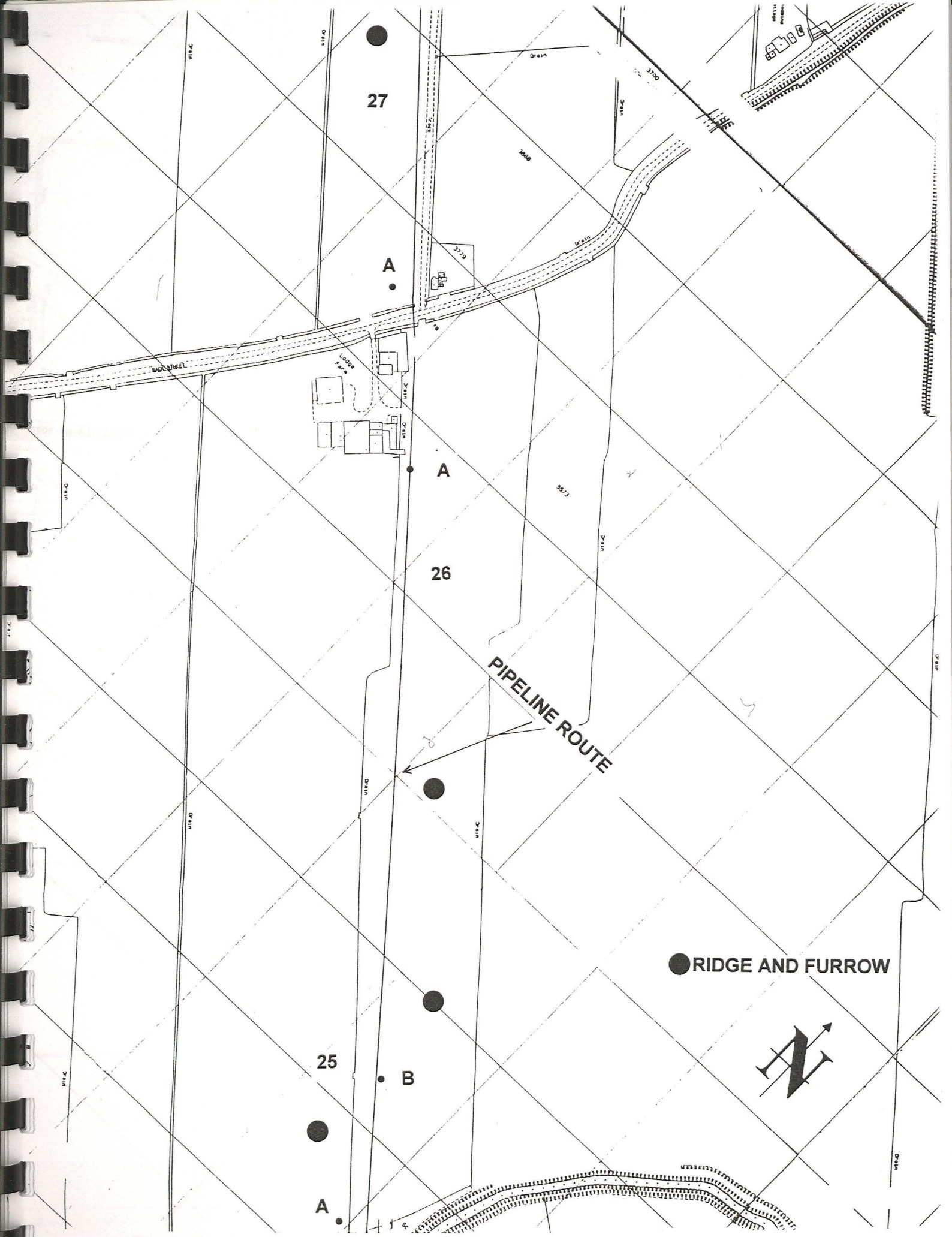



Fig. 6 The pipeline route, showing LAS field numbers 25-27 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).

