



# **Dunham Tank to Knutsford Pipeline,**

**Greater  
Manchester and  
Cheshire**

## **Watching Brief, Evaluation, and Strip and Record Investigation**



**Oxford Archaeology North**

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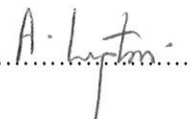
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## SUMMARY

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United Utilities proposed the construction of a new water main from Knutsford Waterworks, Cheshire (SJ 74995 79396) to Dunham Reservoir (SJ 75284 87414). In addition to crossing two counties, with the majority of the route lying in Cheshire East, it also crosses the Dunham Massey National Trust Estate. As a consequence, consultations were held with the Cheshire Planning Archaeologist, Greater Manchester County Archaeologist, and The National Trust Archaeologist, this being dependent upon the precise geographical location along the route.

An archaeological desk-based assessment and walkover survey relating to the application area was recommended. Oxford Archaeology North (OA North) was subsequently commissioned by United Utilities to undertake this work in August and September 2008, with a supplementary research report being undertaken during April and May 2009, following modifications to the pipeline route, and comments received from The National Trust Archaeologist.

In total, 54 sites were identified within the revised study area, 14 of which were considered likely to be affected by the pipeline route. Following discussions with a representative of the client, the County Archaeologist for Greater Manchester, and The National Trust Archaeologist, a programme of archaeological works was agreed. This comprised a geophysical survey to be located in order to investigate the presence or otherwise of remains associated with a smithy; evaluation trial trenching along the projected line of the Chester to Manchester Roman road, and a permanent presence watching brief during all ground disturbances. Following an additional re-route of the pipeline to the south of Rostherne village, Cheshire, a programme of strip and record investigation was undertaken, across an area of earthworks thought to have Bronze Age origins.

The geophysical survey failed to locate the site of the smithy (subject to a separate report). The evaluation trenching did not reveal any remains associated with the Chester to Manchester Roman Road, and the watching brief encountered only agricultural-type features of likely post-medieval date. The strip and record investigation revealed a ditch and at least one pit that might pre-date the medieval period, although these features have not been closely dated. Several field boundary and irrigation ditches that are likely to have been associated with the enclosure of agricultural fields during the medieval and post-medieval periods were also identified.

Following the completion of the programme of work undertaken to date, no recommendations are made for further archaeological investigations.

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## ACKNOWLEDGEMENTS

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Chris Ridings and Vicky Bullock compiled the historical background, Sean McPhillips and Des O'leary undertook the watching brief and strip and record investigation, with assistance during the latter from Alastair Vannan. Alastair Vannan wrote the report. Mark Tidmarsh produced the drawings. Sandra Bonsall processed the environmental samples, Denise Druce carried out the assessment of the charred plant remains and charcoal, and Mairead Rutherford carried out the palynological assessment. Elizabeth Huckerby read and commented on the environmental text. Alison Plummer managed the project, and also edited the report.

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## 1. INTRODUCTION

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### 1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 United Utilities proposed the construction of a pipeline from Knutsford Waterworks (SJ 74995 79396) in Cheshire to Dunham Reservoir (SJ 75284 87414) in Greater Manchester (Fig 1). The total length of the proposed pipeline was approximately 13km.
- 1.1.2 An archaeological desk-based assessment and walkover survey relating to the application area was recommended. Oxford Archaeology North (OA North) was subsequently commissioned by United Utilities to undertake this work in August and September 2008, with a supplementary research report being undertaken during April and May 2009, following modifications to the pipeline route, and comments received from The National Trust Archaeologist.
- 1.1.3 In total, 54 sites were identified within the revised study area, 14 of which were considered likely to be affected by the pipeline route. Following discussions with a representative of the client, the County Archaeologist for Greater Manchester, and The National Trust Archaeologist, a programme of archaeological works was agreed. This included a geophysical survey (subject to a separate report; Stratscan 2009), evaluation trial trenching along the projected line of the Chester to Manchester Roman road, and a permanent presence watching brief during all ground disturbance, including within the A556, as it follows the course of the Roman road. Finally, a strip and record investigation, was undertaken along a short section of re-route in the vicinity of Rostherne village (Figs 2a to 2c). This report sets out the results of the archaeological work in the form of a short document, outlining the findings.

