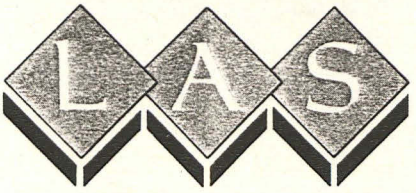

LINDSEY ARCHAEOLOGICAL SERVICES
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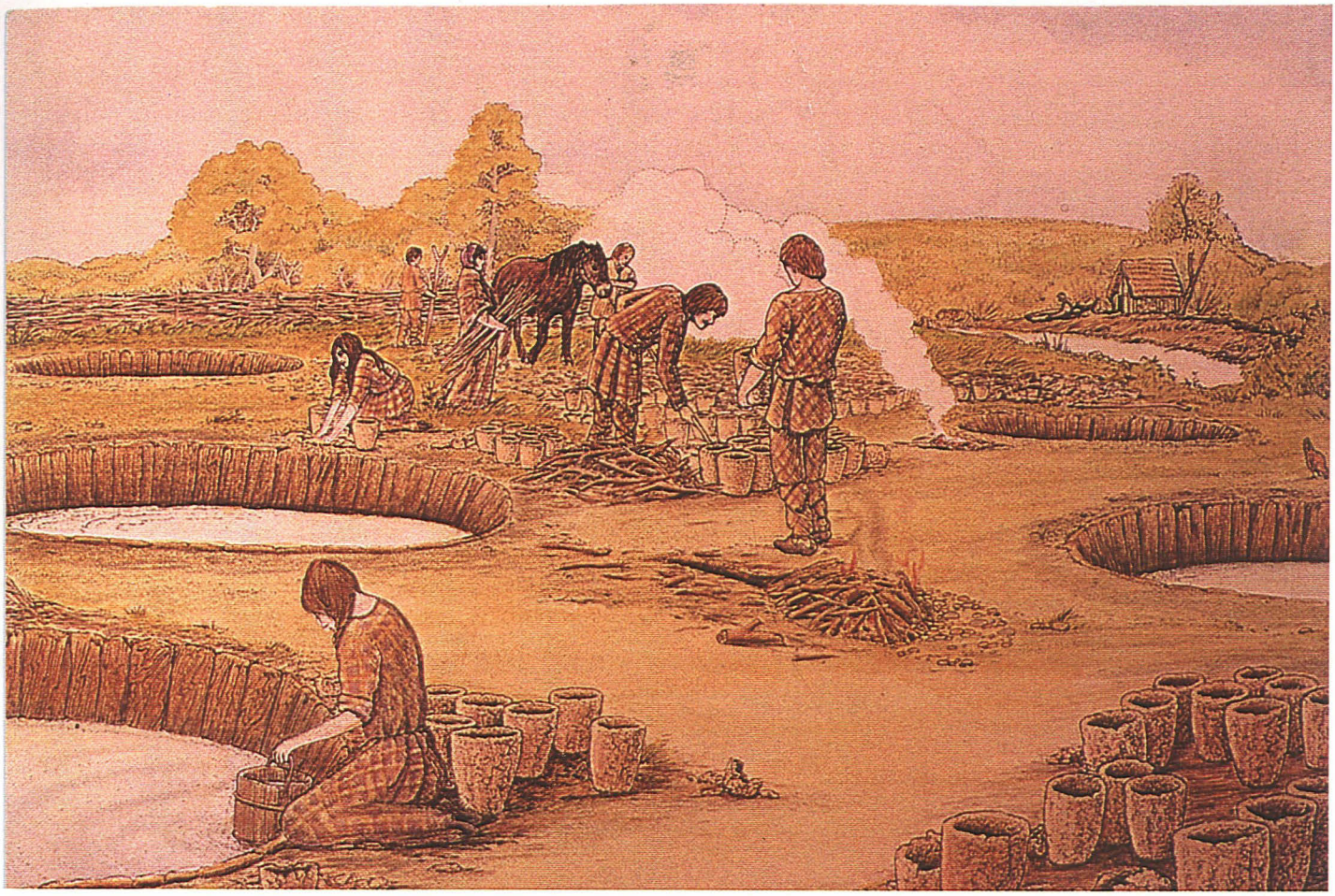
Newton Marsh Sewage Treatment Works, Tetney, Lincolnshire

(From King's Road, Cleethorpes and Hoop End, Tetney to Newton Marsh, Tetney and the River Humber):

Archaeological Monitoring of *Project Clear Water '95*

July 1995
Report prepared for Anglian Water Services



Frontispiece: Saltmaking in Progress - An artist's impression, based on the excavation of a 1st century BC site at Old Bowling Green, Droitwich. The Tetney industry was considerably earlier and based on sea salt; no vessels similar to those depicted were present. (Illustration by Carolyn Hunt. Copyright: County Archaeological Service, Hereford and Worcester County Council. Reproduced with the permission of Derek Hurst).

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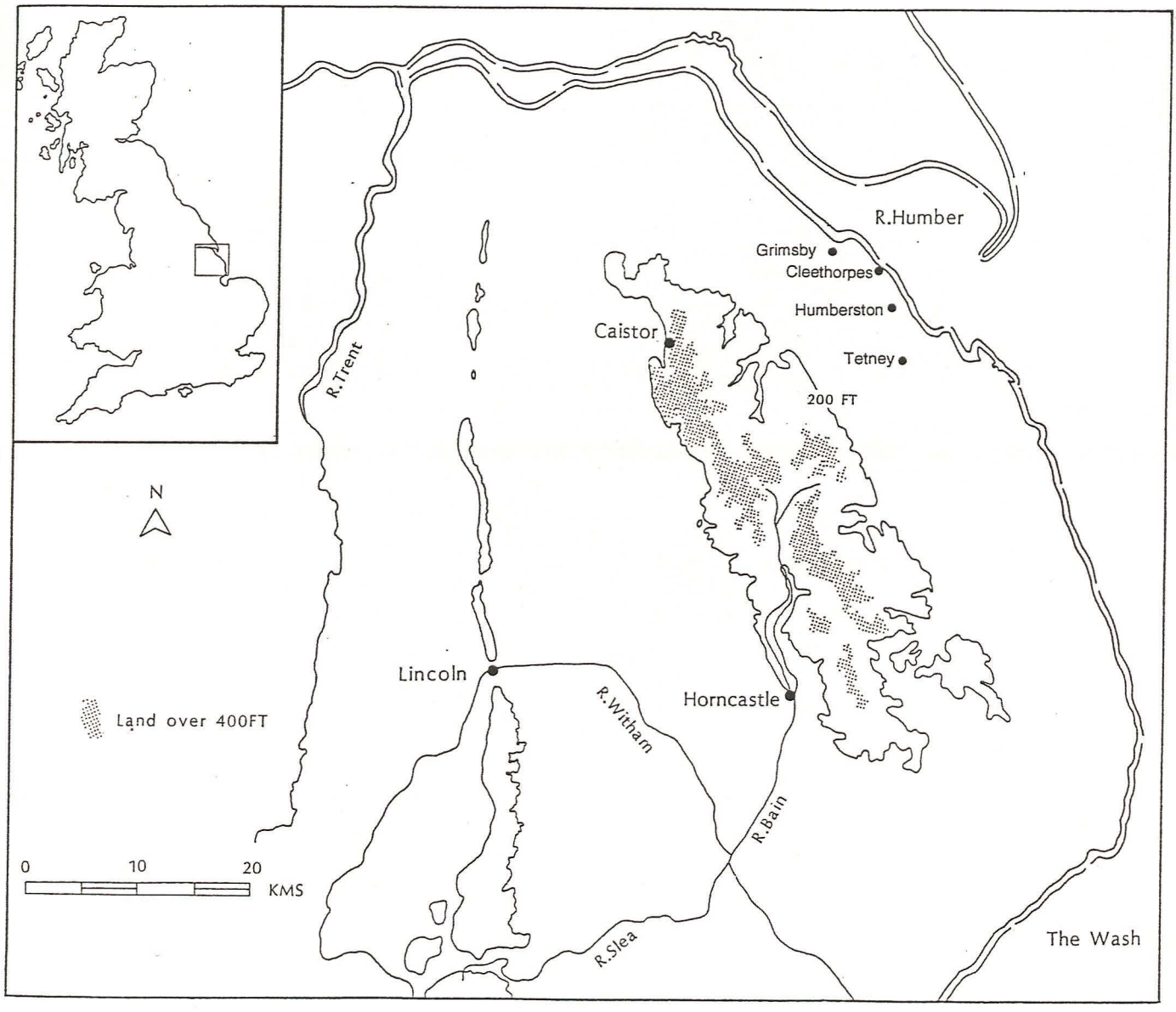

Fig. 0.1 Location plan (D. Taylor)

Fig. 0.2 Present ground contours and drainage (based on the 1992 1:50,000 Ordnance Survey Landranger map Sheet 113. (Crown Copyright; reproduced with the permission of the Controller of Her Majesty's Stationery Office, Licence no. AL 50424A)

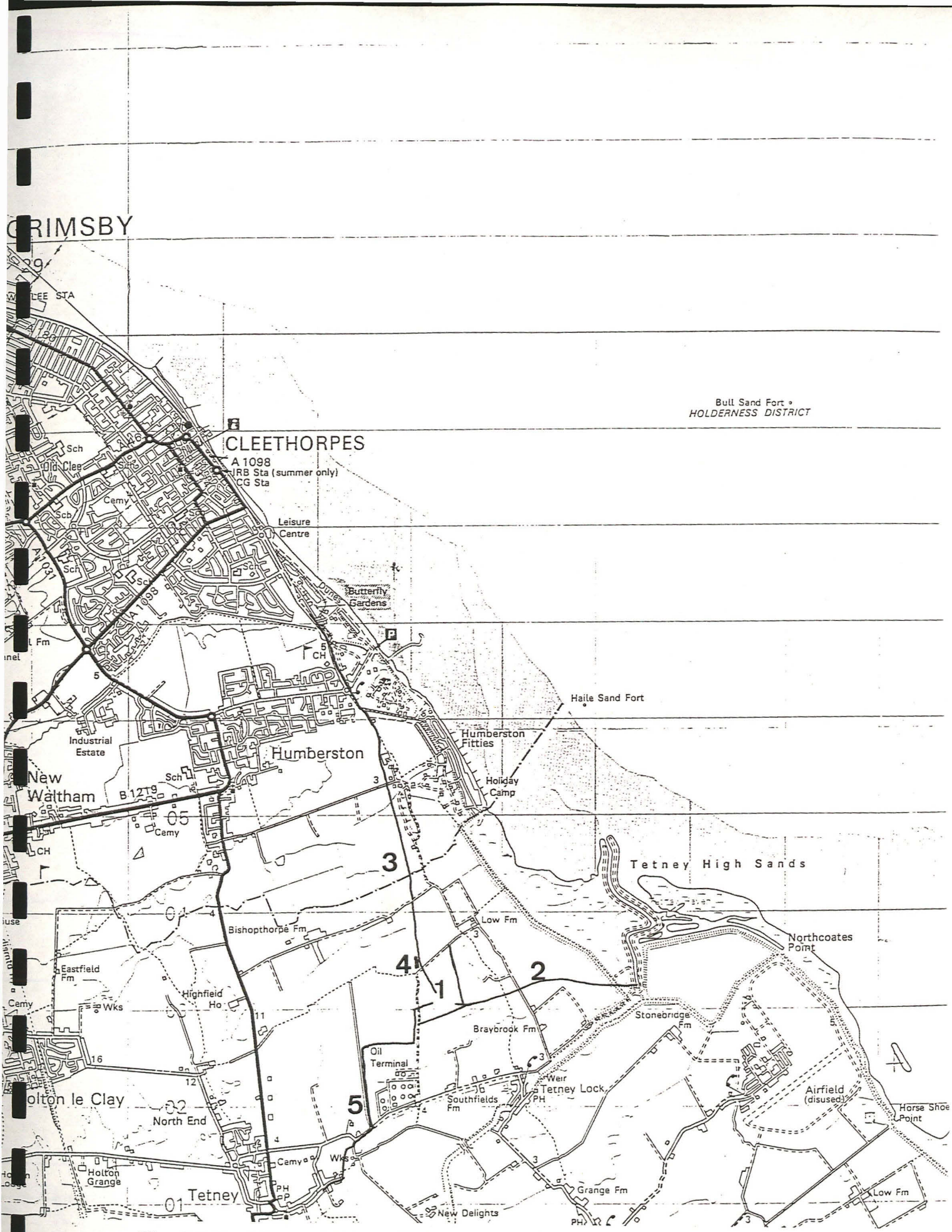

Fig. 0.3 Positions of the projects monitored (based on the 1992 1:50,000 Ordnance Survey Landranger map Sheet 113. (Crown Copyright; reproduced with the permission of the Controller of Her Majesty's Stationery Office, Licence no. AL 50424A)

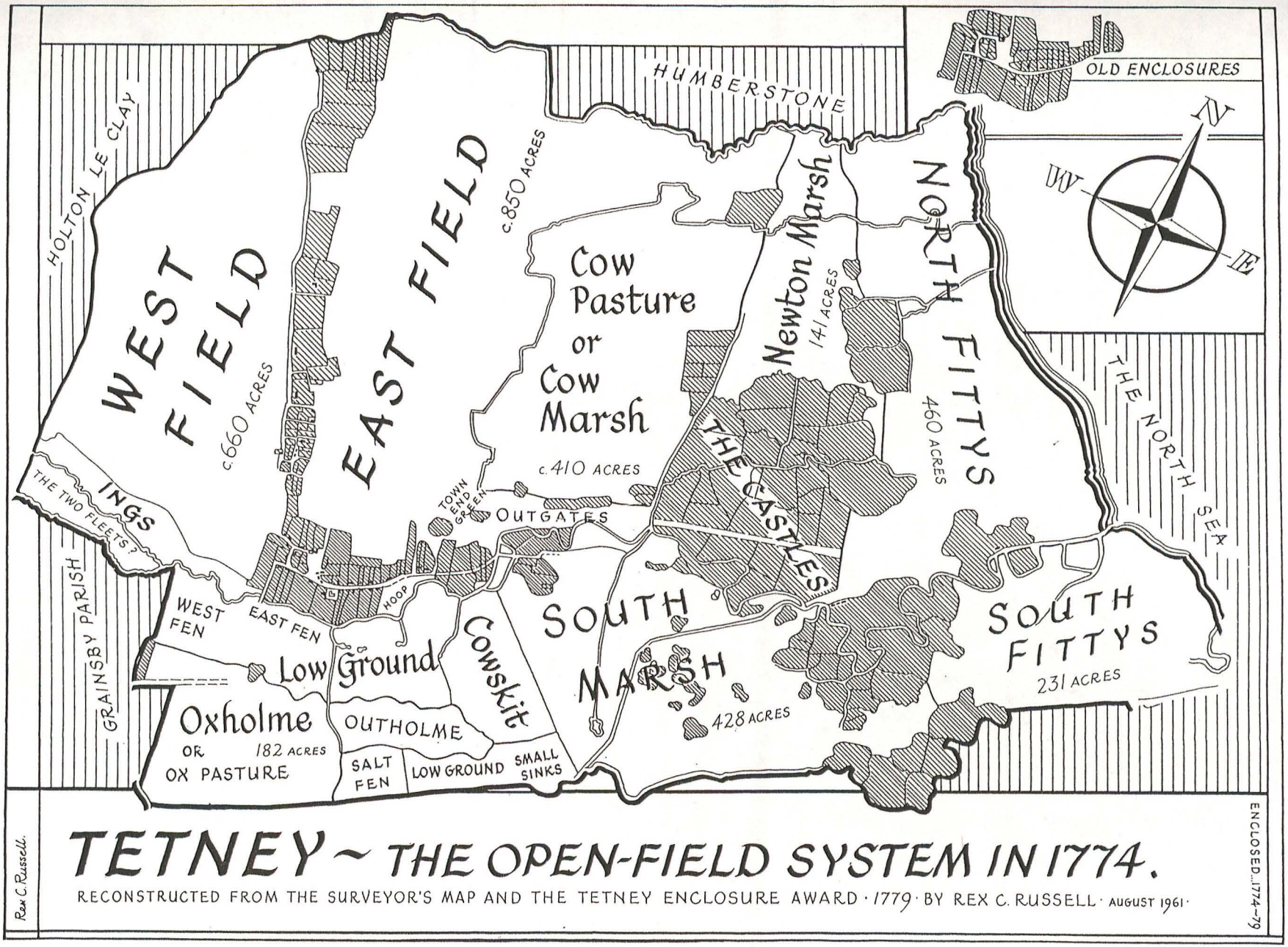

Fig. 0.4 Unenclosed land in Tetney before the 1779 Enclosure Award (reproduced from Russell and Russell 1983, 97)

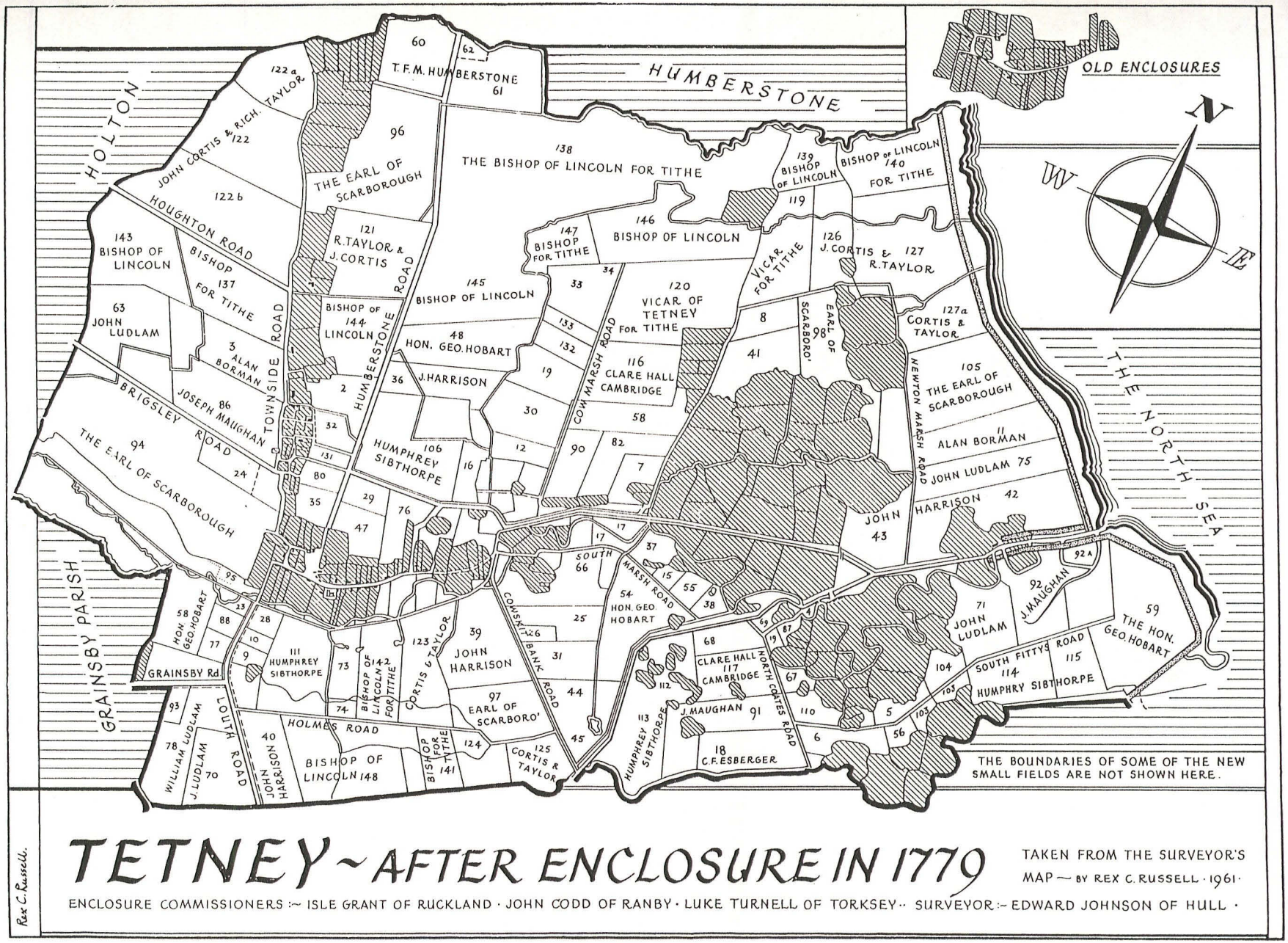

Fig. 0.5 Tetney after the 1774-9 Enclosure Award (reproduced from Russell and Russell 1983, 99)

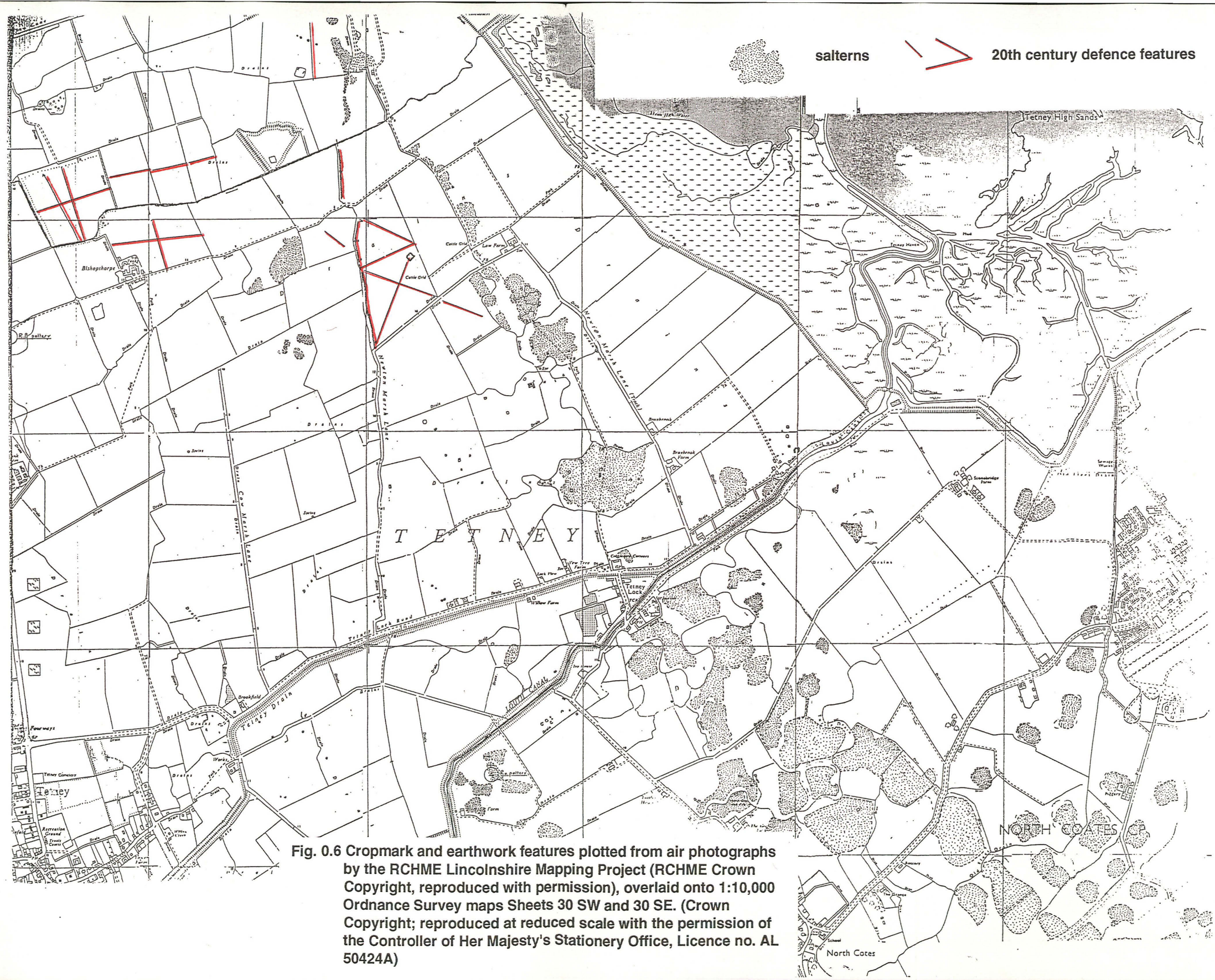

Fig. 0.6 Cropmark and earthwork features plotted from air photographs by the RCHME Lincolnshire Mapping Project (RCHME Crown Copyright, reproduced with permission), overlaid onto 1:10,000 Ordnance Survey maps Sheets 30 SW and 30 SE. (Crown Copyright; reproduced at reduced scale with the permission of the Controller of Her Majesty's Stationery Office, Licence no. AL 50424A)

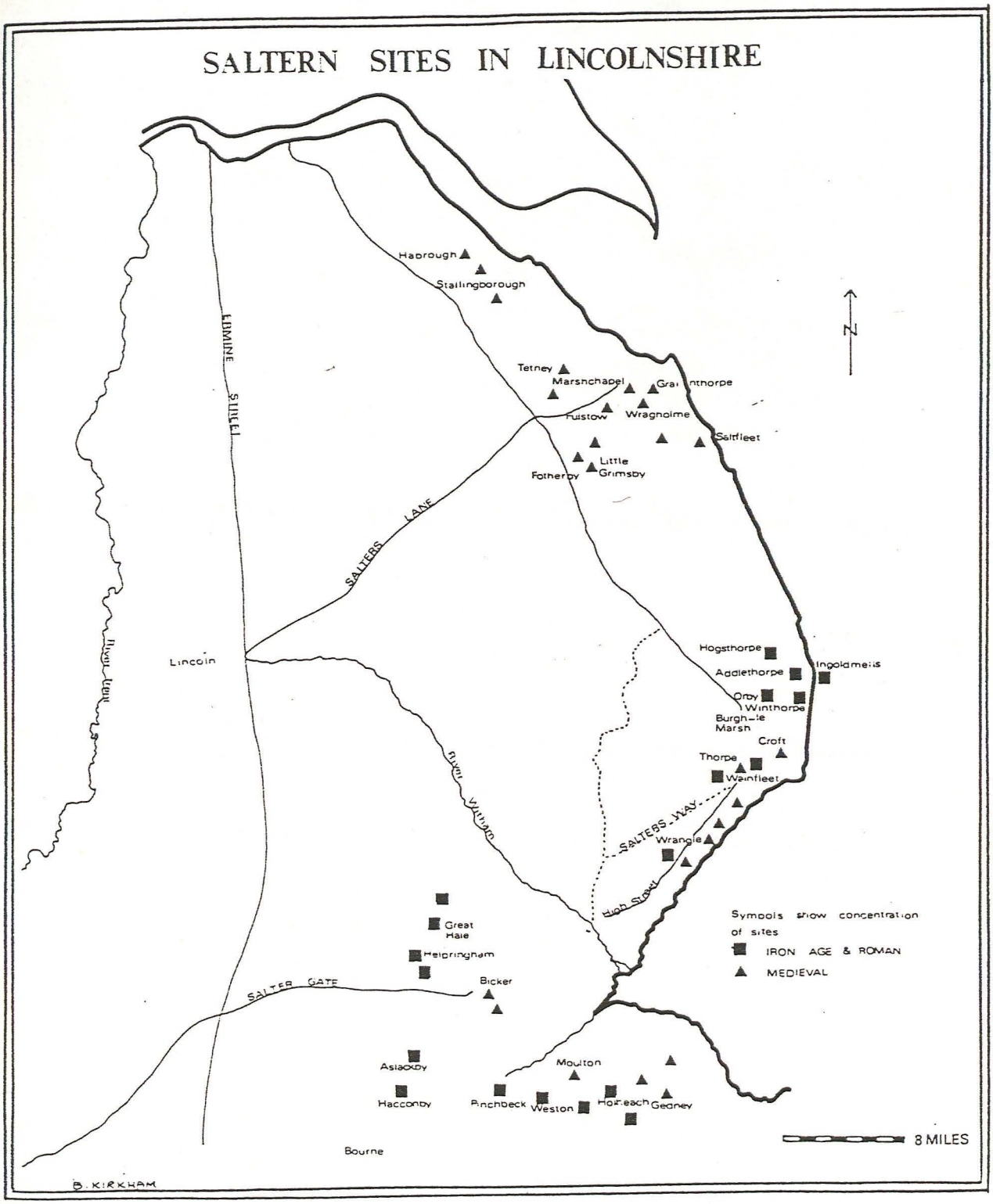

Fig. 0.7 Concentrations of Saltern sites in Lincolnshire (Kirkham 1975)

Pl. 1 Aerial view showing the NW part of the Newton Marsh Lane Sewage Treatment Works (Tanks 1-3 in preparation) and the 1993 saltern excavation area (looking west). Project 3 entered the photograph at the top right, then followed the trample and machine rut line to the Inlet Works (not built, beside the bulldozer). The 1994 excavation was in the top left corner of the cultivated field; note the dark marks of former creeks.

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Bottom row: Flat rims (scale divisions 0.01 and 0.05m)

Newton Marsh Sewage Treatment Works, Tetney, Lincolnshire

(From King's Road, Cleethorpes and Hoop End, Tetney to Newton Marsh, Tetney and the River Humber):

Archaeological Monitoring of *Project Clear Water '95*

Summary

An extended programme of archaeological monitoring was conducted in association with groundworks for the Tetney (Newton Marsh Lane) Sewage Treatment Works during 1993 and 1994. Excavation of the first archaeological remains exposed concluded that the STW was located beside a Late Bronze Age saltmaking site, prompting intensive monitoring of further groundworks including three pipelines.

A very few additional archaeological features, mostly stake or small post-holes, were recognised within the STW plant area. The Outfall trench cut through deposits indicating wetter land and no archaeological sites were identified. A pipe trench to Cleethorpes revealed further evidence of Late Bronze Age saltmaking close to the initial excavation area. Two redeposited Romano-British sherds were recovered from relict beach deposits near Humberston Wadhouse, and most of a medieval pottery jug was found in Cleethorpes. A second saltmaking site was located close to Tetney village but its date was not ascertained (although it appeared to be Roman or earlier).

An important aspect of the monitoring was the recording of trench stratigraphy at intervals, from which various profiles and plans of stratigraphic horizons were produced. These demonstrate the uneven post-glacial land surface very different from the present flat landscape created by sediment deposited during marine flooding episodes. It is evident that the located prehistoric saltmaking features were on former islands of higher land at least partly surrounded by natural creeks.

General Introduction (Figs. 0.1-0.5)

The urban conglomeration of Cleethorpes and Grimsby, and the village of Tetney, experienced considerable population growth during the late 1980s and this has been predicted to continue. Surface drainage was inadequate to cope with heavy rainfall in Cleethorpes where overflow sewer outfalls have traditionally been onto the beach. Anglian Water, as the local provider of water treatment and disposal services, planned a £45m replacement sewage treatment and disposal scheme known as Project Clear Water, to serve this increased demand and improve the quality of seawater at the holiday resorts (Anglian Water 1992a). Project Clear Water consisted of three elements:

- A new Sewage Treatment Works (STW) at Newton Marsh Lane, Tetney
- Laying new sewers to link Cleethorpes and Tetney with the new treatment plant
- Constructing a larger sewer in Cleethorpes

It was intended that this improved sewage management system would be operating by 1995, in advance of UK Government deadlines for closer compliance with EC Standards.

Anglian Water liaised with Lincolnshire County Archaeological Officer from the planning stage of the scheme with the intention of minimising the archaeological damage that might be caused by a project of this size. A geophysical survey of the Newton Marsh Lane STW site was requested and this showed distinct areas of anomalies (Johnson 1992). As a consequence of the survey findings, a watching brief and excavation were arranged for the site and prehistoric saltern features were found about 0.8m below the field surface at the location indicated by the survey. The saltern was excavated and a report on that project was produced in April 1994 (Palmer-Brown 1993a and 1994). Monitoring of the remainder of the STW area continued until the groundworks had been completed, recording a small number of archaeological features and observations of peat and other deposits which mirror the masked post-glacial environment and topography of the site.

Further monitoring projects were arranged on the routes of the Outfall pipeline, and the Inlet Rising Main pipeline from King's Road, Cleethorpes. Additional evidence for prehistoric saltmaking was revealed close to the STW on the Inlet pipeline easement and this was the subject of a second, shorter excavation directed by Colin Palmer-Brown. In 1994 the Rising Main from the Tetney, Hoop End Pumping Station was constructed and this was also the subject of a watching brief. A brief interim report was produced during the fieldwork (Tann 1994).

This report presents the descriptions and findings of the archaeological monitoring of the four separate engineering projects, placing the results in the context of the local landscape (Fig. 0.3). It also includes the report on the second archaeological excavation.

Geology, Soils and Early Vegetation

Tetney and Cleethorpes lie within the Outmarsh zone in the Lincolnshire Marsh. The Outmarsh consists of virtually flat ground below 10m OD, separated by the Middlemarsh zone of slightly undulating higher land from the Lincolnshire Wolds (Van de Noort and Davies 1993, 20). The flatness of the Outmarsh is the result of the uneven post-glacial surface becoming covered with sediment deposited during marine inundations.

The post-glacial coastline lay some kilometres east of the present shore, with the ground surface uneven with small hillocks. A dense woodland of Oak, Elm, Birch and Yew covered part of the area before the late Neolithic period and the remains of this are exposed as fallen trunks, branches and stumps at low tide. A peat formation covered the fallen timber, reflecting a sea-level rise that had produced a drainage deterioration causing waterlogging which killed the trees. The earliest formation is referred to as the Lower peat and may have begun to grow by 4500 BP until about 4000BP. Close to the base of the peat pollen analysis has found evidence of species suggesting nearby agriculture.

The Lower peat was covered by a deposit of Triglochin clay by the Middle Bronze Age. This clay, up to 3m thick, represents a marine incursion and was laid down on an eroded peat surface implying that deposition began later than the initial inundation. Most of the Outmarsh area became populated by saltmarsh species indicating a zone of occasional flooding. Above the clay is a deposit of Phragmites clay containing freshwater reed material; the terminal date for that layer is also believed to be the Middle Bronze Age but closer definition of the duration of each event has not been reported.

Higher deposits cannot be traced over the whole of the Outmarsh but have been studied at specific locations. The earliest was a higher peat only noted close to Chapel Point where it was dated to the mid-late Bronze Age/Iron Age (radiocarbon date 3340 +/- 110BP [Q-686]). A covering layer of Scrobicularia clay indicates a second inundation phase dated to the early Iron Age. An Upper peat horizon, observed at Ingoldmells but not at Chapel Point marks another marine regression, thought to be mid Iron Age/Roman, but this layer was also blanketed by thick Scrobicularia clay from a Roman or post-Roman inundation.

The date at which the sea regressed from the Outmarsh has not been reliably distinguished, but the eastern edge of the Middlemarsh has a distribution of settlements with Anglo-Saxon placenames which indicate that the salt marsh may by then have become suitable for at least seasonal grazing.

Archaeological Background

The Newton Marsh Lane Sewage Treatment Works was constructed on three former arable fields, the most northerly of which lies one field west of a cluster of well-preserved medieval saltern waste mounds south of Low Farm (Fig. 0.6; Pls. 2 and 3). The saltern mounds are relics of the extensive early medieval to post-medieval salt water processing industry of the Lincolnshire

salt marshes (Fig. 0.7; Pattison and Williamson 1986, 77-79). The medieval coastal salt industry continued until disastrous marine flooding in 1571-2 between Boston and Grimsby resulted in the loss of 'all the saltcotes where the best salt was made' (Holinshed's Chronicle 1577, cited by Rudkin 1975, 37). Some salt-workings were still in use in the county at the end of the 16th century when a cartographer, William Haiiwarde, indicated saltern mounds and described the processes used (Walshaw 1935). It has been suggested that the final blow to the Lincolnshire salt industry came as a result of the rapid expansion of the salt industry in the Firth of Forth and the mouth of the Tyne at the end of the 16th century (Sturman 1984, 54).

The medieval salt industry is thought to have been seasonal, sited on mudflats which were flooded by Spring tides but which were not reached by high tides at other times. The sea water impregnated the ground surface; when it dried the upper crust was scraped off and transported to salt-making locations, probably not very far from the flooded ground. The salty soil was washed and the resulting brine was collected and boiled; evaporation produced the salt residue which was important for food preservation and seasoning. The large quantities of rinsed soil (termed 'mold' or 'muldefang') were tipped close to the saltern sites and eventually produced large mounds.

The rinsing and evaporation processes made use of numerous ceramic vessels, some fired before use and others which became fired as evaporation occurred. Wooden troughs and buckets, and leather containers, were probably used but unlike the fired clay these have not survived. The fabric of the containers suggests that the vessels were made locally - perhaps even by the salters as and when required - and the distinctive material has been known as 'briquetage' since at least 1740 (De la Sauvagere 1740, cited by Fawn et al 1990, 10). The troughs and other containers may have been deliberately broken to free the cakes of salt, or the heating processes coupled with salt water caused a rapid turn-over of the vessels. Whatever the reason, the discarded briquetage was incorporated with the 'mold' and other refuse and is often recovered by archaeological fieldwork where the mounds have been cut by land drainage or other modern intrusions (Pls. 4 and 5). An auger hole into a mound close to Low Farm found the mound to consist mostly of silty clay (redeposited flood silts) (Pattison and Williamson 1986, hole B). The observation was confirmed by inspection in 1994 of trenching across the mounds for land drains.

The locations of medieval and early post-medieval saltern sites along the Lincolnshire coast moved eastward as the saltern mounds reclaimed land and small settlements developed. The older mound sites near Marshchapel and Grainthorpe have merged, but the later examples remain separated as mounds around a hollow (Pattison and Williamson 1986). The mounds at Low Farm, Tetney are separated and may therefore represent some of the latest examples in the locality.

In the 19th century, with the industry long dead, a local writer recognised the Newton Marsh mounds to be artificial but stated that they were 'supposed to

be druidical places of worship' (Dobson 1850, 39). It is possible that the early 20th century report of hut circles and a Roman sea bank at Tetney Lock referred to medieval saltern remains. The note described "*At Tetney Lock, part of the old Roman sea bank can be traced within a double bank of later date. Beyond the bank are clay masses in the sand... on which are curious remains of hut circles and some rectangular hollows of different date. There are traces of fire in the flooring...*" (Jeans 1903, 175). This account was repeated in later general county guides but with no extra detail.

Few other archaeological sites or finds have been reported from the immediate vicinity of Cleethorpes, Humberston and Tetney. Last century 'Danish spears', 2 'Danish silver medals' and 'human bones' were retrieved from a village centre location in Tetney (Dobson 1850, 39). The description can probably be best re-interpreted as of an Anglo-Saxon cemetery. A concentration of Romano-British finds from Tetney village have been found by a local amateur archaeologist, R.N. Hannigan, as a result of persistent fieldwalking in a market garden close to Hoop End; other finds from the site have included Saxon pottery, a broken Early Bronze Age stone axe and a struck flint flake (Appendix 1). In 1945 an urn containing 389 Anglo-Saxon and 5 Danish coins was disturbed during ploughing to the west of the village, and fieldwalking nearby located Roman occupation material. No archaeological finds were reported when the Tetney Lock Road oil terminal was constructed in the early 1970s or when the linking pipeline to South Killingholme was installed.

Along parts of the North Sea coastline, remains of tree stumps, fallen trunks and branches are visible within a peat deposit scoured by tidal action and occasionally exposed during low tides. The 'submerged forest' represents a Neolithic land surface which became waterlogged during a rise in sea level. Exceptional Spring tides during the floods and gales of 1953 exposed large tracts of the forest along the coast, especially at Huttoft. Its extent (much reduced over the past 40 years by erosion from the sea) has been mapped recently at Ingoldmells, Chapel St. Leonards, Anderby, Huttoft and Sutton on Sea although the foreshore was not inspected north of Tetney Haven (Brooks 1990). A reference to an exposure at Humberston in the early 19th century after Autumn Equinoctial Tides was located in manuscript Church Notes prepared by General J.H. Loft in August 1826 (LAO Dixon 19/1/2, f20). Loft also noted a large number of large blue stones, some perhaps 2 tons in weight, exposed at an exceptional low tide close to Cleethorpes.

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Project 1: **Archaeological Watching Brief on the site of the**

Tetney, Newton Marsh Lane Sewage Treatment Works

Site Code TE 93; Accn. No. 47.93
(NGR: TA 3320 0325)

Introduction

The Sewage Treatment Works site consisted of three virtually level arable fields under stubble (Fig. 1.1; Pl. 6). In view of the prominent medieval saltern mounds in the close proximity, the Lincolnshire County Archaeological Officer requested a geophysical survey of the development site in order to identify the presence of any features below the surface which might be of archaeological interest.

Pioneering use of magnetic susceptibility techniques enabled a geophysical survey of the entire plant area (15ha) to be conducted by Oxford Archaeotechnics (Figs. 1.2-1.6). This indicated that most of the site was free of detectable magnetic anomalies, with the exception of three locations with unusually high readings (suggesting fired material). Two of these were beside the farm track known as Newton Marsh Lane, one of which was not investigated because it was not disturbed by topsoil removal. The second proved to be the remains of a recently demolished building; the third was some distance into the field and had no obvious derivation (Johnson 1992).

Lindsey Archaeological Services (LAS) were commissioned by Anglian Water Services to monitor mechanical removal of topsoil and flood deposits over the plant area, with the aim of identifying the magnetic anomalies located by geophysical survey and ensuring no archaeological remains were removed without some record. Fieldwork began on 26th January 1993 and continued at intervals throughout that year.

The Watching Brief

The area to be developed at Newton Marsh Lane consisted of a large arable field with uncultivated stubble (Pl. 6). Ordnance Survey maps as late as 1953 show the site to have been sub-divided with ditches parallel to the southern limit (OS 1953). The field surface was fieldwalked by the author in January 1993 before earthmoving began, but only one medieval pottery fragment was recovered. It was expected that the geophysical anomalies would be associated with a medieval or early post-medieval saltmaking site or contemporary features.

a) Topsoil Removal

The earthmoving contractors, Alf Kitching Ltd, used box scrapers, Drott bladed machines and a combination of 360 degree excavators with Volvo dump trucks to remove the ploughsoil (of variable depth but often about 0.3m) together with an underlying dark grey silty clay layer, about 0.1m thick (Pl. 7). The area was stripped onto the surface of the brown marine silt deposit below, and then scraped to level and consolidate the exposed

surface (Pl. 8). Topsoil was embanked around the plant area for eventual redistribution and landscaping.

The defined area of magnetic anomaly furthest from Newton Marsh Lane was stripped of topsoil and the grey clay under constant archaeological supervision. A crescent-shaped ridge of red loamy material containing charcoal was exposed below the grey clay and further controlled soil removal was arranged, using a 360^{o} excavator and a JCB with untoothed ditching buckets (Pl. 7). A spread of fired soil and ceramic material to the west of the ridge, about 0.6m below the field surface, was then investigated by an excavation team directed by Colin Palmer-Brown for LAS. The archaeological excavation examined a large, probably natural pool, around the periphery of which were post holes, stakeholes, gullies and a small fire pit. Flint artefacts and quantities of briquetage (with 500 fragments of Late Bronze Age pottery) were recovered from the slope around the pool and in some of the backfilled occupation features. The investigation has been reported in detail (Palmer-Brown 1994).

The watching brief over the remainder of the plant area continued until the topsoil and underlying grey silt layer had been removed. The floor of a small building was uncovered below the ploughsoil immediately south of the entrance from the farm track into the plant area, at NGR: TA 3310 0305. (Pl. 9). The building remains extended over an area 10m north-south x 2m east-west, aligned beside Newton Marsh Lane. Part of the area (4m x 2m) was covered by a deliberately laid brick surface constructed with orange/red complete or half-bricks bonded with a white loose mortar. The surface was a single brick thickness; brick dimensions were 230mm x 112mm x 77mm and they were unfrogged. A chalk rubble spread, perhaps an external hardstanding, incorporating numerous marine shells, overlay the bricks and extended a further 6m to the south of the floor. Paper sack fragments and baler twine indicated that this surface or demolished structure had been in use until recently.