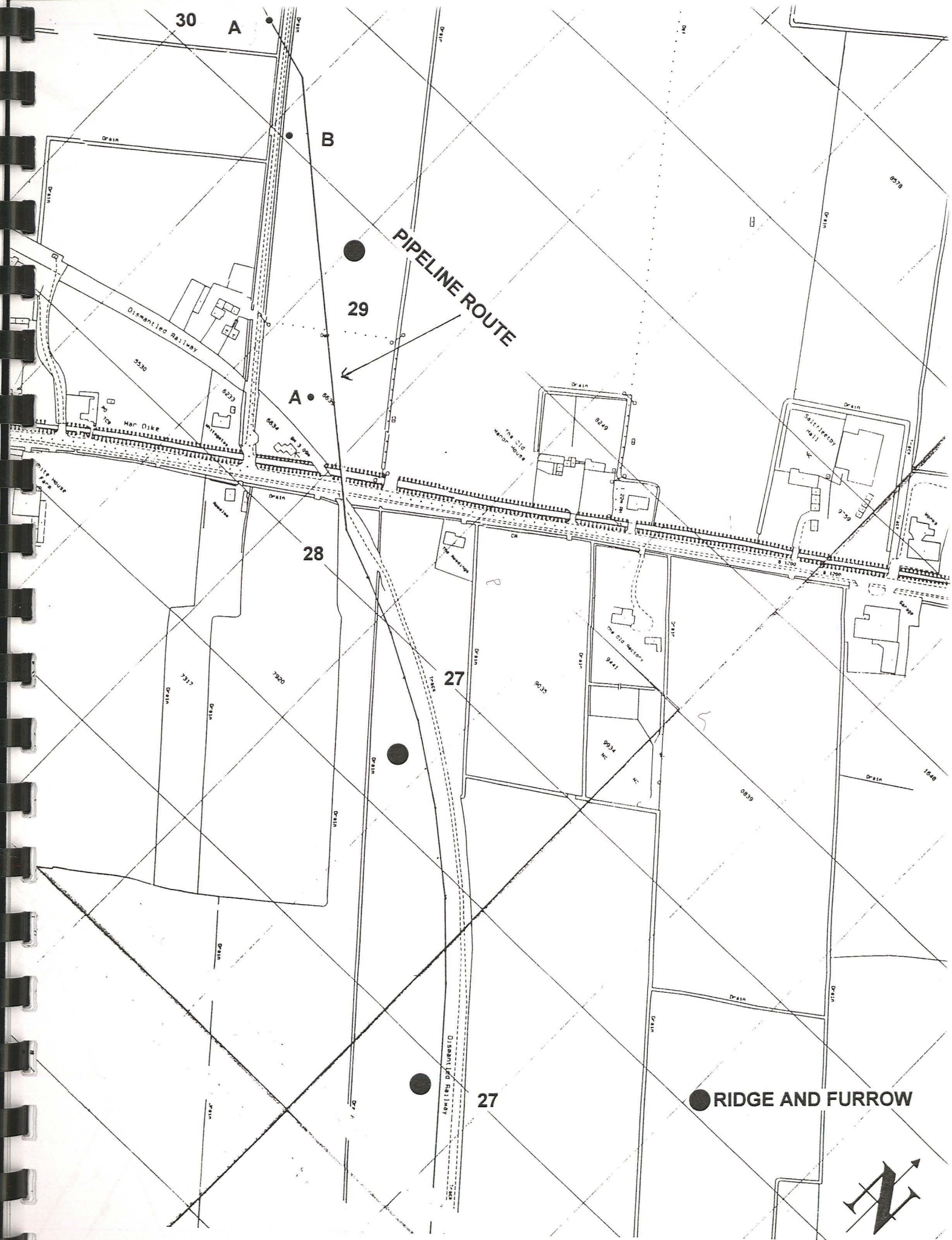



**Fig. 7** The pipeline route, showing LAS field numbers 27-30 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).

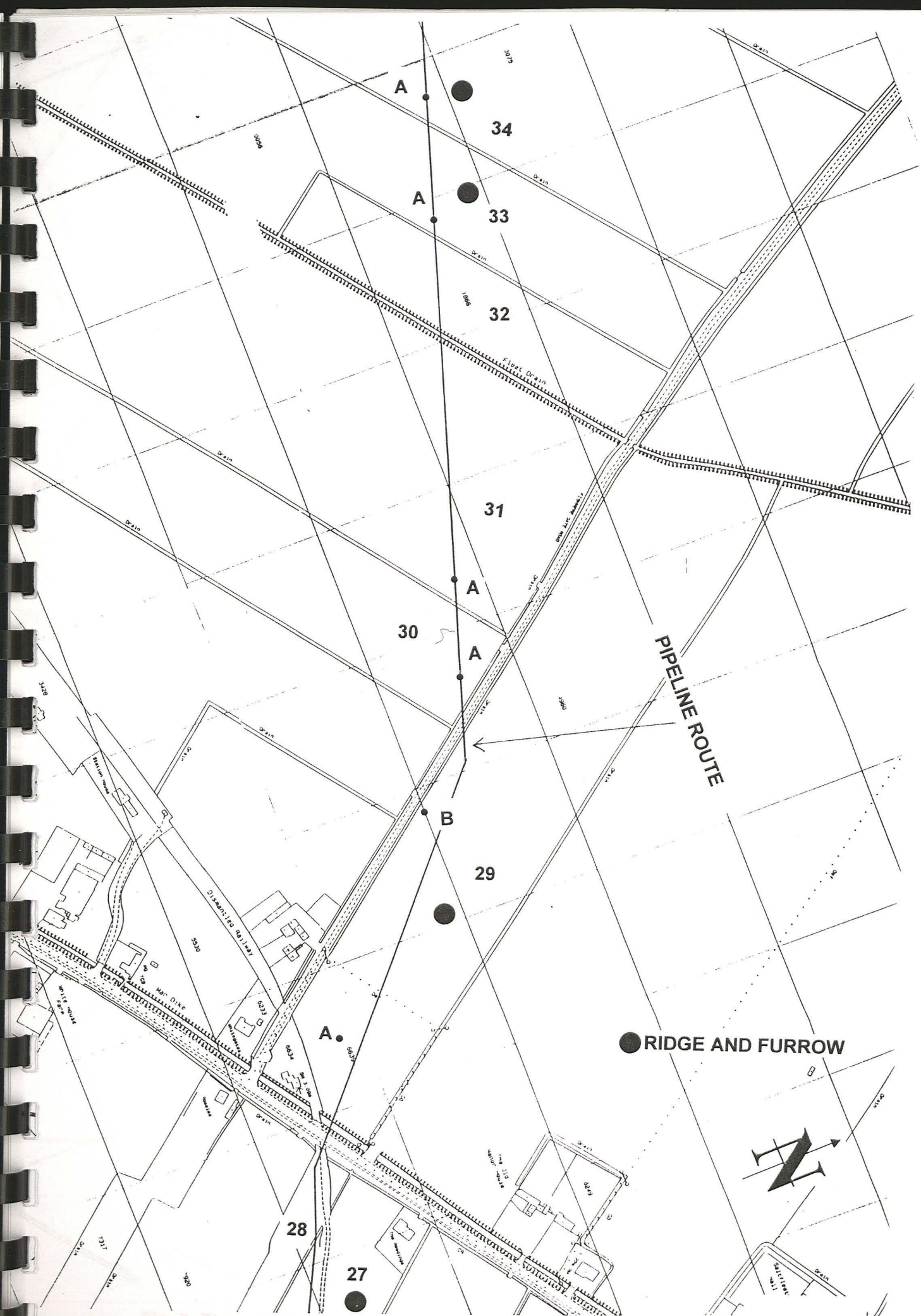



**Fig. 8 The pipeline route, showing LAS field numbers 27-34 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).**

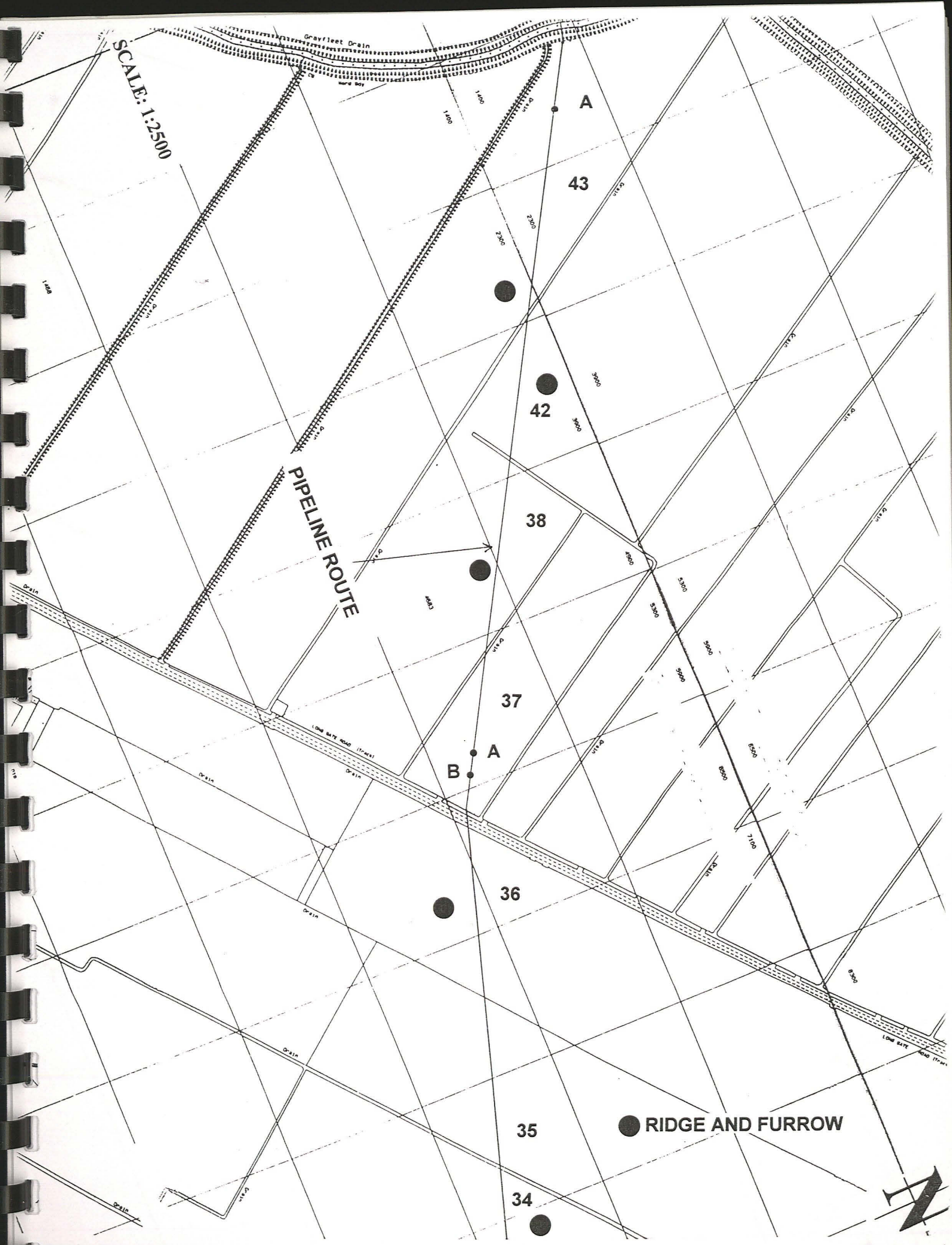



Fig. 9 The pipeline route, showing LAS field numbers 34-43 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).