### 1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

- 1.2.1 The pipeline route is situated to the north of Knutsford (SJ 74995 79396 to SJ 75284 87414) (Fig 1). The south end runs north-west from the waterworks at Knutsford for almost 3km, then turns to the north-east for a further 1.75km. From here, it runs north-west again for 3.3km, until it reaches Millington, at which point the pipeline runs through Bollinton. The final stretch of the route lies within Bowdon, Greater Manchester, and involves a short stretch heading north and east before terminating at Dunham Reservoir.
- 1.2.2 The Shropshire, Cheshire and Staffordshire Plain, in which the pipeline lies, is formed from Triassic sandstones and marls, overlain by glacial deposits of clay, silt, peat, sand and gravels (Countryside Commission 1998, 146). Much of the plain is rolling, with only gentle changes in elevation between 20m and 50m (*op cit*, 145).

## 2. METHODOLOGY

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### 2.1 EVALUATION TRENCHING

- 2.1.1 A series of five evaluation trenches was excavated (Fig 2c), between Dunham Road, Farm Walk, and the River Bollin, in order to investigate the potential presence of remains associated with the Chester to Manchester Roman road (Watling Street), according to the methodology described in the project design for the agreed archaeological works (*Appendix 1*). The initial evaluation methodology proposed the excavation of four 25m long trenches, with a combined length of 100m. However, ground conditions led to slight modifications to the location, shape, size, and number of the trenches. Five trenches were excavated, which varied in length between 10m and 30m, and represented a total length of 115m. All of the trenches measured 1.5m wide and were excavated by a 10 ton 360° mechanical excavator.

### 2.2 WATCHING BRIEF

- 2.2.1 During the course of all ground works associated with the pipeline, a programme of field observation recorded the location, extent, and character of all surviving features and deposits of archaeological interest. All excavation work was carried out using 13 or 20 ton 360° mechanical excavators fitted with toothless ditching buckets, under archaeological supervision.

### 2.3 STRIP AND RECORD INVESTIGATION

- 2.3.1 A programme of strip and record investigation was undertaken to the south-west of the southern end of Rostherne village (Fig 2b). The proposed route of the pipeline through Rostherne village originally corresponded with the line of Rostherne Lane. However, this route was modified during the course of the pipeline installation and the pipeline was diverted into the fields to the south-west of the road. Due to the presence of features identified from aerial photography within the near vicinity of this area (OA North 2009, sites **101** and **103-6**), which were thought to represent ring ditches and linear features of Bronze Age or Neolithic origin, the strip and record investigation was undertaken.
- 2.3.2 The area was stripped under archaeological supervision using 13 and 20 ton mechanical excavators fitted with a toothless ditching bucket. All features and deposits of archaeological interest were subject to sample excavation, by hand. All discrete features were excavated by 50%, in order to produce accurate and representative cross sections, and linear features were excavated to a minimum of 10%. A programme of sampling was undertaken in order to provide material for palaeoenvironmental assessment.

## 2.4 ARCHAEOLOGICAL RECORDING

- 2.4.1 The 'preservation by record' of all features of archaeological interest was achieved by the generation of a comprehensive excavation archive, in accordance with the standard and guidance for archaeological excavations produced by the Institute of Field Archaeologists (2001). All of the features identified were recorded stratigraphically, using a system adapted from that used by the Centre for Archaeology Service of English Heritage, with accompanying graphic documentation (plans, sections, and both colour slide and black and white print photographs, both of individual contexts and overall site shots from standard view points). Photography was undertaken with 35mm cameras on archivable black-and-white print film, as well as colour transparency, all frames including a visible, graduated metric scale. Digital photography was used extensively throughout the course of the fieldwork for presentation purposes. Photographic records were also maintained on special photographic *pro-forma* sheets.