Topsoil removal for the contractors' offices compound (in the SW corner of the plant area) exposed a spread of very shelly sandy material with numerous oysters close to the ditch forming the southern boundary. Other finds from the topsoil consisted of 1 sherd of medieval pottery and 8 later sherds (514). No archaeological finds were observed in the underlying grey clay or on the surface of the brown flood silts.

b) The Flood Silt Deposit (Layer 500)

The layer below the grey clay subsoil was a mid brown silty clay, incorporating infrequent shells except for distinct concentrations; in places dense sandy shell deposits overlay the brown silt in small depressions. An attempt was made to plot the shell spreads (thought to represent pools or creeks at the end of the last prolonged marine incursion) but the surface was too trampled by machinery to permit this; shells had also been moved and redeposited by a bulldozer used to compact the fresh working surface.

The brown silty clay layer, of variable thickness, was deposited during a marine inundation towards the end of the Romano-British period. The flood silt extends at least 3km inland from the present coastline near Tetney, and its boundary with the boulder clay was recorded close to Green Lane, Humberston (0.5km inland) during monitoring of the Inlet pipeline.

The flood silt exhibits numerous thin compacted lenses of homogeneous material, reflecting numerous deposition episodes in similar conditions. In places these laminations are evident, but elsewhere the layer appears to the eye to be a single deposit (Pl. 10). Within the plant area its thickness was between 0.5m and 2m, but a shallow deposit 0.2m thick was recorded immediately north of Newton Marsh Lane.

Part of a cattle jaw was exposed within **500** (Pl. 11) but it was in fragmentary condition. It is impossible to state how part of an animal came to be sealed within the deposit, but possibilities include marine erosion from nearby land or a brief phase of dry conditions within the period of inundation.

No other archaeological finds were observed within **500**. This may have been because of the large volumes removed by the mechanical excavators but a watch of the fine spoil produced from inserting land drainage across the stripped plant area seemed to confirm the barrenness of the layer (Pl. 12).

c) Peat Deposits

500 had sealed at least one phase of peat formation (composed of 503, 512, 531 and 534), produced by deteriorating drainage conditions as sea level rose and freshwater became ponded back inland. One layer was recognised intermittently over most of the plant area and a second was identifiable in some locations. The observed extent of each formation was recorded, providing an indication of low ground, small depressions and stream channels (coinciding with the lowest contours on Fig. 1.9). Pollen analysed from samples of this peat has enabled the proportion of locally prevalent plant species to be established, depicting the late prehistoric environment of human activity (Appendix 8).

d) The Previous Ground Surface

The peat had blanketed an earlier land surface, and it was on this clay horizon below that archaeological features were found. Two archaeological features contained peat, showing that they had been open contemporary with the deteriorating drainage. The previous surface was the top of a tenacious yellow clay layer, containing some angular stones and flints. This has been identified as a soil horizon developed from the boulder-clay after weathering. The underlying material here is red-brown boulder-clay, incorporating shale fragments, flints and chalk eroded by glacial action from the Lincolnshire Wolds. The upper part of this boulder-clay contains fewer chalk fragments, probably as a result of rainwater leaching and weathering.

e) Excavation of the Tank Pits

Methods

The upper surface of the flood silt layer was used as the working level for construction of the sewage treatment works. A series of circular and rectangular pits (to contain the settling and treatment tanks) were excavated to different depths using 360° machines with large, toothed buckets. Large volumes of material were removed at a time and only the cutting faces of the excavation could be viewed. It was not possible to see or record any of the topographical features in plan (except for features in the Aeration Tank) and safety considerations reduced the amount of close inspection undertaken. A few small archaeological features were visible in section, either in the trench faces or during mechanical excavation of the various tanks. Monitoring was protracted but enabled the local topography prior to the inundation to be mapped, setting the archaeological saltern site in a landscape context (Figs. 1.7-1.9).

The pits for the tanks were recorded and numbered by LAS usually in the order in which they were dug, cross-referenced with the nomenclature used by Anglian Water Services and their contractors, Birse plc (Fig. 1.7). All compass directions relate to the Ordnance Survey Grid.

Tank 1

Work on Storm Tanks 1-3 began while excavation of the saltern was in progress. The mechanical excavation of Tank 1 was not closely observed but the section displayed a sequence of 0.45m of brown silt (**500**) above red-brown boulder-clay with chalk inclusions. A small area of grey silty clay with frequent charcoal flecks lay between the two layers over the NW part of the tank. This deposit (**510**) was 0.05m thick; the grey coloration was interpreted as 'gleying', the result of a rising water-table preventing the rapid complete decay of previously growing vegetation. Insufficient charcoal was present to determine whether it represented archaeological activity or had become redeposited. The base of this layer was at 1.51m OD, the same level as the base of a charcoal deposit on the east side of Tank 2, suggesting that the charcoal was naturally redeposited as in that Tank. The surface of the chalky boulder-clay was 0.25m higher than in Tank 2 (40m further east) but much lower than the 2.30 to 2.00m OD recorded from the archaeological excavation 60m to the SW. This demonstrates a natural downward slope in the post-glacial topography to the NE of the excavated prehistoric saltern.

Tank 2 (Pl. 13)

Removal of the thick flood silts started on 23.2.93; work on this tank was in progress and was inspected while the County Archaeological Officer was visiting the site. Mechanical excavation started at the SW quadrant and worked anti-clockwise; a ramp was left in the west part of the tank. Initial machining lowered the tank area to the level of the inside shelf. Subsequent work removed the deeper peat deposits on the NW side which were waterlogged and required pumping for several days, before excavation of the deeper central cut took place.

The layer of light brown silt **500** was thinnest to the SE at 0.75m, becoming thicker to the NW with a depth of 1m, and containing a very few visible rotted marine shells. A jaw from a young bovine, (under 36 months) with 4 teeth in place and a displaced small tooth beside it, was found horizontally within the silt on the north side of the tank (**502**) (Pl. 11). No further trace of this or any other beast was found in the immediate vicinity but animal bone in poor condition was recovered from archaeological contexts on the excavation area (Appendix 3).

501, immediately below the marine silt deposit, was a layer (approximately 12m north-south and 32m west-east in extent) of fine charcoal fragments. There was no briquetage in this layer, but an occasional burnt stone was seen. The material was in a thin grey (probably gleyed) silt of depth 0.04m. This layer was interpreted as a water-spread waste heap of charcoal from salt-processing, perhaps from the excavated saltern site c.80m to the SW. The stratigraphic position indicates the redeposition of this material to have been earlier than the flood silt deposit and probably roughly contemporary with the saltern activity. The charcoal had lodged on a small area of ground that had been a slight ridge during the prehistoric period.

A palaeochannel (**504**) was encountered in the NW part of Tank 2 below the flood deposit (Pl. 14) The extent was difficult to determine as it was of irregular shape and depth; it seemed shallow and flat to the west, becoming deeper towards the NW and north. The width was at least 16m and the depth 0.25m, but the channel continued to deepen towards the edge of the excavated tank. The alignment was uncertain but on the evidence of the south edge of the channel it was probably NE-SW.

The channel was filled with very dark brown silty peat (**503**) with natural iron staining. It was saturated with water with a noticeable salt content, which although pumped for several days was continuing to enter the site. The fill was apparently contemporary with the spread of redeposited charcoal (**501**) but no charcoal, burnt material or briquetage was found in the peat. A sample was taken of the peat layer sandwiched between the flood silt deposit and the gleyed silty clay below, and submitted to the University of Durham Dept. of Geography for pollen analysis (see Appendix 8) (Pl. 15).

The base and extent of the peat within the palaeochannel was not revealed during the excavation of the Storm Tank and the stratigraphic relationship of the peat and the charcoal of archaeological origin could not be proved. One interpretation may be that saltern waste was carted and tipped into post glacial depressions and channels to the north of the processing site. These natural features later became subject to a rising water-table or occasional flooding which caused the charcoal to be spread and redeposited on the periphery of the feature/s. Peat formation in the channel may have post-dated this episode, concluding with the marine transgression responsible for layer **500**.

The peat material and the redeposited charcoal both sealed a mixed layer of dark yellow silty clay with light yellow and light grey sandy silt inclusions (**505**). This was only exposed on the east side of the tank and became thickest beside the palaeo-channel **504** (Pl. 16). The layer merged into boulder-clay on the SE side of the tank and was interpreted as a glacial or post-glacial erosion deposit which had partially levelled uneven topography; the channel had apparently formed in a shallow mirroring of a lower glacial undulation. Chalky red-brown boulder-clay (**506**) was noted at the tank shelf level on the SE part of the tank (1.27m OD.) but was lower than this over the remainder of the tank area.

Tank 3

Tank 3 lay south of Tank 1 and SE of the TE 93 excavation area. **500** was 0.40m thick except for a linear band 3.4m wide which crossed the Tank north-south but was not seen in any other Tanks or pits. Here the silts had filled, or been backfilled into, a deeper feature (**507**) (Pls. 17 and 18). The straightness of both sides suggested that it was an artificial feature such as a drainage ditch; its width appeared similar to existing open drains around the field edges. The base of the feature was not exposed during the Tank excavations but was more than 0.25m below the surrounding post-glacial ground surface. This feature was an anomaly in that it appeared post-medieval in character but no cut could be seen in the late prehistoric flood deposit which seemed to fill it. A 19th-20th century ceramic land-drain cut the fill but no other dating evidence could be found.

500 sealed a 0.02m thin discontinuous layer of light brown sandy silt with signs of some gleying and frequent charcoal flecks (**508**). The charcoal was especially noted on the SE and SW sides of the Tank, and there was slight evidence for charcoal filling very small cavities in the underlying layer **505**. These may have been small soil-cut features of archaeological interest but insufficient survived to permit detailed examination (Pl. 19). No briquetage or other archaeological material was present despite the close proximity of the saltern.

The upper surface of **505** in this Tank was compacted and uneven, indicating some form of wind or water erosion when it had last been exposed. Similar compaction and rippling of the corresponding horizon was noted in other parts of the site. This appears to have been the late prehistoric land surface.

Chalky boulder-clay was exposed at 1.65m OD. on the NW side of the tank, but dropped away slightly towards the SW.

Tank 4 (Pls. 20-23)

This Final Tank, at the SE limit of the plant area and about 200m from the saltern site, was excavated into boulder-clay in a single operation. This method reduced the opportunities for recording the post-glacial deposits and no archaeological remains were seen.

The brown flood silts (similar in colour to **500** but here designated **511**) were 1.05m thick but had formed in a succession of thin lenses with slight sand dusting between. The lenses varied from minute thickness up to bands apparently 0.20m thick; they had been compressed and undulated in broad ripples which reflected through the deposit. This evidence for multiple episodes of deposition was witnessed in some other tanks elsewhere on the site.

A layer of grey sand with silty peat (**512**) crossed the western side of the Tank from NW to SE (Pl. 22). The peat was deepest on the south side where it was 0.25m thick; at its edges it was 0.05m thick. It had formed blocks of compressed peat with some small visible organic traces thought to be reeds or roots and was flecked with yellow (?sulphurous) residues (Pl. 21). The water retaining peat seemed to be restricted to a broad, shallow feature curving through the Tank about 30m in width; this may be better interpreted as a depression rather than a palaeo-channel.

The very pale buff layer below the saturated peat was thought to be identical in nature to **505** but affected by moisture. This layer was 0.35m thick, overlying 0.30m of red-brown weathered boulder-clay. The boulder-clay with chalk inclusions was highest on the NE side of the Tank where the peat had not formed, at 0.65m OD. This demonstrates a difference in height of 1m between the boulder-clay under the saltern and this part of the site.

Tank 5

The SE Storm Tank was the last of the group to be excavated. **500** was 0.50m thick and overlay small patches of charcoal about 0.02m thick, particularly to the north and south of the Tank. A small rectangular feature was observed to cut the charcoal layer close to the south edge. **537** measured 1.15m by 0.75m and was of unexamined depth. It was unclear whether it had been cut from modern ground level or had been sealed by **500**, but the brown clay loam fill seemed to be a disturbed version of the upper silts and suggested that it was a post-medieval feature, perhaps for a fence post.

In the west part of the Tank there were smaller areas of thin charcoal on the same horizon, but after further mechanical excavation of the edge a possible archaeological feature was observed in section. **513** was 1m NE-SW and 0.15m deep, cut into a thin white sandy silt deposit which overlay the yellow weathered boulder-clay. It was impossible to determine whether this had been a post-hole or a small pit, but it was filled with charcoal fragments (Pl. 24). Analysis by G.C. Morgan of a charcoal fragment 50mm diam. (Sample 10) noted 12 growth rings and concluded an age of over 25 years (Appendix 10). It was interpreted as a small feature close to a hearth, which had become filled with waste material from a domestic or industrial heating process. No briquetage, pottery or other inclusions were found in the feature and a search of the Tank section revealed no further features (Pl. 25). The stratigraphic position of this feature indicates a date contemporary with the

saltern site; there was no reason to suspect that the charcoal had been washed by flood action into an open feature at a later date as in **501**.

The thin white silt layer overlay **505**, a yellow silty clay 0.11m thick. Chalky boulder-clay was exposed at 1.63m OD, the same height as in Tank 3 to the west but higher than in Tank 2 to the north.

Tank 6 (Pl. 26)
The most southerly of the Final Tanks exhibited a marked slope in the post-glacial surface below **500**. Modern ground level in the vicinity had been flat prior to the topsoil strip, but the thickness of **500** varied from 1.4m on the north side to 1.8m to the south. A deposit of marine shells was noted in the NW part of the Tank below the brown silt and above a peat deposit.

The peat layer undulated and sloped down slightly towards the south, becoming 0.55m thick and containing a sulphurous residue. It continued across the Ultra-Violet Disinfecting Chamber (immediately to the south), but was thinner on the eastern side (Pl. 27). No trace of charcoal or other archaeological material was present. A layer of brown weathered boulder-clay 0.2m thick lay below the peat and above the chalky boulder-clay, the highest exposure of which was slightly below 0m OD.

Tank 7
In the western Final Tank the thickness of **500** varied from 1.15m on the north side to 1.9m to the west (Pl. 28). Marine shell concentrations were noted on the upper surface of the layer in the west and NW of the Tank. A layer of peat (mostly silty but woody in places) lay between the silt layer and boulder-clay. The peat was thinnest (at 0.15m) to the east but thickened to 1.70m in the NW where it incorporated pieces of well-preserved tree branch (Pl. 29). One sample, 0.35m long, 0.12m broad and 0.06m thick, was calculated to have had a diameter of 0.15m when intact. The timber exhibited no signs of working or human use and was identified as a piece of oak.

Boulder-clay was highest on the east side at 0.55m OD. but was lower than 0.05m OD. in the NW.

Tank 8 (Aeration Tank) (Figs. 1.10-1.12)
The rectangular Aeration Tank was positioned to the west of the Final Tanks and to the SE of the saltern excavation area (Pl. 30).

500 varied considerably in thickness from 0.5m in the SW to 2m in the NW. These differences reflected the microtopography of the lower strata which ranged from a small ridge of higher land to a broad west-east palaeo-channel. The silt had filled a sub-circular cut (**522**) 0.15m deep and 0.32m diameter in the surface of layer 528 below (Pls. 31 and 32). There was no apparent function for this feature but it was the only depression filled with **500** (apart from a small area of **524**) within the Tank. It is likely that this represents a natural disturbance of the previous ground surface (by animal

action or the uprooting of a small bush) immediately before the start of the marine transgression, but an unidentified archaeological cause is possible.

The highest exposure of **528** was along the west side of the Aeration Tank with a slight projection towards the middle of the Tank 5m from the south end. There was evidence for archaeological activity here, perhaps associated with the periphery of a salt processing site. A small concentration of fired soil fragments **523** was found in a narrow groove 0.08m wide and about 0.2m long. The feature did not seem to be functional, nor the fragments of fired material to be in place. The remains of a possible hearth (**524**) were recorded 13m NE of **523**, and this may have some association with the fired fragments.

Hearth **524** was noticed under the tracks of a bulldozer and was probably partly damaged before recording could take place (Pls. 33 and 34). The vigilance and co-operation of the operator and foreman from Alf Kitching Ltd prevented the total destruction of this feature and their assistance is gratefully acknowledged. The 'hearth' was an ovoid of red-brown fired soil with charcoal fragments, 0.03m thick, on the approximately flat surface of **528**. There was no evidence of heat having affected that surface or of any feature containing the burnt soil. A small area of gleyed silt, approximately central, indicated a slight depression in the spread which had become filled with flood material. There were no remains of any structure of fired clay or other substance, but **524** is not thought to have been fill of a higher pit or post-hole. It was unclear whether the soil was and this uncertainty restricts interpretation of the feature.

Part of the natural ridge in the SW of the Aeration Tank was covered by a thin layer of gleyed silt **529**, incorporating quantities of charcoal (Pl. 35). The depth of this layer varied from 0.01m to 0.1m, and it lay between **500** and the weathered boulder-clay **528**. The charcoal was assumed to originate close to this location, probably from hearths or lesser features such as **524**. The grey soil colour demonstrated the rise in water-table contemporary with this material remaining on the ground surface.

At a date between deposition of 529 and the eventual marine transgression, at least one and probably two small post-holes were dug close to the edge of the higher ground within the Aeration Tank (Fig. 1.11). The larger of these (**532**) was 0.5m diameter and 0.25m deep, with a post-pipe (**531**) (0.2m diameter and 0.24m deep (Pls. 36-39). The dimensions indicate the post to have been small, unless the surrounding soil was truncated in prehistory, and probably served as a fence post marking a boundary. A second hole of similar depth but 0.1m diameter, **525**, was revealed in the same section 1m to the north (Pl. 36). This had no post-pipe, but the cut was filled with charcoal-rich silt which appeared to have been disturbed from layer **529**. Post **525** may have been driven into the soil but Post **532** was certainly placed into an excavated hole.

An interesting aspect of **532** was the compact fissured silty-clay peat **531** filling the post-pipe or void left by the removed post. At the time of the abandonment of the fence or structure supported on these uprights, the post had been extracted for re-use or for firewood. The void had become filled by vegetation and peat had developed prior to the marine inundation of the site. This is evidence that the marine transgression was not responsible for a sudden cessation of human activity here, but that a contraction of operations preceded a rise in ground water some time before habitation was impossible.

The remainder of the Tank exhibited a natural sequence of deposits with **500** overlying an extensive dark grey silty layer (**534**) which in places comprised woody peat (Fig. 1.10). The deposit was mostly 0.1m - 0.2m thick but became considerably thicker (up to 0.4m) where it filled depressions and palaeo-channels. The analysis of fossil pollen from the peats **531** and **534** has shown that two environments are represented despite the close proximity of the sampling points. The differences have been interpreted as chronological changes; layer 534 developed while post-hole 532 was in use, and became filled with a subsequent peat formation after the post was removed but before the marine inundation (Appendix 8).

The positions of the posts define the limits of the natural ridge on which traces of archaeological activity were found in the Aeration Tank. Immediately to the north and NE the prehistoric ground surface dropped away into a minor palaeo-channel (Pls. 36 and 40). This island or projection was the only provenance of archaeological remains south of Tanks 3 and 5 and indicates the importance to humans of higher ground in a marginal area subject to water-table fluctuations (Fig. 1.12).

From stratigraphic indications **534** seemed to post-date or be contemporary with the charcoal layer **529** (Pls. 41 and 42). The peat contained yellow (?sulphurous) residues and a few thin fragments of partially rotted unworked wood.

The peat overlay the extensive yellow gritty silt layer with frequent small stones and a rippled surface (**521** [=**528**]) which ranged from 0.1m to 0.3m thick and usually overlay a yellow clay layer **527** (Pls. 31 and 43). Both contexts were interpreted as weathered glacial deposits forming a prehistoric subsoil above the red-brown boulder-clay. Chalky boulder-clay was only exposed in the NW part of the Tank at 0.83m OD.

Pit 9 (Inlet Works)

The sections around an excavation for the Inlet Works were inspected but the pit contained standing water and close investigation was not practicable. Layer **500** was 0.85m thick on the north side and 1.15m at the south corner. A layer of brown peaty silt 0.4m thick was below the flood material at the north corner.

Pits 10 and 11 (Screw Pumps)
Two separate pits associated with the Screw Pumps plant were inspected after they had been mechanically excavated. The depth of these features reduced the level of practicable archaeological recording but it was obvious from the trench faces that **500** had been relatively thin (up to 0.7m) above weathered and unweathered boulder-clay.

There was no indication on the eastern side of Pit 10 that **500** was about to increase in thickness and seal a peat deposit (visible in the east face of Pit 11 and the north face of Tank 7 (Pl. 44).

Tank 12
There was no evidence of archaeological activity revealed during the excavation of this Primary Tank but the natural sequence of layers was recorded. **500** varied little from an average thickness of 0.9m and overlay thin areas (0.02m) of black coarse peat (**540**) in the east and SW parts of the Tank. Black flecking, initially suspected to be charcoal but identified as manganese, was associated with the peat.

The peat sealed the pale yellow gritty silt layer noted in other parts of the site on this horizon. A number of small sub-circular features (approximately 0.5m diameter) cut that layer and were filled with dark brown silt, grey silt and even peat in some instances. The disturbances were concentrated on the south and west parts of the Tank. These were thought to be of natural origin and may have been holes left by uprooted bushes or small saplings which filled naturally during wet conditions (Pls. 45 and 46).

No chalky boulder-clay was exposed at the monitored level but the red-brown clay in the north part at 1.14m OD. was identical to that found above the unweathered boulder-clay elsewhere.

Tank 13
The cut for this tank revealed only the brown marine silt over boulder-clay, with no evidence for charcoal or palaeochannels.

Tank 14
This Primary Tank was to the east of Tank 12. Concentrations of marine shells (oysters and cockles) were noted on the upper surface of **500** in the south, north and NW areas of the Tank and its periphery. **500** was a uniform thickness of about 0.8m, and had formed in numerous thin lenses (Pl. 47). A thin scatter, 4m broad, of shells with small stones and rounded pebbles was found at the base of **500** towards the east edge and aligned west-east.

Silty peat, paler in colour than **540** in Tank 12, was present in a spread 0.12m thick at the northern part of the excavated Tank. This incorporated pockets of silty sand. Below the flood silts and peat was yellow weathered boulder-clay 0.25m - 0.4m thick, over red-brown clay. Chalky boulder-clay was visible only in the south and SE parts, at 0.95m OD.

Sludge Treatment Tank

Seven sludge treatment tanks were excavated to the NW of the Blower House and Sludge House. On the northern side of the most easterly tank a thin lens of peat was present between **500** and the weathered boulder-clay but no trace of archaeological remains was noted (Pl. 48). The other tanks were free of peat and consisted of **500** above weathered boulder-clay.

Sludge House Foundations

Foundation trenches for the Sludge House were excavated in June 1993 and were observed closely because of the earlier findings from the Aeration Tank. A thin band of peaty grey clay was present over most of the area immediately below **500**. This peat merged with charcoal concentrations on the north, NE and SW parts of the foundation and appeared to be later than the charcoal (Fig. 1.13; Pl. 49).

A small post-hole (**538**) was revealed in the trench section on the east side of the foundation trenches (Pl. 50). The post diameter had been about 0.10m and 0.08m of the hole depth survived, cut through the sandy silt layer below **500**. The post-hole fill was light grey silty clay with dense charcoal fragments, which were sampled. The charcoal did not reflect a post burnt in place and was interpreted as material tipped, spread or washed onto the open feature after the post had been removed. A restricted area of dark clayey silt below the post-hole may have been the remains of a post pipe from a driven stake. From stratigraphic indications the post-hole has been ascribed to the Late Bronze Age/Early Iron Age period of the saltern activity excavated elsewhere on the site.

The layer of charcoal recorded from other parts of the foundation trenches produced no evidence for further archaeological features although a localised soil fissure with heat-affected soil (**539**) suggested an adjacent hearth or fire not exposed by the trenches (Pl. 51). Most of the charcoal may have been washed across the prehistoric land surface from waste heaps during a flooding episode before the marine transgression, explaining its presence on the peat horizon.

Blower House Foundations

The foundation trenches for this building (between the Aeration Tank and the Sludge House) were monitored closely after both the adjacent areas had produced signs of archaeological activity. More charcoal was revealed in the trench sections, often in close conjunction with thin peat deposits.

Discussion

The extensive watching brief on most of the Sewage Treatment Works area at Newton Marsh Lane demonstrated that the geophysical survey had indicated the only concentrated area of archaeologically significant deposits within the surveyed zone. This was confirmation of the validity of using magnetic susceptibility despite the surveyed surface having neither artefacts nor contours to indicate an archaeological site. It was interesting that the technique was successful even with the intervening marine silt layer.

Post-holes pre-dating the marine silt were found in the Aeration Tank and the Sludge House, and a possible small feature was seen in Tank 5. The density of these remains was much less than on the 1993 saltern excavation area and suggested that these were peripheral features to the fire pit area, and perhaps contemporary. There may have been a lesser drying or evaporation site on the western side of the Aeration Tank but it does not seem to have approached the extent of the main area.

The Aeration Tank features were positioned on the edge of an exposure of boulder-clay beside a comparatively narrow palaeochannel. It appears that the salt workers worked on drier ground beside their water (and brine?) supply, in a very similar situation to the pond and peripheral features in the 1993 excavation area.

Saltmaking (or at least some human activity) seems to have continued on the Newton Marsh Lane site as the local environment became subject to poorer natural drainage and peat formed. It is possible that it took actual marine inundation to end the activity here. It was also evident that salt-making had never returned to this site when the regression occurred.

The effects of the early floods on the saltern and its periphery were shown in the areas of redeposited charcoal and burnt soil recorded north of the main saltern site and in Tanks 1, 2, 3, 5, and the Aeration Tank. These were extensive irregular thin spreads which were interpreted as material washed from saltern waste heaps and laid as sediments on the ground surface (Pl. 53). The spreads are indicative of the extent of salt-making activity across the STW area even where no features were revealed by the construction works; there was no evidence of any ancient human activity south of the Aeration Tank.

In addition to locating other archaeological remains, the watching brief produced a range of observations concerning the thicknesses and extent of natural deposits and peat layers (Pl. 52). Although it was seldom convenient to take accurate levels on the different exposed layers it has been possible to reconstruct approximate contours for the site at different periods since the final glaciation, and these have been illustrated as Figs. 1.7-1.9. With this information, coupled with pollen evidence for flora, some idea of the changing environment of the site has been recovered.

Conclusion

Although the groundworks for the STW removed some archaeological evidence from the prehistoric saltmaking site, small areas of undisturbed ground remain between the exposed features, masked by the marine silt layer. The site of the 1993 excavation has been covered with a landscaped soil mound with planted trees and shrubs but the extent of any machine damage after the end of the excavation and before completion of the mound is not known. Across the centre of the plant area the STW is now in use and the ground between structures is mostly covered with concrete (Pl. 54).

However, minor alterations/upgrading to the structures and their services may reduce the quantity of surviving archaeological remains.

The areas with greatest potential for further archaeological features associated with the Late Bronze Age saltern are to the NE, west and SW of the 1993 excavation. The Rising Main installed in 1994 into the Inlet Works removed additional saltern remains between the 1993 excavation and the (since removed) topsoil heap to its west. The site of that topsoil heap offers the greatest potential, as does an area between Tank 1 and Newton Marsh Lane to the north. Parts of these sensitive areas lie within the Anglian Water perimeter fence but parts extend beyond this protection.

It is important that any remaining features and occupation spreads associated with the saltmaking site should be protected and preserved for future research. Ideally, any future groundworks in this area should be investigated archaeologically.

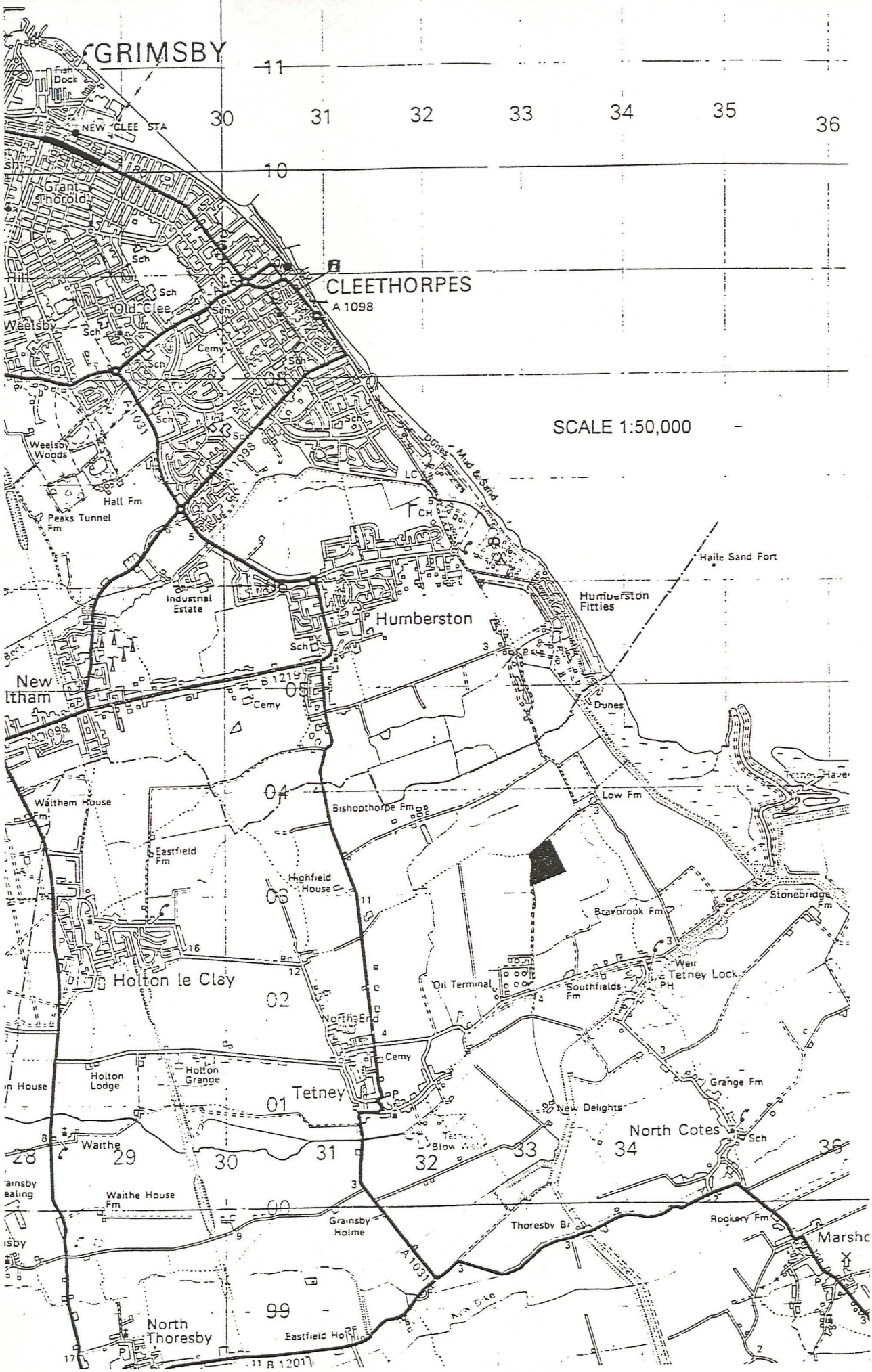
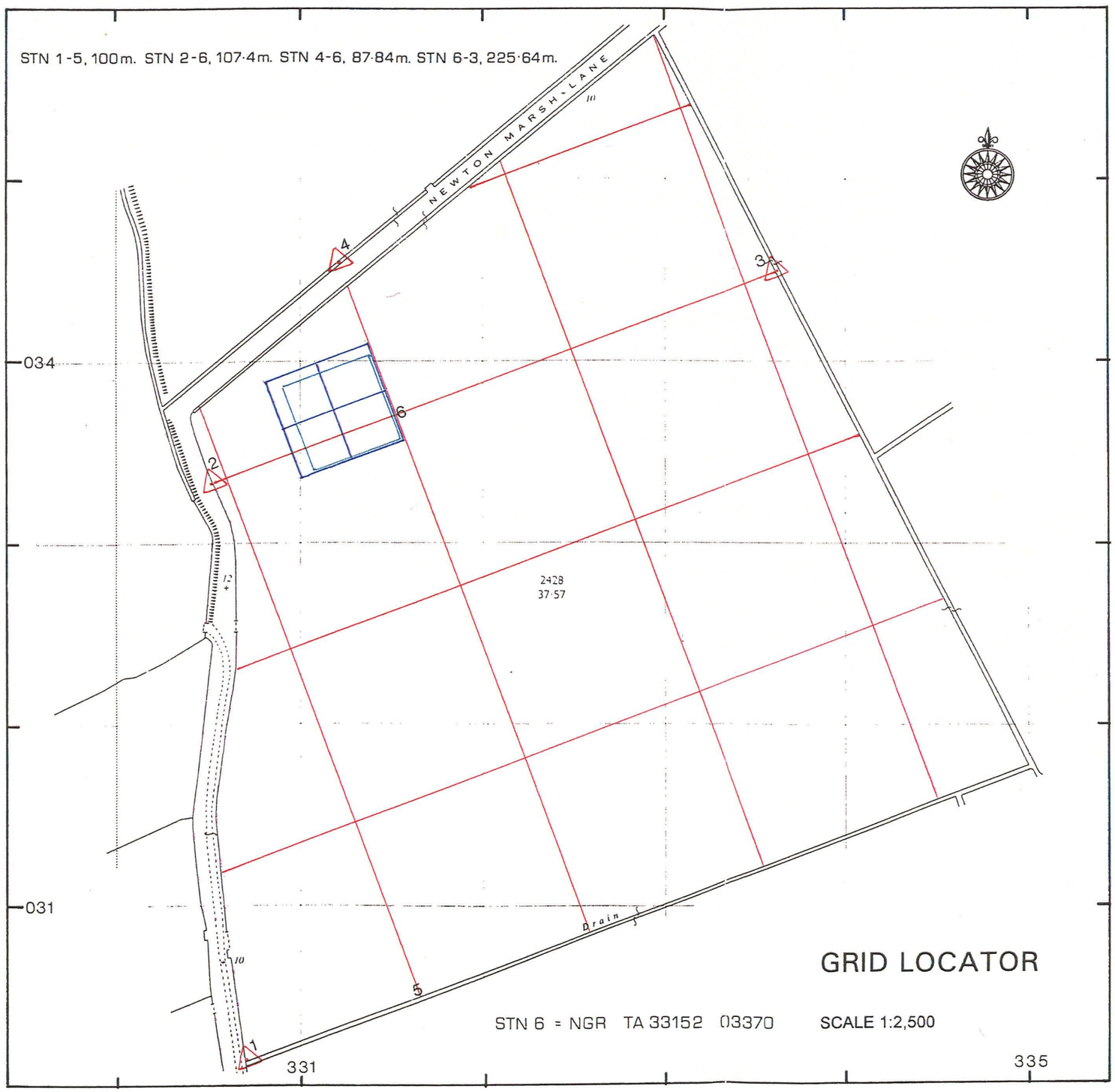


Fig. 1.1 Site of the Tetney Newton Marsh Sewage Treatment Works (Johnson 1992)

TETNEY, LINCOLNSHIRE



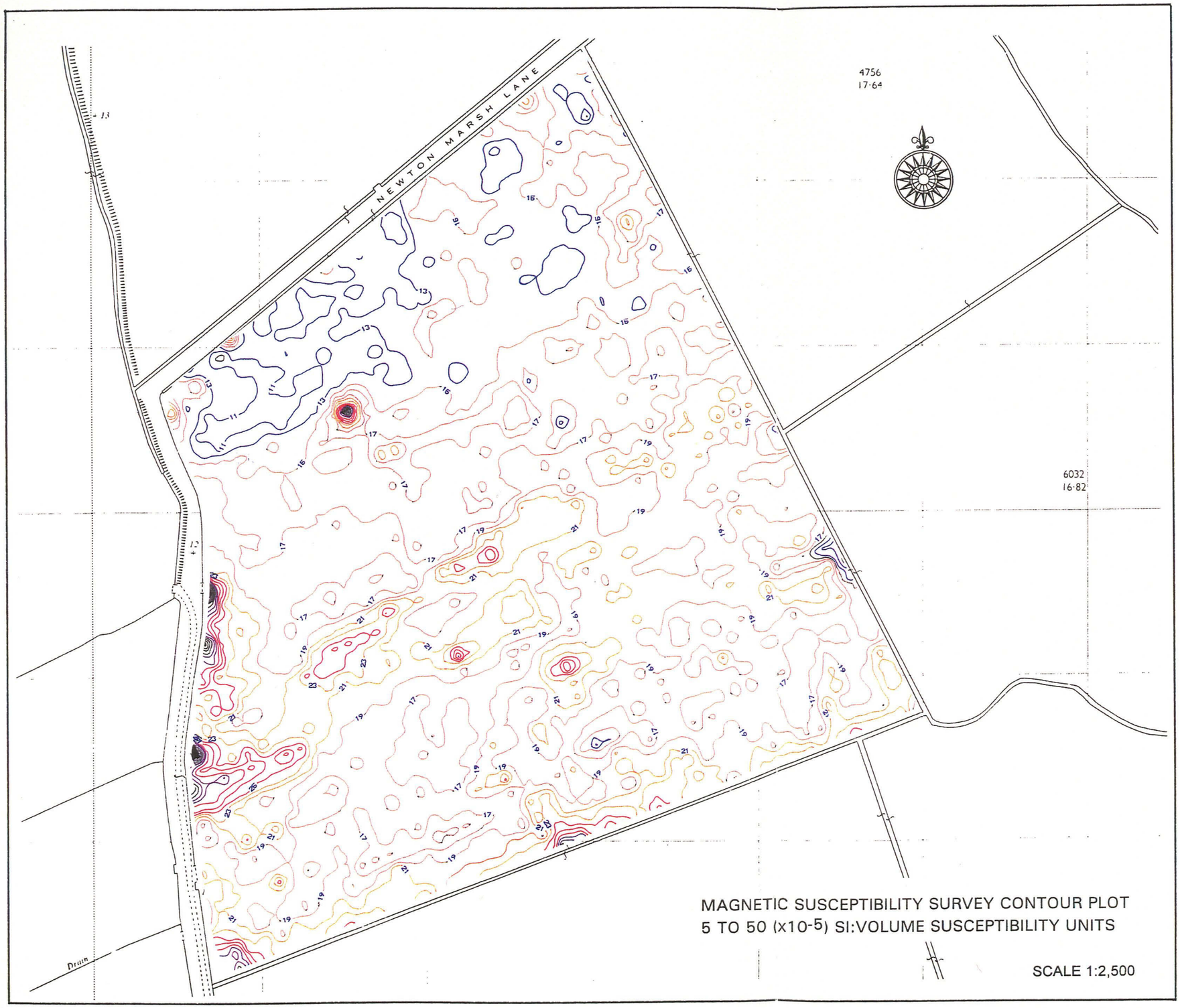
RED MAGNETIC SUSCEPTIBILITY GRIDS
BLUE MAGNETOMETER GRIDS
GREEN TOPOGRAPHIC DETAIL

SPOT HEIGHT CONVERSION
10FT - 3·05MTRS, 12FT - 3·66MTRS

△ SURVEY PEGS

Oxford Archaeotechnics

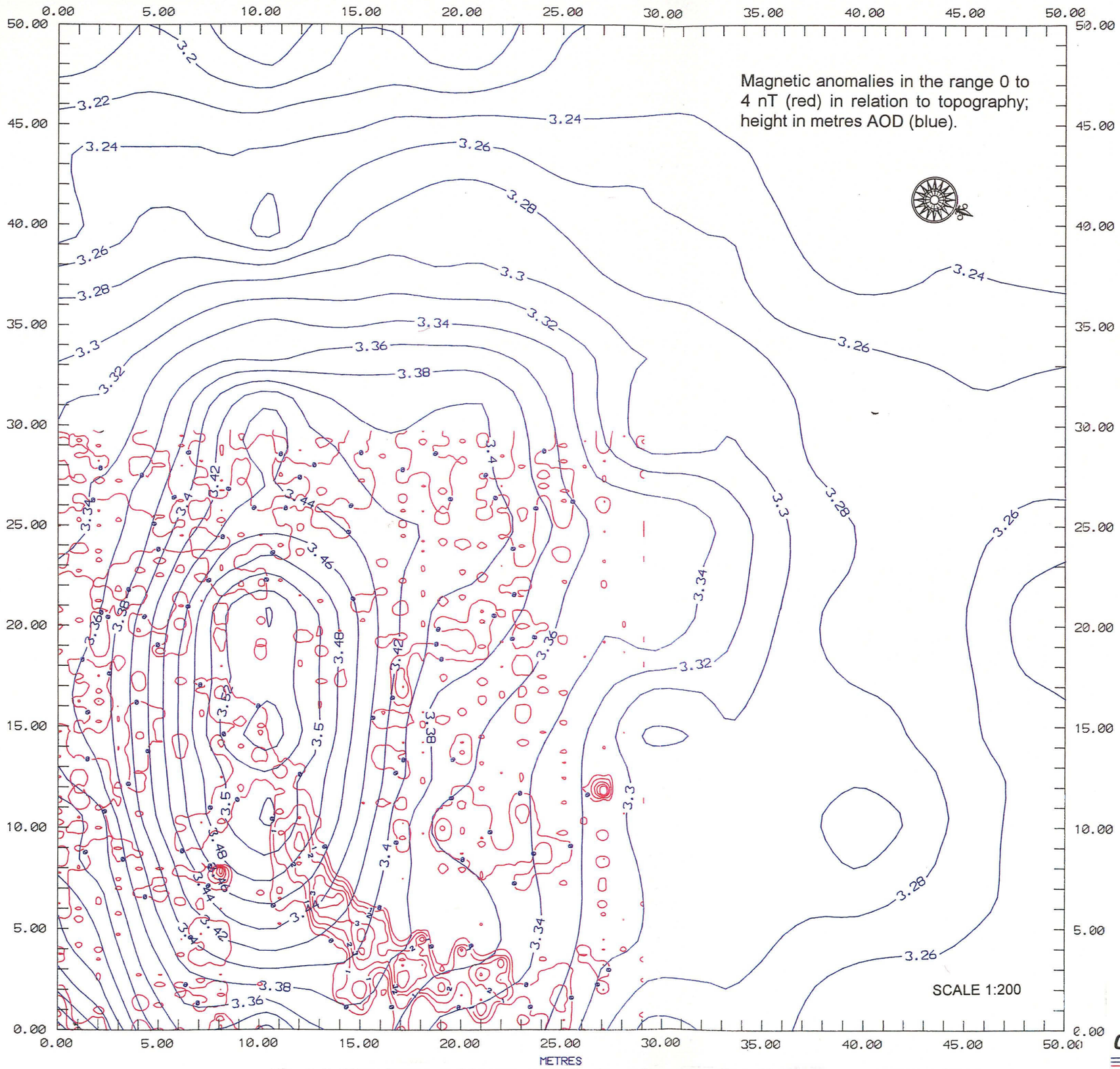
Fig. 1.2 Location of the Oxford Archaeotechnics Survey Grids (Johnson 1992)



Oxford Archaeotechnics

Fig. 1.3 Magnetic Susceptibility survey contour plot of the STW site

TETNEY, LINCOLNSHIRE



Oxford Archaeotechnics

Fig. 1.4 Microtopographic survey with magnetic anomalies, 1993 saltern excavation area (Johnson 1992)