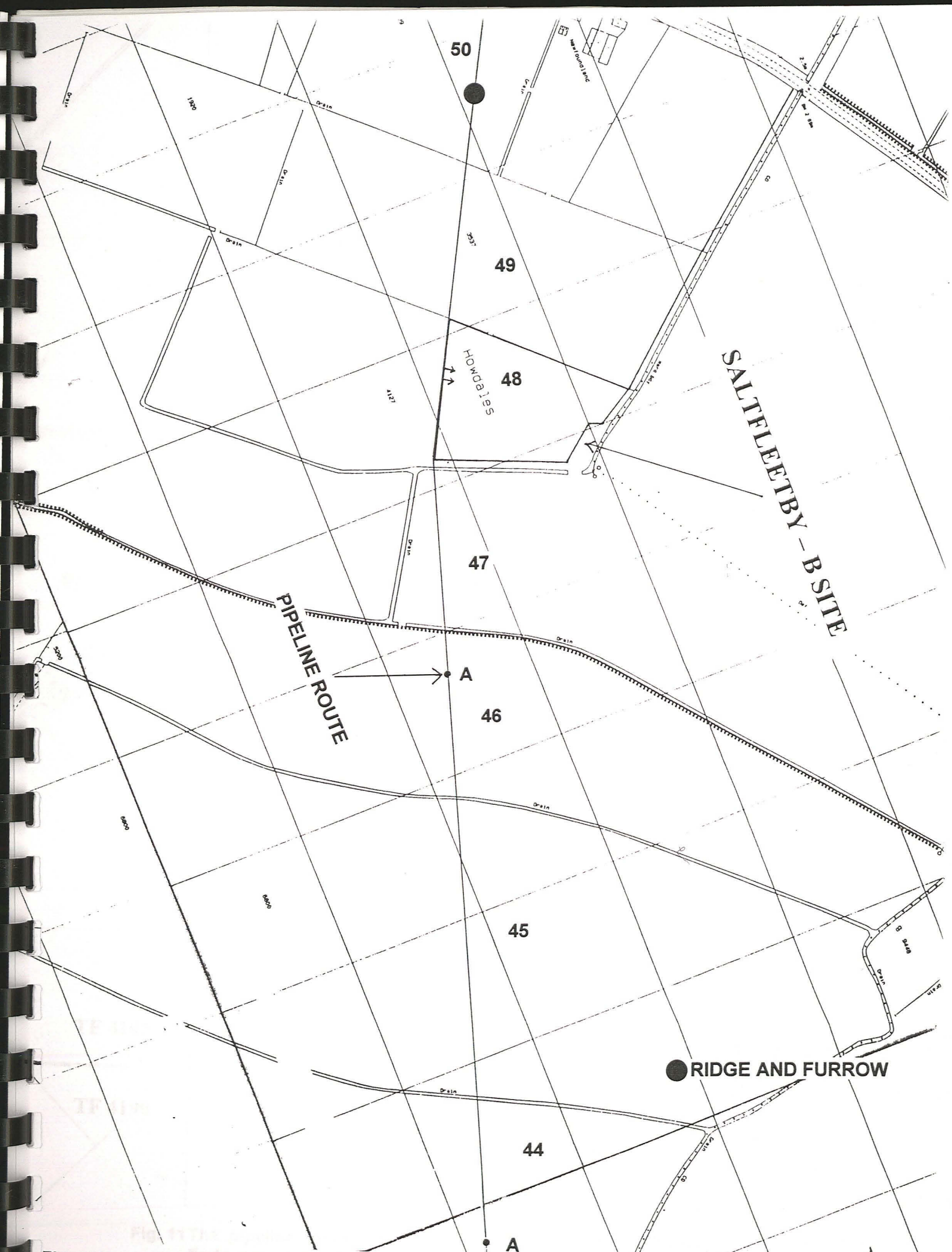



Fig. 10 The pipeline route, showing LAS field numbers 44-50 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).

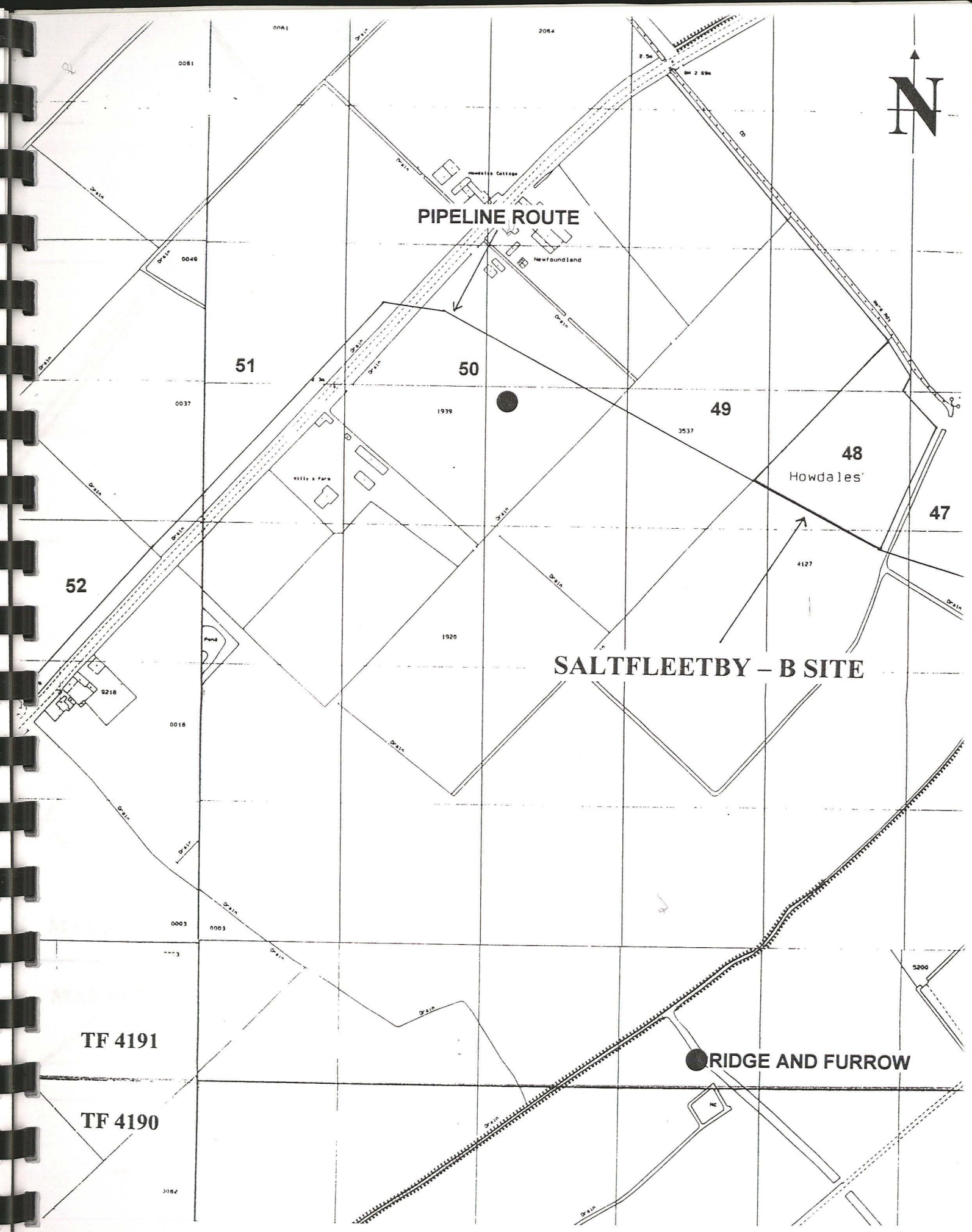



Fig. 11 The pipeline route, showing LAS field numbers 47-52 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).