## 2.5 FINDS

- 2.5.1 Finds' recovery and sampling programmes were carried out in accordance with best practice (following current Institute of Field Archaeologists guidelines), and subject to expert advice in order to minimise deterioration.

## 2.6 PALAEOENVIRONMENTAL ASSESSMENT

- 2.6.1 ***The plant remains and charcoal:*** eight environmental bulk samples, between ten and 30 litres in volume, from features identified in the strip and record investigation, were processed for the assessment of charred and waterlogged plant remains (CPR/WPR). The samples were hand-floated, the flots were then collected on a 250 micron mesh and air-dried. A representative sample of each flot was scanned with a Leica MZ60 stereo microscope and the plant material and charcoal was quantified and provisionally identified. Plant remains and charcoal were scored on a scale of abundance of 1-4, where 1 is rare (up to 5 items) and 4 is abundant (>100 items). The components of the matrix were also noted. Botanical nomenclature follows Stace (1997).
- 2.6.2 ***The pollen:*** four monolith samples were taken from the fills of ditches, cleaned and the lithology recorded. Sixteen subsamples were taken to assess the potential for palynological analysis.
- 2.6.3 Volumetric samples were taken from the sixteen samples and two tablets containing a known number of *Lycopodium* spores were added so that pollen concentrations could be calculated (Stockmarr 1972). The samples were prepared using a standard chemical procedure (method B of Berglund and Ralska-Jasiewiczowa 1986), using HCl, NaOH, sieving, HF, and Erdtman's acetolysis, to remove carbonates, humic acids, particles > 170 microns, silicates, and cellulose, respectively. The samples were then stained with safranin, dehydrated in tertiary butyl alcohol, and the residues mounted in silicone oil. Slides were examined at a magnification of 400x by ten equally-

spaced traverses across at least two slides to reduce the possible effects of differential dispersal on the slides (Brooks and Thomas 1967). Pollen identification was made following the keys of Moore *et al* (1991), Faegri and Iversen (1989), and a small modern reference collection. Andersen (1979) was followed for the identification of cereal grains. Indeterminable pollen was also recorded as an indication of the state of pollen preservation. The preservation of the pollen was noted and an assessment was made of the potential for further analysis. Charcoal particles greater than 5 microns were recorded also (Peglar 1993). Fungal spore identification and interpretation followed van Geel (1978) and Blackford *et al* (in press).

## **2.7 ARCHIVE**

- 2.7.1 The results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Research Projects in the Historic Environment*, 2006). The original record archive of project will be deposited with The National Trust.
- 2.7.2 The Arts and Humanities Data Service (AHDS) online database *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

### 3. HISTORICAL BACKGROUND

#### 3.1 INTRODUCTION

- 3.1.1 The following section presents a summary of the historical and archaeological background of the general area. This is presented by historical period, and has been compiled in order to place the study area into a wider archaeological context. The full background is presented in the previous desk-based assessment (OA North 2008).

Period	Date Range
Palaeolithic	30,000 – 10,000 BC
Mesolithic	10,000 – 3,500 BC
Neolithic	3,500 – 2,200 BC
Bronze Age	2,200 – 700 BC
Iron Age	700 BC – AD 43
Romano-British	AD 43 – AD 410
Early Medieval	AD 410 – AD 1066
Late Medieval	AD 1066 – AD 1540
Post-medieval	AD 1540 – c 1750
Industrial Period	c AD1750 – 1901
Modern	Post-1901