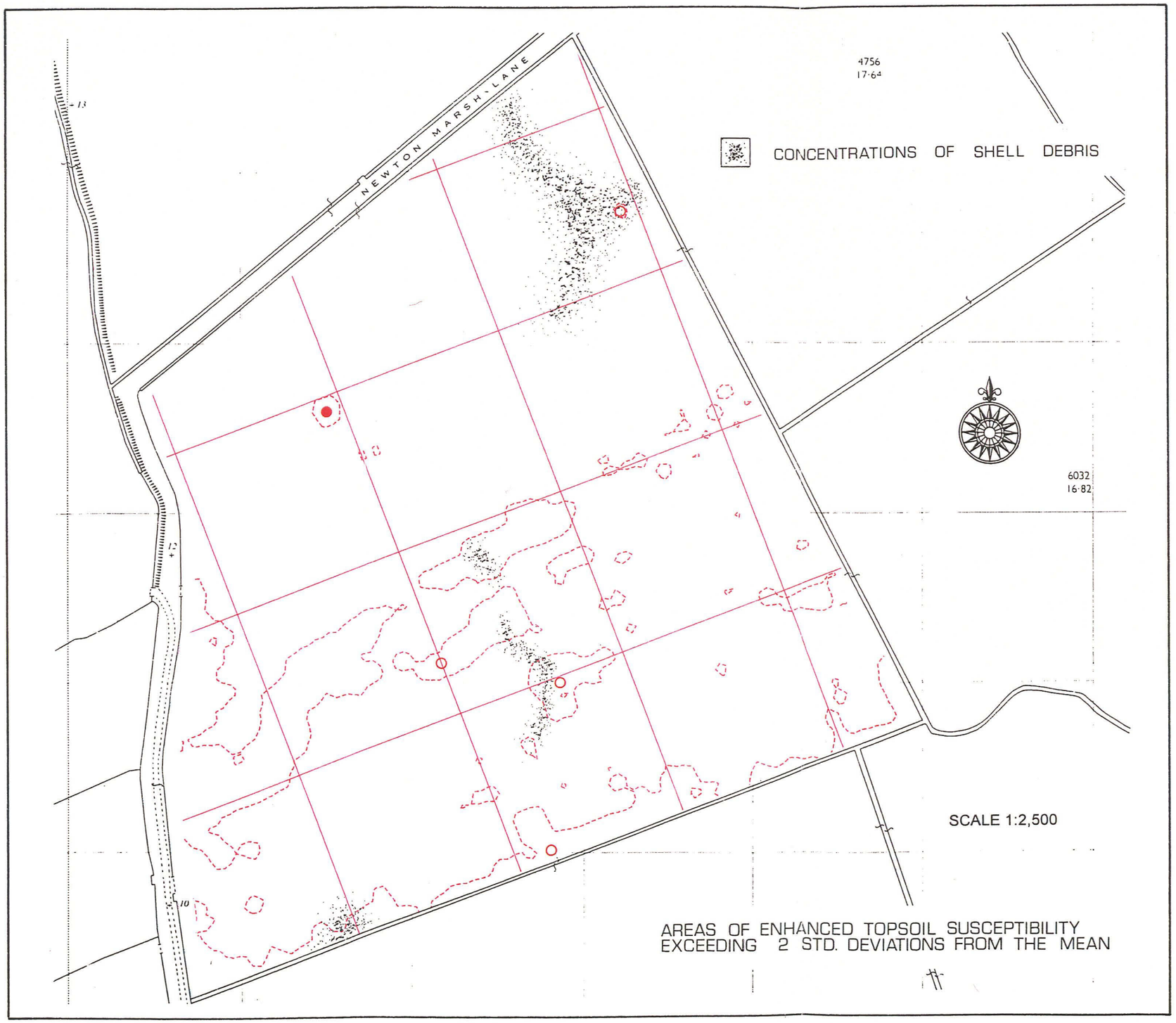


Fig. 1.5 Topsoil susceptibility and areas of shell debris (Johnson 1992)

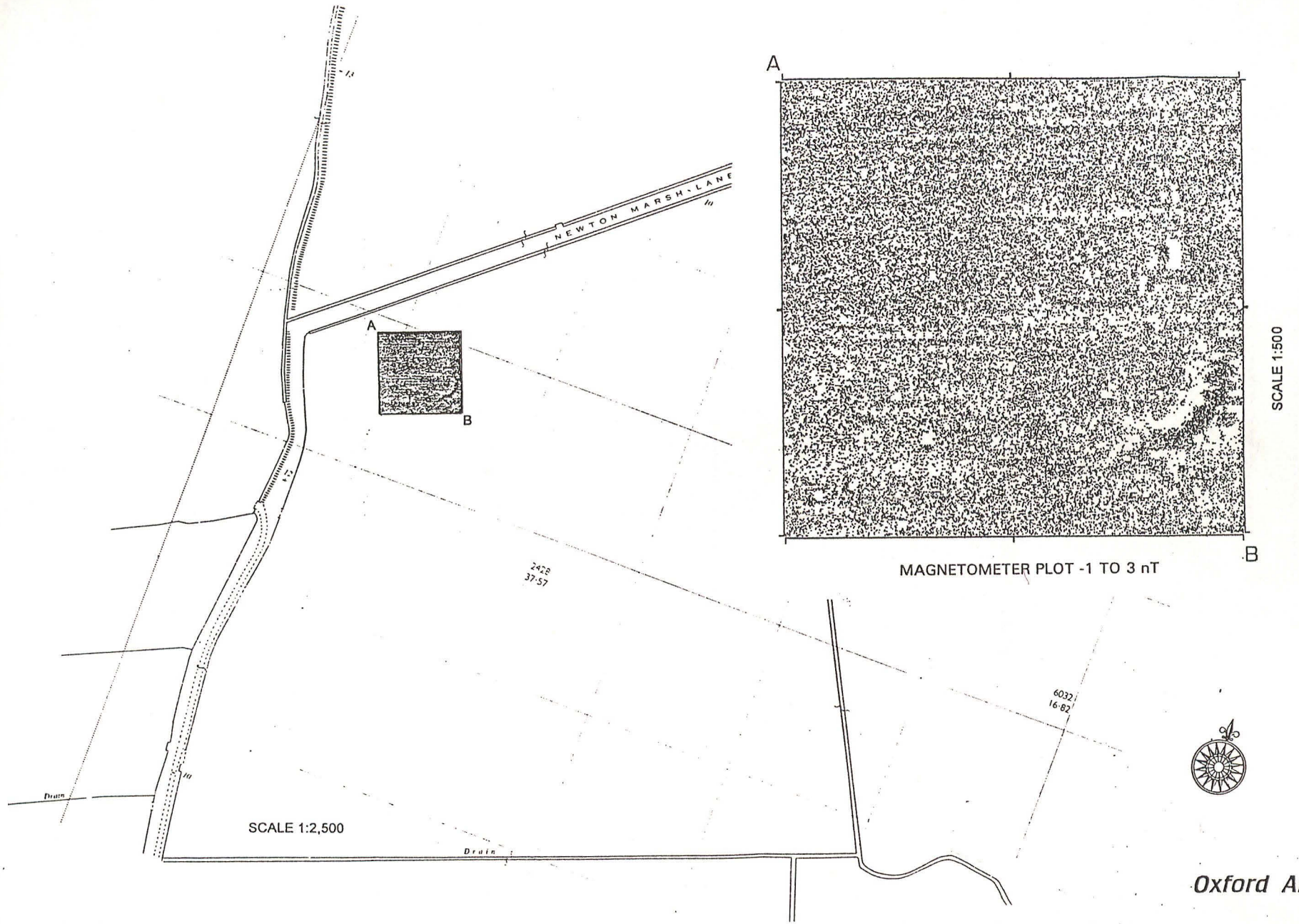


Fig. 1.6 Magnetometer plot of the 1993 saltern excavation area (Johnson 1992)

APPROX

HEDGE

HEDGE

HEDGE

OA MAGNETOMETER GRID 1992

OA MICROTOPOGRAPHIC SURVEY AREA 1992

1993 EXCAVATION AREA

OA MAGNETOMETER GRID 1992

TANK 1

TANK 2

STORM TANKS

TANK 3

TANK 4

TANK 13

INLET WORKS

TANK 12

TANK 14

PRIMARY TANKS

SCREW PUMPS

TANK 10

TANK 11

STORM SCREENS

BLOWER HOUSE

SLUDGE TREATMENT

TREATMENT SCREENS

TANK 7

TANK 4

TANK 8

FINAL TANKS

SLUDGE HOUSE

TANK 6

SWITCHROOM

AERATION TANKS

ULTRA-VIOLET DISINFECTION CHAMBER

KEY

- 3.0m + O.D.
- 2.8m + O.D.
- 2.6m + O.D.
- 2.4m + O.D.
- 2.2m + O.D.

FIG 1.7

TETNEY, NEWTON MARSH

S.T.W.

FIELD SURFACE CONTOURS
1992

Anglian Water
Engineering and Business Systems Limited
Enterprise House
Witham Park
Waterside South
Lincoln
LN5 7JE
01522 557711

LINDSEY ARCHAEOLOGICAL SERVICES
FRANCIS HOUSE
SILVER BIRCH PARK
GREAT NORTHERN TERRACE
LINCOLN
LN5 8LG
TEL: 01522 544554

Plan By :
M. S. E.
MIDLAND SURVEYING & ENGINEERING
259 ALFRETON ROAD
BLACKWELL
ALFRETON
DERBYSHIRE
DE55 5JN
Tel : 01773 811867

SCALE: 1 / 1250

DATE: 17 / 7 / 95

PLAN NUMBER: MSE / LIN / 264

(Based on Anglian Water Services Dwg. 9S/30681/C/01/02)

APPROX

HEDGE

HEDGE

HEDGE

OA MAGNETOMETER GRID 1992

OA MICROTOPOGRAPHIC SURVEY AREA 1992

1993 EXCAVATION AREA

OA MAGNETOMETER GRID 1992

TANK 1

TANK 2

STORM TANKS

TANK 3

TANK 4

TANK 13

INLET WORKS

TANK 12

TANK 14

PRIMARY TANKS

SCREW PUMPS

TANK 10

TANK 11

BLOWER HOUSE

SLUDGE TREATMENT

TREATMENT SCREENS

STORM SCREENS

TANK 7

TANK 4

TANK 8

FINAL TANKS

SLUDGE HOUSE

TANK 6

AERATION TANKS

ULTRA-VIOLET DISINFECTION CHAMBER

SWITCHROOM

KEY

2.3m + O.D.

2.1m + O.D.

1.9m + O.D.

FIG 1.8

TETNEY, NEWTON MARSH S.T.W.

CONTOURS ON SURFACE OF MARINE SILT LAYER 500

Anglian Water
Engineering and Business Systems Limited
Enterprise House
Witham Park
Waterside South
Lincoln
LN5 7JE
01522 557711

LINDSEY ARCHAEOLOGICAL SERVICES
FRANCIS HOUSE
SILVER BIRCH PARK
GREAT NORTHERN TERRACE
LINCOLN
LN5 8LG
TEL: 01522 544554

Plan By :
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MIDLAND SURVEYING & ENGINEERING
259 ALFRETON ROAD
BLACKWELL
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DE55 6JN
Tel : 01773 811867

SCALE: 1 / 1250

DATE: 17 / 7 / 95

PLAN NUMBER: MSE / LIN / 265

(Based on Anglian Water Services Dwg. 9S/30681/C/01/02)

KEY

- 2.25m + O.D.
- 2.0m + O.D.
- 1.75m + O.D.
- 1.50m + O.D.
- 1.25m + O.D.
- 1.00m + O.D.
- 0.75m + O.D.
- 0.50m + O.D.
- 0.25m + O.D.
- 0.00m + O.D.
- -0.25m + O.D.

FIG 1.9

TETNEY, NEWTON MARSH

S.T.W.

CONTOURS ON TOP OF BOULDER CLAY

Anglian Water
Engineering and Business Systems Limited
Enterprise House
Witham Park
Waterside South
Lincoln
LN5 7JE
01 522 557711

LINDSEY ARCHAEOLOGICAL SERVICES
FRANCIS HOUSE
SILVER BIRCH PARK
GREAT NORTHERN TERRACE
LINCOLN
LN5 8LG
TEL: 01 522 544554

Plan By :
M. S. E.
MIDLAND SURVEYING & ENGINEERING
259 ALFRETON ROAD
BLACKWELL
ALFRETON
DERBYSHIRE
DE55 5JN
Tel : 01773 811667

SCALE: 1 / 1250 DATE: 17 / 7 / 95

PLAN NUMBER: MSE / LIN / 266

(Based on Anglian Water Services Dwg. 9S/30681/C/01/02)

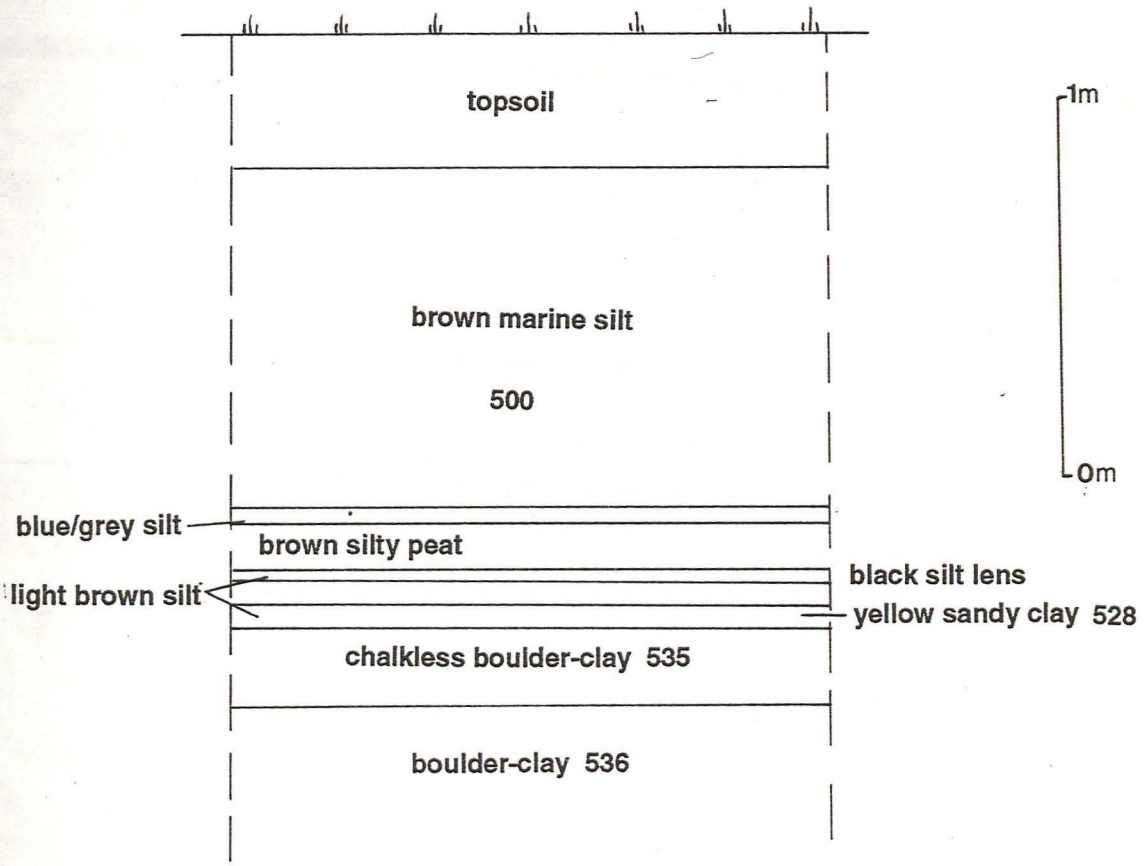


Fig. 1.10 Stratigraphy of the Aeration Tank sump

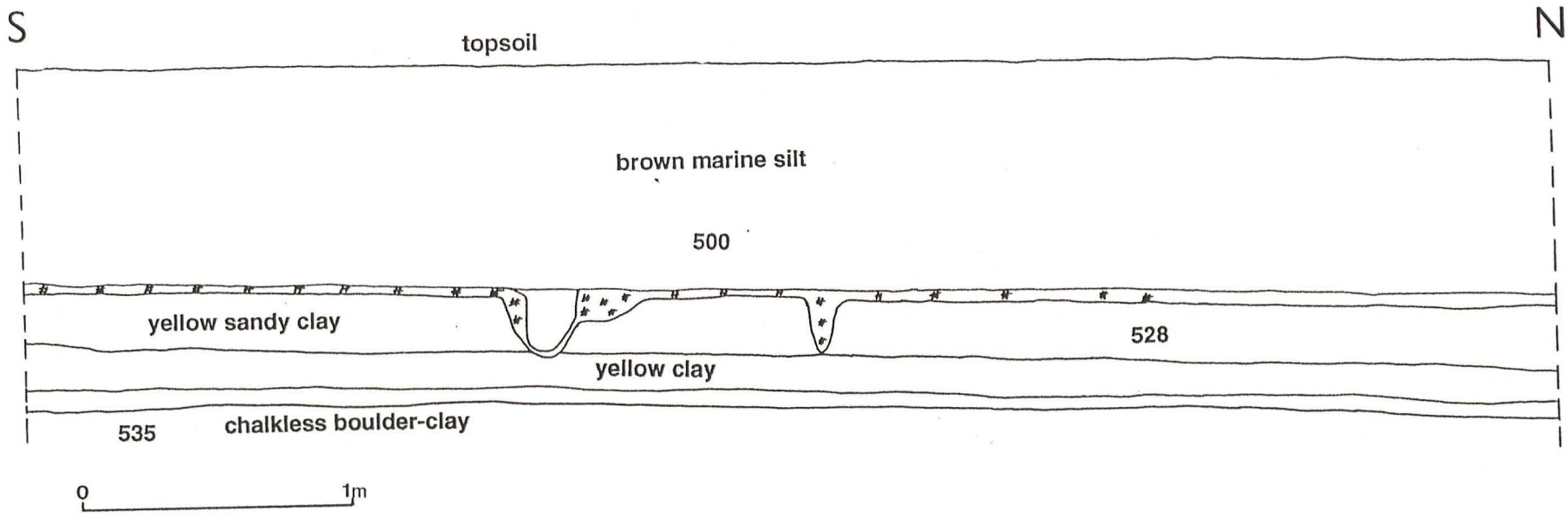


Fig. 1.11 Section of part of the west face of the Aeration Tank (G. Tann)

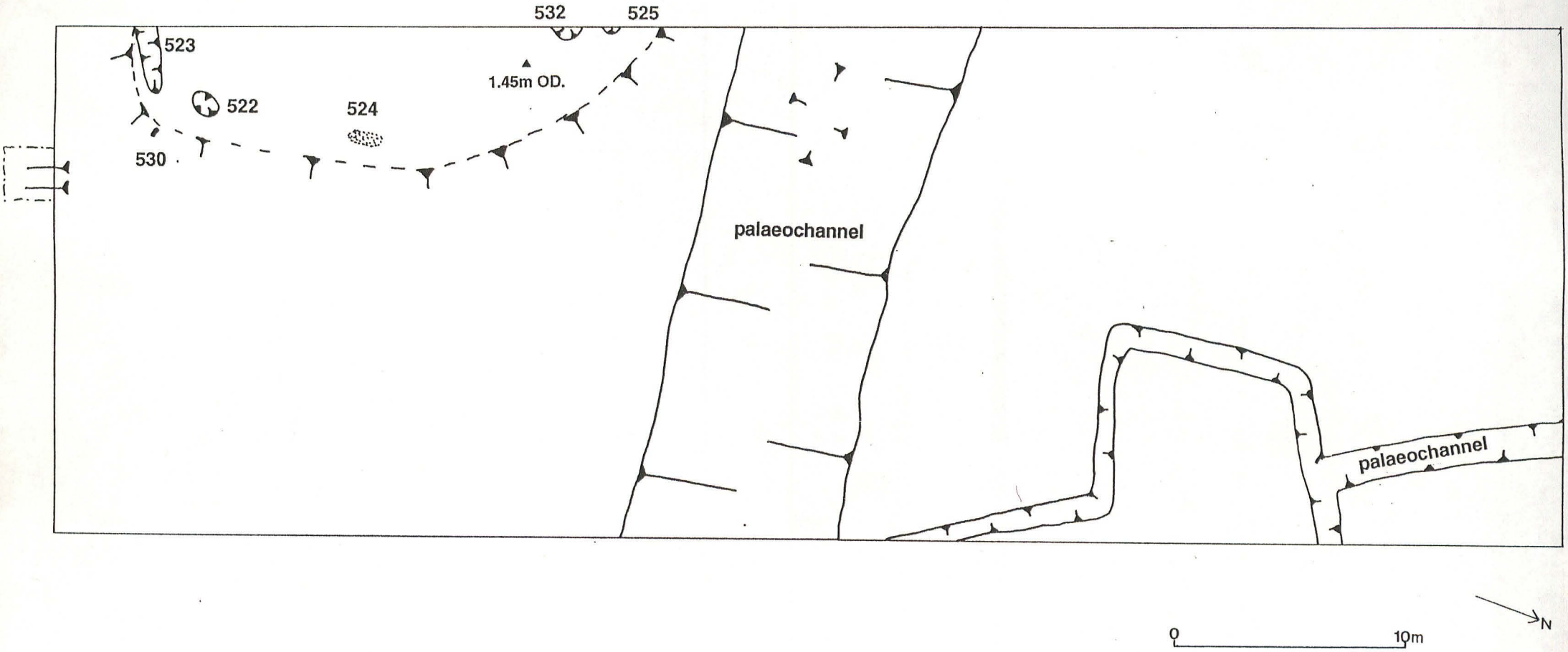


Fig. 1.12 Plan of archaeological features and natural palaeochannels in the Aeration Tank (G. Tann)

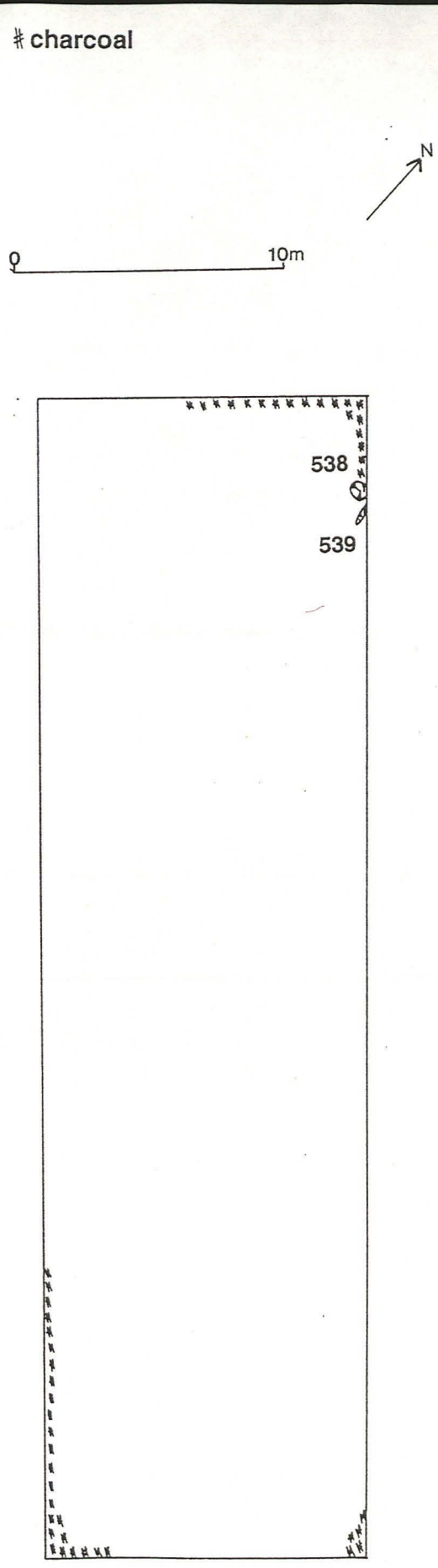


Fig. 1.13 Charcoal deposits seen in the Sludge House foundations, with features 538 and 539 (G. Tann)

Pl. 6 Arable fields on part of the Sewage Treatment Works Site in 1993
before construction began (looking west from Newton Marsh Lane)

Pl. 7 Stripping of topsoil and grey subsoil from the northern part of the STW site; an archaeological excavation within the fenced area located a late Bronze Age salt-processing area. (looking north from a topsoil mound)

Pl. 8 The STW site after topsoil removal and with land drainage in progress (looking west)

Pl. 9 Brick and chalk rubble surface from small post-medieval building beside existing field entrance at the STW compound entrance (looking SW, Newton Marsh Lane behind fence)

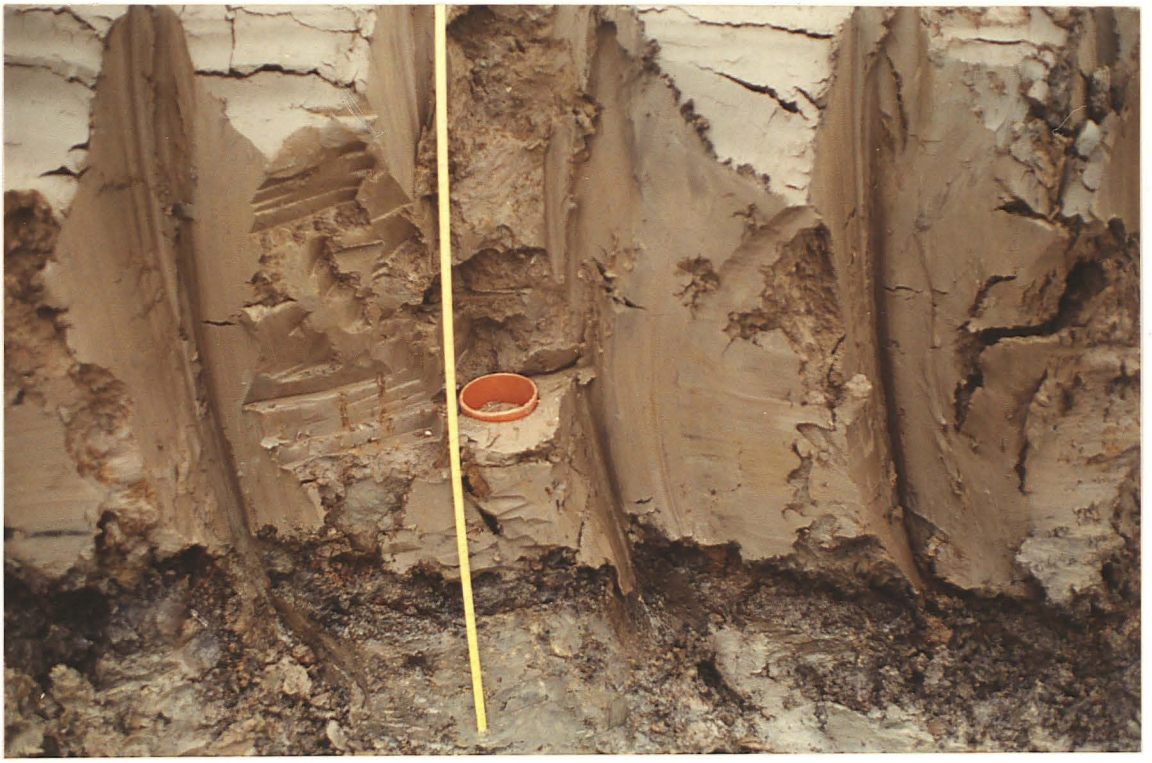
Pl. 10 The flood silt deposit 500 consisted of numerous lenses of silt with some shell inclusions

Pl. 11 Part of the jaw of a small bovine, 502, preserved within the flood deposit

Pl.12 The flood silt layer 500 produced no other finds despite inspection of upcast from land drainage of the STW site. The varying thickness of the layer is evident where the drain has cut through lighter and darker underlying material.

Pl. 13 Mechanical excavation of Tank 2 encountered burnt material 501 and a peat deposit 503 above a light yellow sandier layer 505 (looking north)

Pl. 14 Peat filling palaeochannel 504 in Tank 2. (looking SW, with JCB working within the prehistoric saltern excavation area)



Pl. 15 Top of the column sample taken in Tank 2 through the silt and peat layers

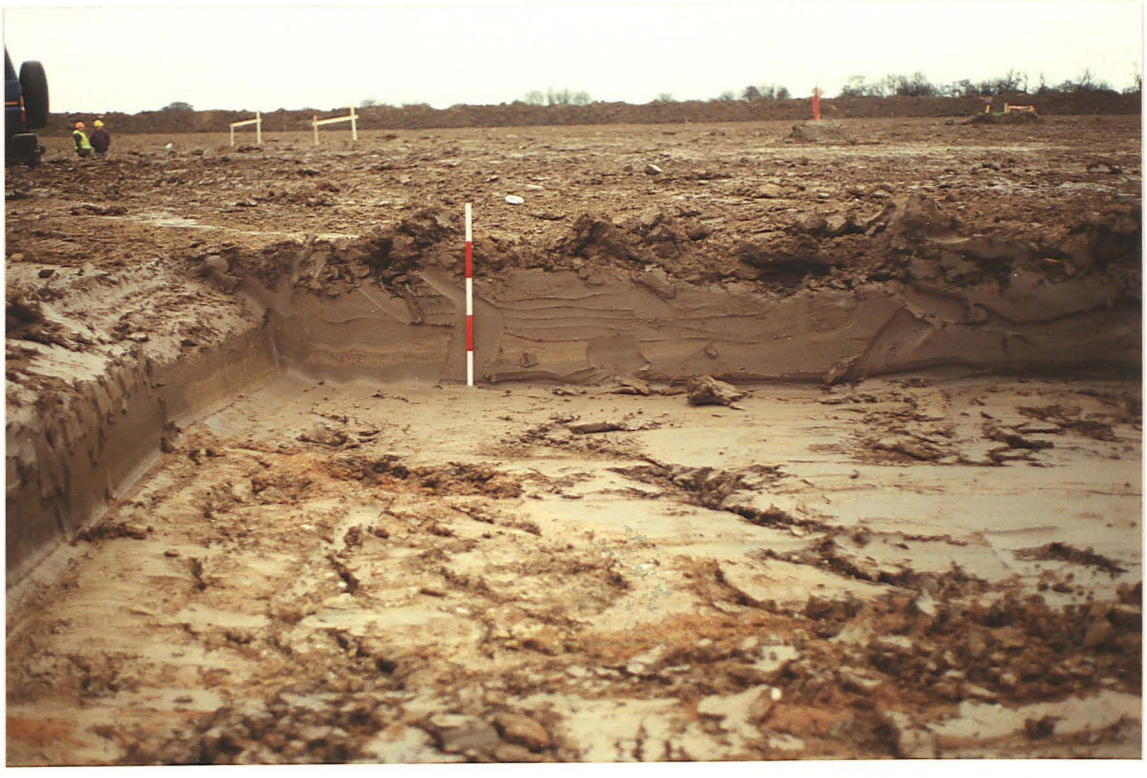
Pl. 16 Palaeochannel 504 partly exposed at the north edge of Tank 2 (it extended further to the north below the flood silt layer). Scale divisions 0.2m; looking NE

Pl. 17 Section through deposits on the SE side of Tank 2: flood silts 500, peat 503, charcoal 501, yellow clay 505 and boulder-clay (looking SW)

Pl. 18 Ditch/channel 507 visible on north side of Tank 3, cutting the yellow sandier clay.

Pl. 19 Ditch 507 crossing Tank 3. Scale divisions 0.5m; looking NE

Pl. 20 Tank 3, showing Ditch 507 and orange/red burnt material with charcoal 508. Scale divisions 0.2m; looking east



Pl. 21 Tank 4: thin peat and grey sand layer 512 in section below the flood silt deposit

Pl. 22 Tank 4: peat deposit 512 revealed in the southern face (looking SE)

Pl. 23 Tank 4: stratigraphy on the NE side, with no peat present

Pl. 24 Tank 5: Location of ?post-hole 513, charcoal filled and cut into the weathered boulder-clay. Looking NW to the saltern excavation area

Pl. 25 Tank 5 during construction, showing charcoal deposits on the western and northern faces. Looking north to concreted Tank 1

Pl. 26 Panoramic view of the south face of Tank 6, showing the prehistoric ground surface dropping towards the west

Pl. 27 NE corner of the Ultra Violet Disinfecting Chamber pit, showing the peat layer thinning towards the east. (looking north)

Pl. 28 Stratigraphy of Tank 7. The peat layer fluctuated in thickness and incorporated preserved unworked timbers where it was thickest. (looking NE)

Pl. 29 Remains of unworked timber preserved in peat, Tank 7.

Pl. 30 Panoramic shot of the Aeration Tank (Tank 8) with the saltern excavation in the left background. The flood silts were noticeably thicker at the north end of the tank. (looking north; scale divisions 0.5m)

Pl. 31 Small silt-filled feature 522 in the Aeration Tank. (looking east; trowel 0.22m, ranging pole divisions 0.5m)

Pl. 32 Detail of feature 522 in the Aeration Tank (trowel 0.22m)

Pl. 33 Hearth 524 as first seen in the Aeration Tank (looking east)

Pl. 34 Detail of Hearth 524 (scale divisions 0.5m)

Pl. 35 Charcoal layer 529 in the SW of the Aeration Tank (scale divisions 0.5m)

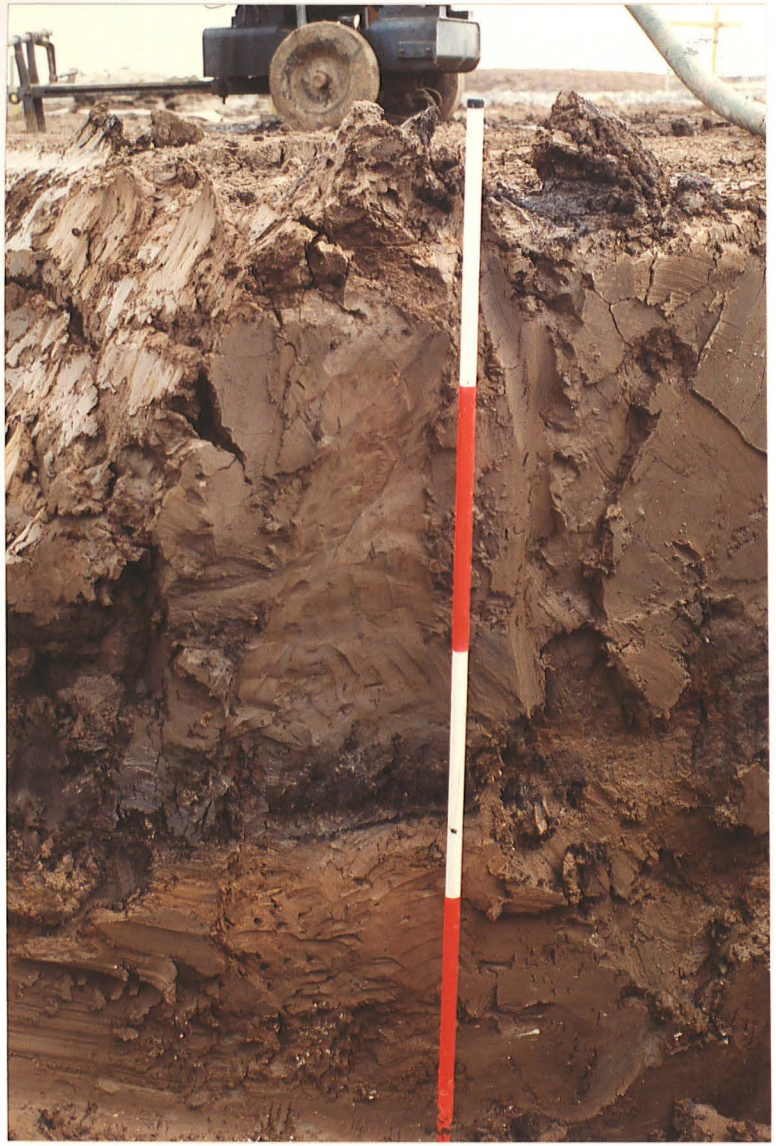
Pl. 36 SW face of the Aeration Tank, showing stratigraphic sequence and post-holes 532 and 525. Looking NW; scale divisions 0.5m

Pl. 37 Detail of post-hole 532, showing charcoal primary fill and peat within the post-pipe. Scale divisions 0.5m; trowel 0.22m

Pl. 38 Post-hole 532, excavated

Pl. 39 Pointed base of post-hole 532 after removal of overlying material

Pl. 40 Sandy peak in SW corner of the Aeration Tank, with deeper flood deposits surrounding it (looking north)



Pl. 41 Complete stratigraphic sequence of post-glacial deposits in the Aeration Tank (looking south; scale divisions 0.5m)

Pl. 42 Detail of deposits in the Aeration Tank, showing the thin charcoal layer 529 below the sulphurous peat 534. Scale divisions 0.5m

Pl. 43 Rippled surface of gritty clay layer 521 at the interface with the flood deposit 500

Pl. 44 Panoramic view of the SE corner of the Screw Pumps (Tank 10) showing no peat layer despite its depth in Tank 7 behind. (looking SE)

Pl. 45 Small peat-filled features in Tank 12, thought to represent uprooted tree or bush holes

Pl. 46 Peat-filled feature in Tank 12, thought to be naturally produced

Pl. 47 Lenses showing episodes of different conditions during the deposition of the flood silts 500 in Tank 14. (Pen length 0.15m)

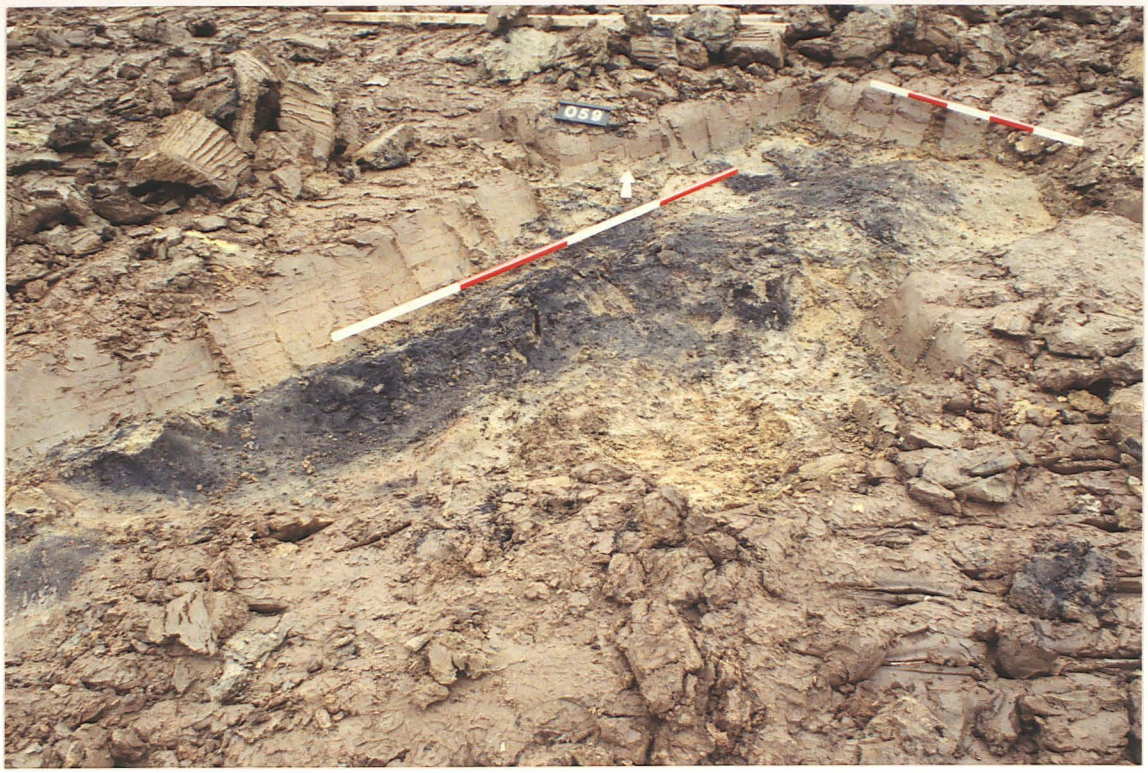
Pl. 48 East side of the Sludge Treatment Tank, showing the stratigraphy and the construction techniques

Pl. 49 Eastern foundation trench for the Sludge House, showing thick flood silt above peat and charcoal deposits. Scale divisions 0.01 and 0.05m

Pl. 50 Detail of post-hole 538 in the Sludge House foundation trench, looking east. Scale divisions 0.01 and 0.05m

Pl. 51 Soil fissure 539 with burnt soil, in the Sludge House foundations

Pl. 52 General view of part of the STW construction site, showing the uneven prehistoric ground surface masked by flood silts (looking SW towards the Lincolnshire Wolds)



Pl. 53 Charcoal deposit 059 below the flood silt layer 500, NE of the saltern excavation. The charcoal may represent a flood-disturbed waste heap redeposited as a thin skim over the ground surface. The undulations in the yellow weathered boulder-clay are thought to be recent, caused by the earth-moving machines crossing soft ground.

Pl. 54 Part of the constructed Sewage Treatment Works, showing the Inlet Works and Primary Tanks. The Low Farm medieval saltern mounds are visible beyond the compound. (looking east)

2

Project 2:

Newton Marsh Lane to Tetney Marshes Outfall Pipeline Archaeological Watching Brief

Site Code TEO 93
LCNCC Mus. Accn. No. 47.93
NGR: TA 3345 0320 - 3520 0320

Introduction

Treated effluent from the Newton Marsh Lane Sewage Treatment Works will be discharged via an Outfall Pipeline into the Louth Canal close to its convergence with the Humber Estuary and the North Sea.

Lindsey Archaeological Services was commissioned by Anglian Water to monitor the Outfall pipeline trench excavations as far as the Tetney Marshes Nature Reserve (Order No. PL 732157 AWSD). The project was expected to provide comparative data in order to place that from the Sewage Treatment Works site in some context. Unfortunately, in the event the Outfall pipeline trench cut through thick grey silt deposits dissimilar to the stratigraphy of the Sewage Treatment Works site and the sequence could not be pursued (Pls. 55 and 56).

The route was divided for recording purposes into fields (numbered from west to east) and these numbers have been used in this report (Fig. 2.1). Findspots were numbered sequentially and referenced with an 8 figure National Grid Reference, using the site code TEO 93 but not including the Field number (Appendix 2). For convenience of description, the approximate chainage (from the west end; see Fig. 2.2) of the observations are used in the text.

The Watching Brief (Fig. 2.2)

The section of the 18m wide easement which passed across farmland (Fields 1-8) was fieldwalked by the author in mid-March 1993. This exercise produced 2 isolated sherds of medieval pottery and a single post-medieval fragment. Slight raised areas, up to about 1m high in Field 1 (close to ch. 200) and Field 5 (ch. 820), were considered to be possible flattened medieval saltern mounds but there was no visible surface evidence for an artificial origin.

The mechanical excavation of the pipe trench was intermittently inspected between Spring 1993 and the following October. Ground conditions were unsuitable for access into the trench and the sides were battered for safety - this restricted the useful information which could be seen or recorded from the surface.

Fields 1 and 2 (ch. -125 to 475)

Fieldwalking of the arable fields within the easement produced two pottery sherds from a single late medieval vessel at ch. 345. These were found to the SE of a ridge in the cultivated soil immediately north of the easement at

about ch. 280. The ridge was initially identified as a medieval saltern mound but no material within the ploughsoil or in the nearby trench section indicated such an origin.

At the western end of the outfall pipeline (within the Newton Marsh STW compound) the trench was too shallow to expose deposits below the brown marine silt. In the first field east of the compound a thick grey silt was present below about 1.7m of brown silt, and this layer was present the entire length of the pipe trench. The grey layer could have been either sediments from an earlier inundation waterlogged in antiquity between floods, or part of the same deposit; stratigraphically both interpretations are possible from the recorded data.

At ch. 145 a thin shell layer was seen below the brown silt, covering a thick peat layer with its surface at 0.46m OD. The peat then extended below the trench base. This observation was anomalous, and the relationship of the peat and the grey silt was not visible. Assuming the grey and brown silts to have been sediments deposited during marine transgressions, the peat could represent waterlogged land forming a small hillock raised above the first phase of flooding. The shells might have been deposited on the equivalent of a small beach as the waters encroached; the brown silt then marks the later more extensive flooding.

The peat was not encountered further east within the monitored pipe trench but was present above boulder-clay below the Nature Reserve. In Field 2 the sequence of brown silt above grey silt resumed and this extended the length of the route.

A narrow creek, about 2m wide and aligned NE-SW, crossed the trench at ch. 460 below the brown marine silt layer and cut into the grey silt. The channel was 0.3m deep and filled with shells.