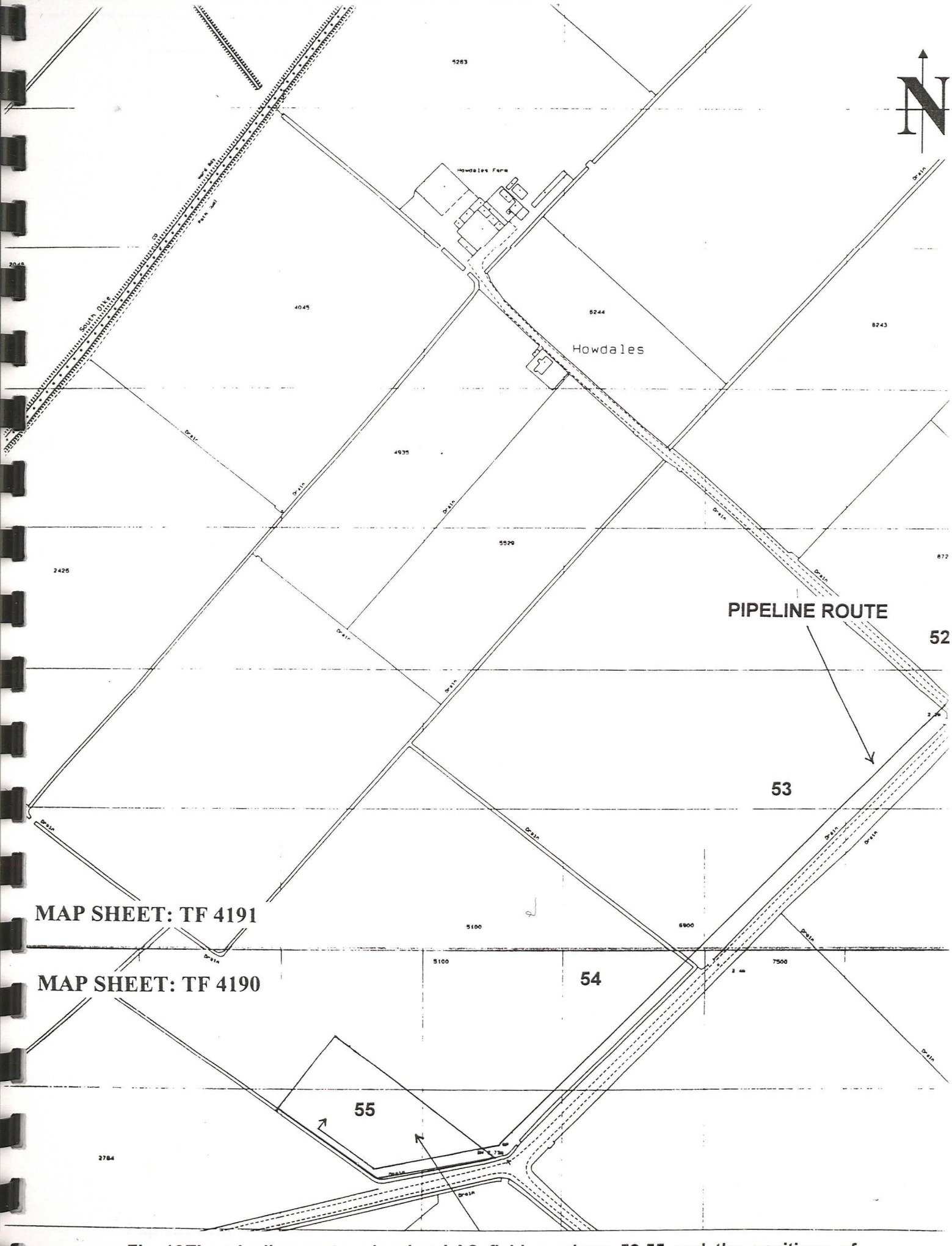



Fig. 12 The pipeline route, showing LAS field numbers 52-55 and the positions of findspots. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).