Table 1: Summary of British archaeological periods and date ranges

#### 3.2 THE PREHISTORIC PERIOD

- 3.2.1 ***The Upper Palaeolithic and Mesolithic periods (c 12,800–3500 BC):*** human occupation in the north of England is known to date from at least 200,000BC, but there is no evidence from the Cheshire area until 12,000BC (Crosby 1996). A pair of unretouched flint flakes, one of which was burnt, was found at Rostherne Mere immediately to the north of Tatton Park (OA North 2008). These are ambiguous in terms of dating but could conceivably be as early as the Palaeolithic. A Cresswell point found at Carden Park, approximately 24km to the south-west of the study area, represents activity during the final stages of the Devensian glaciation (Hodgson and Brennand 2006, 23), during a period when the glacial climate of the region was becoming gradually more hospitable. Mesolithic material has also been found at Carden Park dating to

around 6800–4300 cal BC, whilst evidence of Mesolithic activity at Tatton Park includes a ‘chipping camp’ (Crosby 1996, 16; Higham and Cane 1999) and, possibly, a perforated stone hammer (HER 2061/1/1), although this could conceivably be of later provenance

- 3.2.2 ***The Neolithic and Bronze Age periods (c 3500–700 BC):*** the Mesolithic was the latest cultural epoch in Britain during which people employed a subsistence strategy based wholly upon hunting, gathering, and fishing. Following the introduction of farming to the British Isles, from around 3,500 BC, the Neolithic period saw a gradual increase in permanent settlement and the beginning of the widespread construction of monumental architecture, although few such structures are known from Cheshire (Hodgson and Brennand 2006, 39). Approximately 20km to the south-east of the study area are the Bridestones (Scheduled Monument (SM) 13500), which comprise the remains of a chambered tomb, a typical Neolithic communal burial monument (Carrington 1994), whilst a putative long barrow (SM 13499) is located near Somerford Bridge, approximately 25km to the south of the study area.
- 3.2.3 There is a similar paucity of evidence for the immediate area. Flint tools and a post-hole from part of a small building have been uncovered at Tatton Mere, and these have been carbon dated to 3,500–2,945 cal BC (Higham 1993, 17). Similarly, a rubbish pit yielded hulled six-row barley (*Hordeum vulgare*), which has been carbon dated to 3,370–2,945 cal BC (*ibid*), but no ceramic material was uncovered in either feature, which is, in itself, worthy of some note (Leah *et al* 1997, 101–102). From the study area itself, a ring ditch putatively dated to the Neolithic appears to be the only evidence of activity.
- 3.2.4 The beginning of the Bronze Age in Britain, defined mainly by the introduction of the use of copper-alloy metals, developed only gradually out of the preceding Neolithic during the mid third millennium BC (Parker Pearson 2000, 13; Hodgson and Brennand 2006, 29–30). The Bronze Age saw a warming of the climate, which allowed further arable farming at higher altitudes in the upland areas in the east of Cheshire. Approximately 90 burial sites are known in Cheshire, mostly from the sandier soils and well-drained slopes (Crosby 1996, 18), but there is one known Bronze Age barrow relatively near to the study area; a bowl barrow near Swettenham, which lies 16km to the south of Tatton Park. In addition, evidence of Bronze Age activity exists nearer the study area, in the form of a sub-rectangular enclosure, bounding four roundhouses and two further rectangular structures. Associated finds included only carbonised seeds, waste flint flakes and a possible mortarium sherd (HER 2061/1/0), but the site appears to have been occupied in to the Late Iron Age at the very least (*Section 3.2.6*). Compelling evidence for Bronze Age activity within the study area itself is located in a cluster of ring ditches at the village of Rostherne (*Section 4.4.1*), which lies on the route of the pipeline. Other Bronze Age features in the locality comprise a find spot (GMHER 2061/1/0) and a cremation burial (GMHER 1307) between Millington and Little Bollington.
- 3.2.5 ***The Iron Age (c 700 BC – AD 43):*** the most obvious traces of Iron Age activity in the region relate to the series of hillforts situated along the Cheshire Sandstone Ridge approximately 25km to the west and south-west of the study

area. These run from Helsby in the north and continue southwards to Eddisbury, Kelsborrow, Beeston and Maiden Castle (Crosby 1996, 19). Some of these hillforts, such as Beeston and Eddisbury, may have represented social and political centres from which the trade of salt was controlled (Leah *et al* 1997, 90-1).