Fields 3 and 4 (ch. 475 to 730)
A number of parallel NW-SE bands of dark brown soil, interspersed with three slight ridges of light brown silty clay were observed on the field surface, especially to the north of the pipeline route. The maximum contour variation noted in this field on the Anglian Water survey for this project was 0.22m (Anglian Water 1992b). The undulations may be vestigial traces of medieval 'ridge and furrow' cultivation.

A series of footpaths marked on OS map TA 30 (1953) lead quite directly from North Cotes village through Tetney Lock to the saltern mounds at TA 3374 0353 and continue NW towards the coast at Cleethorpes, at least partly along the line of the medieval sea defences (Fig. 1.1; Owen 1984). The footpath was cut by the pipeline at the western side of this field but no physical traces were observed. The right of way may fossilise the course of a coastal path of Saxon date, linking the settlements along the edge of the then tractable land. Sea level changes and deliberate reclamation since have pushed the coastline further east, leaving the path surrounded by farmland.

This route (at about 2.80m OD.) lies 0.15km to the west and 0.1m higher than the present metalled farm track (Newton Marsh Lane).

Newton Marsh Lane, East (ch. 730)
The farm track to Low Farm from Tetney Lock was cut by the pipeline between Fields 4 and 5; the section showed the road to be of stone and small rubble with no substantial foundation or sequence of repairs (Pl. 57). It is unlikely that this surface acted as a metalled route to the nearby saltern sites. Medieval salterns in this area appear to have fallen from use after severe flooding in 1571 (Rudkin 175, 37) and this would suggest a later date for this track (which is probably a later re-alignment of the footpath course deliberately avoiding the redundant and inconvenient saltern mounds).

Fields 5-9 (ch. 730 to 1700)
In the field immediately east of Newton Marsh Lane a raised area in the field beside the pipeline easement, aligned NW-SE, was thought to be a possible medieval saltern mound. Observation of replacement land drainage trenching and fieldwalking of the adjacent easement produced no finds to support the identification and it seems likely that the ridge is a naturally produced feature.

The fields to the east showed no trace of any archaeological features on the surface and only brown and grey silts were revealed in the trench section.

Field 10: Thrust-bore pit (ch. 1700 to 2050)
The sections of the pit dug at the east end of the exposed pipeline for the insertion of the pipe below the Nature Reserve were inspected (Pls. 58 and 59). The pit extended almost 6m below ground level and bottomed onto a silty red-brown deposit which may have been boulder-clay. No chalky inclusions were visible from the pit top, but the material removed during the moling of the pipe trench contained typical boulder-clay inclusions of chalk and shale. A few small unstratified organic fragments retrieved from the spoil from the tunnel (including a branch segment and a thin twig) were later discarded.

Conclusion
The absence of archaeological remains from the pipe trench is almost certainly an accurate reflection of the prehistoric and later environment of these fields close to the mouth of the River Humber. The stratigraphy of the trench face indicates thick marine sediments laid over a post-glacial ground surface sloping downwards from the STW site to the coastline. This land may have remained tidally covered or as intractable marshland until the late medieval period, and Newton Marsh Lane (East) with Braybrook Farm could have been at the edge of habitable land. The salt-making sites of all periods at Low Farm and the Newton Marsh STW could only have existed if the coastline or a tidal creek extended inland to those places, and from the indications of the Outfall watching brief there may have been no human activity further to the east.

The possible identification of successive sea banks between Tetney Haven and Humberston requires considerably more research, beyond the scope of this report. It seems possible that both the west and east parts of Newton Marsh Lane may have been developed on the edge of firm ground at different periods; distinguishing phases in the reclamation of Newton Marsh could help to establish a chronology for the late Saxon and medieval sea level around this part of the coastline.

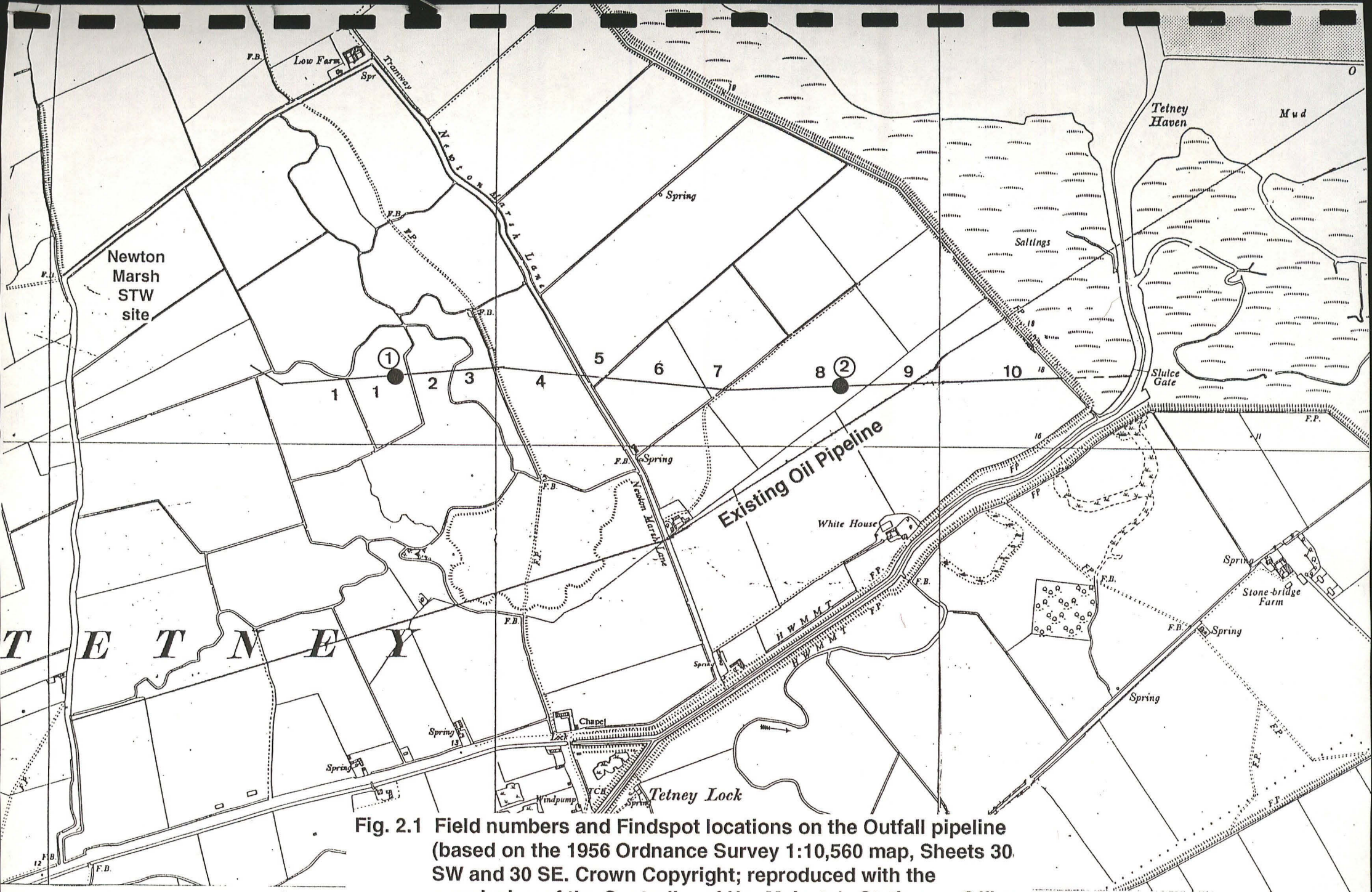
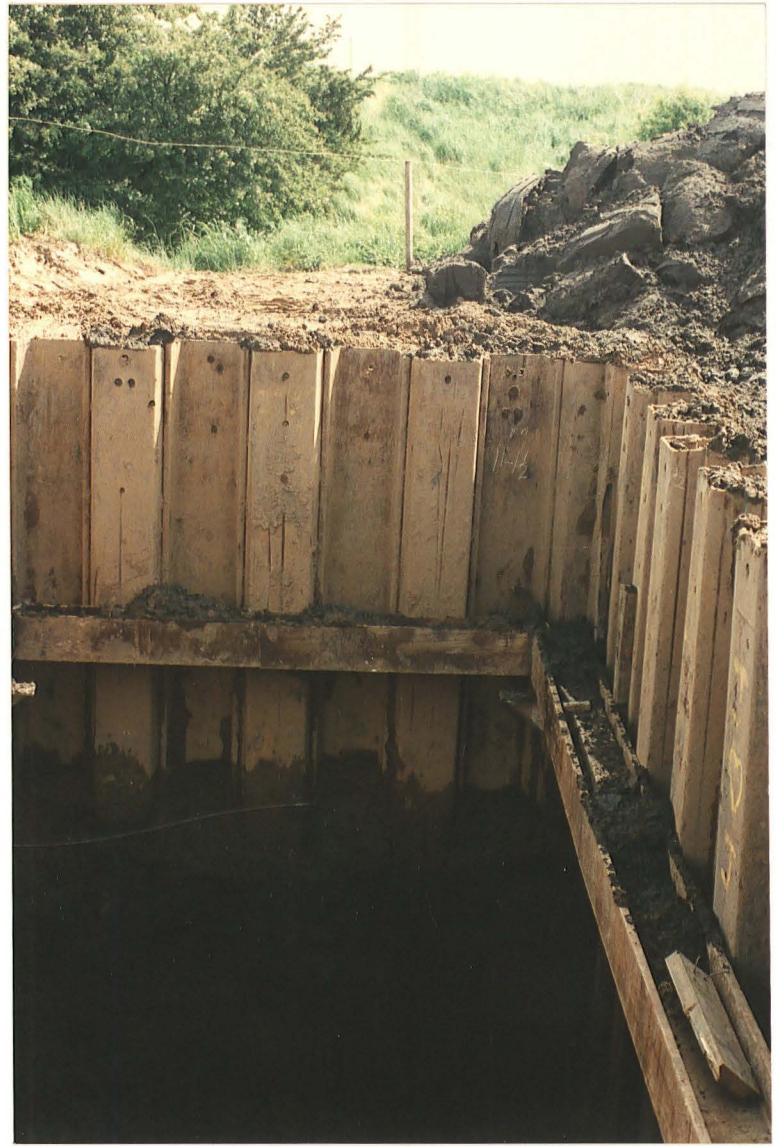


Fig. 2.1 Field numbers and Findspot locations on the Outfall pipeline (based on the 1956 Ordnance Survey 1:10,560 map, Sheets 30 SW and 30 SE. Crown Copyright; reproduced with the permission of the Controller of Her Majesty's Stationery Office, Licence no. AL 50424A)

Pl. 55 The Outfall Pipe trench cut through thick brown flood silts into a grey silt deposit, Field 1

Pl. 56 Detail of the interface between the brown and grey silts in the Outfall pipe trench (looking north)



Pl. 57 The trench section through Newton Marsh Lane showed a thin chalk rubble foundation for the track above flood silt. (looking north)

Pl. 58 Location of the thrust-bore pit, Field 10 (looking SE)

Pl. 59 Grey silt deposits in the thrust-bore pit

Project 3: King's Road, Cleethorpes to Newton Marsh Lane Rising Main (Tetney Inlet Pipeline)
Archaeological Watching Brief
Site Code TEI 94
LCNCC Mus. Accn. No. 47.93
(NGR: 3200 0700 - 3320 0330)

Introduction

The larger of the two pipelines designed to convey effluent to the Newton Marsh STW joined a pumping station at King's Road (on the southern fringe of Cleethorpes) with the new Treatment Works (Fig. 3.1). The pipeline consisted of two parallel cast iron pipes placed in a single 6m wide continuous open trench, within a 45m wide easement. The pipes were placed close to the base of the 2-3m deep trench. An intermittent archaeological watching brief was requested for the project which passed through parts of the counties of Lincolnshire and Humberside, each with separate archaeological jurisdiction. Lindsey Archaeological Services commenced monitoring on behalf of Anglian Water in early October 1993 and completed the fieldwork in late March 1994 (Order No. PL 735390 AWSD).

Archaeological Background

The unexpectedly early date of the prehistoric saltern site located within the Newton Marsh Sewage Treatment Works compound in 1993 (Palmer-Brown 1994; this report p. 22) increased the perceived archaeological sensitivity of the Rising Main scheme although a thin scatter of previous casual finds from near the route already merited some investigation of the groundworks (Appendix 1).

To the south of Humberston Beck (the Humberston/Tetney parish boundary) the route passed 0.4km NW of the medieval saltern waste mounds near Low Farm on Newton Marsh (LSMR 41229). A footpath crosses those substantial mounds and continues northward to Cleethorpes; it was believed that the right of way might reflect a medieval salt-trading route or sea bank and that contemporary dwelling sites or levelled saltern mounds could be located beside the path. Part of the footpath has become the track to Humberston Woodhouse known as Green Lane, along which the pipeline was directed (Fig. 3.1). The site of the deserted medieval village of Thrunscoe lies about 0.8km from the northern end of the route.

The Humberside SMR lists a scatter of prehistoric flint implements found NW of South Sea Lane (HSMR 1168, 1171). The findspots are clustered (and one axehead find may have become duplicated in the records) and indicate a change in the surface geology from the masking late Roman marine silts to the south, to exposed glacial boulder-clay to the north. The zone between the higher boulder-clay and the silts was potentially of great interest in determining the date of the inundation by sites or artefacts sealed by the silt.

Romano-British pottery has been noted from Manor Farm in Humberston, 1.6km west of the pipeline and it was possible that further sites associated

with a coastal community might be revealed during the groundworks for the pipeline.

The Watching Brief

The line of the route was divided into plots for purposes of recording any archaeological finds; the divisions used field boundaries marked on the Ordnance Survey maps (OS 1956) where possible but then divided open ground, tracks and verges for convenience (Fig. 3.1). Finds or archaeological observations were recorded by reference to the plot with an additional 8 figure National Grid Reference to permit easy correlation with the Sites and Monuments Records held by both counties.

The defined route was rapidly covered by a non-intensive field-walking strategy, designed to locate areas of surface finds in advance of topsoil removal. It was hoped that this would locate medieval saltern sites and prehistoric flint scatters in time for detailed recording before sites were removed by the pipe trench. A single medieval pot sherd, one Roman rim sherd and a prehistoric flint scraper were found as a result of this exercise (Pl. 60). The absence of more medieval pottery reflected the isolation of the coastal marshland zone from the communities at Tetney and Humberston.

During the subsequent monitoring of the topsoil stripping and the trench excavation, a number of stratigraphic observations were made in order to add data to the topographic information collected within the Sewage Treatment Works area. The depth of marine silts and the presence of peat deposits or shell concentrations was recorded and this has extended knowledge of the late-Roman environment between Tetney and Cleethorpes (Fig. 3.2). It had been anticipated that the width of the trench would permit access for archaeological recording despite the considerable depths, but in practice a layer of water-retaining peat caused instability of the trench sides and shoring boxes were used for the entire length. The trench sections were therefore obscured; measurements of the strata were possible at intervals but interpolation was difficult when layers merged or disappeared between points.

Field 1 (Figs. 3.3 and 3.4)

A prehistoric flint scraper was found on the surface of the ploughed field about 120m north of Newton Marsh Lane (**1A**; ch. 3650). The flint is rectangular (30mm x 25mm x 10mm) with one corner damaged by modern ploughing. Original cortex survives on two edges, with irregular retouch evident on the other faces. From the secondary patina which has developed on the black flint material it is clear that the working was ancient, even though the artefact was recovered from the ploughsoil surface above post-Roman marine silts; the likely Bronze Age date coincides with the date of the saltern site found below the silt in the same field later in the project. The topsoil find indicates that a prehistoric ground surface has been disturbed since the marine regression either by field ditches or land drains which were found to cut the briquetage spread in the same field.

After topsoil had been stripped from the easement in the field, the surface was again inspected but no archaeological remains were visible on the brown marine silt layer. The easement was rapidly disturbed by vehicles delivering the pipes and tipping gravel and stone (Pl. 61). When the field was trenched it was discovered that the silt layer was exceptionally thin at the southern edge of Field 1; below this a yellow clay weathered ground surface and further saltern remains were present. Archaeological remains were present about 0.2m below the surface of the marine silt in places, and had been affected by the weight of the vehicles crossing the area in wet ground conditions. Some archaeological features had been moved, others had been squashed and interpretation of the cluster was unreliable. These seemed to represent part of the same Late Bronze Age/ Early Iron Age industrial activity investigated on the main archaeological excavation area TE 93 although the two concentrations were separated by over 20 metres.

At **ch. 3835**, about 15m north of the field boundary ditch, a spread of charcoal and briquetage was seen in a 0.1m deep depression 1.2m x 1.4m in area. The material had been covered by the marine silt layer but lay in the yellow sandy clay thought to represent the weathered prehistoric ground surface (Pl. 62). Other concentrations of charcoal and briquetage were noticed in the machine bucket close to this point as the trench was excavated towards the south; the finds and features were hastily recorded in salvage conditions. For recording purposes the spreads of archaeological material and the possible features forming the complex were allocated a series of context numbers from 50 to 62 before further work took place.

Context 50 The base of a pot or tray, positioned upright, was found resting in a small hollow or pit (0.26m diam.) cut 0.13m into the yellow sandy clay subsoil; there were no signs of localised heating close to it (Pls. 63 and 64). Part of the rim remained in place although the top of the vessel had been scraped by a machine bucket (Pl. 65). Inspection of the vessel fragments found no evidence that it had been intact when the feature was abandoned. The vessel was filled with grey silty material and had been set into grey soil. The top of the vessel coincided with the upper surface of the yellow clay at 2.52m OD.

The site was to be left for an unknown period while arrangements were made for any future archaeological investigations. In view of the wintry conditions of extensive standing water, snow and frost, coupled with the vulnerable location of the site beside a restricted width access for plant equipment, the vessel was removed shortly after it had been identified. An attempt was made to lift the vessel without causing further damage although a number of widening cracks were visible across the fabric and its fill. The context was cleaned, planned and photographed before cuts were made into the surrounding subsoil to slide a shovel blade below the feature, removing the vessel and its fill in one lump. This process created an irregular hole greater in size than the small pit containing the vessel and the outline of the feature was added to the site plans of the subsequent area excavation.

The vessel was removed and its fill excavated off-site. It became apparent that the vessel was too irregular and angular to be a pot but exhibited the shape of a small trough. The emptied trough was photographed before the sherds were freed from the yellow clay into which the pit had been cut, and the sherds were then separated and cleaned (Pl. 66). The fill was retained but discarded after examination.

Context 51 An extensive spread of briquetage and burnt pebbles lying in a brown-grey silt matrix was noted close to Context 50, particularly dense 2m NE of that vessel and feature (Pl. 67). The impression of this spread was that it formed a thin layer in a shallow defined depression about 2.6m square. The top of the deposit was at 2.53m OD, virtually flush with the pot rim.

The briquetage spread became the focus of a short archaeological excavation (described below) and appeared to be the remains of a saltern waste heap levelled and spread into undulations on the contemporary post-glacial ground surface by a flood.

Context 52 Another less extensive spread of briquetage and charcoal flecks with burnt stones and pebbles was found surviving within the north- south linear depression of a recently formed machine wheel rut, about 2.5m to the east of context 51 (Pl. 68). Although the 0.88m x 0.45m deposit was dense (Pl. 69), it is possible that it had become transported from elsewhere, although it may have been a small feature *in situ*. Other smaller patches of briquetage were seen in nearby ruts where the machine weight may have pressed a layer into the profile of a gully-like feature (Pl. 70).

Contexts 61-2 An oval feature (61) filled with dark soil and briquetage was identified in the centre of the line of the pipe trench about 10m NE of context 51. The machine bucket removed the entire feature and moved it outside the working area where it was excavated and recorded (Pl. 71). The fill (context 62) consisted of dense fragmentary briquetage, heat-shattered and burnt flints (both worked and unworked) mixed with charcoal fragments and brown clay loam (Pl. 72). A narrow slot was excavated through the deposit to determine the depth and profile of the feature, which proved to be very shallow (0.06m) and gently sloping with a rounded base (Pl. 73).

Other traces of archaeological activity were recorded on the southern side of Newton Marsh Lane both outside and within the STW compound (Pls. 74 - 76). The proposed pipe trench course from the track into the compound and up to the Inlet Works (Pit 9) was cleared of the brown marine silt layer (identical to TE 93 500) in advance of deeper trenching, in order to allow recording of any archaeological remains close to the 1993 saltern excavation area. The thickness of the silt layer varied from about 0.5m south of the track to 0.9m close to the Inlet Works, where it overlay a peat layer (Pl. 76). The abrupt slope began about 10m NW of the Inlet Works and had been recorded at an earlier date, continuing south of the excavations for the structure.

The surface below the silt was examined, and several archaeological features were identified despite the saturated ground which made cleaning and definition of the shapes impossible. Positions of the contexts are shown on Fig. 3.3.

Context 53: (ch. 3895) a 0.15m diam spread of fired clay.

Context 54: (ch. 3908) A charcoal and silt spread, 2.2m north-south and at least 1.4m east-west (it extended beyond the east edge of the stripped cut). The surrounding yellow clay had not been affected by heat so it was interpreted as a redeposited spread, probably washed here by flooding.

Context 55: (ch. 3910) 1.5m south of 54, a rectangular concentration of charcoal and a few briquetage fragments, 1.5m east-west and 0.7m north-south (Pls. 75 and 78). The spread was in thin lenses with well-defined edges; it is possible that the spread was tip-layers within a NE-SW ditch but the shape could not be confirmed in the ground conditions. The surface of the feature was at 2.24m OD.

Context 56: A very thin layer of redeposited charcoal, 1m diam., with a few fragments of briquetage was seen close to ch. 3915.

Context 57: (ch. 3915) A rectangular area of red and yellow burnt clay surrounded by charcoal fragments, at the west side and extending beyond the edge of the cleared cut was identified as a possible hearth (Pl. 79). The visible dimensions were 0.8m east-west and 0.5m north-south, with the surface at 2.25m OD. This hearth was about 15m west of the natural pool beside the Late Bronze Age saltern excavated in 1993 and probably represents another heat source for the evaporation or drying processes.

Context 58: (ch. 3955) A 1.5m diam. spread of redeposited charcoal flecks and a few fragments of burnt clay was seen south of context 57.

Context 59: A dense charcoal spread with a peripheral washed spread extending 1.2m west of the main deposit was recorded at ch. 3986. The dimensions of the main area were 0.9m east-west and 1.0m north-south, with a surface height of 1.76m OD.

Context 60 (ch. 3991) At the extreme southern end of the area cleared of marine silts, the yellow sandy clay prehistoric land surface dropped abruptly to the south and was sealed by a lens of silty peat (Pl. 77). Peat was only exposed south of ch. 3989, with its surface at 1.66m OD. Above the peat was a 0.3m thick layer of blue/grey silt thought to be a waterlogged form of the 0.6m thick brown marine silt layer 500 above.

After recording of the archaeological features, an excavation was arranged for a small area beside the pipe trench in the south west corner of Field 1 (see Project 4). A geophysical survey of part of the easement was conducted by Oxford Archaeotechnics to determine the extent of vulnerable

archaeological remains. The ground conditions and the proximity of large buried metal pipes prevented this survey from contributing much information (Figs. 4.5 and 4.6) but a series of test pits hand-dug by LAS established the depth of the existing flood silts along a length of the easement and noted the extent of the exposed archaeology. Within 150m north of Newton Marsh Lane the marine silt layer thickened until the post-glacial land surface was no longer under threat from machine disturbance during the reinstatement of the field; archaeological features were only found up to about 35m north of the lane (Pl. 80).

Field 2

The pipe trench exposed a layer of peat between two silt deposits at the northern side of Field 2, close to the track from Bishopthorpe Farm (Pl. 81). The full sequence of deposits was recorded and small samples were taken for pollen analysis at ch. 3185 (Appendix 9). The stratigraphy showed that there had been two post-glacial inundations separated by a period of regression with poor drainage during which peat had formed (Fig. 3.5). It is clear that the archaeological activity present at the southern side of Field 1 had utilised a ridge or promontory of higher ground partly surrounded by creeks or a bay. The boulder-clay surface had dropped about 2m within 600m of the observations near Newton Marsh Lane (Fig. 3.2). Faint surface indications of channels or creeks can be seen on the field surfaces to the south of Humberstone Beck, reflecting larger features below the later marine silt (Pl. 82).

Field 3

The trench base rose in the field immediately south of Humberston Beck and deposits below the two marine silt layers were not exposed. No intervening peat layer was seen close to the watercourse, perhaps showing that the vicinity had been flooded continuously during the local sea level fluctuations; Humberston Beck may itself reflect the centre of a former creek.

Field 4

A rim fragment from a large Romano-British greyware pottery vessel was found during the initial fieldwalking, in some disturbed sand beside the disused minor gravel quarry workings north of Humberston Beck (**4A**; ch. 2750). The sherd measures 90mm in length and is very abraded on all edges (Pl. 60). It had been smoothed by water movement and may have been incorporated and protected within the sand deposit shortly after it was discarded but before further damage had occurred. From the evidence of the pipe trench stratigraphy it is clear that thick sand and shell deposits are present close to the gravel pit and that the marine silts extended less than 1km further north. The sand seems to be a relic of an irregular coast line contemporary with the marine silt deposition, and probably dateable to the late Roman period; the sherd is of mid/late 3rd/4th century AD date so incorporation into the sand deposit cannot have been earlier. The sherd may have been discarded onto the foreshore, or eroded from a settlement site by wave action; no Romano-British site was found during the watching brief.

The field surface undulated considerably within and just to the west of the pipeline easement north of Humberston Beck and part of the field was surveyed by M. Clark for LAS before topsoil was removed (ch. 2785; Pl. 83). The ridges were suspected to be medieval saltern waste mounds and had been plotted as such from air photographs by the RCHM(E) (Fig. 0.6). Trenching showed these ridges to be composed of sand and shells, and they were reinterpreted as coastal dunes formed during the last major inundation. The siting of the post-medieval gravel pit had already indicated a change in the drift geology, and this was apparently the shoreline during the marine inundation (Pls. 84 and 85).

19th century Highway Accounts for Humberston record the use of gravel from Fitty Gravel Pit for road maintenance in the parish; the pit was still in use during the 1930s but had been effectively abandoned by 1953 (Kirkby 1953, 153). A local resident reported to the author in 1993 that the pit had since been used erratically but abandoned when the worked deposit became too thin to be viable.

Field 5

A second Romano-British pottery sherd was recovered from the surface of the stripped easement at ch. 2600, also of mid 3rd-4th century AD date (Pl. 60). This sherd also displayed signs of abrading and may have become worn in water.

Concentrations of oyster and cockle shells were found at intervals crossing the pipe trench from east to west, apparently indicating the positions of small tidal streams (Pls. 86-88). The interleaved beach and marine silt deposits in Fields 4 and 5 seem to show a fluctuating coastal zone, sometimes with a marine and sometimes with a dune environment. No peat was seen at this part of the pipe trench.

A small area of slight *in situ* burning with burnt soil and charcoal flecks was observed on the stripped easement surface at ch. 2480 (Pl. 89). There were no associated dateable artefacts although the feature must post-date the last marine transgression. It was assumed that the burning was post-medieval or more recent.

Field 6

Within Field 6 the frequency of shells and sand reduced and the sediments became thicker. At ch. 2130 there was 1.9m of brown marine silt above 0.3m of grey silt, beneath which was at least 0.55m of light brown silty peat (Pl. 90). It was unclear, because of the thin lower silt layer, whether two marine silt layers were present or a single layer affected by the peat.

Field 7

A test pit was mechanically excavated by the contractors in the field south of South Sea Lane (ch. 1980) to a depth of 4.5m. Peat was exposed at the base of the hole, below marine silt. Within the pipe trench the peat was slightly higher at ch. 1930 mixed with grey silt (Fig. 3.2; Pls. 91 and 92).

Field 8

Topsoil stripping in the field north of South Sea Lane disturbed the skeletal articulated remains of a pig at **8A**; ch. 1785 on the eastern side of the easement (Pl. 93). The burial was in a shallow rectangular cut 1.1m x 0.5m, intruding about 0.3m into the marine silts below the topsoil. An iron nail was present beside the skeleton. This animal burial was interpreted as of post-medieval or modern date by the nail and the scatter of post-medieval china observed in the vicinity. As a pig was traditionally an animal reared for its high food content it is likely that some disease had been diagnosed or suspected for the corpse to have been buried intact.

This animal burial illustrated the superficial similarities of some pig bones to those of humans: the contractors had feared that the partly exposed bones were from a human burial and had halted work pending expert advice. Identification was provided by a member of staff from the Humberside Archaeology Unit before LAS had been informed.

Almost 25m further north (at **8B;** ch. 1760 on the eastern edge of the easement) a small spread of gravel, pebbles and broken bricks was observed below the topsoil, filling a feature 2m north-south x 3m east-west which extended beyond the stripped area (Pl. 94). The bricks were red and unfrogged, measuring 220mm x 112mm x 53mm. The broken ends of two small vertical wooden posts remained within the surface where they had been driven. This was interpreted as the site of a flimsy structure of quite recent date.

Boulder-clay was seen at the trench base at ch. 1725, and rose sharply to about 0.5m below the present surface at the northern part of that field, at 2.6m OD. The rise in the underlying post-glacial land surface was visible before the trench was dug, from the material thrown up by the replacement land drains laid in Field 8 (Pls. 95 and 96).

At the northern limit of Field 8, immediately before the pipe trench deflected into the adjacent green lane, a single sherd of late medieval pottery was found in the ploughed topsoil within the easement (ch. 1590). No earlier finds were made although previously reported artefacts including at least one Neolithic stone axe are recorded from the close proximity. The find scatters reflect the limit of the exposed post-glacial land surface; similar finds to the east may have been covered by the later flood deposits.

Field 9

The pipeline was laid below an unmetalled track leading from Cleethorpes Leisure Park to Humberston Woodhouse, eventually joining a footpath at Low Farm parallel with Newton Marsh Lane. It is probable that this access represents the course of a medieval route between salt-making sites; the track may also mark the line of a medieval sea wall. Excavation of the trench below the track was not observed but the excavated material appeared to consist entirely of sand below the modern aggregate. The sand may

represent deliberate reclamation of the coastal zone, using material from the beach (Mills 1989).

The foundations of a recently demolished structure, possibly a World War II defensive structure, were reported at ch. 1260.

The trench section in front of Cleethorpes Leisure Park was inspected and the following sequence recorded at ch. 700 (Pl. 97):
0.00- 0.15m tarmac and make-up material
0.15- 1.60 m fine sand
1.60- 3.10m running sand and marine clay, with blue boulder-clay inclusions
3.10-3.30m chalky boulder-clay
This observation places the upper surface of the boulder-clay at about 2.5m OD, about 0.5m lower than at ch. 1250. Further north the surface drops lower still to below the trench base in Field 10.

Field 10
An almost complete medieval jug was recovered by a Birse employee, Mr Brooks, after a partial collapse of a trench section at **10A**; ch. 105 (Fig. 3.6; Pl. 98). The instability of the ground required the section to be box-shored and the face was not accessible for inspection when a site visit was made by the author shortly afterwards. It later became possible to see part of the section face when the box-shoring was removed for backfilling and the observations were recorded.

The vessel was found in dark silt lenses within gravel, sealed by 1.5-2m of yellow sand on the west side of the pipe trench. No other fragments of pottery or other refuse were seen in the trench despite a short search by the finder. The section indicated a thick band of sand (about 2.3m thick) below the present turf layer, covering marine silts (Pl. 99). The silt deposit was cut or interrupted by an apparently linear feature which crossed the pipe trench approximately NW-SE. At the interface with the sand layer it was 1.5m wide but it gradually narrowed with depth; the feature extended to an unknown depth below the trench base (3.3m below the surface). The fill of this anomaly was gravel which was stained black.

The pot has been dated to the 14th-early 16th centuries, indicating that the feature had cut the marine silt layer. The width and depth of the feature implied an artificial drainage ditch cut from a post-medieval ground surface below the thick sand layer but this could not be confirmed; the pot may have been thrown into a natural creek.

Conclusion
Monitoring of the King's Road to Newton Marsh pipe trench produced further important evidence for prehistoric saltmaking activity at Newton Marsh and prompted a further archaeological excavation. An improved idea of the extent of the saltern site was obtained and a hearth was identified close to the natural pool of the 1993 excavation but on the opposite side. Archaeological features, briquetage and charcoal spreads were found at intervals between

the 1993 site and the 1994 excavation, suggesting that a single extensive working area was involved rather than several discrete salt-making sites.

The close relationship of the briquetage spread and saltern features to higher ground was evident from the monitoring (Fig. 3.2). The profile was prepared using observations and measurements at irregular intervals with some interpolation.

Observations from this pipe trench, especially north of Humberston Beck, showed that the rising main was following an alignment very close to the Romano-British coastline. The two redeposited contemporary pottery sherds hinted at a nearby settlement site or rubbish deposit eroded by the changing shore line; it is unlikely that the pottery came from the nearest previously known Romano-British site at Manor Farm, Humberston (almost 2km to the NW). The location of the source remains undiscovered and no other evidence for contemporary local activity was found in any of the related projects.

Green Lane, Humberston (Field 9) may have marked the edge of the drier and stable land in the medieval period. The thick sand deposits suggest an abrupt change in ground contour coinciding with the lane, but deliberate sand movement and landscaping may have occurred this century.

Fig. 3.1 Field numbers and Findspot locations on the King's Road Cleethorpes to Newton Marsh pipeline (based on the 1989 Ordnance Survey 1:25,000 Pathfinder map, Sheet 720 (TA 20/30) Crown Copyright; reproduced with the permission of the Controller of Her Majesty's Stationery Office, Licence no. AL 50424A)

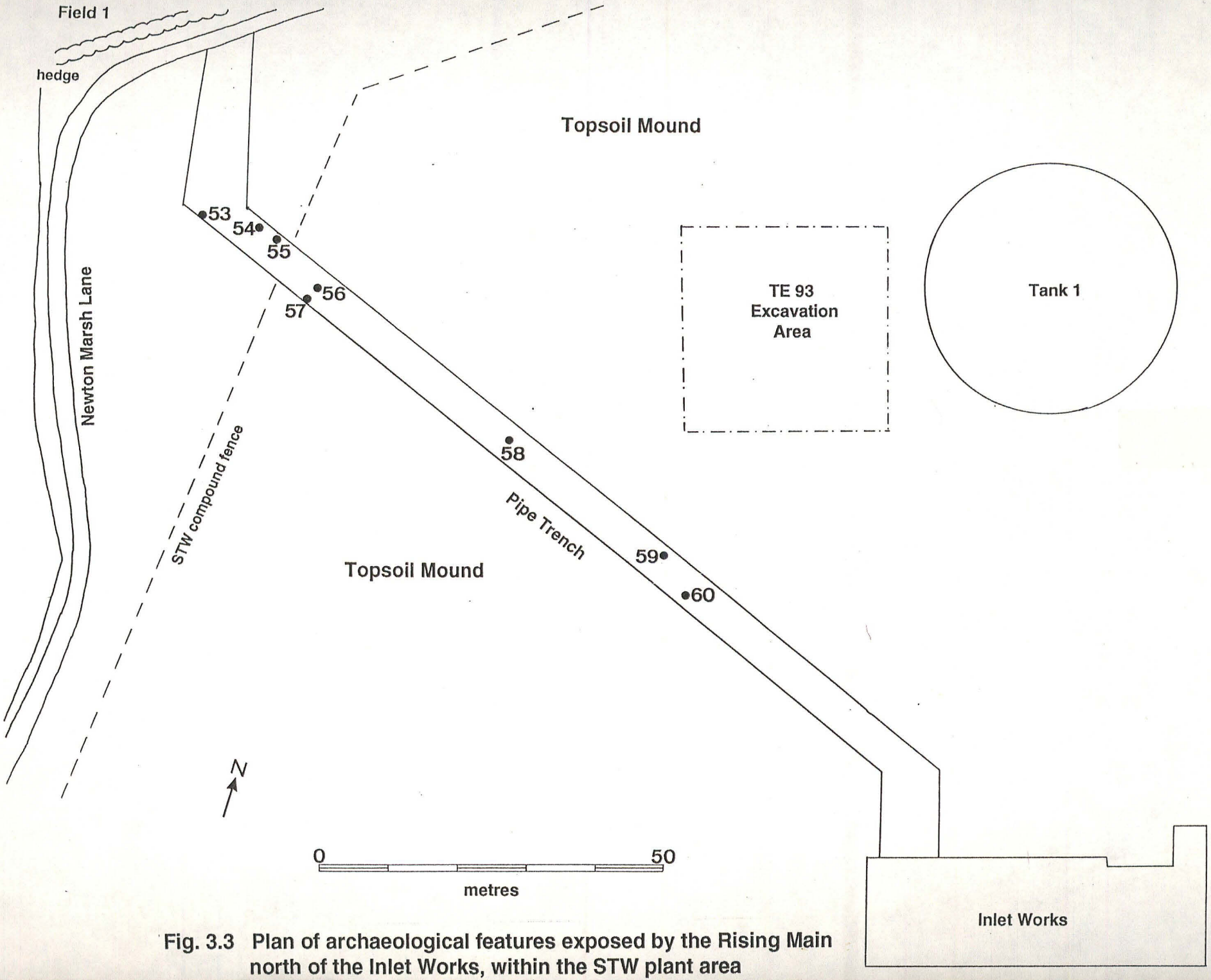


Fig. 3.3 Plan of archaeological features exposed by the Rising Main north of the Inlet Works, within the STW plant area

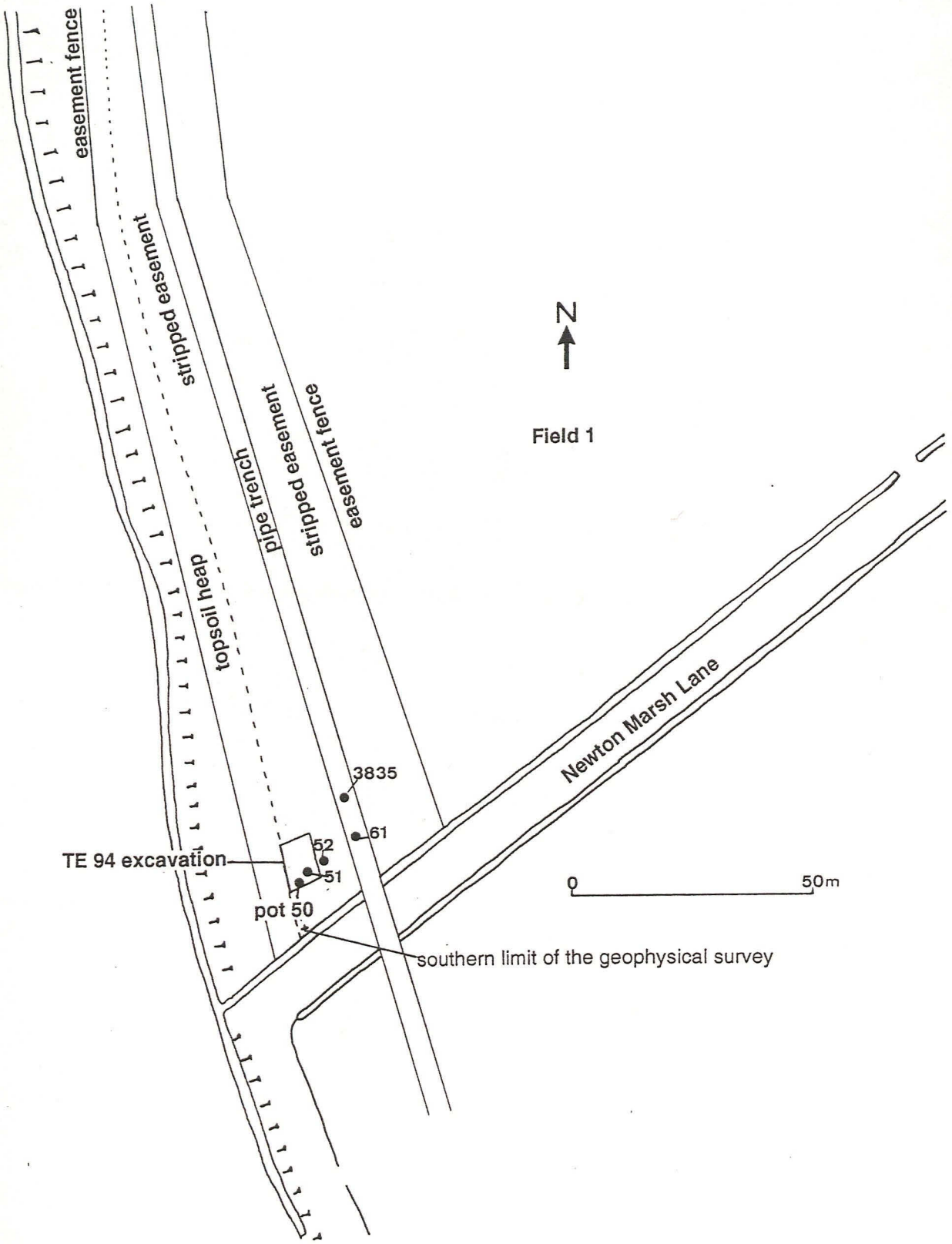


Fig. 3.4 Plan of archaeological features on the pipeline easement, Field 1

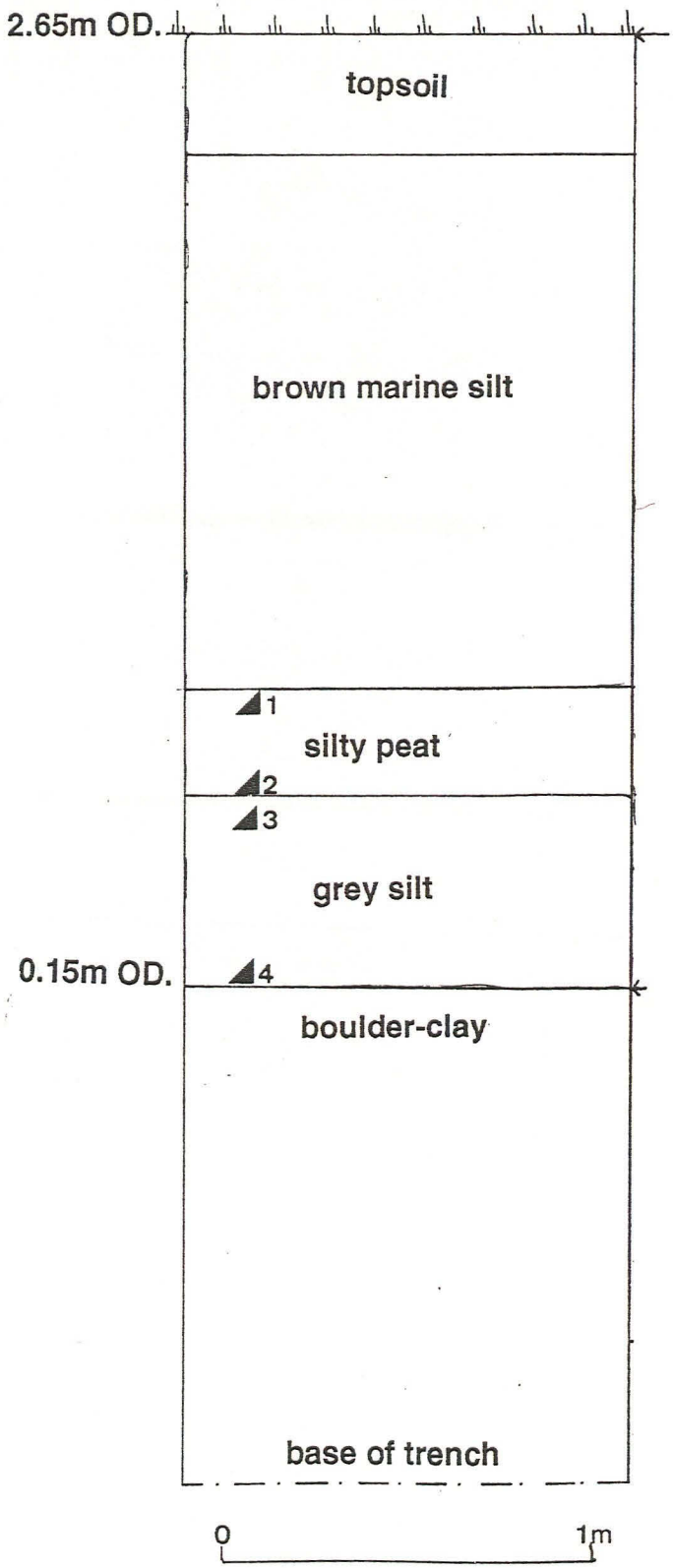


Fig. 3.5 Stratigraphy visible in the trench face pollen sample sequence, Field 2B