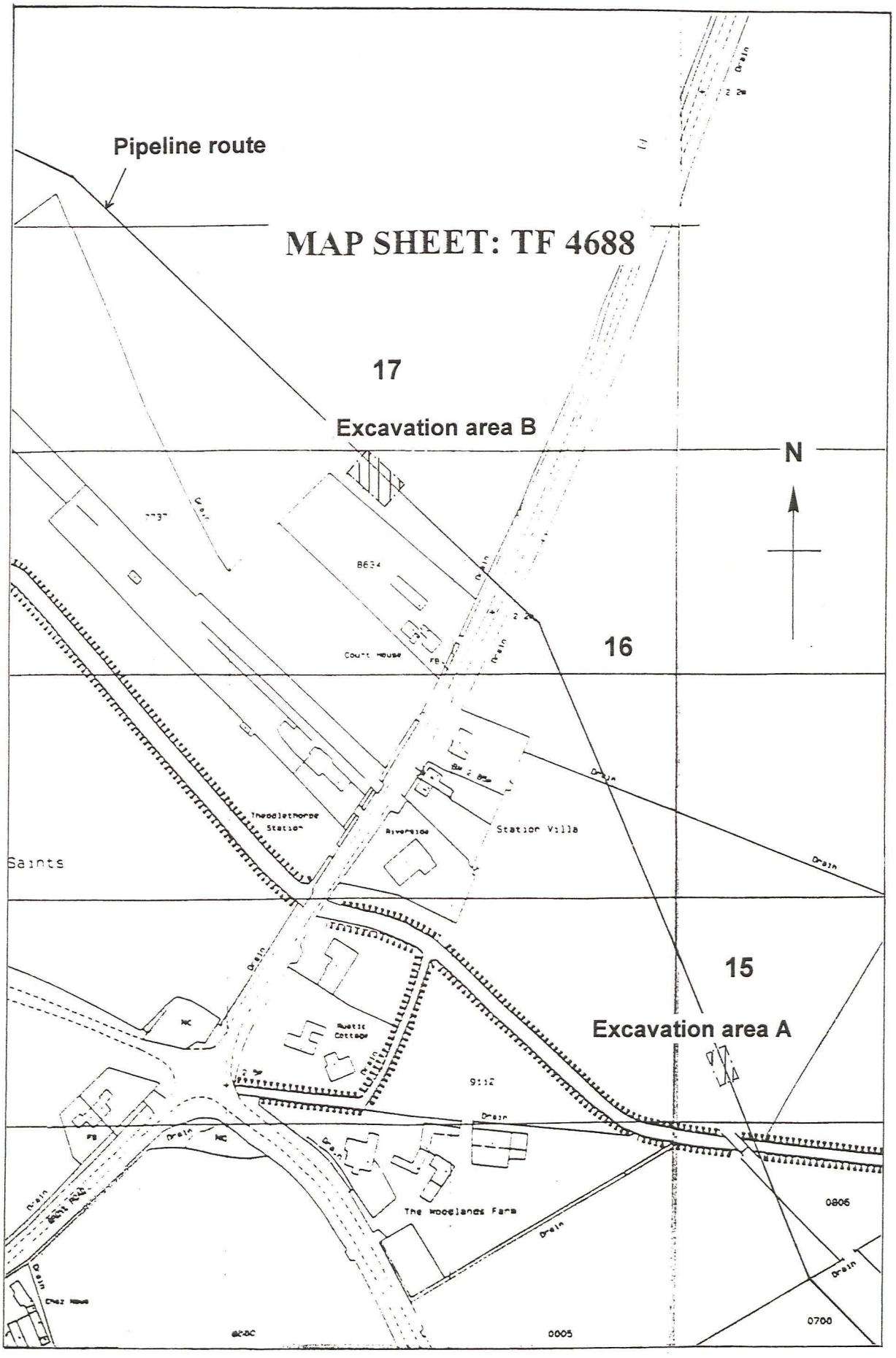



Fig. 13 Location of the Excavation Areas. (Based on the 1:2,500 plans supplied by the client. © Crown Copyright, reproduced with the permission of the Controller of HMSO. LAS Licence No. AL 50424A).