- 3.2.6 Aside from these prominent defensive sites, the Iron Age was a time when farming increased and, consequently, farmsteads would have been established across the landscape. The pollen record suggests this to be the case, from the evidence of widespread clearance (Leah *et al* 1997), although specific evidence of subsistence strategies is poor with only a few sites, such as Beeston and Mill Hill Road, Irby, showing any evidence of cereal waste (Hodgson and Brennand 2006, 55). A general lack of pottery and other surviving elements of material culture from both the Iron Age and early Romano-British periods in the region has led to great difficulty in identifying settlement sites (Hodgson and Brennand 2006, 51–2; Philpott 2006, 59). Aerial photography has, however, revealed numerous cropmark enclosures in Cheshire (Hodgson and Brennand 2006, 52) and when similar examples have been excavated, Iron Age and Romano-British occupation has been demonstrated (Hodgson and Brennand 2006, 53; Philpott 2006, 61). A great deal of continuity in rural settlement has been suspected between the Iron Age and Romano-British periods in the region (Leah *et al* 1997, 153; Philpott 2006, 73), although little definitive evidence for this has been collated.

### 3.3 THE HISTORIC PERIOD

- 3.3.1 ***The Romano-British Period (c AD 43 – AD 410):*** the general character of this region during the Romano-British period, as suggested by the nature of most of the known sites in the area, is one of military and industrial centres being interlinked by roads (Philpott 2006, 59–60; 69). Cheshire was an important area for Roman salt workings, with major sites at Northwich (*Condате*), Middlewich (*Salinae*) and Nantwich (Crosby 1996, 24-5).
- 3.3.2 There is little evidence for the villa sites that are commonly found further south in Britain. Instead, settlements would have taken the form of farmsteads, which were, in many instances, a continuation of earlier Iron Age settlement patterns (*op cit*, 25). In addition, the pollen record does indicate a growth in agricultural output for this time, both in terms of land used for grazing, and in cereal production (Timberlake and Prag 2005, 17).
- 3.3.3 The evidence for Roman activity from the wider area is based solely upon the presence of a pottery sherd, which was found during the excavation of the enclosed Bronze Age settlement (*Section 3.2.4*). This would suggest an extended period of settlement (though not necessarily continuous) from the early Bronze Age to the end of the Iron Age, at the very least. Within the study area are four sites associated with the Chester to Manchester Roman Road (Margery 1957, route 7a) known locally as Watling Street. The road was revealed during flooding in 1987 at the crossing point to the north-west of Dunham Road over Tipping's Bank. The stratigraphy of the road and the large road dimensions necessary to fend off the floods from the river were clearly

discernible. A Roman amphora handle was found in a field close to the line of the Roman road (HER 844/1/0; HER 844/1/29).