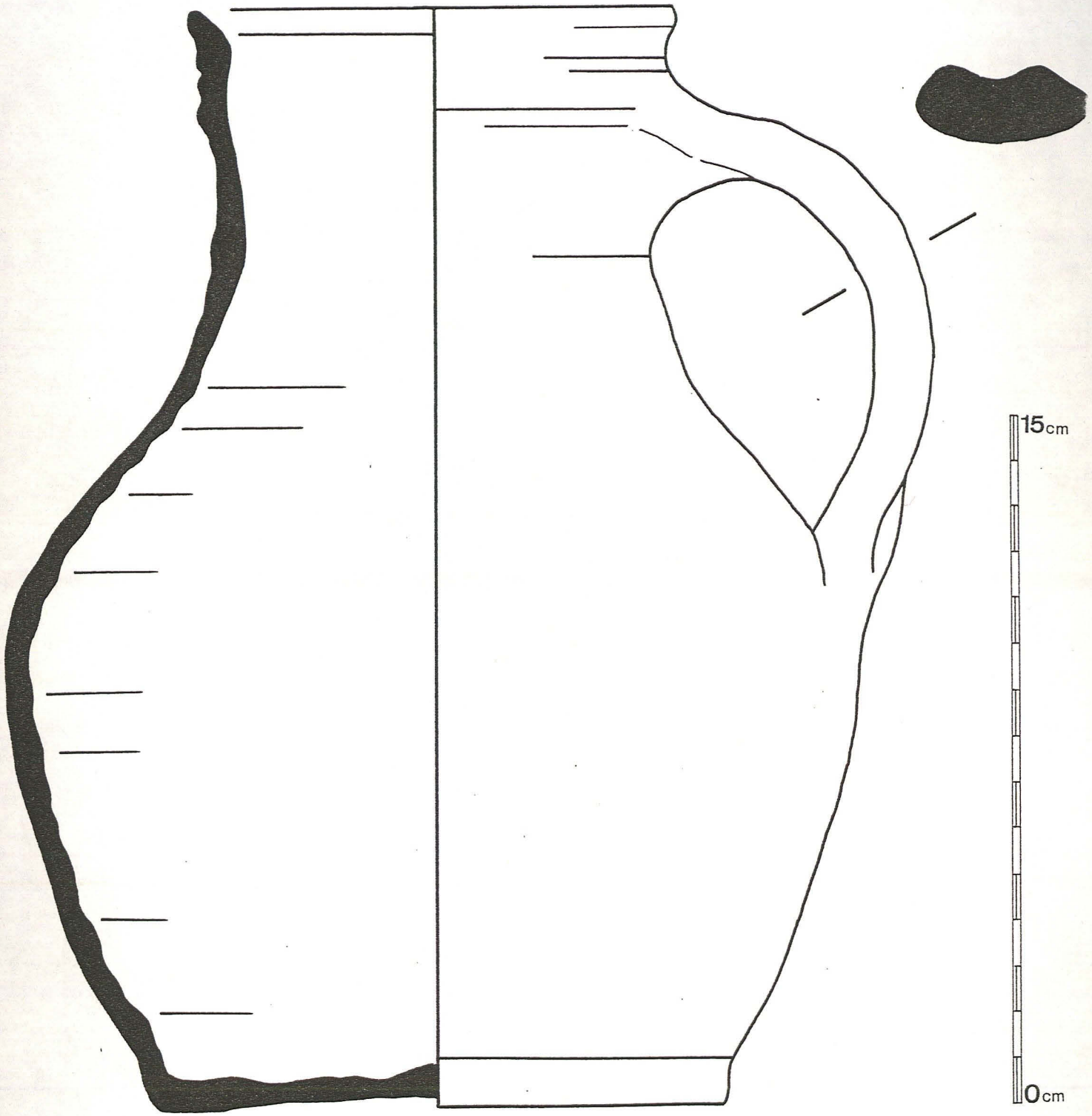


Fig. 3.6 Illustration of the Humberware jug from findspot 10A (Z. Pattinson and J. Young)

Pl. 60 Finds from Project Clear Water: (clockwise from top left)
abraded Roman greyware pot rim, TEI 93 4A;
flint scraper, TPS 94 32B; flint blade, TE 94 107;
flint tool, TEI 93 62; probable gun flint, TEI 93 1A.
(scale divisions 0.01 and 0.05m)

Pl. 61 The broad easement for the Cleethorpes-Tetney Rising Main after removal of topsoil; Field 1. Note the numerous vehicle movements and the sewer pipes. Briquetage and post-hole features were found in the position of the gravel heap after the marine silts had been removed. (looking south with the STW plant area marked by the crane)

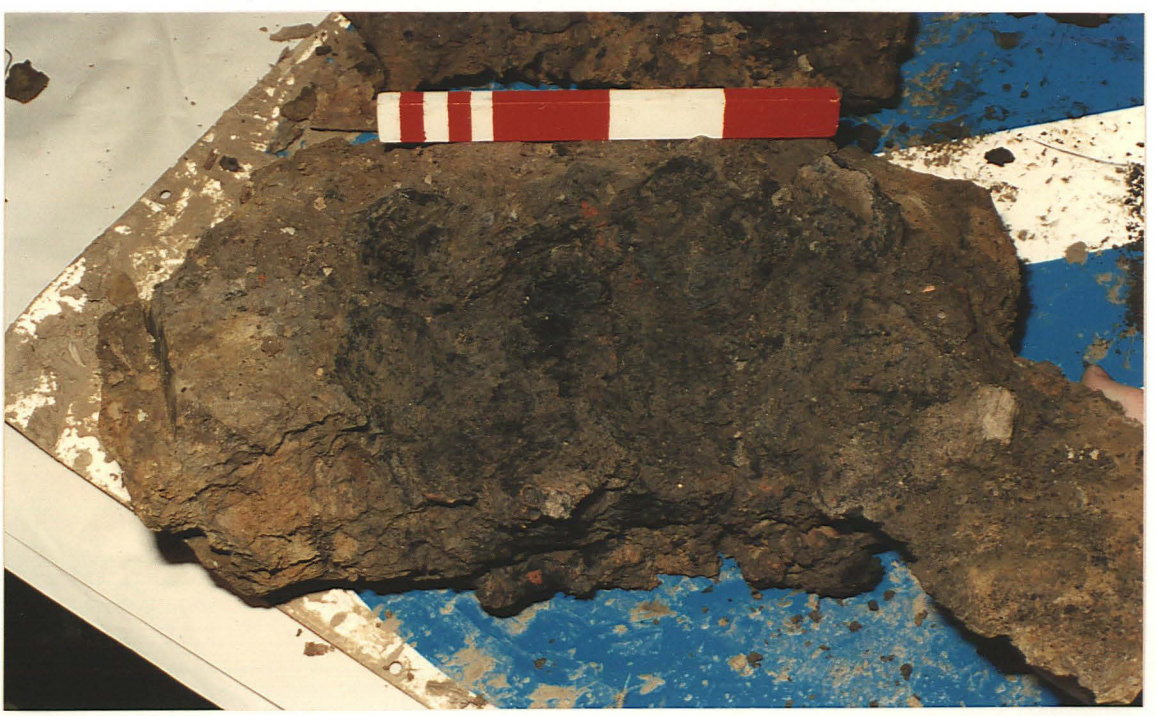
Pl. 62 The marine silts were thinnest close to Newton Marsh Lane, Field 1, where a thin charcoal layer above the yellow weathered boulder-clay indicated archaeological remains

Pl. 63 Machine scraping of the adjacent easement after installation of the pipe in Field 1 exposed a pottery vessel set into the prehistoric ground surface (Pot 50, looking south; scale divisions 0.01m and 0.1m)

Pl. 64 Pottery vessel 50 after part-excavation. The pipe trench has been backfilled below the mound of surplus silts, and parallel ruts containing burnt material show machine damage to the saltern site. (looking NE; scale divisions 0.01m and 0.1m)

Pl. 65 Detail of Pot 50, part-excavated. A small segment of rim survives at the rear of the vessel. (looking south, scale divisions 0.01m and 0.1m)

Pl. 66 Pot 50 was lifted in a block of surrounding soil and removed from its vulnerable position for recording and inspection. The single attached rim sherd is on the right of the photo. Note that the sub-rectangular vessel fills a small feature cut into the yellow clay, and that there is charcoal below its base. (scale divisions 0.01m and 0.05m)



Pl. 67 Briquetage spread TEI 93 51 (scale divisions 0.01 and 0.10m)

Pl. 68 Linear depressions in the yellow clay were seen at the southern end of Field 1, filled with marine silt above dense briquetage material. The depressions appeared to have been created by tracked excavators and other equipment constructing the pipeline, probably altering a previously flat surface.

Pl. 69 Detail of a small briquetage spread beside a machine rut, Field 1

Pl. 70 Briquetage visible in the side of a machine rut in saturated ground conditions, Field 1

Pl. 71 Briquetage spread from the path of the pipe trench, Field 1, lifted and redeposited by the machine bucket for investigation

Pl. 72 Detail of the dense briquetage in the redeposited spread (see Pl. 71)

Pl. 73 A section cut across the redeposited spread found it to be of minimal depth and that it had probably not filled a deliberate feature

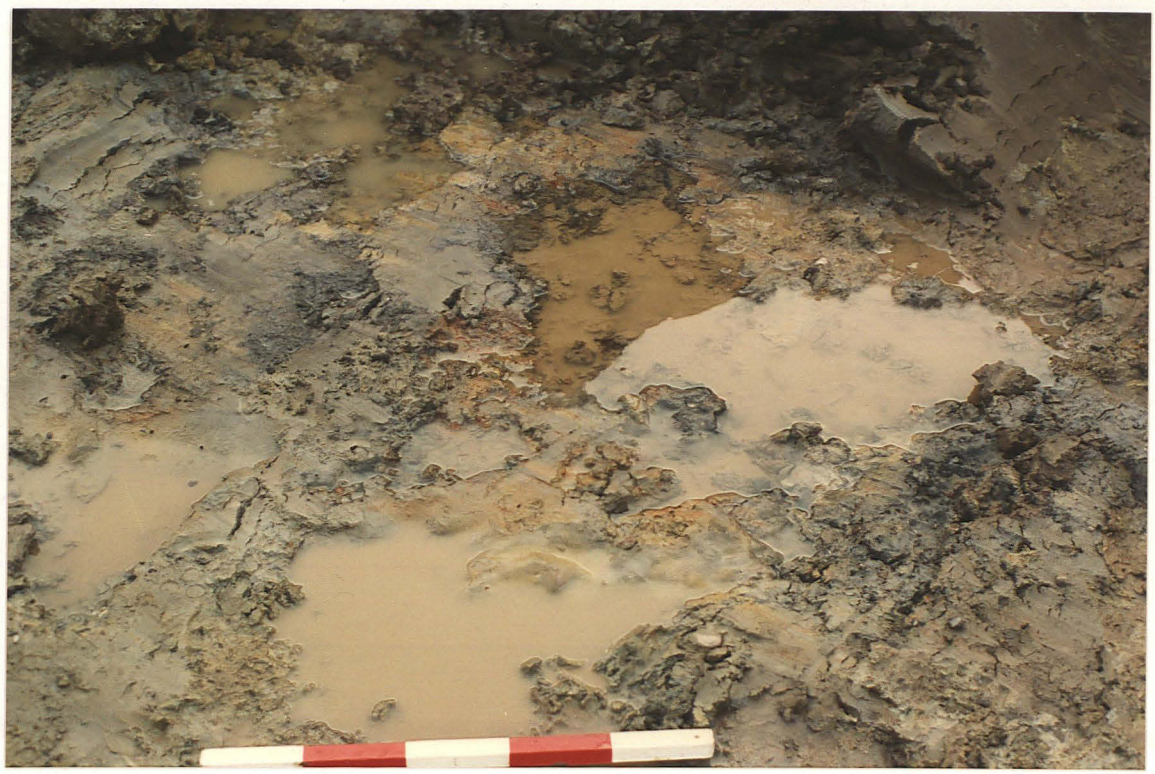
Pl. 74 The contractors stripped the marine silt layer from the pipe trench route between Field 1 and the Sewage Treatment Works to permit archaeological recording in advance of trenching. (looking north from the STW compound fence towards Newton Marsh Lane and Field 1)

Pl. 75 The stripped pipeline course, looking south towards the STW structures. The 1993 Late Bronze Age saltern excavation was behind the spoil heap on the left. The position of Context 55 is marked by the scale (divisions 0.5m)

Pl. 76 The depth of the marine silts were thin between Field 1 and the STW compound but increased to the south of the 1993 excavation (looking SE)

Pl. 77 Thick marine silts close to the southern end of the pipeline route, sealing a peat layer with some charcoal. (looking SE, scale divisions 0.5m)

Pl. 78 Surface spread of charcoal and briquetage at the STW compound limit (looking SE, scale divisions 0.5m top; 0.1m and 0.05m right)



Pl. 79 Hearth 57: an irregular area of heat-reddened clay immediately inside the STW compound. The feature was waterlogged and could not be investigated. (looking west, scale divisions 0.1m)

Pl. 80 Trench stratigraphy in Field 1, north of the saltern features. The section shows thin marine silts above yellow weathered boulder-clay and chalky red boulder-clay

Pl. 81 Trench stratigraphy at ch. 3185, Field 2, showing the sequence of small spot samples from the grey silt and peat layers taken for pollen analysis.

Pl. 82 Panoramic view of part of Field 1 before construction of the pipeline, showing slight undulations in the cultivated surface which may represent silt-filled creeks. (looking north)

Pl. 83 Surveying within the easement in Fields 4 and 5 before topsoil removal. The edge of a disused gravel pit is marked by tall grass in front of the hedge, and irregular ridges can be seen behind the surveyor. (looking north)

Pl.84 No trace of structures or backfilled pits were found beside the gravel pit after topsoil removal in Field 5. (looking north)

Pl. 85 Topsoil stripping across the ridges found that they were naturally produced dunes, containing sand and marine shells. This is thought to have been part of the beach during the Romano-British marine inundation. (looking north)

Pl. 86 Concentrations of marine shells and fine shingle in Field 5 marked the position of the former beach close to the limit of the inundated area.

Pl. 87 The land drain trench face on the west edge of the easement in Field 5 showed a well-mixed layer of numerous shells with small amounts of marine silt. (looking north)

Pl. 88 Section through a shell deposit showing distinct lenses of shells and an earlier deposit of marine silt

Pl. 89 A small enigmatic area of heat-reddened boulder-clay with charcoal flecks, on the west side of the pipe trench at ch. 2480, Field 5.

Pl. 90 The trench face at ch. 2130, Field 6, showed brown marine silt over grey silt and thick peat. Machine smearing has obscured the peat layer in section but it can be seen on the adjacent spoil heap. (looking east)

Pl. 91 Peat at the trench base in Field 7

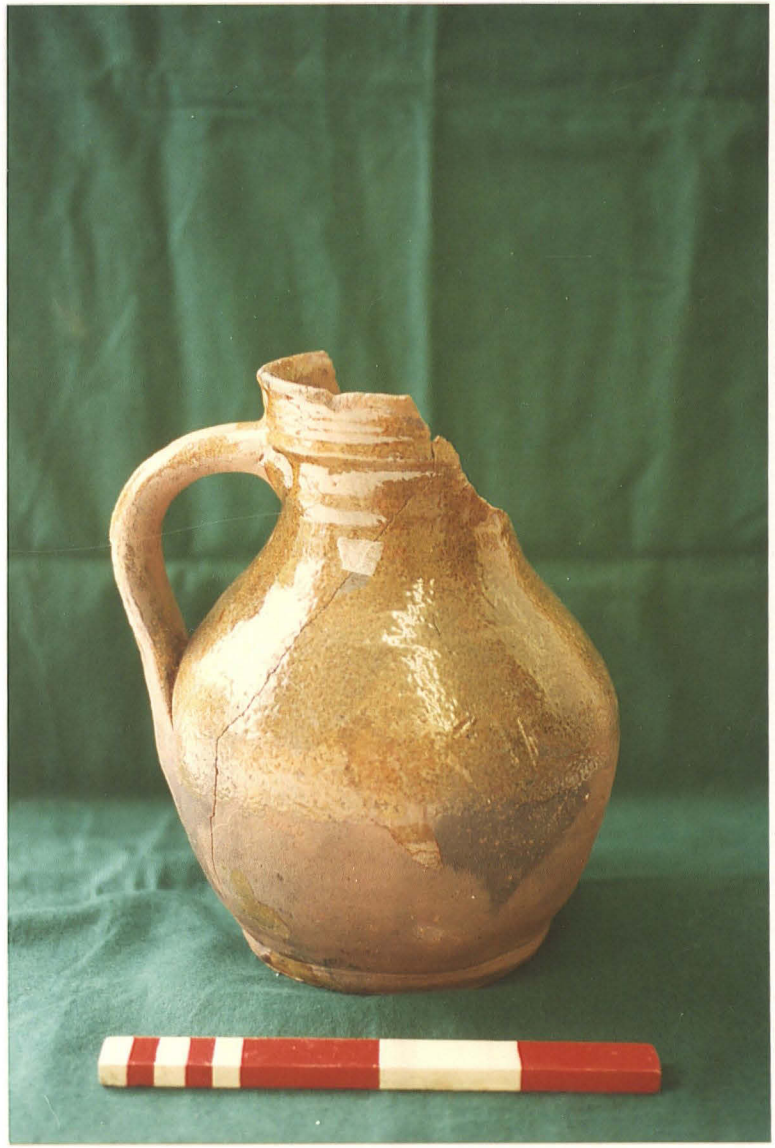
Pl. 92 Peat revealed at the base of a test pit dug at ch. 1980 below thick grey silt

Pl. 93 Disturbed skeletal remains of a pig at ch. 1785, Field 8

Pl. 94 Remains of a small post-medieval shed at ch. 1760, Field 8 (looking east)

Pl. 95 North of South Sea Lane, the change from previously inundated to dry ground was evident in the land drain upcast. The lighter soil in the foreground marks chalky boulder-clay close to the ploughsoil, but thicker intervening marine silt produces a darker upcast in the middle distance. (looking south)

Pl. 96 At ch. 1622 (Field 8) the trench face revealed the boulder-clay less than 0.8m below the present ground level, close to the limit of the marine inundation.



Pl. 97 Trench section at Cleethorpes Leisure Park (ch. 700) with almost 3m of sand above undisturbed boulder-clay

Pl. 98 Medieval Humberware jug from TEl 93 10A (scale divisions 0.01 and 0.05m)

Pl. 99 Section of the trench face between shoring boxes close to the medieval jug findspot. The section shows bands of sand; the jug was recovered from a gravel deposit about 2m below the surface.

Project 4: **Tetney Inlet Pipeline Archaeological Excavation**
Site Code TE 94
LCNCC Mus. Accn. No. 47.93
(NGR: TA 3303 0345)

Introduction

The pipe trench across the briquetage spread in Field 1 was completed, the pipes laid and the hole backfilled by late January 1994. Anglian Water then advised that the machine-compacted subsoil would be broken-up for drainage purposes during the reinstatement of the easement for agricultural use. This operation was likely to cause further damage to any archaeological features where the silt masking layer was known to be exceptionally thin. Spreads of briquetage and charcoal had already been revealed on the surface after machine movements and scraping of saturated soil after heavy rain.

It was unfortunate that the briquetage exposure lay close to a field corner where contractors had positioned a temporary crossing of the field ditch - all machinery needed on part of the pipeline needed to pass the area despite the constrictions of the spoil heaps and the unconsolidated wet trench backfill. These problems restricted the width available for archaeological examination, but the earlier machine activity was thought to have effectively removed any archaeology further east.

The easement in the vicinity of Contexts 50 and 51 (about ch. 3820) was scraped by machine under archaeological supervision with co-operation from the contractors, who then laid sleepers beside the proposed archaeological excavation area so that heavy plant would not cause further damage (Pl. 100). The visible extent of the industrial spread was then cleaned and examined in detail by an archaeological excavation team directed by Colin Palmer-Brown for LAS between March 7th-9th 1994 (Pl. 101).

The Excavation (Fig. 4.3)

The 7.5m north-south x 6m west-east area was chosen because of the dense visible briquetage on the stripped surface; it was thought likely that the material was filling small features such as pits or gullies. The area was divided into 1m grid squares in order to permit more accurate location of briquetage retrieved from the upper layer or spread if this proved necessary in post-excavation (Pl. 102). The grid numeration started at 1 in the NW corner, and ran in rows from west-east, ending at 48 in the SE corner. Context numbers from 01-09 were allocated but were renumbered after the excavation with a preceding 1 to avoid confusion with the 1993 excavation.

On the western side of the examined area two clay land drain courses had removed or disturbed the archaeological remains. The topsoil heap lay along the west edge of the easement, leaving no space to expand beyond the disturbance.

The brown marine silt (identical to TE93 500) had been removed by machine, exposing a mixed brown clay with blue mottling **103** which incorporated small amounts of briquetage and pebbles. This 0.14m layer may have been a flood-mixed horizon consisting of marine silt and saltern waste. Beneath 103, the excavators identified a 0.1m thick layer of blue/grey clay mixed with brown silty clay, **104**, which was interpreted as part of the same deposit. The colour suggests that this may however have been either a prehistoric soil horizon which became waterlogged between abandonment of the site and subsequent inundation, or a thin flood deposit by an intermediate marine transgression. The two layers were not completely excavated except on the eastern side where they had mostly been removed by machining. Sample grids were removed on the western side to determine the extent of an earlier spread.

A sub-rectangular shallow cut **102**, filled with a mixed dark brown fill with charcoal and briquetage fragments **101**, was revealed after cleaning of the eastern edge of the area. The east-west feature was 0.28m wide and at least 0.9m long, with a surviving depth of 0.06m. It had become stratigraphically isolated, cut into weathered boulder-clay 105, but by the density of briquetage inclusions it may have become filled with the same material as spread 107.

The briquetage spread **107** seemed to be a single layer, in places about 0.15m thick, which had filled apparently natural shallow depressions in the prehistoric ground surface (Pls. 103-107). It was sealed by 104 and extended over most of the examined area with the exception of the SW corner. 107 comprised a dark grey/brown sandy clay with frequent inclusions of briquetage fragments and charcoal flecks. It contained burnt stone and flint pieces, 4 worked flint flakes and 121 sherds of prehistoric pottery (Appendix 4). The spread partly overlay an irregularly shaped area (about 0.8m diam.) of reddened clay **106**, which was interpreted as the site of an associated hearth although no fire pit was located. A restricted cluster of closely packed limestone and quartz pebbles **108**, 1m NW of the hearth, showed signs of burning and the pebbles may have been used either *in situ* or elsewhere for heating purposes.

A small post-hole **109** (0.13m diam. and 0.13m deep) was excavated 0.5m north of the hearth 106, and found to contain material identical to 107. It is tempting to see 109 as part of a structure associated with the hearth but there was no evidence to support such a function. The base of 109 was at 2.34m OD., compared with the base of post-hole 110 at 2.05m OD. and the lowest point of 107 at 2.39m OD.

The briquetage spread indicated an industrial function for the site, probably as part of a complex including the fire pit and natural pool excavated in 1993 about 120m to the SE. The briquetage spread seems to have derived from a saltern waste heap, or perhaps from debris in an occupation deposit near the heat source.

Pot **50** had been removed in a block of surrounding soil earlier from within the excavation area but its position has been reconstructed from the photographs and measured sections produced at the time. It had been upright within a small depression or feature of slightly greater depth but similar dimensions, 4m SW of the hearth area. From its position it is possible that it had been deliberately set into the ground, perhaps for storage of liquids or dry salt crystals.

A second adjoining area to the north was mechanically stripped of vehicle trample and flood silt under archaeological supervision. A small feature interpreted as a possible post-hole **110**, backfilled with charcoal-rich soil, was located and excavated 2m north of the initial area (Fig. 4.4; Pl. 108). The feature was of irregular shape, as if a post had been installed or removed with some effort, and measured 0.65m x 0.25m, with a depth of 0.20m. The internal post may have had a diameter of about 0.25m. The post-hole was not stratigraphically related with any other features (it cut 105) and the fill was dissimilar to layer 107.

No other archaeological features were identified during the stripping of the second area. This confirmed the results of a hand trenching survey conducted by LAS and supported the geophysical survey by Oxford Archaeotechnics (Figs. 4.1 and 4.2). The thickness of the flood deposits increased to the north sufficiently to provide greater protection to any other archaeological remains, and it was concluded that no further work was necessary as the scatter of saltern material within the easement was restricted to the area already examined (Pl. 109).

The Site Grid:

NORTH

1	2	3	4	5	6	
7	8	9	10	11	12	
13	14	15	16	17	18	
19	20	21	22	23	24	EAST
25	26	27	28	29	30	(machine
31	32	33	34	35	36	access)
37	38	39	40	41	42	
43	44	45	46	47	48	

SOUTH

Context List

101 dark brown clay with much charcoal in shallow depression in NE corner; fill of 102

102 slight depression in the surface of 105

103 brown clay layer with some briquetage and quartzite pebbles;

104 lower part of 103; lighter colour but probably same layer; briquetage and pebbles

105 yellow sandy clay, probably a weathered version of the red and grey chalky boulder-clay below.

106 Area of heat-reddened sandy clay 1m north-south x 0.80m west-east; heat penetration 0.10m thick into layer 105. ?Site of hearth

107 burnt sandy clay with charcoal and much briquetage on east side of hearth 106; 0.15m thick.

108 area of closely packed limestone and quartz pebbles NW of hearth 106; some stones burnt.

109 possible post hole 0.13m diam, 0.13m deep, on north side of hearth 106; filled by 107.

110 charcoal filled post-hole 0.65m NW-SE x 0.26m SW-NE diam., 0.20m deep;

111 fill of 110

112 unstratified finds from beside excavation area

Site : tetney2		Gradiometer Survey		Resolution	58.nT/cm
Mesh : 1-6e					
Trace Plot (Standard)			Size x 0.5	Block	Off
View	Front	Resolution	.5		
X-Displ. (%)	0	Units	Std.Dev.		
Y-Displ. (%)	0				
Hidden Line	Off				

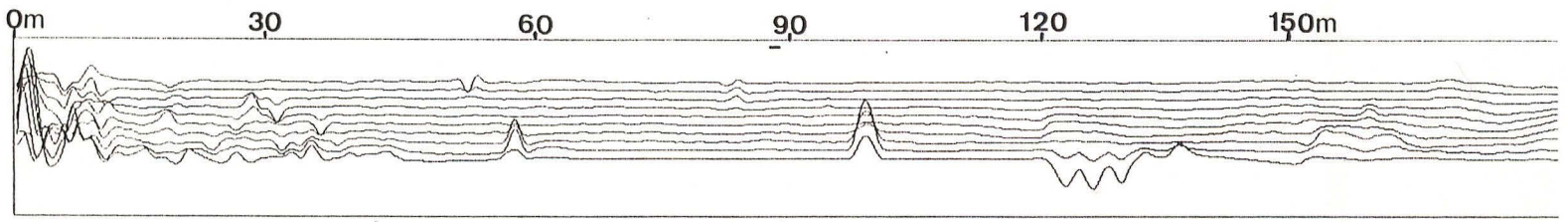


Fig. 4.1 Trace Plot of data from geophysical survey north of Newton Marsh Lane. The southern survey limit is marked on Fig. 3.4. (after Oxford Archaeotechnics)

Site : tetney2		Gradiometer Survey			
Mesh : 1-6e					
Shade Plot (Clip)			Size x 0.5	Block	Off
Minimum	-2	Grey Levels	17		
Maximum	10	Palette	Positive		
Contrast	1			Black	Positive
Units	Absolute			White	Negative

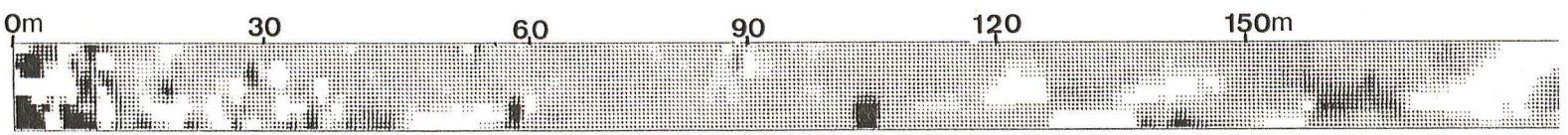


Fig. 4.2 Shade Plot of data from geophysical survey north of Newton Marsh Lane. The southern survey limit is marked on Fig. 3.4. (after Oxford Archaeotechnics)

Fig. 4.3 Plan of the 1994 excavation (N. Field, after W. Livesey, R.Schofield and G. Tann)

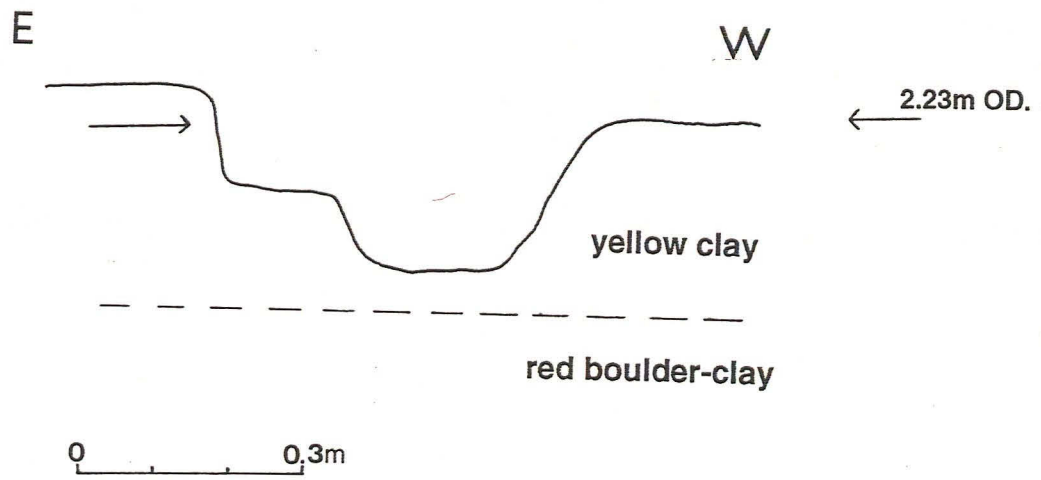
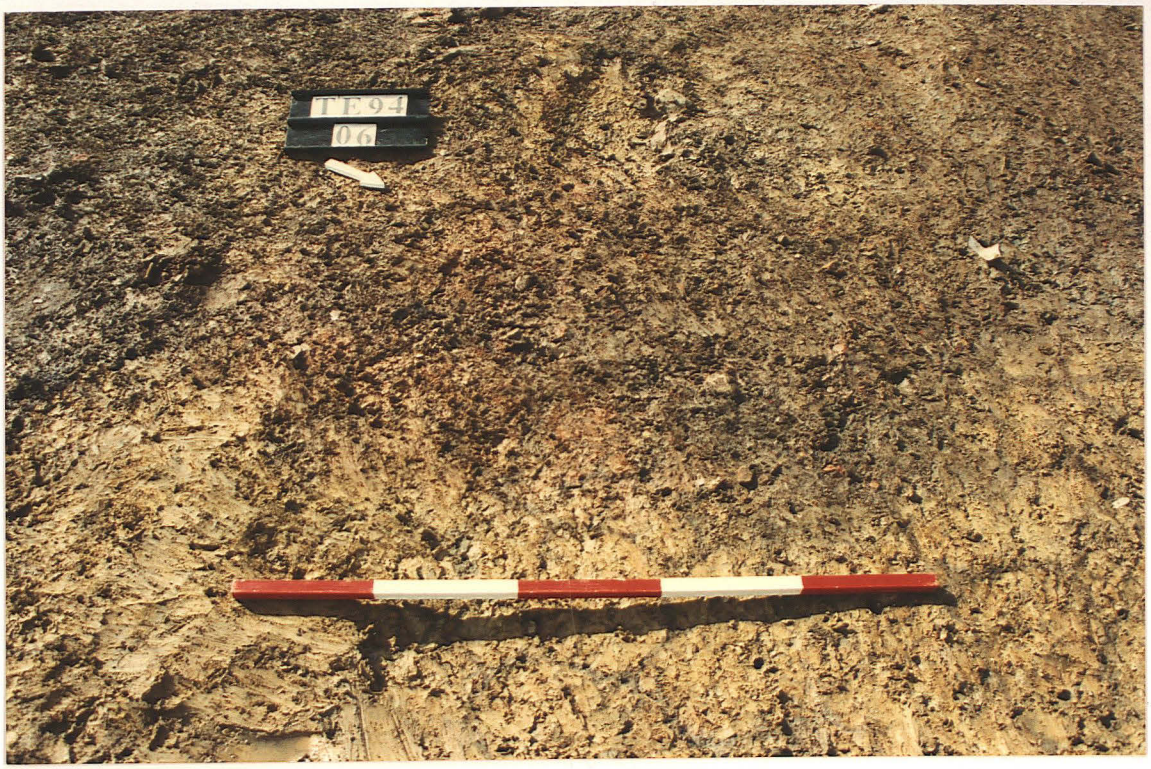


Fig. 4.4 Profile across post-hole 110

Pl. 100 The contractors stripped an area to the west of the backfilled pipe trench in Field 1 in preparation for an archaeological excavation (looking south, with equipment on Newton Marsh Lane)

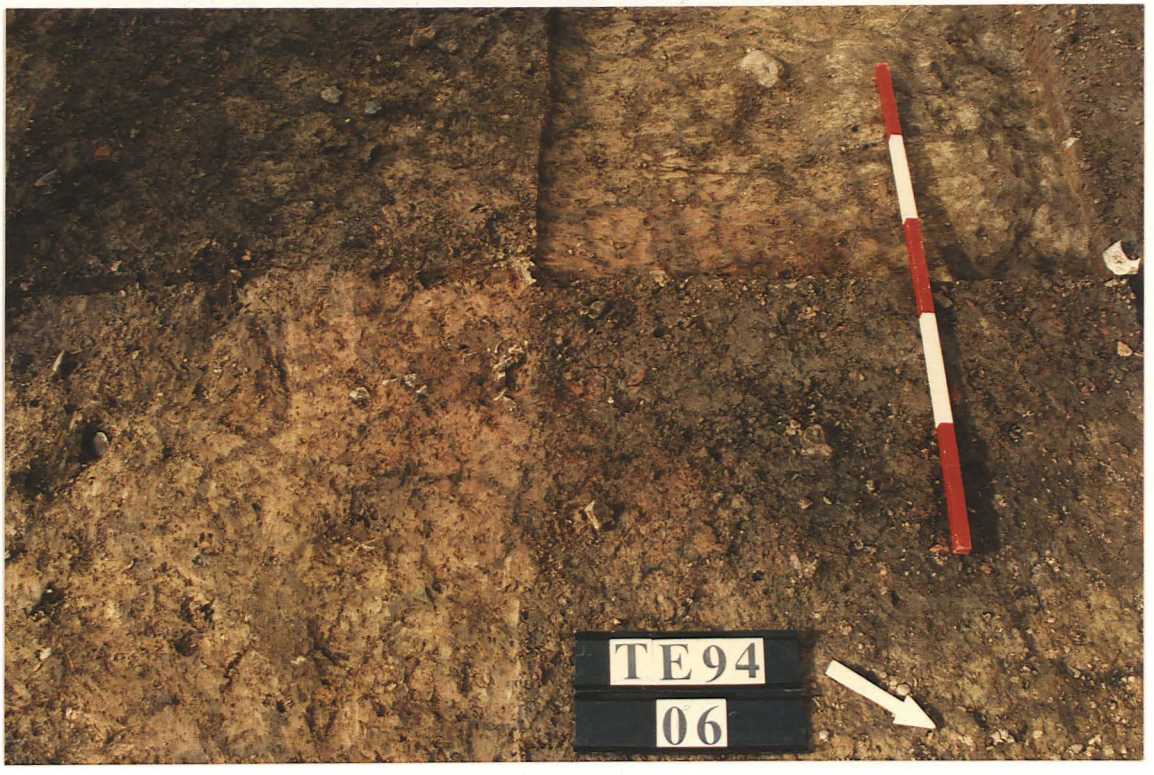
Pl. 101 Part of the stripped area after initial cleaning; the hole from where Pot 50 was removed is on the centre right. (looking east, scale divisions 0.5m)

Pl. 102 The TE 94 excavation in progress, with Hearth area 106 on the right. The 1m grids used to locate material from the briquetage spreads can be seen near the photographic scales. (looking NW, scale divisions 0.5m)



Pl. 103 Hearth area 106 before excavation (looking SW, scale divisions 0.2m)

Pl. 104 Excavation of hearth 106 and spread 107 (looking north, scale divisions 0.5m)



Pl. 105 Soil covering hearth 106 and the adjacent charcoal with briquetage spread 107 (looking west, scale divisions 0.2m)

Pl. 106 Hearth 106, post-hole 109 and stones 108 after excavation (looking SE, scale divisions 0.5m)

Pl. 107 Sherds of prehistoric pot from layer 107, Grid 23 (looking north, scale divisions 0.01m)

Pl. 108 Post-hole 110 during excavation, showing dense charcoal fill. (looking south; trowel length 0.22m)

Pl. 109 Depressions east of the TE 94 excavation site may reflect a prehistoric creek delimiting the area of salt-making activity. (looking SW towards Newton Marsh Lane)

Project 5: **Tetney, Hoop End Pumping Station**
to
Newton Marsh Lane Pipeline
(Tetney Village Pumping Main)
Archaeological Watching Brief
Site Code TPS 94; LCNCC Mus. Accn. No. 111.94
(NGR: 3315 0330 - 3202 0115)

Introduction

The final part of the Project Clear Water scheme groundworks was the diversion of sewage from the Hoop End Pumping Station, Tetney to the Newton Marsh STW. This element took the form of a 200mm diam. pipeline from Church Lane, Tetney, following the route marked on Fig. 5.1. Parts of this 3km long pipeline were inserted using a moling technique; the stretches across open farmland were excavated either by a trenching bucket or using specialist land drainage equipment.

Lindsey Archaeological Services was contacted by the Lincolnshire County Archaeology Section in June 1994 for comments on the archaeological sensitivity of the route in the context of the previous fieldwork at and close to the Newton Marsh STW. LAS suggested that the farmland immediately west of Newton Marsh Lane should be geophysically surveyed using the magnetic susceptibility technique which had located the prehistoric saltern features within the Plant Area. It was considered that this information would establish the extent of the known saltern site and either enable the route to be revised to avoid it or to prepare an archaeological strategy to record the site. The landowner's requirements for the land prevented this survey taking place; land drainage alterations were to be completed and the pipe was to be in place immediately after harvest, allowing no opportunity to survey the field surface before it was disturbed.

Instead, provision for an archaeological watching brief was agreed between Anglian Water and Lincolnshire County Archaeology Section, and LAS was commissioned by Anglian Water to monitor the route (Order No. E856865-AWSD). Fieldwork began on 15th July with the installation of replacement land drains in the fields between Cow Marsh Lane and Newton Marsh Lane. As with the previous pipelines, each field, track or road through which the pipeline passed was numbered by LAS to enable easy reference to any findspots or other observations. The numbering for this project started at the Newton Marsh STW, with 20 as the first number used (to distinguish the pipeline easily from the Kings Road - Newton Marsh project) (Fig. 5.1).

The Watching Brief (Pls. 111-122)

Construction for the pipeline to Hoop End started in fields between Cow Marsh Lane and Newton Marsh Lane. Replacement land drains were installed on either side of the pipeline easement to replace existing drains truncated by the pipe trench. During this operation the mixed soil expelled by the drainage machine was inspected for artefacts and the smeared faces of the narrow trench were examined from the surface although no observations

were made. This was the only section of the pipeline route which was under cultivation, but fieldwalking produced no finds. Topsoil was stripped from a 9m width within a 12m easement across pasture fields between Tetney Lock Road and Mill Race Lane. Close inspection of the exposed surface produced concentrations of medieval pottery sherds but no visible features; distinct dips in the field surface may have been backfilled drainage ditches but no structural remains were recognised.

The pipe trench was then excavated using a drainage machine in preference to a mechanical excavator, resulting in a mixing of all spoil and a smearing of the virtually inaccessible trench faces. Spoil was expelled some distance from its source which prevented reliable correlation of soil and archaeological features (Fig. 5.2).

The pipe was laid below Mill Race Road using a moling system, in order to reduce inconvenience to local residents. No observations could be made in that location, although the face of a shaft excavated in the Hoop End pumping station compound was inspected.

Fields 20 and 21 (Newton Marsh STW compound and Newton Marsh Lane)
At the eastern end of the pipeline the section beneath Newton Marsh Lane and across the STW compound to the NW corner of the Inlet Works was not monitored because of a misunderstanding. This was an unfortunate omission as it prevented correlation of the archaeological deposits and natural stratigraphy between the Plant Area and the western side of Newton Marsh Lane.

The pipe trench within the compound consisted of a 120m west-east cut with a small pit beside the compound fence. The backfilled trench, adjacent upcast heap and pit faces were inspected but there were no signs of briquetage. Charcoal fragments and indications of a peat layer (probably over 0.3m thick) were seen.

Field 22
22A Grey chalky boulder-clay was seen in the trench section at the northern end of this field for a distance of 40m south of the field ditch. At the southern end of the exposure, the boulder-clay lay 1.3m below the field surface, at 0.8m OD. The topsoil covered 0.85m of brown marine silt above a thin peat layer 0.1m thick, separated from the boulder-clay by 0.15m of blue clay which may have been a gleyed prehistoric soil horizon.

22B To the south of the exposed boulder-clay was a stretch of thicker peat, 1.15m below the field surface, with no lower layers revealed.

22C The prehistoric ground level appears to have sloped downwards towards the centre of the field. The brown marine silt layer increased to a thickness of about 1m, sealing a 0.2m thick layer of blue/grey silt mixed with peat. This sequence was noted for a distance of about 32m.

Field 23 (ch. 2575)
A layer of grey peaty clay above traces of boulder-clay was seen in the trench face to the north of the field entrance about 2m below ground level. South of this, the prehistoric ground surface had been lower and only brown marine silt was visible.

Fields 24-28
Between Newton Marsh Lane and Tetney Lock Road the pipe trench remained within brown marine silt, revealing no finds or features of archaeological interest.

Field 29
The pipeline crossing of Tetney Lock Road was not observed.

Field 30 (ch. 550)
Trenching along the field access track revealed a thin metalling layer 0.1m thick, of chalk lumps and brick rubble. This had been spread above brown marine silt with no visible intervening layer. The trench base was at 1.5m below the present surface.

Field 31
This small field had been trenched and backfilled between monitoring visits but the upcast spoil indicated that the stratigraphy had been similar to that below the track in Field 30.

Field 32 (Fig. 5.3)
89 medieval pot sherds were found in the topsoil or when the surface of the subsoil was inspected. The sherds were from numerous different vessels and most were badly abraded; the machine had caused further damage and had crushed other sherds until there was no advantage in collecting them. The concentration spread across much of the field but was densest in the middle of the field, coinciding with a marked depression. There was no surface evidence that the pottery was on the site of any structure but the scatter represented waste material from a nearby source, probably ceasing by the end of the 13th century. No similar pottery was found in the adjoining fields 33 and 31 to the SW or north and it did not appear to reflect a general high background level of medieval pottery that could be explained as refuse spread from the nucleated settlement of Tetney. The scatter was interpreted as spread from the periphery of a isolated dwelling a short distance to the east or west of the finds. It may be relevant that an existing public footpath to Tetney Lock passes to the east of the scatter (Fig. 5.1). The Enclosure Award plan for Tetney in 1779 shows South Marsh Road on the alignment of the footpath, crossing old enclosures (Russell 1983; reproduced as Fig. 0.5).