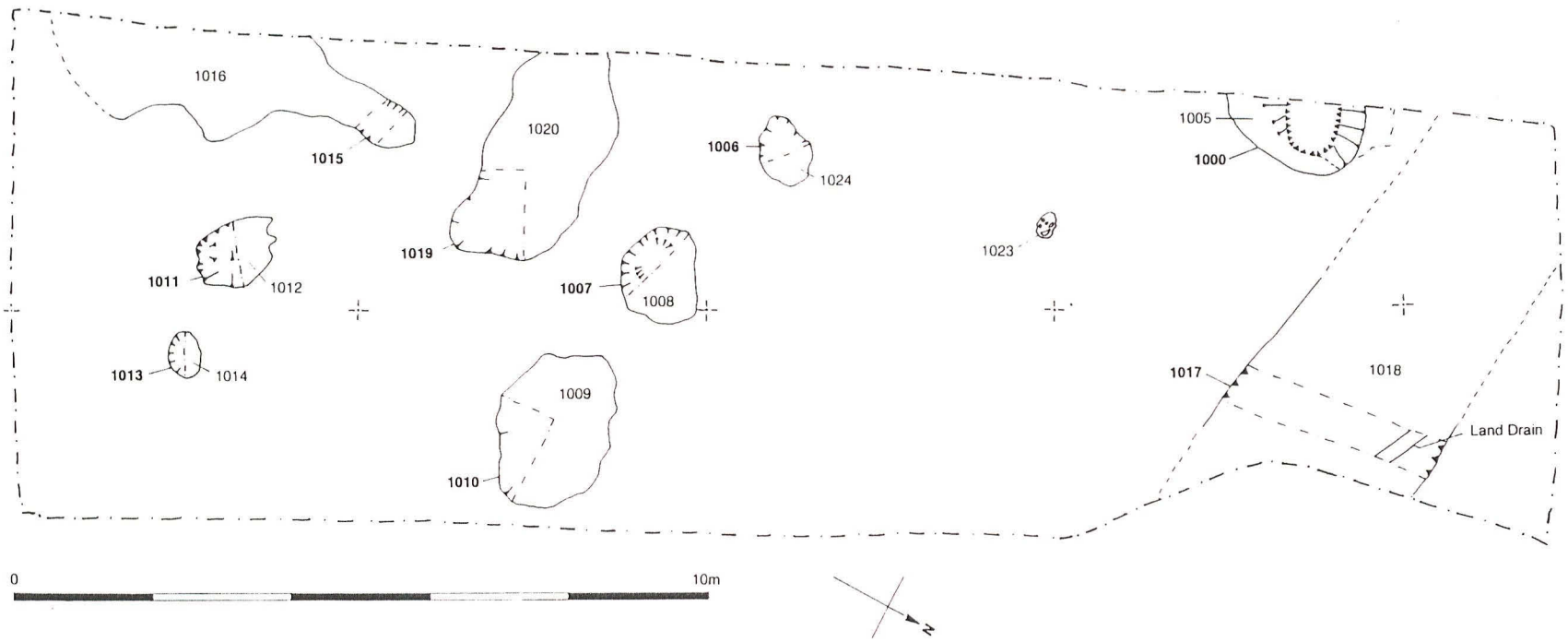



**Fig. 14 Plan of archaeological features, Excavation Area A (McDaid, after Allen).**

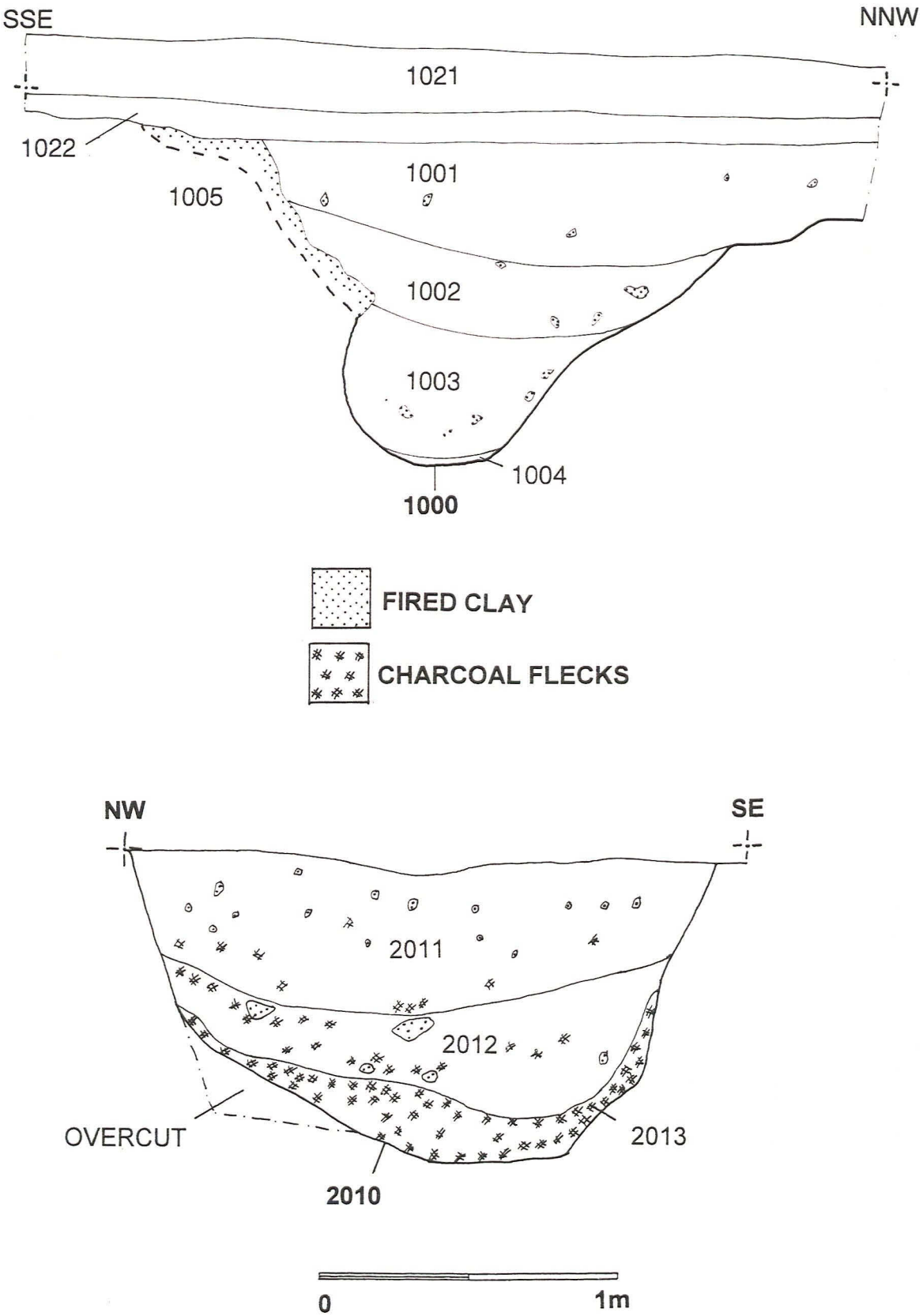



**Fig. 15 Sections across the fills of well/pit 1000 (Area A), and ditch 2010 (Area B). (McDaid, after Bailey).**

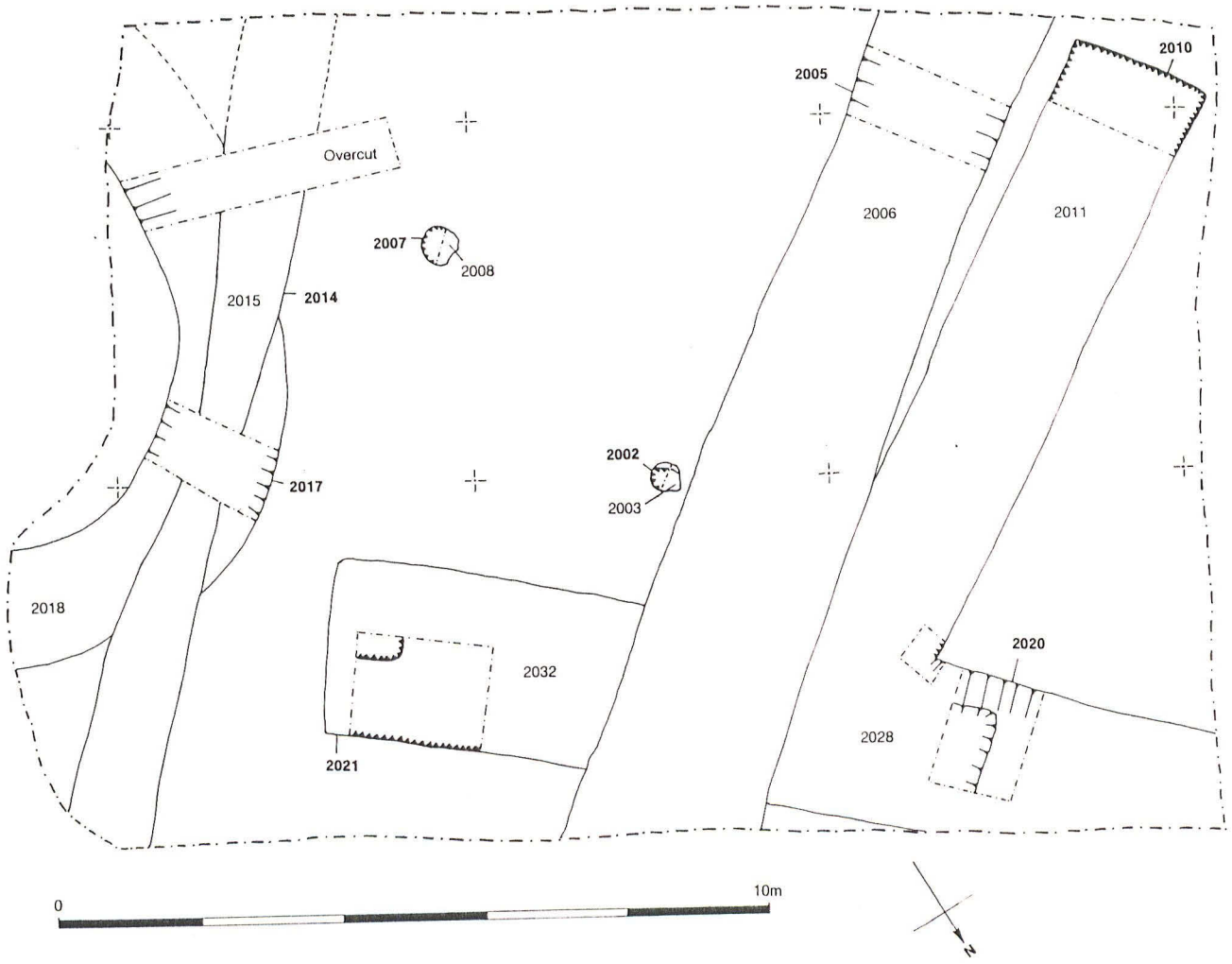



**Fig. 16 Plan of archaeological features, Excavation Area B (McDaid, after Allen).**

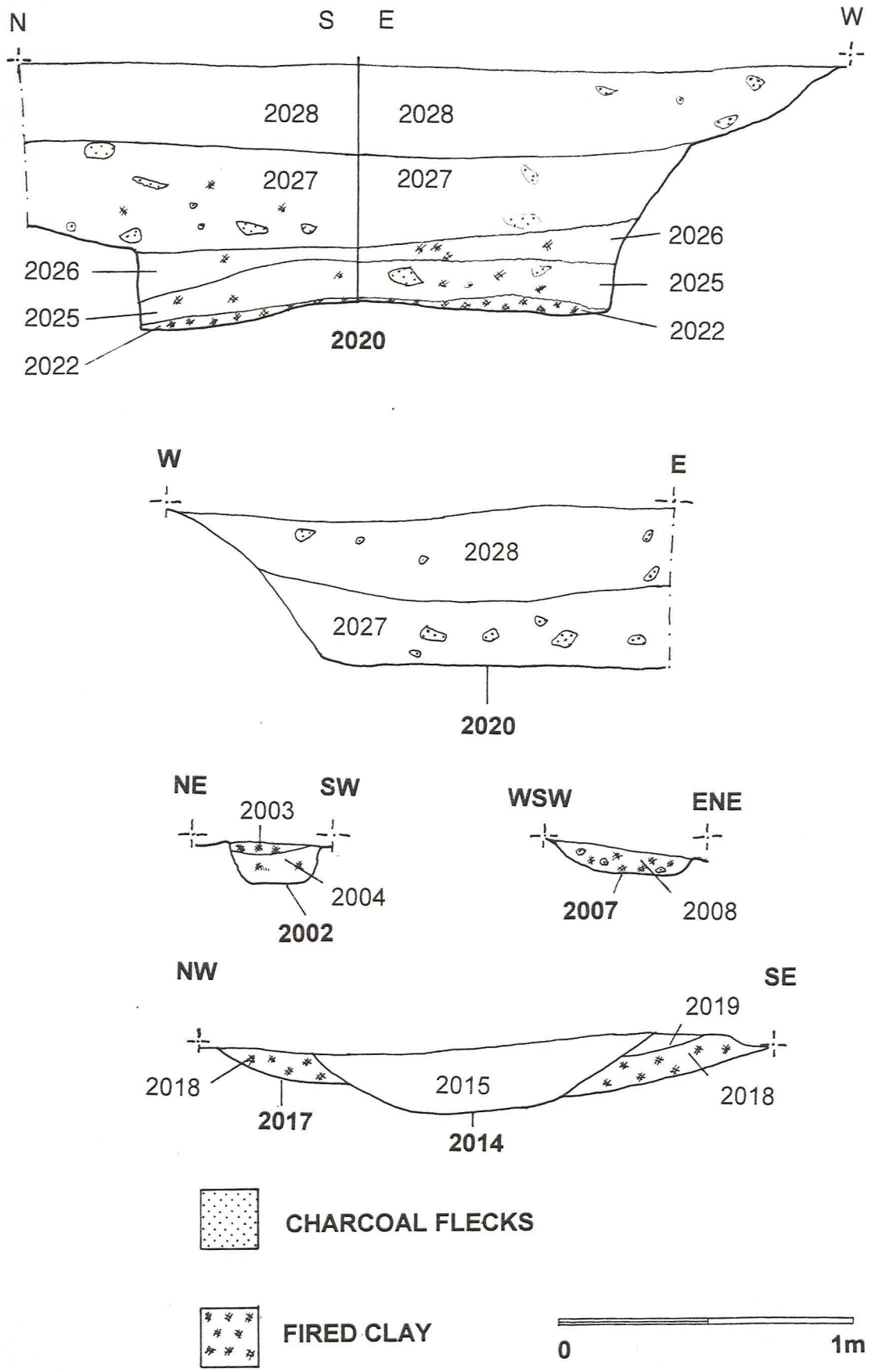



**Fig. 17 Sections across the fills of ditch 2020, post-holes 2002 and 2007, plough furrow 2014 and ditch 2017 (Area B). (McDaid, after Allen).**

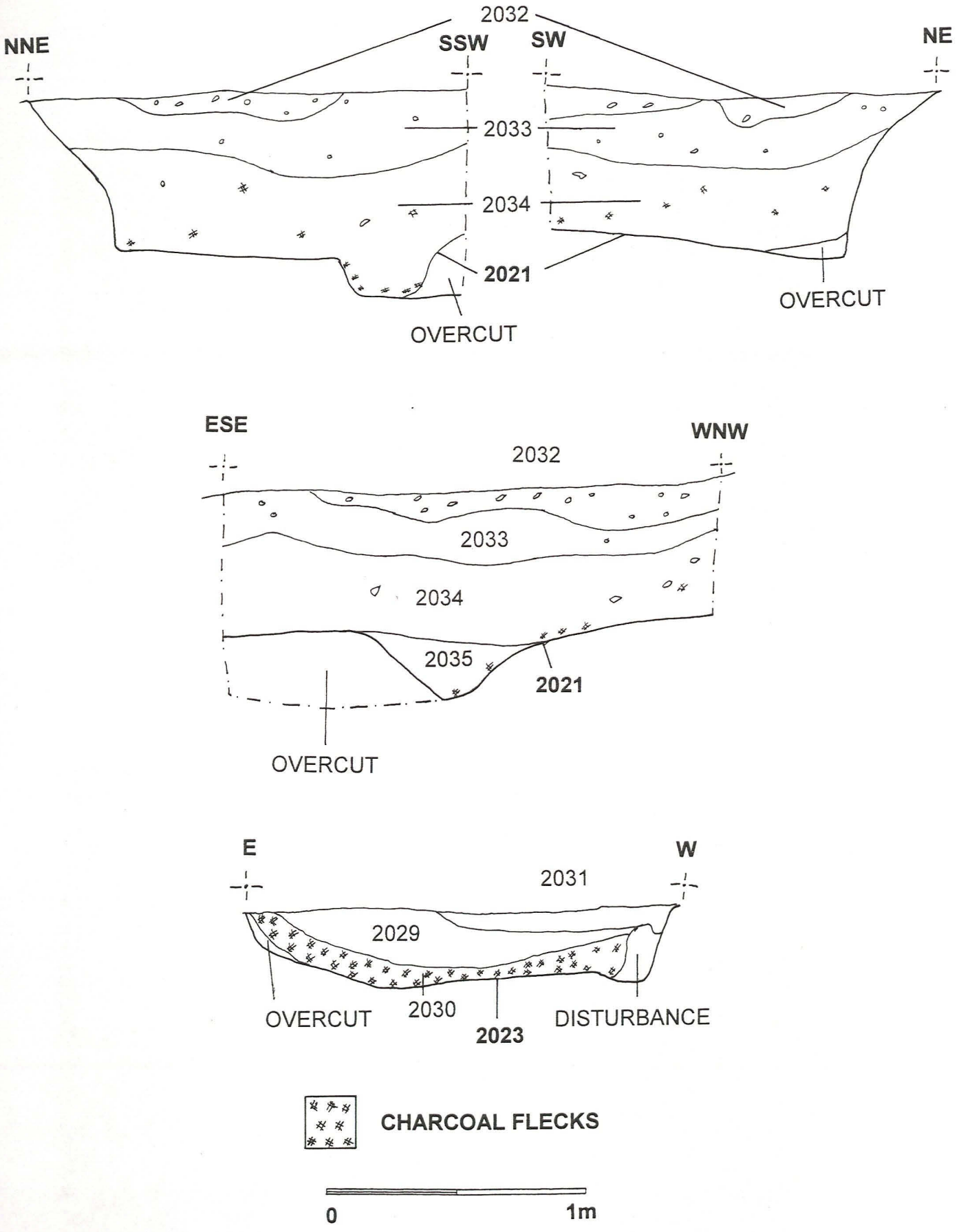



**Fig. 18** Sections across the fills of ditches 2021 and 2023 (Area B). (McDaid, after Allen).

Pl. 1 Topsoil stripping in progress, Field 27 (looking NW).

Pl. 2 The pipe trench after excavation, Field 4.

Pl. 3 Peat layer covered by silt visible in the pipe trench face, marking a broad depression between Fields 7 and 8. Looking west.

Pl. 4 Location of pit 10A (left foreground) and depression 10B (centre distance) at northern end of Field 10. Looking NW.

Pl. 5 Multiple unexcavated features similar to 10A, containing ash, were seen across this section of easement after topsoil removal. Looking SE from northern end of Field 10, with 10A on right edge of the easement.

Pl. 6 Part-excavated small pit 10A, with ash and cereal chaff as primary fill. Scale divisions 0.5m.

Pl. 7 Engineering bricks in the bridge formerly carrying the railway track over field drainage ditches between Fields 12 and 13. Looking east.

Pl. 8 Soil colour differences visible after removal of the topsoil show traces of levelled ridge and furrow in Field 12 (looking NW).


Pl. 9 Ridge and furrow surviving in pasture, Field 14. Looking SE across the former railway bridge over The Cut.

Pl. 10 Theddlethorpe All Saints, showing the pipeline easement. The position of Excavation Area A, at 15A-B, is marked by the orange barrier fencing.

Pl. 11 Spread of fired clay fragments with wattle impressions at 15A, sloping downwards at the edge of a small pit or well.

Pl. 12 Location of Excavation Area B, Field 17 (looking NW across Station Road. The excavation site was at the right side of the easement, beyond the tall spoilheap.

Pl. 13 Dark burnt material visible on the easement surface after topsoil removal, 17B (looking NW).

Pl. 14 Planking protecting Excavation Area B, with the pipe trench in Field 17. The white stones in the trench side mark a backfilled field ditch. Looking SW.