32A
A scatter of 12th-14th century medieval pottery was recovered from the stripped easement surface but no occupation features were identified on the surface or in the trench faces.

32B ch. 440
A Neolithic or Bronze Age flint scraper was found in the same field on the stripped easement surface. This find must have become disturbed from its prehistoric context to be present above the Romano-British marine silts. In addition to the field ditches around this field, a major disturbance occurred in this field when services associated with the now redundant Tetney Sewage Works were installed. The trench line is still apparent and redeposited boulder-clay from that project was visible across the easement. The flint tool was not found in association with redeposited boulder-clay, which may indicate that another process was responsible for its movement.

32C ch. 350
A spread of charcoal, and fired soil with briquetage flecks was seen in the trench face below the marine silt. Most of the charcoal was associated with a shallow feature 1.00m north-south and 0.15m deep (Fig. 5.4). This feature was certainly pre-medieval and has been used to suggest a date for the unstratified briquetage traces found in Field 32.

32D ch. 325
A very thin spread of charcoal flecks and briquetage was seen below the marine silt layer. Shells and animal bone fragments in the trench spoil were thought to derive from medieval cultivation.

32E ch. 310-15
The trench cut through a backfilled existing rising main trench about 1.9m wide, aligned from the western field boundary to the former Tetney Sewage Works on the eastern side of the field. The mixed fill was dark brown silt with peat, and briquetage flecks were present in the upper fill (Fig. 5.5). The former trench was over 1.2m deep, with almost vertical sides. Its backfill sealed a layer of brown clay with briquetage flecks which was probably spoil from excavating the trench. There were no signs that the earlier trench had cut through saltern remains at this point, and the briquetage had probably been redeposited from an archaeological site nearby on the former trench.

32F ch. 285
30 sherds of medieval pottery were retrieved from the stripped easement surface. A large piece of fired clay with at least 3 surfaces and tubular impressions (probably from thin stick wattling rather than vegetable inclusions) was found in the trench face but not apparently *in situ* (Pl. 126). It is unlikely that this object was part of a loom weight but it may have formed part of a structure such as an oven.

Field 33
The ditch crossing between Fields 32 and 33 was not monitored. No archaeological remains were seen in the field beside Mill Race Lane.

Field 34
To the south of Mill Race Lane a linear depression and bank crosses the pasture field parallel to the lane (Pl. 128). A neighbouring farmer, Mr.

Chapman, remarked that the feature had been more pronounced within his lifetime but the earthwork is still clearly identifiable. Mr. Chapman said that the lane was named after a water mill that had stood between the lane and the feature, and that a millstone had been incorporated into a structure in his farmyard (directly north of the site). He conjectured that the stone used for re-building the church had been conveyed by vessel up a creek which had produced the backfilled feature. He suggested that it represented a former course of Waithe Beck which meanders SW of the village before being directed into the artificially straight course of Tetney Drain.

Field 35 (Hoop End Pumping Station, ch. 10)
There was a short opportunity to examine the trench excavated in the grounds of the Hoop End pumping station after installation of equipment and before backfilling was completed. The trench face consisted of mixed yellow clay unlike the stratigraphy seen elsewhere along the route and seemed to have been redeposited.

Conclusion

This project extended the monitored area towards Tetney village centre, linking the observations of the marsh periphery with the higher ground of the medieval village. The trench depth was too shallow along most of the route to expose the post-glacial land surface (with any pre-Roman archaeological sites) but traces of a saltern of unknown date were recorded on the village outskirts. It may be impossible to date that saltern without future excavation but it would be useful to know whether it represented a site contemporary with or later than the Newton Marsh complex. In view of the Romano-British finds previously reported from Tetney village (see Appendix 1) the saltern may well be Roman.

The possible Stamford-ware sherd (?late 9th century- early 13th century) has too large a potential date range to be a reliable indicator of the early establishment of the village, allegedly raided by Danes. The 12th and 13th century pottery wares probably mark outlying settlement (perhaps along a former path to North Cotes) at the end of a period of medieval population growth. There was no reason to suspect a separate, deserted or migrated settlement but a single farmstead would seem most likely.

The local tradition (on the basis of placenames) for a mill to the south of Mill Race Lane may well be based upon fact. The supposed site, at present a pasture field, looks a possible location for residential infill; future survey could confirm or disprove the theory.

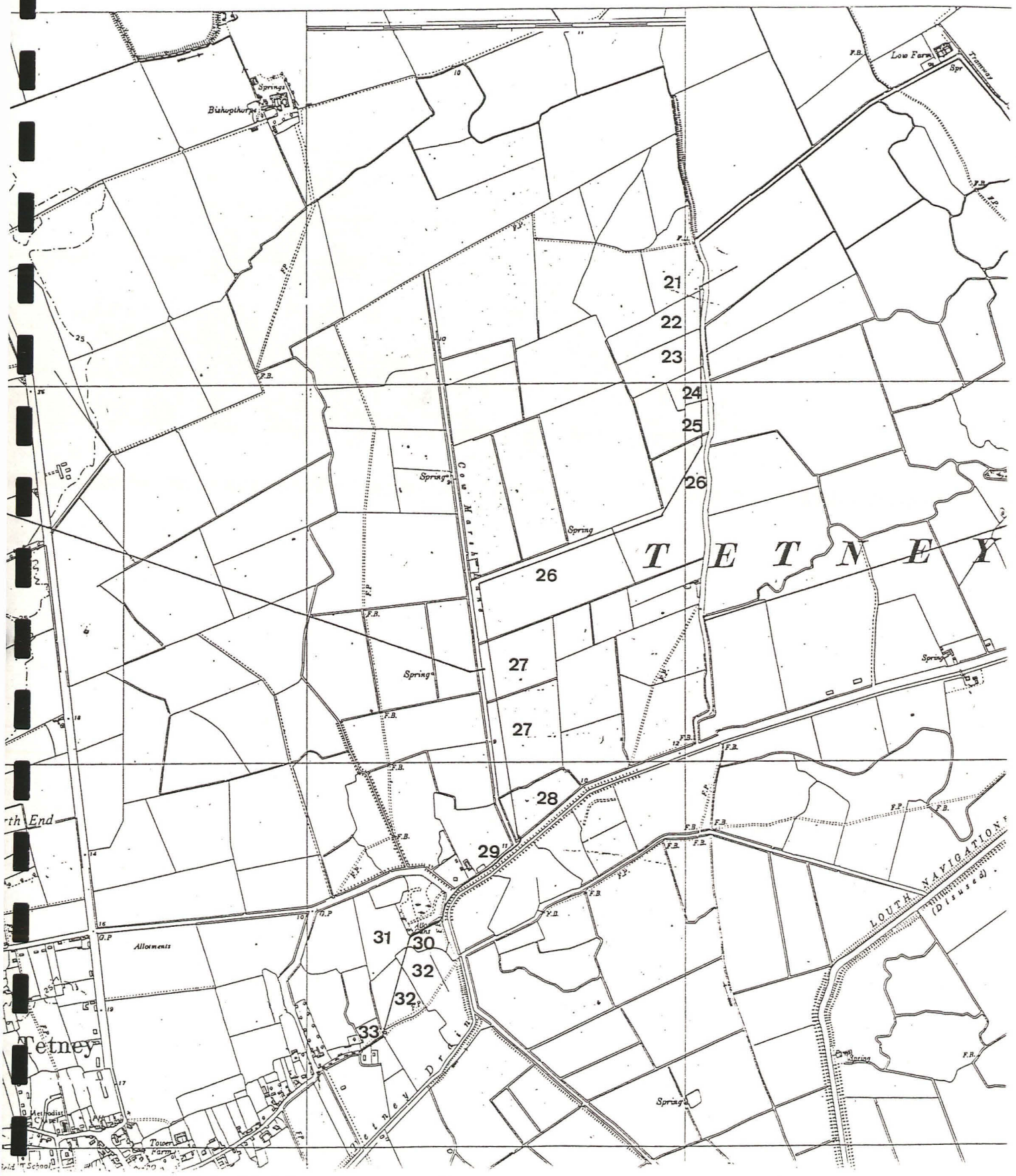


Fig. 5.1 Field numbers and Findspot locations on the Tetney, Hoop End to Newton Marsh pipeline (based on the 1956 Ordnance Survey 1:10,560 map, Sheet 30 SW. Crown Copyright; reproduced at reduced scale with the permission of the Controller of Her Majesty's Stationery Office, Licence no. AL 50424A)

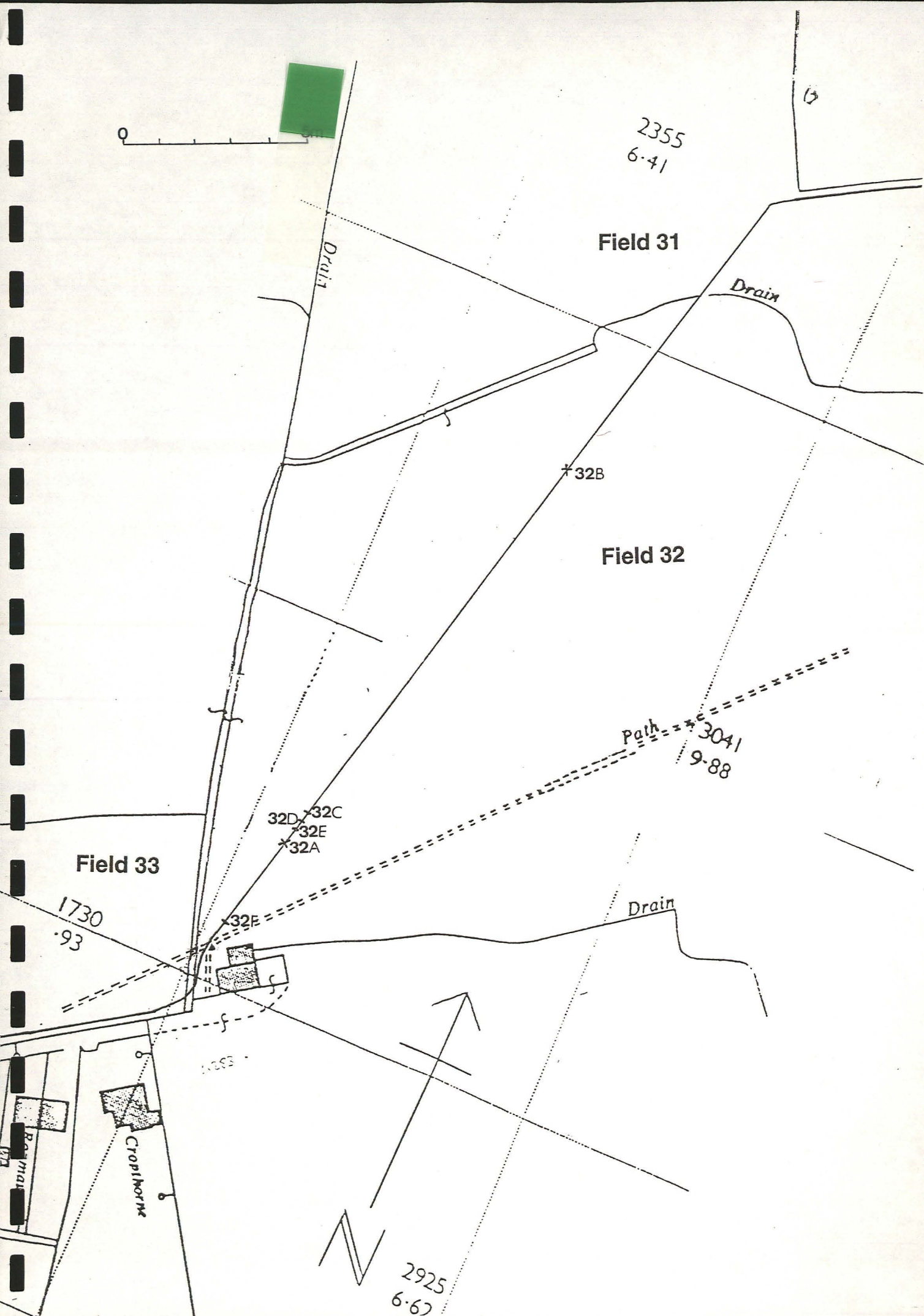


Fig. 5.3 Location of findspots, Field 32

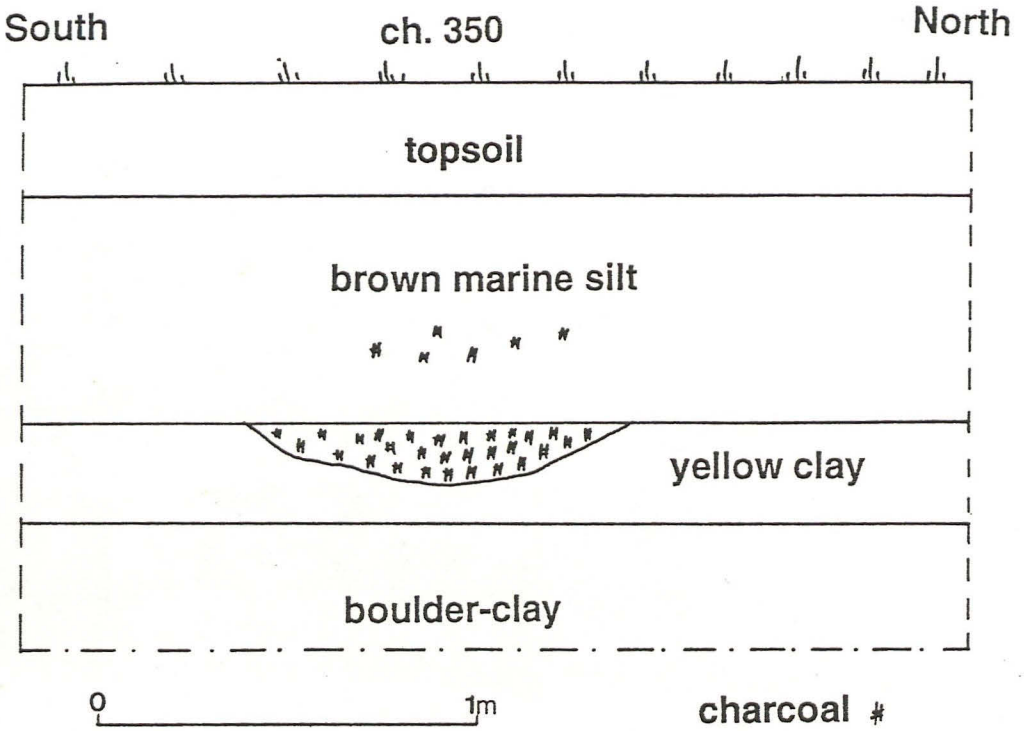


Fig. 5.4 Section across Roman or earlier gully 32C (G. Tann)

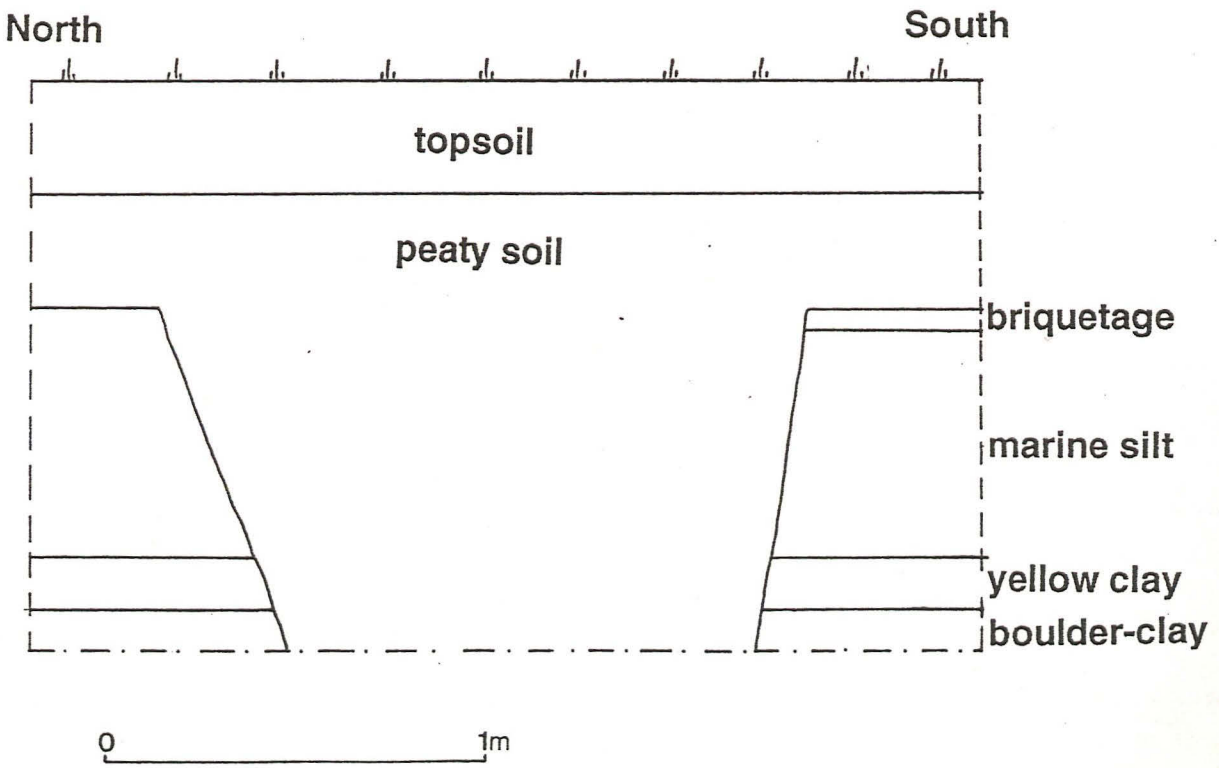


Fig. 5.5 Section across existing backfilled service trench 32E, showing redeposited briquetage (G. Tann)

Pl. 110 Panoramic view showing the backfilled trench of the Hoop End Rising Main within the Newton Marsh Lane STW. (see also Pl. 111). The landscaped mound lies above the 1993 saltern excavation area; some peat was visible in the trench upcast. (looking north from the STW raised walkway)

Pl. 111 The Hoop End Rising Main in relation to Newton Marsh Lane and the TE 94 excavation area (beyond white vehicle). Looking NW

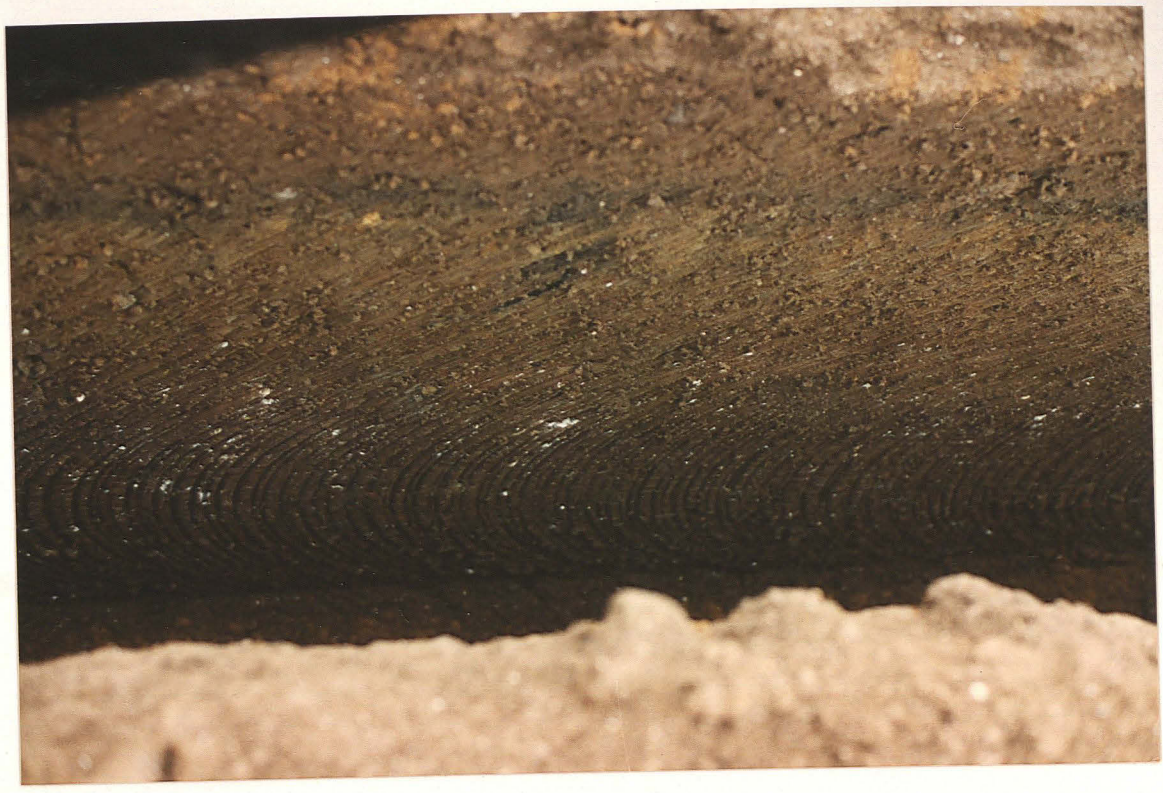
Pl. 112 Land drainage beside the easement was monitored but no finds were seen. (Field 26, looking west with vehicles beside Cow Marsh Lane)

Pl. 113 East face of pipe trench in Field 22 with a thin band of peat and charcoal visible below the marine silt layer

Pl. 114 Field 22, showing peat upcast from the pipe trench (looking north)

Pl. 115 Field 32 after removal of topsoil. The depression at the start of the fence line probably marks a backfilled field ditch. (looking NE; Pl. 116 was located beside nearest vehicle)

Pl. 116 The pipe trench at Field 32C, north of the archaeological features shown in Pls. 117-126 (looking NE)



Pl. 117 Thin band of grey silt and charcoal below the brown marine silts, 32C, looking east

Pl. 118 Charcoal and burnt stones at 32C, looking west

Pl. 119 The charcoal and grey silt layers became thicker to the south and may have filled a shallow gully aligned west-east. (scale divisions 0.2m)

Pl. 120 Briquetage fragments in the trench section at 32D

Pl. 121 Location of the former backfilled sewer trench in Field 32 crossed by the pipeline at the pipe bend (looking north)

Pl. 122 Redeposited peaty fill of the earlier sewer trench at 32E

Pl. 123 South side of the backfilled earlier sewer trench at 32E

Pl. 124 Fired Clay object from 32F, showing wattle-like impressions

Pl. 125 Undulations in field to east of Mill Race Lane, perhaps marking a medieval saltern mound (looking SE)

Pl. 126 Earthworks in pasture field beside Mill Race Lane, which may be the site of a medieval water mill (looking SW)

General Discussion

The watching briefs around the area of the 1993 Late Bronze Age saltern excavation site demonstrated that the archaeological site identified by geophysical survey in 1992 formed part of a more extensive complex. Although pottery was found, few prehistoric vessels were represented and briquetage remained the most frequent artefact, confirming the function of this site as industrial. A small number of features with inconclusive interpretations were recorded, but there was no evidence for identifiable dwellings. No trace of metalled tracks or deliberately laid hardstanding areas was noted, although the 1994 excavation examined a restricted spread of burnt material. Most of the isolated stake- or post-holes located from the watching briefs and excavation may have supported short fence-type structures, possibly removed when the site was abandoned. No organic artefacts were found despite waterlogged peat surviving in numerous areas.

Many more pedestals were found from around the 1994 excavation area than in 1993; in fact only 63 fewer briquetage sherds were retrieved from projects 3 and 4 than from the 1993 saltern excavation which was undertaken in better conditions and over a longer period. The relative numbers of finds suggests that the activity needing the pedestals probably occurred much closer to the TE 94 area than to the 1993 excavation, pointing to spatial arrangement of the saltmaking industry. The absence of additional distinct fire pits remains puzzling, although heat sources such as flat hearth areas were identified.

Petrological examination of pottery and briquetage from the saltern features exposed on the Inlet pipeline route (TEI 93 and TE 94) showed that at least some of the briquetage had been formed using apparently local material (Appendix 6). There may have been casual use of boulder-clay as and when demand for 'clips' and 'spacing' items occurred. Small-scale gathering of boulder-clay might have produced shallow scoops as seen on the TE 94 excavation area (although a natural cause is equally possible). The briquetage vessels and supports must have fired before use, however, and this would indicate a separate activity serving the saltern. The small hearths and fire pits identified in the various locations have been interpreted as associated with heating brine or drying salt (or domestic use) but perhaps they may have provided a heat source for firing briquetage.

The pottery from the site included 'grog' which might come from a local, unsampled boulder-clay source or from Charnwood Forest in Leicestershire (Appendices 4 and 6). Control petrological samples of boulder-clay were taken at Hoop End (0.5km SW of the salt-making site) and localised variations in the constituents of the clay are likely. The implications for either source are considerable with regard to the likely expense of the vessels and the trade routes to the Outmarsh.

The pottery forms, reflecting a broad Late Bronze Age/Early Iron Age transitional date, provide one of the dating methods for this site. Two radiocarbon dates have been obtained, suggesting an overlapping period

between 920 and 875 cal. BC. This would support a Late Bronze Age rather than a later date for the site and subsequent peat growth. Pollen analysis has produced further support for this suggested date.

General Conclusion

The low lying ground to the east and north east of Tetney has been shown from these watching briefs to contain potential for important if infrequent archaeological remains. The medieval saltmaking heritage has been recognised for many years; now it is clear that saltmaking was also taking place much earlier. The Newton Marsh saltern site has been dated (by radiocarbon analysis and by pottery identification) to the Late Bronze Age/ Early Iron Age period (about 875 BC) and at present appears to be one of the earliest located saltmaking sites in Britain. The quantity of pottery recovered (614 sherds from all investigations of the Newton Marsh site) is an extremely important assemblage which contains rim and base sherds, allowing some dating on form. The briquetage from the outskirts of Tetney village may be of a similar date but (on the basis of the visible stratigraphy) certainly cannot be later than Romano-British. There is no reason to see these as the only archaeological sites in this vicinity that have been hidden by marine sediments.

The identified sites were revealed during unintentional partial destruction, although careful arrangements were made by Anglian Water and their contractors to reduce the damage where possible. Part of each site complex is thought to survive beyond the stripped areas and with good fortune only peripheral features will have been exposed and destroyed. These newly discovered sites can be protected by planning and management means, allowing the possibility for future investigation and excavation in considerably better conditions.

Further unidentified sites, probably but not necessarily associated with saltmaking, should be anticipated along the coastal Outmarsh fringe wherever the post-glacial ground surface rose to about 2m OD. These locations may only be exposed during intrusive operations such as field drainage, maintenance of open drains, trenching for services and deep building foundations. It is too late to record groundworks for the Newton Marsh Lane Oil Storage Site and its pipeline to Killingholme, but now the archaeological vulnerability of the area can be appreciated. Inspections for the Lindsey Coastal Survey between 1989 and 1990 covered the foreshore as far north as Tetney Haven; the extension of that study into Humberside would offer another opportunity to assess the level of early local human activity. One of the Coastal Survey's recommendations was that a survey of archaeological deposits in the Lincolnshire Marsh (as revealed in drainage work) should be undertaken. During monitoring of the Hoop End Rising Main, surveying in advance of future works by the local Louth Internal Drainage Board was in progress; an imminent proposal to clean or deepen open drains may be made as a result.

It is probably unnecessary to wait until further sites have been trenched before taking action to preserve them intact or by record. The magnetic susceptibility survey of the Newton Marsh STW area showed graphically that techniques exist which will locate accurately anomalies caused by fired material despite thick overlying sediments. Even simple auguring will identify high boulder-clay contours that must be considered as archaeologically sensitive. Other techniques might become available which would permit the hidden topography of the coastal fringe to be plotted on a larger scale.

No one had expected the boulder-clay to outcrop so close to the present ground surface. The project has shown how little is known of the localised variations in topography which were clearly so fully exploited.

Acknowledgements

LAS would like to thank the many Anglian Water and Birse personnel involved in this project for their sustained interest and co-operation. The assistance given by Stuart Hunter (STW Project Engineer) and both Ian Coleman and Mike Meenaghan (Clerks of Works) was consistent and invaluable on all the projects. Other help was received from John Ryland (Engineer), Derek Scarborough (Senior Engineer, Projects 3 and 4) and Graham Henson (Project Engineer, Projects 3 and 4).

Birse Plc personnel, especially Paul and Daniel Skinner, provided practical help in the early stages of the watching brief and continuing assistance throughout the projects; as also did Pat Hickey who was involved with Project 3.

Thanks are due to Lincolnshire County Archaeology Section, (especially Steve Catney [County Archaeologist] who prompted the initial geophysical survey of the Treatment Works site and provided curatorial and other support during the projects; Ian George [Assistant Archaeology Officer], Mark Bennet, Sarah Grundy and Julia Wise [County Sites and Monuments Record]). Similar gratitude is expressed to Gail Falkingham (Humberside Archaeological Officer), staff at the Humberside Sites and Monuments Record, and Kevin Leahy (Curator, Scunthorpe Museum and Art Gallery).

Tony Johnson (Oxford Archaeotechnics) directed geophysical surveys of the Treatment Works Site in 1993 (locating the saltern area with precision) and the saltern extension area in 1994 (with less useful results because of the adjacent cast-iron pipes).

Dr. Carol Allen examined and described the briquetage; Dr. David Knight, (Trent and Peak Archaeological Trust) identified the prehistoric pottery. Dr. Alan Vince and Rick Kemp (City of Lincoln Archaeology Unit: CLAU) arranged the thin-sectioning and petrological examination of briquetage and pottery sherds. The briquetage and Bronze Age pottery was drawn by Jane Goddard. Roman and Post-Roman pottery was identified and described by Maggi Darling, Judy Wilkinson and Jane Young (CLAU); Fig. 3.6 was illustrated by Zoe Pattinson and Jane Young.

Professor M. Tooley and Dr. Jim Innes, (University of Durham, Dept. of Geography) assisted with the environmental sampling strategy and arranged analysis of peat samples from the 1993 works. Radio-carbon dates were obtained by Radiocarbon Dating, Wantage, using the Harwell laboratories. Pollen assessment on samples from the 1993-4 monitoring was undertaken by Dr. Barbara Brayshay (Archaeological Research and Consultancy at the University of Sheffield). Tree species represented by charcoal were identified by G.C. Morgan (School of Archaeological Studies, University of Leicester), and identification and specialist discussion of animal bone from Project 1 was by J. Hamshaw-Thomas.

Permission for access to land beside the easements and local information was provided by landowners and farm workers. Particular thanks are expressed to Mr. S. Dawson (Bishopthorpe Farming) and Mr. Chapman (Charlton Cottage).

Acknowledgement is also due to the staff at Lincolnshire Archives, Lincolnshire Local Studies Library and Ms. Padraicin Ni Mhurchu (Cambridge University Committee for Aerial Photography). LAS is grateful to Derek Hurst (County Archaeology Service, Hereford and Worcester County Council) for permission to reproduce artwork by Carolyn Hunt as the Frontispiece.

Surveying for projects 3 and 4 was by Mick Clark (LAS). The excavation team for Project 4 (directed by Colin Palmer-Brown) consisted of Wayne Livesey, Rob Schofield and Darren Pullen.

Much help was given by Mick McDaid and Jane Frost, sorting the photographs and site archives and cleaning finds. Constructive comment was made by Naomi Field, who also prepared Fig. 4.3. The report was collated and produced by Jane Frost.

Geoff Tann
Lindsey Archaeological Services
24th July 1995

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Appendix 1:

Summary of the County Sites and Monuments Records for Lincolnshire and Humberside

SMR codes: NGR: Description
(H= Humberside SMR no.; hwp= Humber Wetlands Project no.; suffix letters refer to Lincs. SMR, OS Sheet TA 30 SW)

41228 (H) 3134 0349 Romano-British pottery (3rd-4th century) [hwp 476]
41229 (A) 34 02 Salterns (numerous, ?medieval) [hwp 477, 474]
41226 (F) Saltern (medieval) 1959
41223 (B) 3356 0145 Romano-British pottery (3rd-4th century) 1958 [hwp 471]
42864 3182 0132 Saxon pottery
318 013 Stone axe (Early Bronze Age) 1986 and struck flint flake 1984
41225 (E) 3184 0132 Romano-British pottery, quern fragment and oyster shells [hwp 473]
41224 (D) 3176 0112 Socketed iron axehead, 15th-17th century [hwp 472]
41730 (I) St. Peter and St. Paul's church [hwp 478]
42866 3175 0120 Ridge and furrow cultivation (medieval) [hwp487]
41227 (C) 3075 0132 Coin hoard in pottery urn (Anglo-Saxon)
42933 3061 0142 Roman occupation spread
42934 3057 0149 Roman occupation spread

hwp 479 430 022 Post-medieval tile works
H1168 3258 0570 Stone axe head ?Neolithic [hwp 3170]
H1171 326 057 Polished stone axe ?Neolithic [hwp 3171]
hwp 3169 3222 0549 Axe, and flint scatter (Bronze Age)
hwp 487 3166 0089 Medieval cross [Tetney]
hwp 3165 310 051 Humberston abbey
hwp 3167 3107 0515 Moat around abbey
hwp 3168 312 052 Site of church

Appendix 2: List of Archaeological Finds from Projects 1-5

(fe: iron; pm: post-medieval; frag.: fragment)

Project 1: Tetney, Newton Marsh Lane Sewage Treatment Works TE 93

501 charcoal deposit, thought to be redeposited (retained as Sample 3)
502 animal bone frags; 1 individual (bovine)
513 charcoal fragments (retained as Sample 10)
514 (topsoil) 9 sherds pot; 2 lumps slag (discarded); 1 fe obj (discarded)
523 small fragments burnt soil and charcoal flecks (discarded)
524 burnt soil and charcoal fragments (retained as Sample 16)
530 remains of thin burnt timber, and charcoal flecks (retained as Sample 14)
533 small quantity of charcoal from post-hole (retained as Sample 12)
534 unburnt wood remains from within peat (retained as Sample 11)

Project 2: Newton Marsh Lane to Tetney Haven Outfall Pipeline TEO 93

Find	Grid Ref.	Description
1	TA 3380 0312 ch. 250	1 medieval pot sherd
2	TA 3477 0314 ch. 1450	2 medieval pot sherds (1 vessel); 1 sherd pm pot

Project 3: King's Road, Cleethorpes - Newton Marsh Pipeline TEl 93

1A 3301 0357 ch. 3650 ?Bronze Age flint scraper; 1 ?gunflint
1 ch. 3820 Context 50 358 sherds prehistoric pottery (at least 2 vessels); 17 fragments briquetage
ch. 3820 Context 51 1 fragment briquetage
ch. 3820 Context 52 14 fragments briquetage; 3 sherds prehistoric pottery
ch. 3895 Context 53 14 fragments briquetage
ch. 3955 Context 58 1 fragment briquetage
ch. 3990 Context 59 1 sherd prehistoric pottery
ch. 3830 Context 62 396 fragments briquetage; 2 worked flints; 1 prehistoric pottery sherd

2A 3299 0384 ch. 3400 1 sherd medieval pottery
4A 3302 0470 ch. 2750 Roman greyware pot rim (abraded by marine action?)
5A 3290 0476 ch. 2600 Roman coarseware pot rim, abraded by marine action?
7A 3273 0532 ch. 2000 1 sherd undateable pottery
8A 3270 0543 ch. 1592 Medieval pot sherd
8B 3270 0540 ch. 1785 Animal burial, post-medieval pig
10A 3200 0700 ch.105 Medieval/ post medieval jug with sand fill; ?Humber ware; late 15th-early 16th century. The fill, which appeared to have entered the pot after deposition and contained fragments of marine shells, was discarded.

Project 4: Tetney Inlet Excavation TE 94 excavation

(TA 3303 0345; ch. 3835)

101 4 sherds pottery; 16 fragments briquetage

103 18 sherds pottery; 90 fragments briquetage

Gr 11; gritstone fragment (boulder-clay inclusion?); 1unworked flint , discarded

Gr 2 1 frag land drain pipe, discarded

Gr 21 3 unworked flints, discarded

Gr 27 3 unworked flints, discarded

Gr 29 2 burnt unworked flint (1 discarded)

Gr 34 3 unworked flints, discarded

107: 120 sherds pottery; 951 fragments briquetage

Gr 17 [5 sherds pottery]

Gr 21 [6 sherds pottery]

Gr 22 [2 sherds preh pottery]; 1 flint flake ?worked; 3 burnt stones

Gr 23 [82 sherds pottery]

Gr 27 1 flint flake ?worked

Gr 28 [14 sherds pottery]

Gr 36 1 flint flake ?worked

Gr 40 2 flint flakes ?worked

Gr 29 4 unworked flints, discarded

Gr 34 1 unworked flint, discarded

Gr 41 2 unworked flints, discarded

Gr 42 [11 sherds pottery]

111 charcoal (partly retained as Sample 19)

112 5 sherds pottery; 8 fragments briquetage

Project 5: Hoop Lane - Newton Marsh Pipeline TPS 94

32A 3222 0136 50 sherds post medieval pottery

32B 3223 0146 ch. 440: flint scraper, ?flint scraper

32C 3221 0136 ch. 350: medieval pottery from topsoil and upper brown silt
charcoal frags. from below brown silt and above yellow weathered boulder-clay

32D 3221 0133 ch. 325: 8 sherds medieval pottery, 1 oyster shell and 1 animal (cattle) tooth from brown silt
2 briquetage frags. and 2 larger fired clay/briquetage from between brown silt and yellow clay

32E 3220 0132 ch. 310-15: briquetage flecks from old sewer trench backfill and briquetage flecks above brown silt, below sewer trench (possibly also disturbed by sewer cut)
10 sherds briquetage; 1 sherd Saxo-Norman Stamford ware pot

32F 3220 0130 ch. 285: 30 sherds AS or med pott from topsoil or upper brown silt briquetage; 1 large fired clay lump; ?wattle impressions

Appendix 3:

Animal Bones
from the
Tetney (Newton Marsh Lane) Sewage Treatment Works Site
by J. Hamshaw-Thomas

Saltern Excavation Area TE 93

[02] Cow metacarpal prox. and dist. ends fused; shaft shattered

[05] ? 2 indeterminate frags.

[08] Cow/Red Deer/Horse vertebra, highly fragmented

[60] Cow humerus dist. fused, L highly fragmented; cut
The presence of a series of cut marks on the humerus is of particular interest. The location of these would seem to indicate the removal of flesh (filleting) as opposed to disarticulation or skinning. The material of the tool used is unclear. A simple and amusing scenario for the taphonomy of the humerus may be along the lines of a prehistoric packed lunch - a raw or cooked clod joint brought and consumed at work!

[72] Horse maxillary cheek tooth (P3, P4, M1, M2?)

Plant Area Watching Brief TE 93

[502] Cow mandible young adult, over 3 years, L. (The age is based on the third cusp of the M3 being in wear).

It is unfortunate that such an interesting and unusual site yielded such a small faunal sample.

Preservation:
There is considerable variation in the state of preservation. All except [72] are highly fragmented, being broken in antiquity (eg. [60]) or recently (eg. [08 and 502]). The vertebra fragments showed a perfect surface texture, yet the metapodia and humerus were battered and abraded. The mandible was so fragmented that it could not be removed from the surrounding marine silt matrix without losing its integrity.

Appendix 4:
Late Bronze Age/ Early Iron Age Pottery from Tetney, Lincs

by David Knight

With a Report on the Petrology by Dr. Alan Vince

1. Introduction

A synthesis is provided in this report of an important collection of Late Bronze Age/ Early Iron Age pottery which was obtained during archaeological investigations prior to consruction by Anglian Water of a large sewage treatment works at Newton Marsh Lane, Tetney. A total of 614 sherds (3.656kg), all probably deriving from Late Bronze Age/ Early Iron Age activity, was retrieved from work in three separate areas, as follows:

TE 93: STW area archaeological excavation, directed by C. Palmer- Brown in 1993.
TEI 93: inlet pipeline watching brief, directed by G. Tann in 1993-4.
TE 94: inlet pipeline archaeological excavation, directed by C. Palmer-Brown in 1994.

A full archive list of pottery by context is provided separately for TE 93, TEI 93 and TE 94, together with details of fabric, vessel part, profile class, dimensions, surface finish, decoration, abrasion, surface deposits, method of manufacture and firing. Each entry in these archive lists represents an individual sherd, a group of non-joining sherds with identical attributes, or a group of joining sherds, thus permitting detailed quantitative analyses by weight and number of each vessel attribute. A range of pottery from the site is illustrated in Figs 1-4.

The distribution by context of the pottery obtained from each of the above three areas is considered in the first section of this report. Attention is then focussed upon variations in vessel fabrics, forms and styles of surface treatment, with consideration finally of the typological affinities and dating of the collection.

2. Distribution of Pottery by Context

TE 93. A total of 100 sherds (0.913kg) was obtained during excavation. 75 of these (0.611kg) were recovered from a single occupation layer (**078**), together with four fragments of briquetage (17g). The remaining sherds, excluding three (52g) unstratified fragments, derived from an extensive spread of reddish brown and possibly burnt silty clay, 003, adjacent to the saltern pool, fills of several shallow depressions, 018, 046 and 057, a layer of sandy clay, 051, a charcoal spread, 059, ditch fills 060 and 070, and an occupation spread, 079, on the southern side of the saltern pool. 003 also yielded a large quantity of briquetage (234 fragments; 2.525kg), together with charcoal flecks and stones, while smaller quantities of briquetage, in some

cases associated with charcoal, stones and flint, were retrieved from all other contexts yielding pottery.

TEI 93. A total of 367 sherds (1.677kg) was obtained during the watching brief, all but nine sherds (64g) from context 50. The latter was a small hollow or pit, containing a substantial portion of a large round-shouldered or open vessel, apparently placed deliberately in an upright position within the feature (Fig.3). The top of the pot had been scraped during machine stripping, although part of the rim remained, and it is unclear how much of the vessel had originally been deposited in the feature. Most of pottery sherds from this context probably belong to this vessel, on the grounds of similarities in form, fabric and surface finish, but the pottery is very fragmented and few joins may be located with confidence. A full description of this vessel is provided below. 17 fragments (57g) of briquetage were also recovered from this feature, but the great bulk of the briquetage from TEI 93 (90%) derived from context 62, referred to below (396 fragments; 3.794kg). The remaining handful of pottery sherds from this area derived from contexts 52 (3 sherds; 23g), 59 (1 sherd; 9g) and 62 (5 sherds; 32g): respectively a patch of briquetage, charcoal flecks, burnt stones and pebbles, a dense charcoal spread, and a layer of briquetage, burnt flint and charcoal.

TE 94 A total of 147 sherds (1.066kg) was recovered from a 6x8m area within the stripped pipeline easement, adjacent to the backfilled pipe trench; these derived mainly from context 107 (120 sherds; 0.853kg): a burnt sandy clay with much charcoal and briquetage, adjacent to a possible hearth, 106. Other pottery was recovered from a shallow depression filled with a dark brown clay and much charcoal, 101 (4 sherds; 44g), and from a brown clay layer with with some briquetage and quartzite pebbles: 103 (18 sherds; 111g); 5 sherds (58g) were unstratified (context 112). The pottery was recorded within a grid of 1m squares, enabling the spatial distribution of pottery and briquetage within the stripped area to be plotted with reasonable accuracy. The distribution of pottery from context 107 is biased strongly towards grid square 23 (82 sherds) and adjacent squares 17, 21, 22 and 28 (respectively 5, 6, 2 and 14 sherds), with an outlier of 11 sherds in square 42. Sherds deriving from context 101 were recorded in square 12 (4 sherds) and from context 103 in squares 11, 21, 27, 33 and 34 (totalling 18 sherds). The distribution corresponds closely with the distribution of briquetage, with which this material is clearly directly associated.

All of the above areas yielded pottery in direct association with briquetage, and there can be no doubt that the salt-making activities date from the same period as the pottery, much of which was obtained in a fresh or moderately fresh condition (most notably from context 050). As argued below, this could imply salt production on the site from as early as the Late Bronze Age: a conclusion of major significance for our understanding of the early history of salt production within the coastal zone of Lincolnshire.