Pl. 15 Backfilled field ditch north of Excavation Area B. This ditch is in line with an existing ditch to the west.

Pl. 16 North of Theddlethorpe All Saints village, the pipeline cut through a pasture field with ridge and furrow earthworks, Field 19. Looking NW to the former railway line.

Pl. 17 Clearing the pipeline easement in Fields 18 and 19, north of Theddlethorpe All Saints (looking south across ridge and furrow, with the railway line to the right).

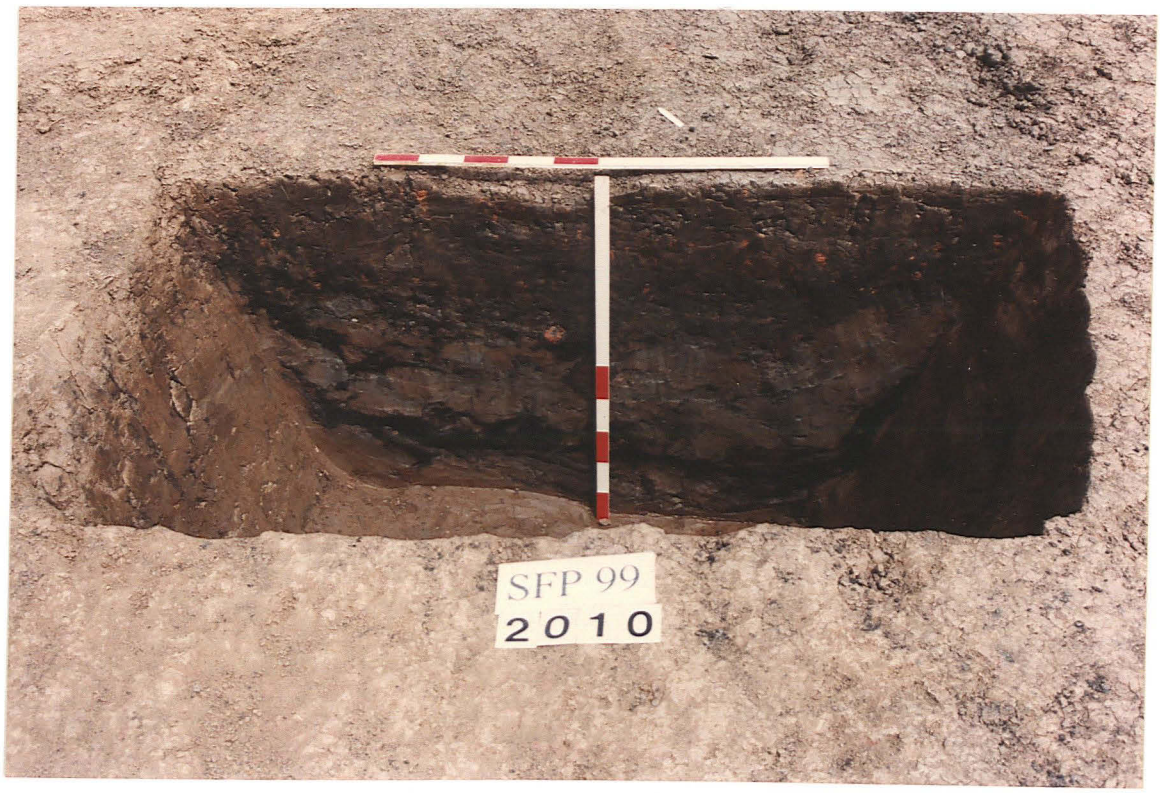
Pl. 18 The pipe trench in Field 29, with undulating interface between the topsoil and silt reflecting post-medieval plough furrows (looking SE).

Pl. 19 Excavation Area A during excavation, Field 15 (looking NW).

Pl. 20 Part-excavated well or pit 1000, Excavation Area A. Looking south, scale divisions 0.5m).

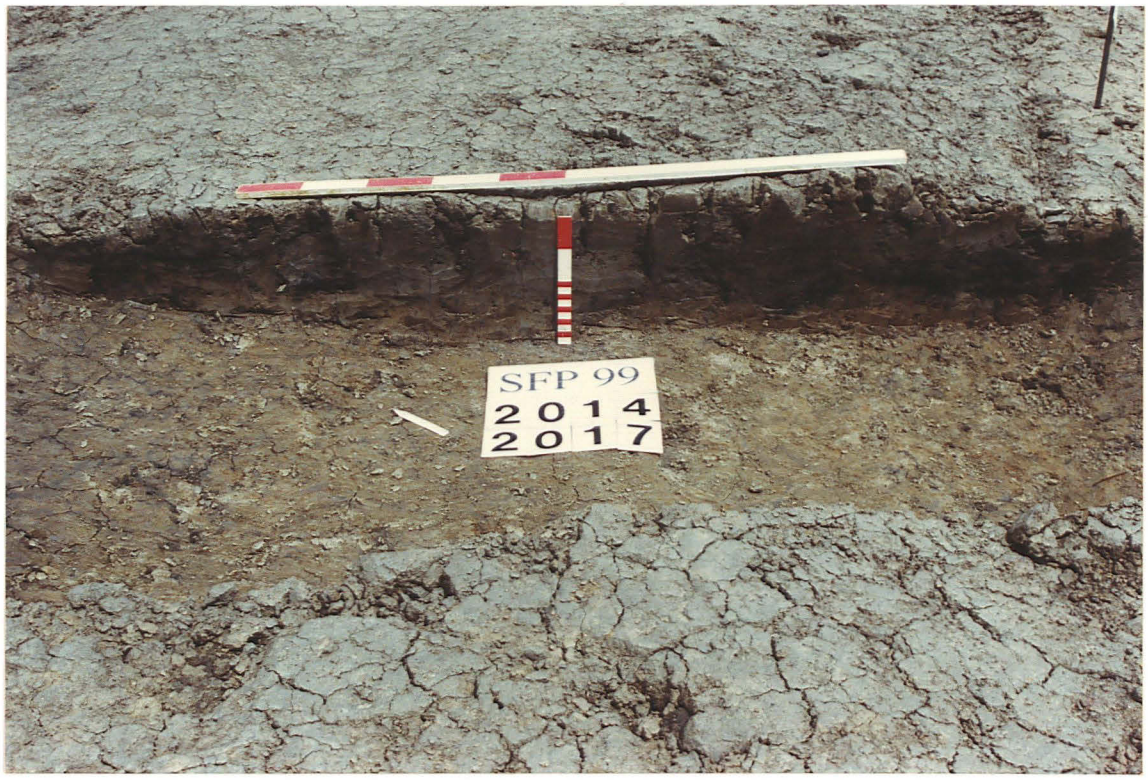
Pl. 21 Excavation Area B, Field 17, prior to excavation (looking SW).

Pl. 22 Section across ditch 2010, Excavation Area B (looking NE, scale divisions 0.1m and 0.5m).




Pl. 23 Section across part of ditch 2021, Excavation Area B (looking NW, scale divisions 0.01m, 0.1m and 0.5m).

Pl. 24 Section across part of ditch 2020, Excavation Area B (looking SE, scale divisions 0.1m, 0.5m and 1m).




Pl. 25 Section across truncated ditch 2014 (light brown fill in centre) and earlier ditch 2017 (charcoal rich fill), Excavation Area B. Looking NE, scale divisions 0.01m, 0.1m and 0.5m.

Pl. 26 Section across part of ditch 2023, Excavation Area B (looking west, scale divisions 0.01m, 0.1m and 0.5m).