3. Fabrics

Two main fabric groups have been distinguished on the basis of variations in the kinds of inclusions which could be observed within the clay matrix (employing a x30 binocular microscope). The fabric divisions were devised jointly with Dr. C. Allen, who compiled a detailed archive record of each fabric group, and were refined after thin-sectioning of selected sherds by Dr. A. Vince. Specialist geological advice was also provided by Dr. R. Firman.

The following conventions are employed in the fabric descriptions:
Condition: unabraded (original surfaces unworn); moderately abraded (part of original surfaces worn); abraded (original surfaces substantially worn); very abraded (all surfaces worn).
Frequency of inclusions: rare (<3%); sparse (3-10%); moderate (11-25%); common (26-40%); abundant (<40%).
Size of inclusions: fine (<0.25mm); medium (0.25-1mm); coarse (1-3mm); very coarse (<3mm).

Fabric 1 (Sandstone and Igneous Inclusions)

All but three sherds derive from a coarse ware characterised by a sparse to moderate density of poorly sorted and mainly coarse to very coarse sandstone and igneous inclusions. The outer surfaces of these vessels are generally oxidised (orange to buff) and the inner surfaces more commonly unoxidised (black/grey), but a substantial minority of vessels preserves evidence of irregular firing on the inner and/or outer face. The core is almost invariably unoxidised (black/grey). The fabric is soft, generally with a granular feel and a hackly fracture.

Petrology.
by Dr. A. Vince (City of Lincoln Archaeology Unit)

Four samples from context 50, TEI 93 (L929; L930; L931; L932), together with two samples from context 107, TE 94 (L933; L934) were thin-sectioned. All incorporate igneous inclusions, but two sub-groups might be represented:

Group 1: The main feature of this group is the presence of large, rounded fragments of basic igneous rock, sometimes in excess of 5mm across, and, in lower quantities, fine-grained sandstones and a greywacke. The basic igneous rock was mainly a relatively coarse, even textured rock containing mainly plagioclase felspar crystals *c.*0.5mm across. Lava and lava with phenocrysts of plagioclase felspar up to 0.8mm across were present in lower quantities. The sandstone fragments varied in their grain-size, grain-size distribution and in their cement, and probably come from several sources. Angular flint fragments up to 0.5mm across were present in one sample. All samples showed a poorly mixed texture, and in some cases there were differences in colour between different pellets in the clay. There is, however, no clear evidence that these pellets were added as grog, and all are probably relict clay. All samples contained a scatter of rounded and angular quartz grains up to 0.4mm across within an aniotropic clay matrix containing sparse silt-sized quartz.

The presence of rounded basic igneous rock in these samples indicates that the inclusions have a glacial origin. Whilst this might have been a glacial sand or gravel used to temper a clay of non-glacial origin, it is more likely that the clay and inclusions together were obtained from a till (*i.e.* boulder clay). In the Tetney area, the most likely source for such a till is the Basal Till recorded as occurring in a band running down the east coast from Flamborough Head to Skegness. This till is stated to be covered with later deposits over much of its extent, and presumably would have been obtained where this overburden was exposed by river or coastal erosion rather than by quarrying. Samples of clay from Tetney itself have been made into test briquettes, and once fired will be compared with the Group 1 fabric.

Group 2. A single sample from context 107, TE 94 (L934) contained fragments of acid igneous rock and sandstone. The acid igneous rock was not sufficiently abundant for a detailed description, although it contains crystals of felspar, quartz and biotite. The sandstone may be somewhat coarser than those in Group 1. The clay matrix is similar in all respects to that found in Group 1.

Two possible sources for Group 2 exist. It could be a variant of Group 1, since boulder clays are notoriously variable in composition. Alternatively, Group 2 may be from the Charnwood Forest region of Leicestershire, a known source of pottery throughout the East Midlands from the Neolithic to the Anglo-Saxon periods. Confirmation of a Leicestershire source might be obtained by making further thin-sections, so as to maximize the chance of being able to identify some of the common features of the Mountsorrel granodiorite (such as zoning in the felspar grains) or by incorporating a sample of the clay matrix into a programme of elemental analysis.

Fabric 2 (Flint-tempered)

Two sherds of this fabric group were recovered from TE 93, one from Context 051, in association with six sherds of Fabric 1, and the other from Context 057, which otherwise yielded no pottery. One other unstratified sherd derived from TE 94. They are distinguished by a moderate density of mainly coarse to very coarse angular unburnt flint inclusions, poorly sorted and possibly added as temper. The inner and outer surfaces are oxidised (orange), while the core is unoxidised (grey). The fabric is soft, granular in feel and has a hackly fracture. It appears to resemble closely one of the Late Bronze Age/Early Iron Age fabrics recorded on a site at Barnetby Wold Farm, Lincs. (Didsbury and Steedman, 1992, 8: Vessel 20.1), referred to below, but the chronological and spatial spread of flint-gritted wares in this area has yet to be examined systematically. Flint might have been obtained from the local boulder clays, or alternatively a more distant Wolds source might be suggested.

4. Vessel Forms

Fragments have survived of the following classes of vessel, all modelled by hand:

4.1. Ovoid Vessels

TE 93. Vessels of ovoid form are suggested by three fragments from one or possibly two pots with a direct rounded rim and short everted neck, and embellished along the rim by a row of diagonally incised lines (Fig.1.1-3). The form cannot be determined with certainty, but the high girth and gently curving profile would suggest a vessel of ovoid or similar form (*e.g.* globular/ellipsoid). Four other sherds, two joining, preserve similarly decorated rounded rims surmounting slight eversions in the body wall, and could conceivably derive from this same vessel (Fig.1.4-6). This cannot be established beyond doubt, but it is made more likely by their discovery in unabraded condition within a restricted area of Context 078 - a disturbed charcoal-flecked layer of mottled dark sandy clay, interpreted by the excavator as probably an occupation layer. One other vessel which may originally have been of ovoid form was recovered during excavation: a thin-walled pot with a short and probably upright neck and a neatly executed plain direct flattened rim, from Context 051 (Fig.2.2).

TEI 93. No convincing examples of ovoid vessels may be distinguished, although two sherds with flattened rims, in one case decorated with a row of finger-nail incisions along the lip, could possibly derive from vessels of this or related form (Fig.3.6-7).

TE 94. A maximum of four vessels of possibly ovoid form may be distinguished, but none is sufficiently well preserved for the profile to be established with certainty (Fig.4.1-2, 4-5). A small rim fragment from one of these vessels preserves a short and probably upright neck and, if the angle is correct, an internally bevelled rim (Fig.4.2), while a group of four joining sherds may derive from an upright or everted necked vessel with a rounded direct rim (Fig.4.4). The two remaining sherds may derive from neckless ovoid vessels; one preserves a rounded rim (Fig.4.5), but the rim of the other sherd is too abraded for its form to be established (Fig.4.1).

4.2. Round-shouldered Vessels

TE 93. A small body sherd from a vessel with a pronounced rounded girth was recovered from Context 03 (Fig.2.1). Another vessel of this class with a high everted or possibly upright neck and a slightly tapered rim with rounded lip was also retrieved, but unfortunately was unstratified (Fig.2.5).

TEI 93. A substantial portion of a pottery vessel with a pronounced change of angle in the wall *c.*3cm below the rim was retrieved from a small hollow or pit, into which it seems to have been deliberately set (context 50; Fig.3.2). The pot appears to have been placed in an upright position, and part of its rim, unfortunately, had been scraped during machine stripping. Most of the 358 sherds from this context probably derive from this vessel, on the grounds of similarities in form, fabric and surface finish, but the pottery is very

fragmented and few joins may be located with confidence. Several sections of profile may be reconstructed, the most complete of which is illustrated in Fig.3. This shows a bipartite round-shouldered vessel with an internally bevelled rim, but drawings of the vessel suggest that the sherds may in fact derive from a wide-mouthed open vessel with a short upright neck and flattened rim: a most unusual form, lacking close parallels on LBA/EIA sites elsewhere in the region (see below). At least one other round-shouldered vessel was retrieved from this context: a vessel with a concave neck and pinched out rim (Fig.3.1), possibly represented also by another rim fragment illustrated separately (Fig.3.3).

TE 94. A maximum of six examples of round-shouldered vessels has been recorded on this site, mostly represented by small girth fragments. The best example was obtained from context 107, and is characterised by a pronounced rounded girth and an upright neck with flattened rim (Fig.4.3).

4.3. Carinated Vessels

Two plain sherds from context 50, TEI 93, may represent carinated girth fragments (Fig.3.4-5), but given the small size of these fragments this attribution cannot be established beyond doubt.

4.4. Lids

Context 62, TEI 93, yielded a small 'rim' fragment which is most plausibly reconstructed as part of a lid (Fig.3.8). This is a rare survival on LBA/EIA sites in this region, although the rarity of known examples undoubtedly reflects in part the difficulty of distinguishing lids from other vessel fragments.

4.5. Miscellaneous Vessel Forms

Mention should also be made of a substantial fragment of a thick-walled vessel with a direct rounded rim derived from Ditch 070, TE 93 (Fig.2.4). Insufficient survives for the angle of the wall to be determined with certainty, but it seems best reconstructed as the upper part of a convex or vertically sided vessel. It stands out from the limited number of ovoid vessels which have been recovered from elsewhere on the site, and, as argued below, an affinity might be suggested with local Deverel-Rimbury bucket or barrel urns.

Other evidence for vessel forms from TE 93, TEI 93 and TE 94, in addition to that discussed in Sections 4.1-4.4 above, is confined to a handful of rims from vessels of uncertain form (either of direct rounded or flattened form or flat-topped and pinched out on either face) and several flat base angles, occasionally pinched out around the circumference,

5. Surface Treatment

Finger indentations formed during hand modelling of the vessel may be observed on the inner and/or outer surfaces of many sherds, but distinctive surface finishes (*eg* burnishing or brushing) are conspicuous by their absence. The collection is also largely undecorated, the only exceptions being several incised rims and a cordon with faint traces of incised decoration.

5.1. Incised Rims. Six sherds from TE 93, deriving conceivably from a single vessel of ovoid or similar form, discussed above, preserve a row of closely spaced and deeply incised diagonal lines along the rim (Fig.1.1-6). These incisions could have been produced by a finger-nail or possibly by the blade of a sharp tool. One other rim, from context 62, TEI 93, preserves a row of finger-nail incisions along the lip; the form of the vessel cannot be established with certainty, but a neckless ovoid form may be suggested (Fig.3.7).

5.2. Incised Cordon. The only other evidence of decoration is provided by a girth fragment from context 060, TE 93 (Fig.2.3). This preserves the abraded remains of a cordon with faint traces of two diagonal incisions, possibly formed by a finger-nail.

6. Typological Affinities and Dating

The rims with finger-nail or tooled incised decoration along the lip invite comparison with diagnostic Late Bronze Age/ Early Iron Age vessels from Lincolnshire and Humberside, notably from Barnetby Wold Farm (Didsbury and Steedman, 1992, fig.5: vessel 20.1) and Washingborough Fen (Elsdon, 1994, fig.3), and on current evidence we may suggest a date of manufacture between the later ninth and fifth/fourth centuries BC (*cf.* Barrett, 1980; Didsbury and Steedman, 1992, 8-10; Knight, 1992, 45-8). Vessels with pronounced high rounded girths are also common components of Late Bronze Age/ Early Iron Age ceramic assemblages throughout the Midlands and eastern England (*eg* Cunliffe, 1991, figs A:4-5), although local parallels for these forms are at present less common (*eg* Dragonby: Elsdon and May, 1987, fig.29.37: girth embellished with finger-tipping; Brigg: May, 1976, fig.62.2; Washingborough Fen: Elsdon, 1994, fig.3). The presence of two tiny carinated girth fragments (Fig.3.4-5) would support this date attribution, for carinated bowls and jars are diagnostic elements of LBA/EIA ceramic assemblages throughout southern Britain (*e.g.* Barrett, 1980; Cunliffe, *op. cit*).

The most remarkable find is the substantially intact vessel which was recovered from Context 50, TEI 93 (Fig.3.2). This preserves a pronounced change of angle in the wall, suggesting affinities with the tradition of round-shouldered vessel described above. Drawings of the pot , however, suggest that it may in fact be an open vessel, with an upright neck above the change in wall angle. Open vessels are not unknown in southern British LBA/EIA ceramic assembalges (*e.g.* Ivinghoe Beacon, Bucks.: Cotton and Frere, 1968, fig.17. 36-45), but no close Lincolnshire parallels have yet been located in ceramic collections of this period.

Finger-decorated cordons were also applied regularly to coarse wares of the Late Bronze Age/ Early Iron Age period (*eg* Brigg: May, 1976, fig.62), although we should not forget that cordons are also a feature of the preceding Deverel-Rimbury ceramic tradition (*eg* Allen *et al*, 1987, 212). More persuasive evidence for Deverel-Rimbury influences may perhaps be

provided by the substantial rim fragment which was recovered from Ditch 070, TE 93 (Fig.2.4). The vessel profile cannot be determined with certainty, but if the proposed angle is correct a typological link with barrel or bucket urns might be suggested (*cf* Allen *et al*, 1987, figs 6-10, 13-17; Didsbury and Steedman, 1992, fig.4: Vessel 34.1/2.1; Field and Knight, 1992, fig.8.3). An earlier ancestry for this vessel is therefore possible. However, given that its fabric is indistinguishable from most other pottery from the site, it may be safer to conclude that it signifies only the continuation of ceramic influences derived from Deverel-Rimbury beyond the main period of currency of this style.

On balance, therefore, a date of manufacture for the pottery from this site no earlier than the later ninth or eighth centuries BC (when occurred the ceramic developments which herald the beginning of the post-Deverel-Rimbury ceramic tradition) would seem most appropriate. This tradition continued in the Midlands and eastern England well into the earlier Iron Age, but the presence at Tetney of at least one vessel which may have affinities with Deverel Rimbury bucket/barrel urns might imply a date towards the beginning rather than the end of this tradition. Cordons, as noted above, find extensive parallels in both Deverel-Rimbury and Late Bronze Age/Early Iron Age ceramic assemblages from this region, and unfortunately the presence of an example at Tetney does not, therefore, clarify this issue.

The argument for Late Bronze Age activity is supported by a radiocarbon date of 2640+/-70BP (845-745 cal BC; Har: RCD-1305) obtained from charcoal in a shallow depression (057) recorded at TE 93 - from which was also obtained a small (6g) flint-gritted plain body sherd. Too much emphasis should of course not be placed upon a single radiocarbon date, but it would support a Late Bronze Age rather than earlier Iron Age date for at least some of the pottery from the site.

Catalogue of Illustrated Pottery

Fig.1: Pottery from TE 93, Context 078
The illustrated sherds from this context vary slightly in details of their form, but otherwise all are of the same fabric group (F1), preserve one or more closely spaced finger-nail/tooled incisions along the rim and compare closely in firing and colour (irregularly fired surfaces [buff to grey], with unoxidised core [grey]). All are unabraded, and as noted in the text could conceivably derive from one vessel whose neck was exaggerated to varying degrees around the circumference.

Fig.2: Pottery from TE 93, miscellaneous contexts,
2.1. Fabric 1. Tiny girth sherd. Pronounced rounded shoulder, with faint finger indentations on exterior. Incompletely oxidised exterior (mid brown), but otherwise unoxidised (dark grey). Unabraded. Context 03.

2.2. Fabric 2. Rim of ovoid (?) vessel with probably upright neck and flattened rim. Oxidised exterior (orange), unoxidised core (light grey) and irregularly fired interior (light grey and orange). Moderately abraded. Context 051.

2.3. Fabric 1. Girth fragment from vessel of uncertain form. Remains of cordon, with two faint diagonally incised lines (bottom right of drawing). Oxidised exterior (orange) but otherwise unoxidised (black). Moderately abraded. Context 060.

2.4. Fabric 1. Fragment of vessel with direct rounded rim and of uncertain angle. Faint finger indentations on exterior and interior. Irregularly fired surfaces (mottled orange, brown and grey) and unoxidised core (black). Traces of blackened burnt matter on exterior. Unabraded. Context 070.

2.5. Fabric 1. Fragment of vessel with direct rounded rim, pronounced rounded girth and a high and probably everted neck. Pronounced finger indentations on interior (along girth). Oxidised surfaces (exterior orange; interior buff) and unoxidised core (grey). Moderately abraded. Unstratified.

Fig. 3: Pottery from TEI 93, Contexts 50 (1-6) and 62 (7 and 8)
3.1. Fabric 1. Fragment of vessel with pinched-out rim, pronounced rounded girth and concave neck. Oxidised exterior (orange); core and interior irregularly fired (orange and light grey). Moderately abraded. Context 50.

3.2. Fabric 1. Fragment of bipartite round-shouldered vessel with internally bevelled rim, or of open vessel with upright neck and flattened lip (see Section 4.2 for detailed discussion). Extensive finger indentations on the outer and inner surfaces, formed during hand modelling of the vessel. In common with the many other sherds of this vessel which were retrieved from this context, the outer surface is irregularly fired (predominantly orange, with mottles varying from light/dark brown to black or grey) while the interior and core are unoxidised (black/dark grey). Unabraded. Context 50.

3.3. Fabric 1. Rim fragment from vessel with concave neck and pinched-out rim. Firing and abrasion as Fig. 3.1, and possibly part of the same vessel. Context 50.

3.4. Fabric 1. Probable carinated girth fragment. Oxidised exterior (orange); unoxidised core (dark grey/black). Inner surface flaked away. Context 50.

3.5. Fabric 1. Probable carinated girth fragment. Oxidised exterior (orange); traces of unoxidised core (dark grey) survive, but remainder of core and inner surface flaked away. Context 50.

3.6. Fabric 1. Flattened rim from vessel of uncertain form (neckless ovoid?). Oxidised throughout. Moderately abraded. Context 50.

3.7. Fabric 1. Flattened rim from vessel of uncertain form, with row of four slightly curved fingernail incisions along lip. Oxidised interior and exterior (orange); unoxidised core (grey). Moderately abraded. Context 62.

3.8. Fabric 1. Lid fragment. Irregularly fired exterior (orange and grey/black); unoxidised core (light grey); oxidised interior (orange). Moderately abraded. Context 62.

Fig. 4: Pottery from TE 94, Contexts 103 (1 and 2), 107 (3 and 4) and 112

4.1 Fabric 1. Fragment of possible neckless ovoid vessel; rim abraded and of uncertain form. Exterior and core unoxidised (light grey); interior oxidised (orange). Generally moderately abraded, but with abraded rim. Context 103.

4.2. Fabric 1. Possible upright neck (angle uncertain), with internally bevelled rim (assuming angle correct). Unoxidised exterior (grey) and core (black) and irregularly fired interior (mottled light and dark grey). Moderately abraded.

4.3. Fabric 1. Fragment of high round-shouldered vessel with upright neck and flattened rim. Extensive finger indentations on the outer and inner surfaces, formed during hand modelling of the vessel. Core mainly unoxidised (dark grey); other surfaces irregularly fired (mainly orange and light grey). Moderately abraded.

4.4. Fabric 1. Fragment of vessel with upright or everted neck and rounded direct rim. Unoxidised throughout (dark to light grey). Moderately abraded.

4.5. Fabric 1. Rim fragment of possibly neckless ovoid vessel with direct rounded rim. Exterior and interior oxidised (orange); otherwise unoxidised (dark grey). Moderately abraded.

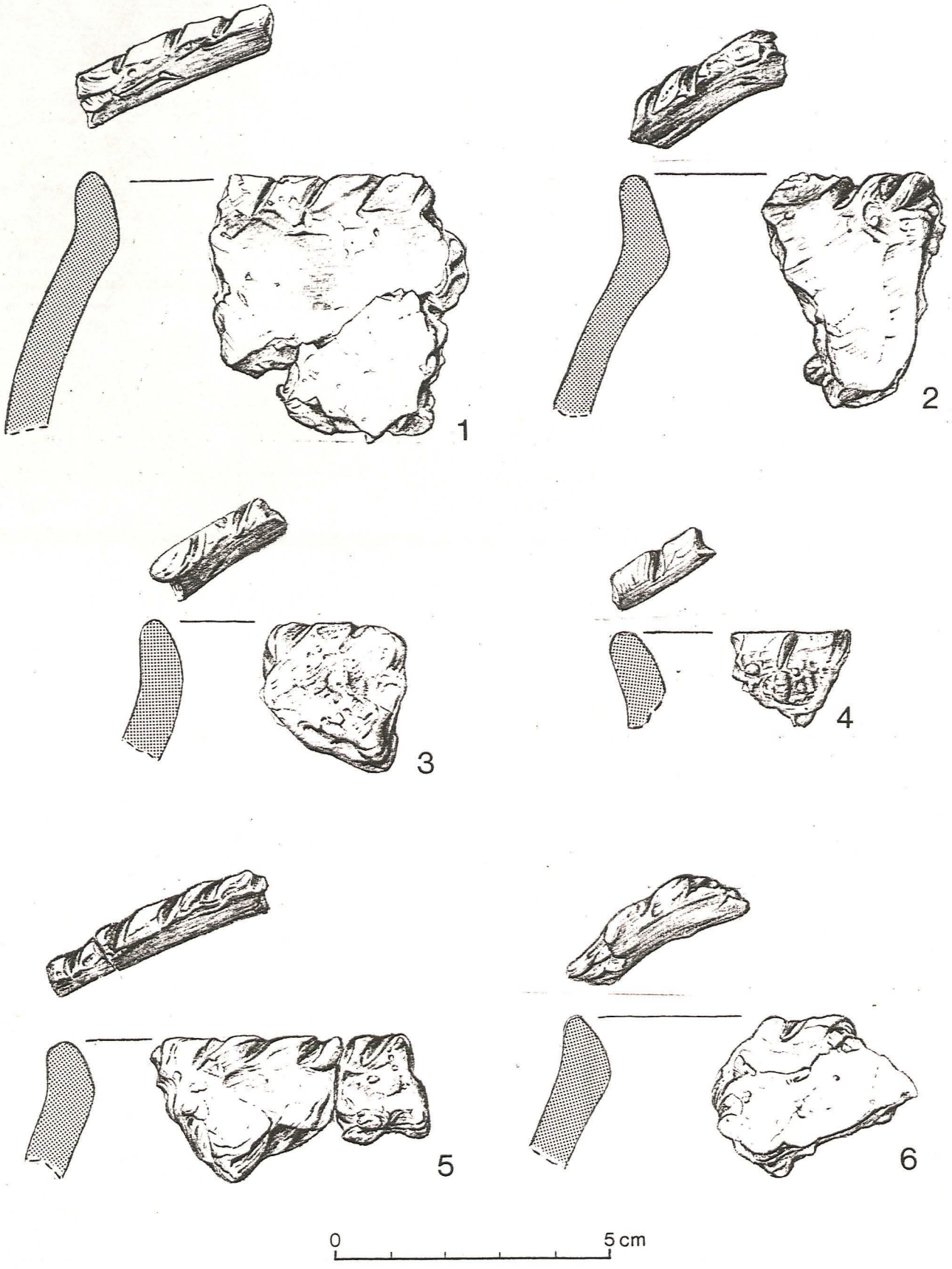

Fig. 1 Late Bronze Age/ Early Iron Age pottery from TE 93 [78]

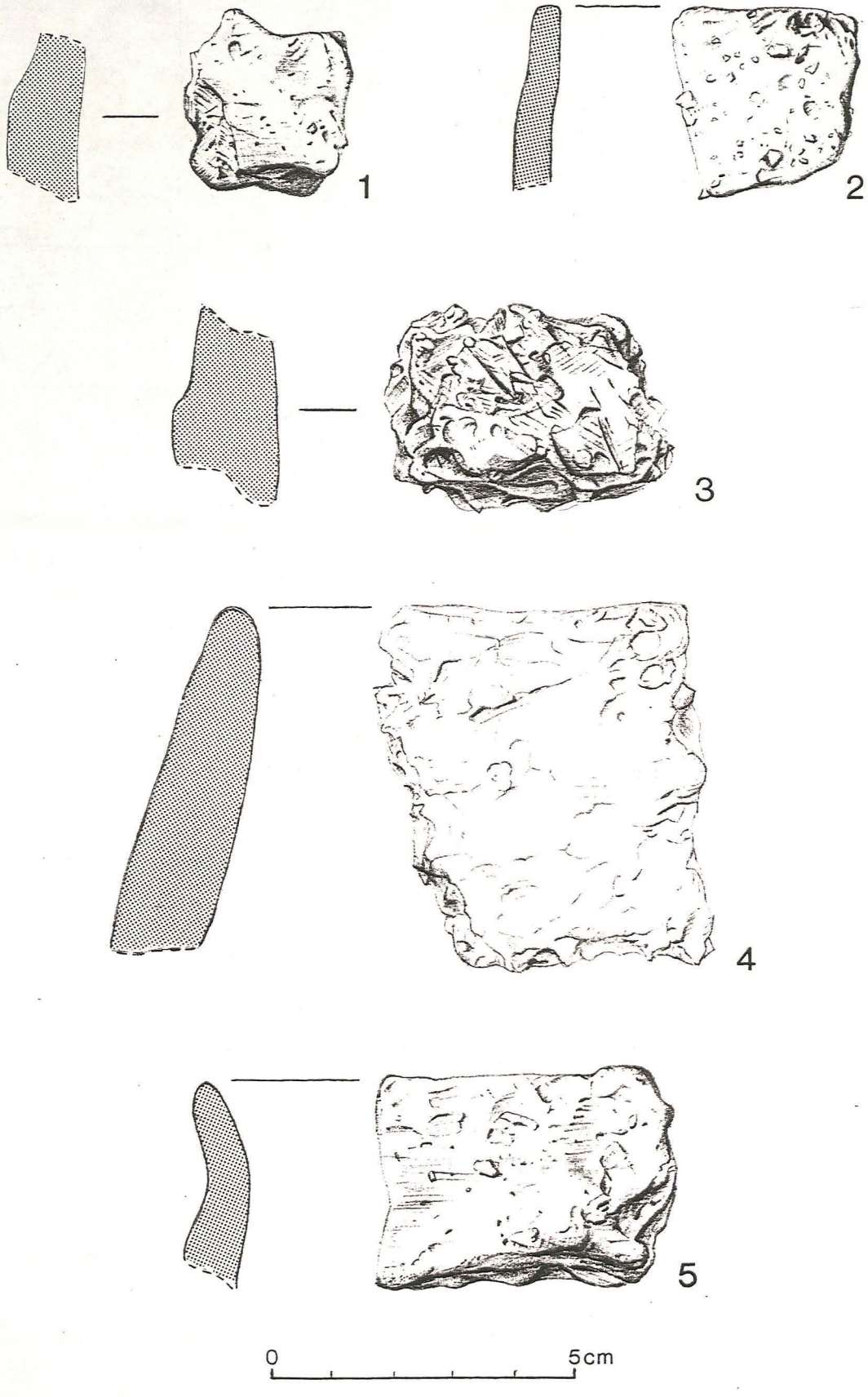

Fig. 2 Late Bronze Age/ Early Iron Age pottery from TE 93 [miscellaneous contexts]

Fig. 3 Late Bronze Age/ Early Iron Age pottery from TEI 93 [50 and 62]

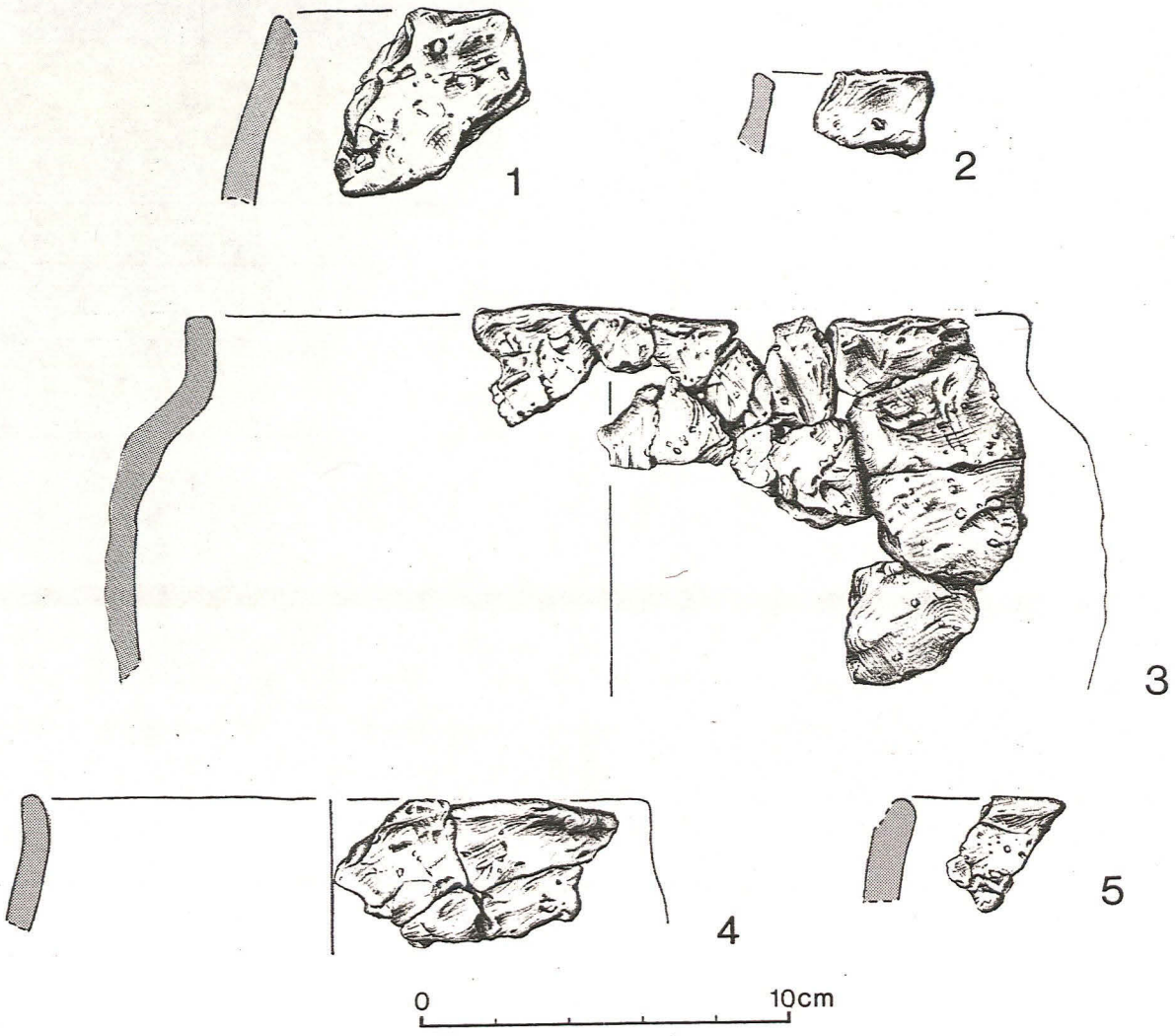

Fig. 4 Late Bronze Age/ Early Iron Age pottery from TE 94 [103, 107 and 112]

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ACKNOWLEDGEMENTS

Gratitude is expressed to Carol Allen for compiling the fabric archive, Eileen Appleton for cataloguing the pottery and Jane Goddard for preparing the illustrations. Ron Firman assisted in the identification of the pottery inclusions and Sheila Elsdon and Jeffrey May commented upon a draft of this report.

Briquetage from Tetney, Lincolnshire

Second Report

Sites TEI 93 and TE 94

Carol S M Allen

Introduction: Material and Location

Briquetage is the general term applied to material considered to have been used in the processing of salt. A total of 1507 pieces (9.451kg) of briquetage was recovered from these two locations: table 1 provides a summary of the material by location and context. At TEI 93, 442 pieces of material (4.237kg) were recovered, almost 90% of which was from context 62. At location TE 94, 1065 pieces of material were found (5.214kg), 81% of which came from context 107, and 17% from context 103/4.

The briquetage from TE 94, context 107 was found on the eastern side of that layer. The different types of material were scattered randomly through the grid and there are variations in total weights from metre square to metre square. There were no concentrations which might indicate different processes taking place in any particular location, but the excavations covered only a small area.

Description and Quantities

The briquetage material has been divided into the categories detailed below:

1. *Vertical supports (pedestals and tines):* A total of 167 (3.122kg) complete or partial supports were identified. The material consisted of vertical cylindrical pedestals or parts of cylindrical pedestals with a clear foot (figure 1.2). There were also incomplete pedestals with complete tines still attached (figure 1.1 and 1.7) and some with partial tines (figure 1.4). A number of tines with a slight curvature (figure 1.3), survived alone, but these had very likely originally been attached to vertical supports.

Location TEI93 contained 43 pieces (1.339kg) of vertical supports, which accounted for 31.6% of briquetage at this location (see table 2). Included were 17 pedestals or parts (0.784kg), 2 pedestals with tines (0.176kg), and 24 detached tines (0.379kg). The material was apparent in several contexts of TEI93, including context 62.

From TE94, 124 support pieces (1.783kg) were identified. This accounted for 34.2% of the total material at this location (see table 2), and consisted of 74 pedestals (0.975kg), 1 pedestal and tine (0.076kg), and 49 tine pieces (0.732kg). This material was found in all contexts of TE94.

2. *Bridges and clips.* 11 pieces were found at location TE94 (0.100kg), 2 in context 103/4 (0.025kg), and 9 in context 107 (various grid squares: 0.075kg). These consisted of small moulded pieces of clay used to steady and separate the containers. This material only accounted for 2% of the briquetage found at this location.

3. *Container rims.* 89 rims were identified (0.580kg), of which 49 (0.168kg) were flat (figure 1.6), and many appear to have been cut with a knife or tool. On some containers the wall broadened out at the flat rim (figure 1.8 and 1.9), possibly to assist stacking of containers. 40 rims were rounded or moulded (0.312kg), occasionally showing finger impressions (figure 1.5). One of the rounded rims (context 107, grid 22) had been part of a small pot lid (figure 1.10).

Location TEI93 contained 43 rims (0.399kg), 2 in context 53 and the remainder in context 62. The rims accounted for 9.4% of material at this location (table 2). TE94 contained 46 rims (0.181kg), 3.5% of the material at this location (table 2), and rims were found within all contexts.

4. *Container bases.* 143 pieces were found (1.298kg) on the two locations. Bases were either rounded or angled. The angled pieces (figure 1.11) may have been from container or trough ends/sides. 45 pieces were found at location TEI93 (0.603kg), accounting for 14.2% of material there. At TE94 98 bases/ends were identified, making up 13.3% of the total material found at that location.

5. *Container body sherds.* 913 body sherds were found at the two locations (3.146kg). A small number had thin walls, 5mm or less in thickness, but the majority were in the region of 8mm to 10mm. The shapes of the containers from which most of these sherds came is unclear, but their flat appearance suggests that the containers were of rectangular or square shape with vertical sides, but the size is unknown. Body sherds accounted for 28.5% of the material from TEI93, and 37.2% from TE94.

6. *Miscellaneous material.* 184 pieces were found (1.205kg). 91 pieces (0.864kg) were thought to have originally formed part of structures used for processing of salt, and the remaining 93 pieces (0.341kg) could not be identified as having any specific use (0.325kg). The miscellaneous material accounted for 16.3% of briquetage at TEI93, but none was found in the main context 62. At TE94, 9.8% was miscellaneous material, but only 12 of the 93 pieces could be identified as being part of a structure. The material was found in all the main contexts.

Fabrics

All the briquetage can placed into one fabric group with some minor variations. The clay was poorly mixed and lightly fired, with a rough surface and sandy feel. Much of the briquetage material is very orange and oxidised, but the containers particularly show some variation in firing colours, with a generally oxidised exterior and interior surface, and an unoxidised core. Exterior and interior surfaces of the container sherds vary from deep orange to pale orange and to brown and grey, and the core may be orange to grey in colour.

The fabric contains a sparse to moderate amount of quartz (3-25%), fine to medium in size (0.25mm-1mm), which is moderately sorted and usually well rounded. Also apparent in the fabric are occasional pieces of angular flint of variable size (0.25mm-3mm), and coarse pieces of quartzite, poorly sorted and subangular. The flint and quartzite may have been added, in minimal amounts, to clay taken straight from the ground. Fine pebbles are also occasionally included, and some of the material shows organic impressions of grass, chaff and similar on the exterior surface.

Pottery sherds were found in many of the same contexts as the briquetage. Usually, the briquetage and the pottery could be clearly sorted on the basis both of typology of the pieces and on the different fabric from which pottery or briquetage was made.

In the case of a few container sherds, however, the fabric of the pottery and of the briquetage was very similar, and there was some difficulty in deciding into which category the sherds should be placed. This indicates that there was some overlap in the type of fabric being used for both types of containers. As the function of both the pottery and briquetage containers is not always entirely clear, this overlap in fabric types is to be expected. However, for clarity in the report this small amount of material has been allocated to either briquetage or pottery on the basis of similarity in fabric types to pieces of which the typology could be clearly defined.

Discussion

Dating of the briquetage

A late Bronze Age date has been suggested for the pottery which was found associated with much of the material, and the briquetage may also therefore date from the ninth and eighth centuries BC. As seen in the first Tetney Report , the early date for the briquetage makes this site of considerable interest, as it is one of a very few Bronze Age salt-making sites confirmed in this country. Also, the amount of material suggests that the production at these locations was on a much larger scale that seen at other sites of comparable date.

Function of the briquetage

The vertical supports, bridges and clips of briquetage material were used for stacking containers which were placed over and within a clay structure whose nature is not clear. The rims and body sherds come from two types of containers, one probably round and the second square or rectangular. The rectangular troughs were probably used for the evaporation of a salty mixture which had already been collected within a natural pool or depression, as seen at TE93, and discussed in the first Tetney report. It would not have been practical to add salt water to

the stacked, and probably covered, structure of this type during the heating process.

A low heat was then applied to the structure to cause further evaporation and drying of the salt into cakes. The round containers may have been used for evaporation, or for transportation of standard salt cakes. However, use of organic containers, lighter in weight, would also be appropriate for this purpose.

Fabric of the briquetage

Some of the supporting and bridging material, may have been formed into shape and put into place between and below the containers whilst damp, and the application of the organic material to the exterior would facilitate the handling of sticky clay with little tempering. Such a fabric would be suitable for briquetage due to the low firing temperature and slow heating period. Tempering was usually required in pottery as an opening material, to assist with drying and firing of vessels, and to ensure their continued function if they were subjected to high temperatures and reheated during use.

Conclusions

Examination of the material from the three locations so far investigated at Tetney provides little indication of the processes at each location, probably due to the nature of the excavations which can only have unearthed a sample of the material. However, the material provides a valuable contribution as it broadens the dating of salt-making activites and provides a valuable contribution to the material and process involved. These processes may become clearer as more of this material is unearthed. The amount of material of each type from the sites shows uneven distributions which cannot be considered typical or representative of different processes at different locations.

Carol Allen 31 October 1994

Table 1

Summary of Briquetage by context

TEI 93

Context	Count	Weight(g)	%
50	17	57	1.2
51	1	7	0.2
52	13	202	4.7
53	14	99	2.2
58	1	78	1.8
62	396	3794	89.9
Total:	**442**	**4237**	**100**

TE 94

Context	Count	Weight(g)	%
101	16	84	1.7
103	90	123	20.4
107	951	4167	77.2
112	8	38	0.7
Total	**1065**	**5214**	**100**

Table 2

Briquetage from Tetney, Lincs., compared by Type and Site

a) 1993 excavation TE 93, compared with TEI 93 and TE 94 (count)

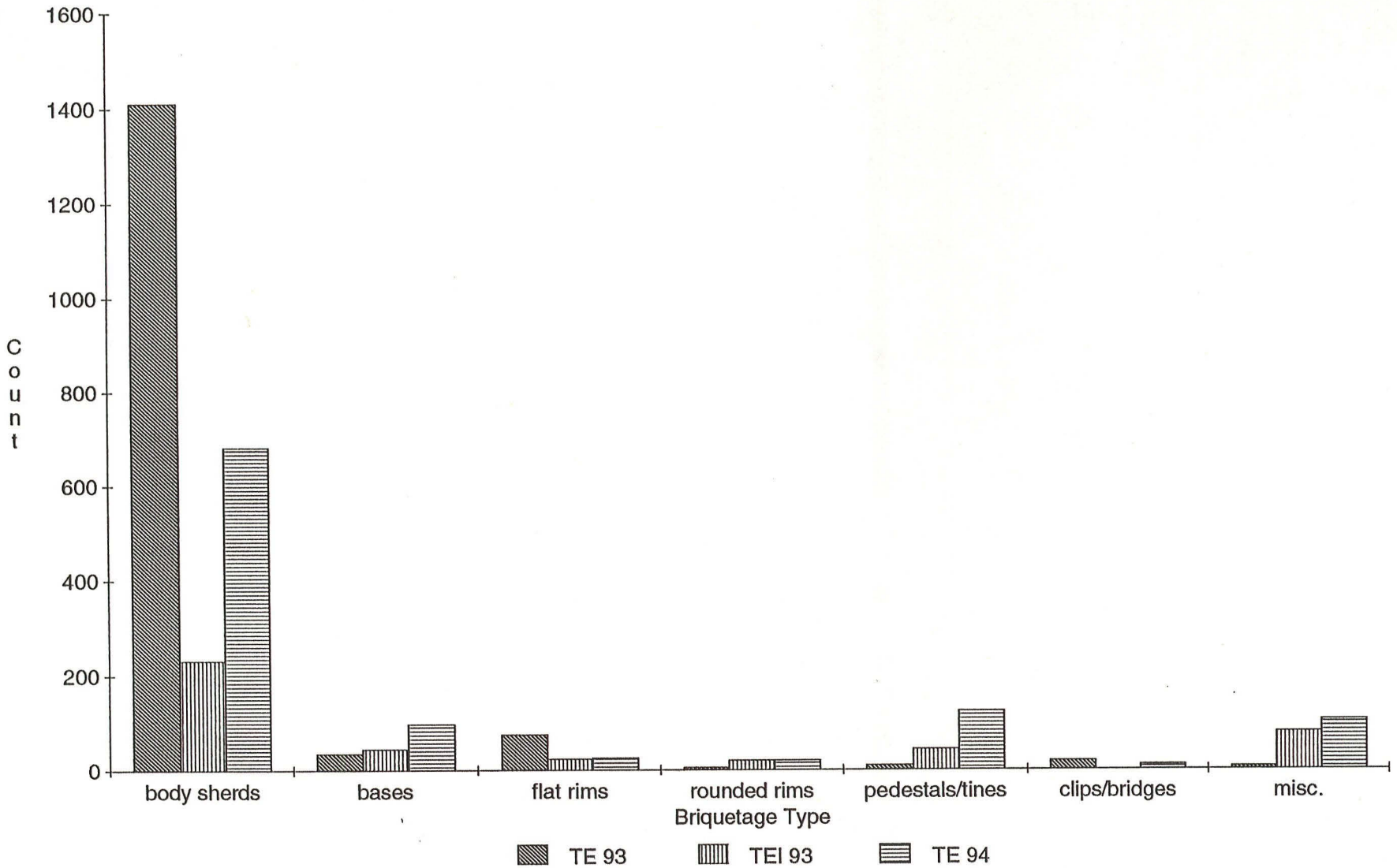
DESCRIPTION		TE93	TEI 93	TE 94
container	-body sherds	1410	232	681
	-bases	35	45	98
	-flat rims	75	23	26
	-rounded rims	5	20	20
vertical supports & tines		10	43	124
clips & bridges		19		11
miscellaneous		7	79	105
Total		**1561**	**442**	**1065**

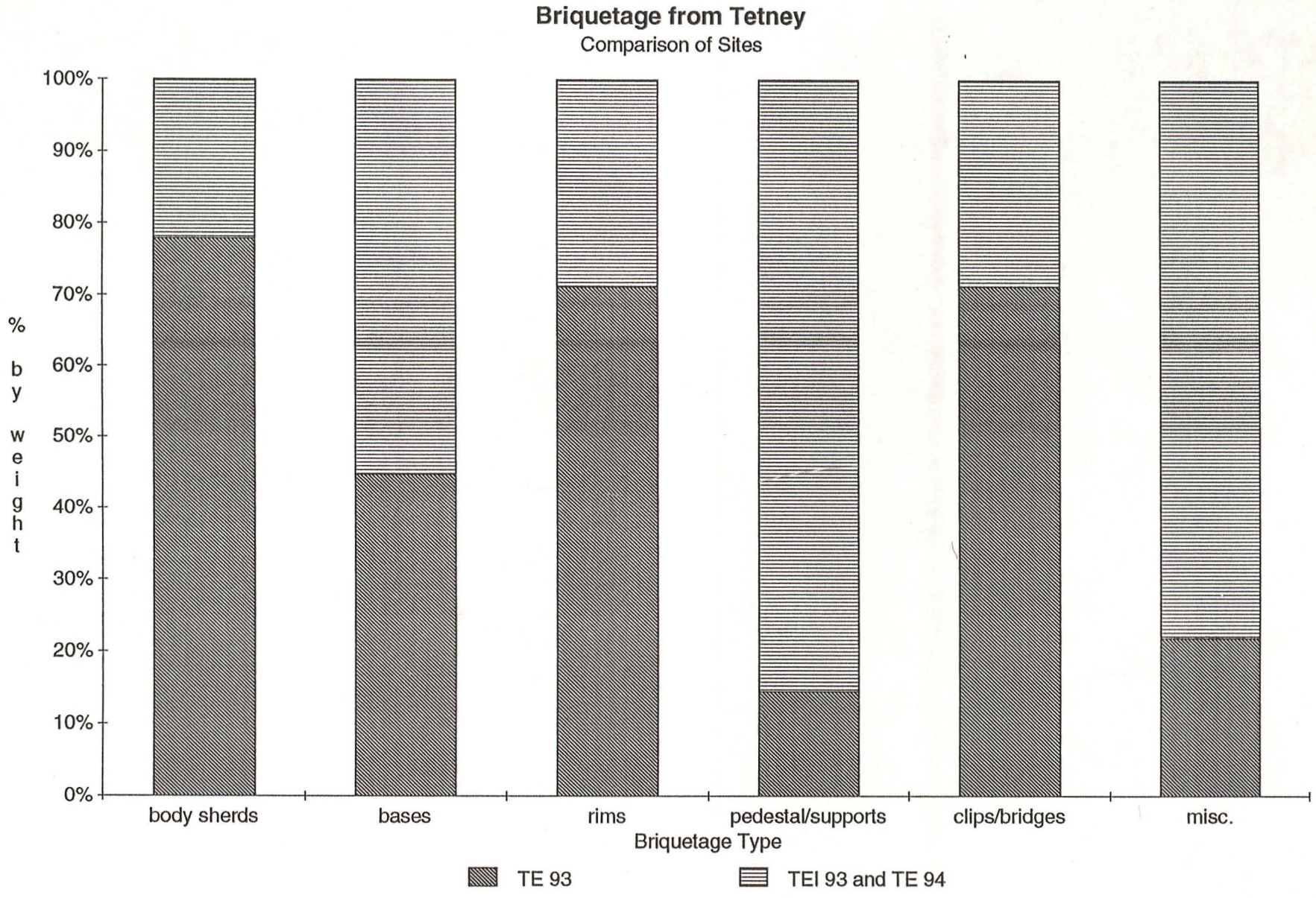
b) TEI 93 and 1994 excavation TE 94 (count and weight)

DESCRIPTION	TEI 93			TE 94		
	count	*wt (kg)*	*% by wt*	*count*	*wt (kg)*	*% by wt*
container body sherds	232	1.206	28.5	681	1.94O	37.2
vertical support & tines	43	1.339	31.6	124	1.783	34.2
container bases-all types	45	0.603	14.2	98	0.695	13.3
container rims-flat	23	0.153	3.6	26	0.115	2.2
container rims-rounded	20	0.246	5.8	20	0.066	1.3
misc. - possible structure	79	0.69O	16.3	12	0.174	3.3
unknown				93	0.341	6.5
bridges & clips				11	0.1OO	2.O
TOTALS	**442**	**4237**	**100**	**1065**	**5.214**	**100**

Briquetage from Tetney

Comparison of Sites




Briquetage from Tetney
Comparison of Sites
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% by weight
body sherds
bases
rims
pedestal/supports
clips/bridges
misc.
Briquetage Type
TE 93
TEI 93 and TE 94

Appendix 5: Briquetage from Tetney (Projects 3 and 4)

Catalogue of illustrated briquetage: Figure 1

TEI 93: (for fabric descriptions, see text)

1. Partial pedestal with tine almost complete. Oxidised, deep orange/pale orange, unabraded. Context 62

2. Incomplete pedestal with foot. Oxidised, deep orange, unabraded. Context 62.

3. Tine from pedestal support. Oxidised, deep orange, unabraded. Context 62.

4. Partial pedestal with 2 incomplete tines. Oxidised, deep orange, unabraded. Context 62

5. Moulded rim sherd, with finger impression. Oxidised surfaces, unoxidised core, deep orange exterior, core grey, unabraded. Context 62.

6. Flat rim sherd. Oxidised surfaces, irregularly fired core, deep orange exterior, orange/grey core, unabraded. Context 62.

TE 94 excavation : for fabric descriptions, see text.

7. Tine with part of pedestal support. Irregularly fired throughout, buff/grey/orange, unabraded. Context 107, Grid 17.

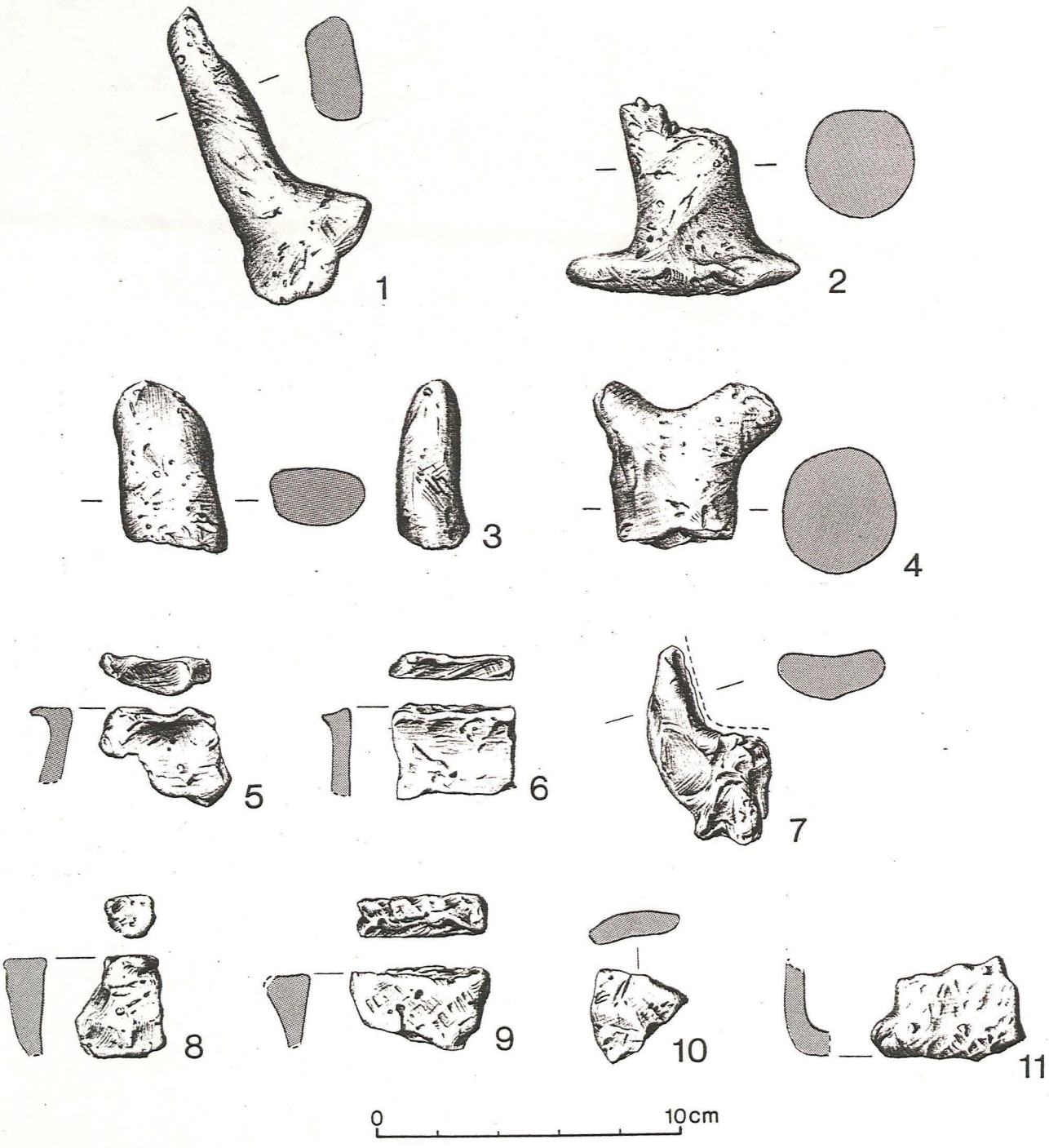
8. Flat rim sherd. Oxidised surfaces, irregularly fired cored, deep orange exterior, orange/grey core, unabraded. Context 107, Grid 34.

9. Flat rim sherd. Oxidised surfaces, unoxidised core, deep orange exterior, dark grey core, unabraded. Context 107, Grid 17

10. Rounded sherd, part of a small pot lid. Oxidised throughout, deep orange/pale orange, unabraded. Context 107, Grid 22.

11. Sherd of body/base from container/trough. Oxidised interior and exterior surfaces, unoxidised dark grey/brown core, orange surfaces, unabraded. Context 107, Grid 42.

Figure 1: Briquetage from Tetney, Newton Marsh
(1-6 from TEI 93 Context 62; 7-11 from TE 94 Context 107)
Illustrated by J. Goddard.



Appendix 6: The Petrology of clay and briquetage samples from Tetney, Lincolnshire

by Dr. Alan Vince, City of Lincoln Archaeology Unit

Introduction

Samples of flood silt, grey clay observed below flood silts, apparently weathered boulder clay, and boulder clay from Hoop End, Tetney were submitted to the Lincoln Ceramic Laboratory for analysis. The samples were made into briquettes and fired to a temperature of c.1000 degrees C in an oxidizing atmosphere. A sample of briquetage from **TEI 93** Context **62** was also submitted. Thin-sections were prepared from each of these samples and stained using Dickinson's method. The thin-sections have been added to the LCPL reference collection under the codes L990 to L993 and L1352. All samples were compared with sections made of later prehistoric pottery from Tetney (which had proved to contain abundant basic igneous rock fragments) in order to test the hypothesis that these igneous rock fragments occurred naturally in clays within easy reach of the Tetney site (see Appendix 4).

Reference Number	Description
L990	Flood Silt
L991	Chalky boulder clay
L992	Yellow sandy clay-weathered boulder clay?
L993	Grey clay below flood silts
L1352	TEI 93 Context 62 briquetage

Description

All of the samples contained a sparse scatter of angular quartz, up to 0.2mm across. Varying quantities of larger rounded grains were present. In the chalky boulder clay these fragments ranged up to 1.0mm across but in the remaining samples the largest grains were up to 0.4mm across. Sparse rounded fragments of non-ferroan limestone were present in the chalky boulder clay. Rounded fragments of chert and flint were present in all samples but only the chalky boulder clay contained sparse sandstone fragments, with equant grains c. 1.0mm across and a brown cement. A single rounded fragment of metamorphic rock, a phyllite, was present in the sample of chalky boulder clay. Sparse rounded fragments of basic igneous rock were present in the sample of chalky boulder clay, but also in the grey clay (L993) and in the briquetage sample (L1352). Sparse fragments of acid igneous rock (composed on plagioclase felspar and quartz) were present in the grey clay. The flood silt sample contained moderate rounded clay pellets with a mottled dark red and black colour. These showed signs of zonation and are probably concretions rich in iron and manganese. The chalky boulder clay contained large rounded fragments of inclusionless relict clay or mudstone, up to 2.0mm across. All the samples contained quartz and mica silt in their matrices but there were considerable differences between the samples in the texture and appearance of the clay matrix. Both the chalky boulder clay and the flood silt samples contained both muscovite and biotite laths in the matrix

whilst the remaining samples contained muscovite alone. The chalky boulder clay also contained small fragments of altered glauconite in the clay matrix.

These samples confirm that basic igneous rock fragments occur naturally in the local clays in the Tetney area. None of the samples contained a similar quantity of basic igneous inclusions to that found in the pottery. The pottery also differs from the clay samples in the maximum size and frequency of angular quartz fragments. Both of these differences could be explained by the use of a sand derived from the erosion of boulder clay to temper the pottery.

The difference in clay matrix between the pottery and clay samples (the pottery contained less quartz silt and no mica) may be a product of sample preparation (the pottery fragments were lower fired and less easy to grind down to 0.03mm without loosing the clay matrix entirely) but may suggest that the clay source for the pottery was not one of those sampled. The presence of acid igneous rock fragments in one clay sample indicates that it is possible that the one pot sample to contain acid igneous rock fragments and no basic igneous rock could have been made using local raw materials. However, it is more likely that this pot represents an import to the area, either from the Leicestershire Charnwood Forest area or from an area where the boulder clay contains a higher proportion of granite and no basic igneous rock.

Appendix 7: Report on the Roman and Post-Roman Pottery from the Anglian Water *Project Clear Water 1995* Watching Briefs, Tetney, Lincs

[Site Codes: TE 93; TEO 93; TEI 93; TPS 94]

M J Darling, J Wilkinson and J Young

CLAU 22/5/95

1. Introduction

Pottery of the Roman through early modern periods comprised 110 sherds recovered during the watching briefs carried out between Cleethorpes and Tetney village . This assemblage was recorded using the City of Lincoln Archaeology Unit's (CLAU) basic ceramic archive for post-Roman pottery (ware type, sherd count, form and comments). Pottery typology abbreviations follow CLAU's standard fabric codes (see Appendices 1 and 2). The basic archive is described in Appendices 3, 4 and 5. All sherds not immediately identifiable macroscopically were binocular microscoped at x20.

2. Condition of the Pottery

All of the pottery sherds except for the modern material was well abraded probably as a result of water and ploughsoil damage. Relatively few sherds had any diagnostic features and very little glaze survived deposition.

3. Overall Dating

Most of the pottery could be classified into general ceramic periods although it lacked specific form or diagnostic decoration. It can be seen in Table 1 that the majority of the pottery was medieval (87.3%) in date and that relatively little pottery of other dates was recovered.

Table 1: Overall date span of Pottery showing ware types by period

Ware code	No of sherds	percentage
R	**2**	
ROMAN TOTAL	*2*	*1.8%*
ST	**1**	
SAXO-NORMAN TOTAL	*1*	*0.9%*
LEMS	**9**	
EMX	**17**	
BEVO	**61**	
MEDLOC	**1**	
HUM	**5**	
MED TOTAL	*96*	*87.3%*
BL	**1**	
SLIP	**2**	
TGE	**1**	
PM TOTAL	*4*	*3.6%*
LPM	**6**	
MODERN TOTAL	*6*	*5.5%*
MISC	**1**	
UNIDENT TOTAL	*1*	*0.9%*
TOTAL SHERDS	**110**	**100%**

4. Overall Distribution of Fabrics

Roman

Only two Roman sherds from site TEI93 were recovered . Both were extremely worn rim sherds. One sherd can be identified as a greyware bowl rim of the mid to late 3rd to 4th century.

Late Saxon to Saxo-Norman Fabrics

Only one sherd of this period was found on site TPS94 and it has tentatively been identified as Stamford ware.

Medieval Fabrics

Much of the medieval pottery studied as part of this assessment has been difficult to assign directly to any specific source. The worn state of most of the sherds has left them with little or no identifiable characteristics. Added to this is a lack of comparative material from the area. The inclusions give little clue to source as almost all the sherds have a uniform subround to round quartz temper with only minor variations in the amount of calcite/flint/iron present. Microscopic examination was used to separate the sherds into local or non-local material and give further information on diagnostic inclusions. The high proportion (21.7%) of undiagnostic medieval sherds overall reflects the poor condition of the material.

The vast majority of the medieval sherds that could be identified came from TPS94 and appear to be products of Beverley, of the type traditionally known as Beverley Orangeware. This ware was in production from the 12th to the 14th centuries. Although it is difficult to be precise about the dating of the TPS94 examples because of their worn condition they probably date to the later 12th or 13th century. This dating is confirmed by the presence of LEMS dated to the 12th century and MEDLOC fabric A which dates to the early 13th century.

Post-Medieval Fabrics

Only three sherds were recovered of this date. Two of the sherds (BL and SLIP) would have come from sources within the East Midlands region. They are only generally datable to the 17th or 18th century.

5. Findspots

Only one watching brief TPS94 produced more than a few sherds of pottery. The distribution of material from the different watching briefs is shown in table 2 and that specifically from field 32 site TPS94 in table 3.

Table 2: Showing pottery by site by ware type

ware code	TPS94	TEI93	TE93	TEO93	Total
R	0	2	0	0	2
ST	1	0	0	0	1
EMX	17	0	0	0	17
LEMS	9	0	0	0	9
BEVO	61	0	0	0	61
MEDLOC	1	1	1	1	4
HUM	0	2	0	3	5
SLIP	0	1	1	0	2
BL	1	0	0	0	1
TGE	0	0	0	1	1
LPM	0	0	6	0	6
MISC	0	0	1	0	1
Total	90	6	9	5	110

Table 3: Showing pottery ware types from field 32 TPS94 by findspot

ware code	32A	32D	32E	32F	Total
ST	0	0	1	0	1
EMX	7	6	0	4	17
LEMS	0	0	0	9	9
BEVO	43	2	0	16	61
MEDLOC	0	0	0	1	1
TOTAL	50	8	1	30	89

Table 3 shows that only medieval or earlier pottery was found in field 32 and that activity had probably ended by the mid 13th century. Too little material was found on the other sites to make any comparative analysis possible.

A near complete Humberware jug was found on TEI93. The vessel is a medium sized plain squat jug with a simple strap handle. Glazing is limited to the upper two thirds of the outside of the vessel. It dates between the 14th and early 16th centuries.

6. Recommendations

No further work other than the stabilisation and illustration of the Humberware jug from site TEI93 is needed on the material.

APPENDIX 1: CLAU MEDIEVAL POTTERY CODES

Ware code	description	period	earliest horizon	latest horizon
BEVO	BEVERLEY ORANGE WARE	EMED-MED	MH1	MH7
BL	BLACKWARE	PMED	PMH3	EMH
EMX	EARLY MEDIEVAL NON-LOCAL FABRICS	EMED	MH1	MH4
HUM	HUMBERWARE	LMED-PMED	MH7	PMH2
LPM	EARLY MODERN OR MODERN	EMOD	EMH	EMH
MEDLOC	MEDIEVAL LOCAL FABRICS	MED	MH4	MH10
MEDPM	MED OR PMED	MED-PMED	MH4	PMH10
MISC	UNDATED MISCELLANEOUS FABRICS	ND	ASH1	EMH
R	ROMAN	ROM	0	0
SLIP	SLIPWARE (GENERAL)	PMED	PMH4	EMH
ST	STAMFORD WARE	SN	ASH7	MH3
TGE	TIN-GLAZED EARTHENWARES	PMED	PMH4	PMH10

APPENDIX 2: CLAU MEDIEVAL POTTERY DATING 5TH TO 19TH CENTURIES
SEP 1994

HORIZONS	DATING	PERIOD
ASH1	5TH - ?L7TH	ANGLO-SAXON
ASH2	?L7TH - ?L7/E8TH	MIDDLE SAXON
ASH3	?E8TH - ?M8TH	
ASH4	?M8TH - ?L8TH	
ASH5	?E9TH - ?M9TH	
ASH6	?M9TH - ?L9TH	
ASH7	?L9TH	LATE SAXON
ASH8	L9TH - E10TH	
ASH9	E/M10TH - M10TH	
ASH10	M10TH - L10TH	
ASH11	L10TH	
ASH12	E11TH - ?E/M11TH	SAXO-NORMAN
ASH13	?E/M11TH - M/L11TH	
ASH14	L11TH - E/M12TH	
MH1	?E/M12TH - M12TH	EARLY MEDIEVAL
MH2	M12TH - M/L12TH	
MH3	M/L12TH - E13TH	
MH4	E13TH - E/M13TH	
MH5	E/M13TH - ?L13TH	HIGH MEDIEVAL
MH6	?L13TH - ?M14TH	
MH7	?M14TH - ?L14TH	LATE MEDIEVAL
MH8	?L14TH -?E15TH	
MH9	?E15TH - M/L15	
MH10	M/L15TH - L15TH	
PMH1	E16TH-M16TH	EARLY POST-MEDIEVAL
PMH2	M16TH-M/L16TH	
PMH3	M/L16TH-E17TH	POST MEDIEVAL
PMH4	E17TH-M17TH	
PMH5	M17TH-M/L17TH	
PMH6	M/L17TH-L17TH	
PMH7	L17TH-E18TH	
PMH8	E18TH-M18TH	LATE POST-MEDIEVAL
PMH9	M18TH-L18TH	
PMH10	L18TH-E19TH	
EMH	L18TH-20TH	EARLY MODERN

APPENDIX 3: TPS94 ARCHIVE

Context	Ware	Sherds	Form	Comments
2	BL	1	MUG	BASE;17/18TH
32A	EMX	4	JAR	UNGLZE;GRITTY FABRIC;SV
32A	EMX	3	JUG	GLZE;? SV
32A	BEVO	38	JUG	DIFF VESS
32A	BEVO	2	JUG	SV
32A	BEVO	1	JUG	RIM/HANDLE
32A	BEVO	1	JUG	APP STRIP
32A	BEVO	1	JUG	FE APP STRIP
32D	EMX	5	JAR	UNGLZE;GRITTY FABRIC;SV
32D	EMX	1	JUG	OXID;NO GLZE;FABRIC INCLUDES RED QUARTZ
32D	BEVO	1	JUG	NECK
32D	BEVO	1	JUG	HANDLE
32E	ST	1	JAR	? ID;UNGLZE
32F	LEMS	1	COOKPOT	RIM
32F	LEMS	8	COOKPOT	BS & BASE
32F	EMX	3	-	DIFF VESS
32F	EMX	1	JAR	RIM;UNGLZE;GREENSAND
32F	MEDLOC	1	COOKPOT	FABRIC A
32F	BEVO	1	JUG	CU GLZE
32F	BEVO	15	JUG	DIFF VESS

APPENDIX 4: TEI93 ARCHIVE

Context	Ware	Sherds	Form	Comments
4A	R	1	BWL	GREYWARE;WELL WORN;
5a	R	1	JAR	RIM WELL WORN;NOT FOUND MAY 95
2A	MEDLOC	1	JUG	RIM
7A	SLIP	1	?	NO SURFACES
8A	HUM	1	JUG	GLZE;
10A	HUM	1	PROFILE;4/5 COMPLETE;LATE?	

APPENDIX 5: TE93 AND TEO93 ARCHIVE

TE93

Context	Ware	Sherds	Form	Comments
514	MEDLOC	1	-	-
514	MISC	1	-	TINY SCRAP
514	SLIP	1	-	-
514	LPM	6	-	-

TEO93

Context	Ware	Sherds	Form	Comments
2	TGE	1	-	HEAVILY BURNT
2	HUM	2	-	SAME VESSEL;
1A	HUM	1	-	FRAG;INT & EXT GLAZE;
1A	MEDLOC	1	JUG?	HANDLE;?TOY/TB;

POLLEN ANALYSES FROM NEWTON MARSH, TETNEY

Report prepared for Lindsey Archaeological Services
Francis House, Silver Birch Park
Great Northern Terrace,
Lincoln LN5 8LG
1993

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Fax: 0191-374-2456

Appendix 8: Pollen Analyses from Newton Marsh, Tetney

Introduction

Pollen analyses have been conducted on a layer of slightly silty amorphous and *turfa* peat which overlies a late Bronze Age archaeological site at Tetney, north Lincolnshire, and upon single sediment samples from three other locations at the site. The peat bed rests upon clay and is sealed by a flood silt deposit. The upper contact of the peat is at 1.18m OD. Standard laboratory techniques (Moore & Webb 1978) were used in the preparation of the pollen samples. Pollen preservation was generally good although all samples contained pollen grains showing a degree of corrosion. At least 300 land pollen grains, in addition to fern and moss spores, were counted from each sample. The results are shown on Figure 1 as percentages of the total land pollen sum. Plant nomenclature follows Clapham *et al.* (1962). The results from two of the individual context samples (531 and 534, associated with the aeration tank test pit) are shown in Table 1, again as percentages of the total land pollen sum. Context 503 proved to be almost devoid of pollen, containing only a few highly corroded grains.

Stratigraphy

The following stratigraphy was recorded from the sampled profile. The notation, and the symbols on figure 1, follow Troels-Smith (1955).

Altitude m.O.D.	Depth cm.	Description
+1.19	0 - 19	brown silty clay As2, Ag2
+1.00	19 - 21	Organic clayey silt Ag2, As1, Sh1
+0.98	21 - 30	Silty crumbly turfa peat Th²2, Sh2, Ag++
+0.89	30 - 47	Slightly organic sandy silty clay with some rootlets As3, Ag1, Gs+, Th+, Sh+

Pollen Analyses

Figure 1 has been sub-divided into two pollen assemblage zones, based upon changes in the percentages of the major pollen types recorded.

Zone NM-a

Dominated by herbaceous pollen, with Gramineae (grasses) most abundant. Chenopodiaceae (orache family) and *Plantago maritima* (sea plantain) are also prominent. These plants are indicative of saltmarsh and other coastal habitats and other taxa which occur in such environments are also recorded in this zone, although in smaller percentages. *Aster* (sea aster)-type, *Spergularia* (sand spurrey), *Armeria* (sea thrift), *Artemisia* (wormwood) *Taraxacum* (dandelion)-type and *Silene* (campion)-type are all either obligatory coastal plants or include species which prefer coastal locations. Some marshland herbs, such as Cyperaceae (sedges) and *Menyanthes* (bogbean), and fully aquatic freshwater herbs, such as *Potamogeton*

(pondweed), occur. These will reflect the effects of rising freshwater tables which created wet surface conditions and instigated soil gleying and peat formation.

Pollen of tree and shrub taxa is present in low frequencies only, with *Corylus* (hazel) most prominent, although this could include some grains of the very similar *Myrica* (bog myrtle) pollen. *Quercus* (oak) and *Alnus* (alder) are the only other significant types, the latter favoured by damp conditions. Any local woodland must have comprised these three taxa, as all other types are very low indeed, but the low total pollen percentages of woody plants makes it very unlikely that any significant woodland existed nearby.

Zone NM-b
Dominated by herbaceous pollen, but Gramineae frequencies decline from over 40% to less than 20% of total land pollen. *Plantago maritima* frequencies are greatly increased to about 25% and percentages of other coastal herbs also rise near to the top of the zone. *Aster*-type, *Spergularia*, *Armeria* and *Artemisia,* therefore probably *A. maritima* (sea wormwood), all behave in this way. Pollen of herbs which prefer more freshwater environments becomes rarer, and is absent in the upper level of the zone, at the stratigraphic boundary with the overlying silt. *Corylus*, *Quercus* and *Alnus* remain the major woody taxa but still in very low frequencies.

Context 531 (sample 13)
This sample comprises compact peat from within the post pipe to posthole context 532 in the aeration tank test pit. In both the range of pollen types recorded and in their relative frequencies, this sample's pollen assemblage is indistinguishable from that of pollen zone NM-b on Figure 1. *Plantago maritima*, Chenopodiaceae and Gramineae dominate. Only *Rumex* (dock) is an addition to the pollen diagram's flora and a number of species of this genus (e.g. *R. crispus* and *R. rupestris*) are found in coastal habitats.

Context 534 (sample 15)
This sample comprises material from a silty peat lens within the test pit. In this case the range of pollen types recorded and their relative frequencies are almost indistinguishable from that of pollen zone NM-a on Figure 1. Gramineae is the dominant type at 32% of total land pollen, with Chenopodiaceae and *Plantago maritima* in lesser frequencies. Only *Salix* (willow) is additional to the pollen diagram's flora and this tree is favoured by wet conditions and so likely to be present in the environments represented at this site.

Radiocarbon Dating
A sample of peat from the level of the transgressive contact with the overlying silty clay was submitted to Radiocarbon Dating Ltd. and yielded a date of 2840±60 BP (RCD-1598). At the one sigma level this date calibrates to between 1095 and 920 Cal.BC, and at the two sigma level to between 1255 and 845 Cal.BC.

Discussion

The evidence from the Tetney peat bed shows the effects of a rising local water table which led to surface waterlogging and peat inception at the site. The low amounts of tree and shrub pollen would have been transported to the site from drier areas to landward. The herbaceous pollen data would be more locally derived, however, and show a progressive transition in plant communities towards more saline conditions prior to the deposition of flood silts which terminated organic accumulation. The high levels of saltmarsh pollen at the upper boundary of the peat show these silts to have been of marine origin. Diatom analyses of the peat and silt should confirm this. The domination of grass pollen in the lower zone, NM-a, but also with substantial saltmarsh taxa frequencies, suggests brackish-water reedswamp to upper saltmarsh habitats, with the freshwater elements gradually superseded by more salt tolerant communities. In the upper zone, NM-b, this trend is continued and saltmarsh taxa predominate. The organic deposit was almost certainly forming as a saltmarsh peat which was eventually covered by intertidal silt deposits. This sequence of events, from peat inception to silt deposition, is attributable to a rise in relative sea level culminating in the transgression of the site.

The pollen data from the two context samples are closely analogous with the environmental evidence from the peat bed, and the samples are almost certainly contemporaneous with it. Sample context 534's pollen data show it to correspond to the earlier phase of peat bed formation, however, while sample context 531's pollen record corresponds to that of the upper phase of the peat bed. It is possible that the pollen differences between the two contexts are due to spatial differences in the distribution of plant communities across the site during peat accumulation. As the two contexts are relatively close together, however, it is more likely that the sediment in context 531 accumulated at a later date than that of context 534, after relative sea level had risen rather higher. If so, then the post which had filled context feature 531 was removed at some point before the final transgression of the site by the sea, but after peat had been accumulating across the site for some time. Whether the removal of the post occurred at the time of the site's abandonment or later cannot be known. There is no evidence in any of the pollen records for human land use or impact upon the vegetation, although a grain of *Melampyrum* (cow-wheat) does occur, a plant which has been found to be associated with burning and woodland disturbance at many other sites (Simmons and Innes 1987).

Artifactual and radiocarbon evidence from the archaeological site suggests a late Bronze Age date of about 2900 radiocarbon years BP for its occupation and therefore a date shortly later than this for its subsequent transgression by the sea. This is in agreement with the date of 2840±60BP obtained from the peat below the marine clay contact. This age agrees well (Tooley 1978) with previous estimates of high sea level in north Lincolnshire at the time of the Bronze Age/Iron Age transition (Smith 1958a,b), the dating based on archaeological evidence. A radiocarbon date of 2815±100BP (Q.844) for the marine transgression of reedswamp peat at 0.12m OD at Chapel Point to the

south of Tetney was reported by Godwin & Willis (1961), and this is very similar to dates on peat/clay contacts and on archaeological material stratified near such boundaries in the Humber estuary. For example, organic material from the base of the marine clay in which a wooden 'raft' was embedded at Brigg, south Humberside (Smith *et al.* 1981, Switsur 1981), was dated to 2720±50BP (Q.1500), while several dates on wood from the raft itself averaged 2599BP. Another wooden boat from Brigg, found in marine clay with a transgression height of 0.34m OD (Gaunt & Tooley 1974), has been dated to 2784±100 (Q.78). The greater altitude of the Tetney transgression contact, at 1.18m OD, is well within the range of variation to be expected for this high sea-level stand. It may be that it represents a relative sea level close to the maximum of the transgression, although Fletcher (1981) considers that this probably occurred rather later at about 2600BP. The maximum altitude achieved by this high sea level in north Lincolnshire would have varied from place to place due to local factors, such as enhanced tidal range in estuaries and creeks, and variations in tidal currents and sediment supply.

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Table 1. Pollen percentages from sample contexts 531 and 534.

Context 531	%	Context 534	%
Betula	1	*Betula*	5
Pinus	3	*Pinus*	4
Quercus	4	*Quercus*	2
Tilia	1	*Alnus*	10
Alnus	3	*Fagus*	1
Fagus	1	*Corylus*	11
Corylus	14	*Salix*	2
Gramineae	24	Gramineae	32
Aster-type	2	Cyperaceae	2
Taraxacum-type	2	*Aster*-type	1
Silene-type	1	*Taraxacum*-type	2
Chenopodiaceae	16	Chenopodiaceae	12
Artemisia	1	*Artemisia*	4
Rumex	2	*Armeria*	1
Plantago maritima	26	*Plantago maritima*	13
Menyanthes	1	*Pteridium*	7
Pteridium	4	Filicales	10
Polypodium	1		
Filicales	18		

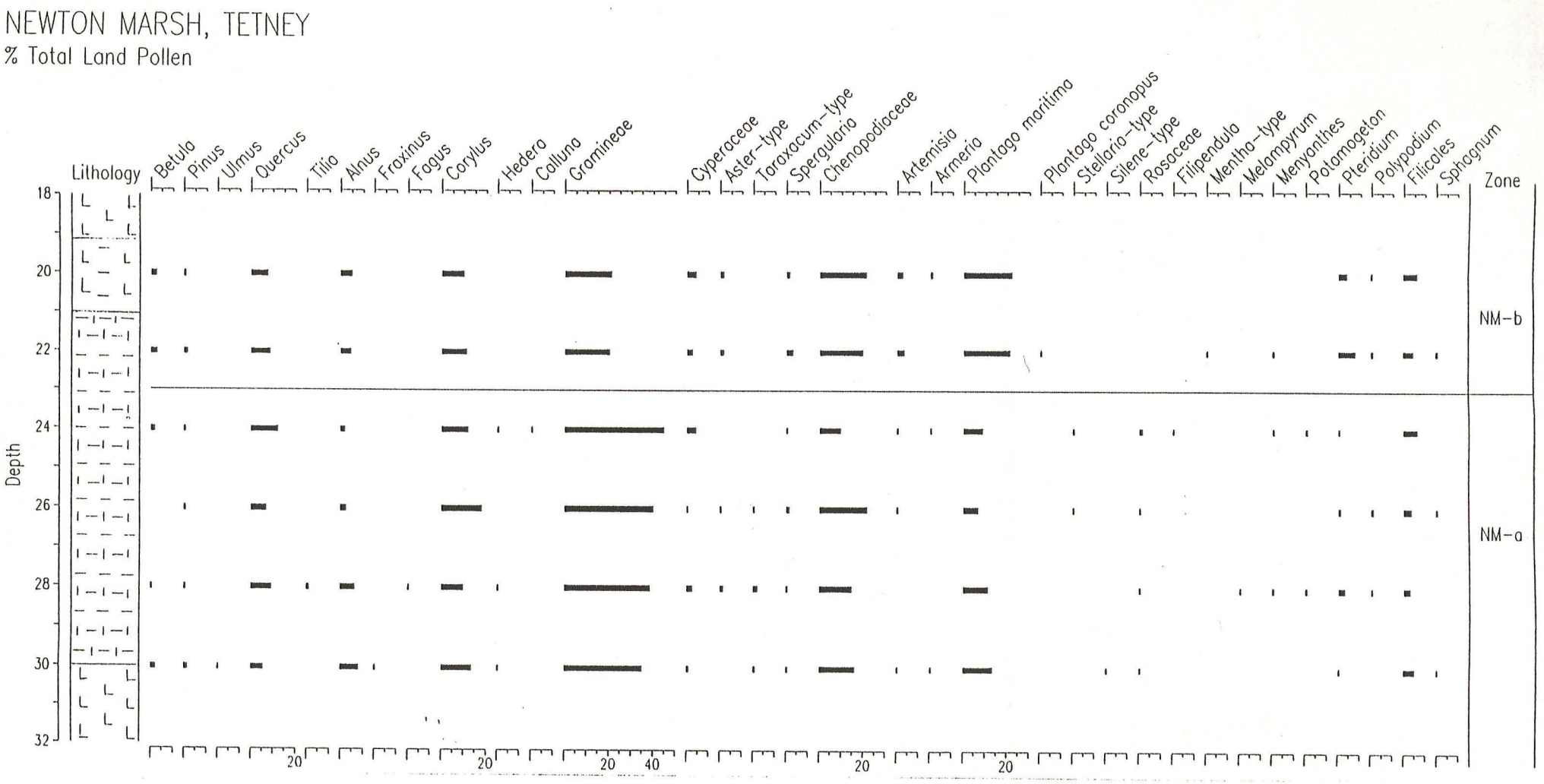
NEWTON MARSH, TETNEY
% Total Land Pollen
Lithology
Betula
Pinus
Ulmus
Quercus
Tilia
Alnus
Fraxinus
Fagus
Corylus
Hedera
Calluna
Gramineae
Cyperaceae
Aster-type
Toraxacum-type
Spergularia
Chenopodiaceae
Artemisia
Armeria
Plantago maritima
Plantago coronopus
Stellaria-type
Silene-type
Rosaceae
Filipendula
Mentha-type
Melampyrum
Menyanthes
Potamogeton
Pteridium
Polypodium
Filicales
Sphagnum
Zone
Depth
18
20
22
24
26
28
30
32
NM-b
NM-a
20
20
20
40
20
20

Figure 1

Appendix 9: Pollen Analysis of Sediment Samples (Project 3)

A PALYNOLOGICAL ASSESSMENT OF SEDIMENT SAMPLES FROM A PREHISTORIC SALTERN NEAR TETNEY, LINCOLNSHIRE

Summary

A preliminary palynological assessment of 4 sub-samples from Tetney TE193 2B indicated further potential for pollen analysis. The sub-samples, consisting of a sequence of 4 spot samples taken at lithological boundaries in the sediment column were assessed primarily for presence/absence of pollen, quality of pollen preservation and the diversity of the pollen flora. Examination of the processed samples showed relatively high pollen concentration values, variable but generally good pollen preservation and a range of pollen taxa present in all the samples.

Introduction

The samples for palynological assessment were supplied by Lindsey Archaeological Services in the form of discrete spot samples from the section Tetney TE1 93 2B located approximately 0.5km north of the saltern.

Method

The samples analysed were as follows

Sample	Sediment Type
TE1/93/4	lower grey silt/boulder clay boundary
TE1/93/3	upper grey silt boundary
TE1/93/2	base of silty peat
TE1/93/1	upper silty peat/brown silt boundary

Samples were prepared for pollen analysis using standard KOH digestion and acetolysis procedures (method B of Berglund and Ralska-Jasiewiczowa 1986). *Lycopodium clavatum* spores were added to the pollen preparation to facilitate the calculation of pollen concentration values (Benninghoff, 1962). Pollen slides were scanned using an Olympus BH microscope operating at x400 magnification.

Results

In order to assess pollen concentration values a count of 200 *Lycopodium* spores which had been added in known quantity to the pollen samples (25,084 grains per 1cm² of sediment) was made from each sample. The number and type of pollen grains encountered in this process were recorded, together with damaged/degraded/unidentified grains. This procedure provided a quick yet accurate indication of pollen concentration values, pollen preservation and the diversity of the pollen assemblages. The results of this assessment are presented below (**Table 1**).

These data suggest that a number of significant vegetation changes are detectable in the profile. The basal sample (TE1/93/4) is characterised by the representation of *Sphagnum, Calluna vulgaris* and *Empetrum nigrum*, plant species associated with acidic conditions and peat-forming plant communities. In TE1/93/3 the basal assemblage has been replaced by one characterised by woodland species such as *Corylus avellana* and *Quercus* with some *Betula, Alnus, Tilia* and *Ulmus*. The herbaceous pollen types occurred as scarce grains in this sample but two genera, Poaceae and Chenopodiaceae were slightly more abundant. It was not possible to separate the Chenopodiaceae pollen to species level but it is suggested that it may represent species associated with coastal marsh communities in which species such as *Salicornia* or *Atriplex prostrata* may have been present.

This interpretation is reinforced by the pollen spectra from samples TE1/93/2 and TE1/93/1 which are characterised by a decline in the pollen representation of woody species and an increase in the abundance and diversity of salt marsh/maritime plant community indicators such as species of Chenopodiaceae, *Plantago maritima* and *Armeria maritima.*

Table 1 Results of Pollen Assessment

Sample No.	Pollen concentration	Degraded pollen	Major taxa
TE1/93/4	c. 8:1 fossil pollen to exotic	<2% tlp	*Sphagnum* *Empetrum* *Calluna vulgaris*
TE1/93/3	c. 5:1 fossil pollen to exotic	<5% tlp	*Corylus, Quercus* *Betula, Alnus* *Chenopodiaceae*
TE1/93/2	c. 5:1 fossil pollen to exotic	<5% tlp	*Plantago maritima,* *Armeria maritima,* *Corylus, Quercus,* *Alnus*
TE1/93/1	c. 3:1 fossil pollen to exotic	c. 17% tlp	*Plantago maritima,* *Chenopodiaceae.* Charcoal present

Recommendations

These results were obtained from a limited number of samples taken from two stratigraphic unit in the profile. They suggest that further palynological investigations are merited by the above findings which indicate environmental change in the location typically associated with the movement inland of coastal salt marsh communities in response (possibly) to transgressive sea level. Further detailed pollen analysis, together with sediment analysis and radio carbon dating of the profile could help to elucidate this story. These data could be correlated with other work in the area relating to sea-level change and help locate the Tetney saltern in its palaeoenvironmental setting.

Barbara A. Brayshay 1995

References

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Appendix 10:

Analysis of Charcoal Samples from Tetney, TE 93

(1993 excavation and Project 1)

by G.C. Morgan (School of Archaeological Studies, University of Leicester)

Sample no.	Context	diam. (mm.)	rings	age	growth rate
4	024	40+			slow
5	038	40+			fast
6	080	5	2	2	
		80+	15	30+	fast
		200+	100	100+	slow
7	059	25	2	5	
		50+	10	10+	fast
8	059	100+	20	20+	slow
9	059	50+	10	10+	fast
10	513	50+	12	25+	

Only oak *Quercus* sp. was found although the very fragmentary smaller particles may have included other species. The wood represented was mainly small branch or twig sized, but with an age range of 2 to 100+ years. This may represent off-cuts from structural timbers although small twig-like material may have been completely ashed or the charcoal broken up. No obvious ancient seeds were found but modern ?weed seeds and roots were present in several samples.

G.C. Morgan, June 1993.

Appendix 11: **Radiocarbon dates from Tetney, Newton Marsh**

TE 93 Context 0**57** (charcoal from small pit)

RCD 1305 2640+/- 70 BP
1 Standard Deviation 845 - 745 cal BC
2 Standard Deviations 920 - 605 cal. BC

TE 93 Context **531** (peat filling post-pipe within post-hole 532)

RCD 1598 2840=+/- 60BP
1 Standard Deviation: 1095 - 920 cal. BC
2 Standard Deviations: 1255 - 845 cal. BC

Provisional Project Archive List

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1:250 1
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Project 2 Outlet Pipeline
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Project 3 Cleethorpes-Tetney Pipeline TEI 93
Annotated OS location plan of pipeline and findspots 1:25,000
parts of 4 early OS maps
Annotated AW longitudinal section and plan 2x3
AW plan of STW showing Inlet location 1:500 1
Annotated """" 1
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Field drawings of section of pottery vessel 1:1 and 1:2 2
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Project 4 1994 excavation TE 94
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feature sections 1:20 2
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geophysical survey - 2 gradiometer plans

Project 5 Tetney Village Pipeline TPS 94
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OS location plan, with findspots 1:2500 1
OS annotated with findspots 1:1250
OS 1st edn. 1:10,560 (part) 1

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AW longitudinal section and plan (annotated) 1
AW Hoop End Pumping Station plan 1:100 1
AW Detail plans of replacement land drains along pipeline route 1:2500 8

colour print films 94/50 15; 32-34
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94/62 00-14
94/63 00-36
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