- 3.3.4 ***The early medieval period (c AD 410 – AD 1066):*** the study area remained essentially Anglo-Saxon throughout the early medieval period until the Conquest. In the early seventh century, the Northumbrian Anglo-Saxon kingdom gained control over Cheshire, which was then subsumed into the Anglo-Saxon kingdom of Mercia around AD 633. However, the fortunes and power of Mercia waxed and waned over the next two and half centuries, until it eventually became a possession (although still a distinct political entity), of the kingdom of Wessex (Crosby 1996, 27–31). Thus, despite Danish raids and a brief period of Danish control in the ninth century, Cheshire remained part of one of the Anglo-Saxon kingdoms from the seventh century until the Norman Conquest (*ibid*), and the study area was then part of the Parish of Rostherne in the Bucklow Hundred (Higham 1993). Unfortunately, although there is sustained settlement within the ‘county’ during the early medieval period, there is no evidence of comparable activity within the study area itself.
- 3.3.5 ***The medieval period (c AD 1066 – AD 1540):*** the Anglo-Saxon period came to an end with the Norman Conquest of 1066, and the introduction of the feudal system, which saw significant changes to the way land was owned and managed. However, there was considerable opposition to this system and Norman armies marched across the country suppressing uprisings in the ensuing years, in order to cement King William’s control. This suppression is particularly evident within the records of Domesday (Crosby 1996).
- 3.3.6 The placenames within the study area are a mixture of Anglo-Saxon and Scandanavian, though this is not always a fair indication of when a settlement was established. Certainly Knutsford, meaning ‘ford of a man named Knútr’, is derived from the Scandanavian personal name and the Anglo-Saxon ‘ford’ (Mills 1998), but no meaningful settlement is believed to have existed until the thirteenth century (Crosby 1996, 50). To the north, the modern placename Tatton is derived from the Anglo-Saxon ‘Tata’s tun’, referring to Tata’s Farm (Mills 1998). Rostherne, like Knutsford, is a combination of a Scandanavian personal name and the Anglo-Saxon for thorn: literally, the ‘thorn tree of Rauthr’, whilst Millington means ‘farmstead with a mill’ (*ibid*). Dunham is derived from the Anglo-Saxon for ‘village on the hill’ (*ibid*), suggesting a settlement was in place long before it was recorded in Domesday in 1086.
- 3.3.7 All of these were manors and have entries in Domesday (Williams and Martin 1992). Knutsford was owned by William FitzNigel, Baron of Halton, and consisted of half a hide paying geld and land for two ploughs (*ibid*). Many Domesday vills (portions of land, rather than focussed settlement in the village sense) incorporated two or more manors, such as at Tatton, which had a pair of manors, recorded under separate ownership in 1086 (Williams and Martin 1992). The larger manor, that of William FitzNigel, had seven recorded households consisting of three villeins (higher economic status villagers) and four borders (cottagers), with land for three and half ploughs (*ibid*). The smaller manor was Norshaw in the vill of Tatton, which was held by Ranulph, and had land for half a plough and contained nine recorded households,

including a radman (riding servant), two slaves, two villeins and two borders (*ibid*). Rostherne was held by Gilbert de Venables, and consisted of one virgate of land paying geld, with land for one plough, whilst William also held Millington, which comprised half a hide paying geld, and room for one plough. Hamo de Mascy held Dunham, comprising one hide paying geld, and land for three ploughs. In the demesne of de Mascy, there was also one plough, two oxmen, two villans, one bordar, an acre of woodland, and in the city (Chester), a house. In the case of some of these, there is a reference to 'waste' land, which Crosby (1996, 33) notes, is endemic for the entries relating to the area around Macclesfield, and would suggest that this part of Cheshire bore the brunt of William the Conqueror's savage oppression during his campaign of 1069-70 (the 'harrying of the north'). Indeed, in nearly all the cases, the new holders of the Tatton manors were Norman, having supplanted their former Anglo-Saxon owners.

- 3.3.8 Following the Conquest, the area around Dunham (in the parish of Bowdon) was acquired by Hamo de Mascy and this became the nucleus of the barony of Dunham Mascy (Higham 1993, 164). In the late twelfth century, repeated civil unrest plagued the reign of Henry II, and the baronial revolt of 1173, of which Hamon de Mascy was a part, precipitated the hasty construction of the motte and bailey at Watch Hill (GMHER 25727).
- 3.3.9 During the same period, there were few towns within Cheshire as a whole, save Chester, and the three wiches (Crosby 1996, 50). However, during the thirteenth and early half of the fourteenth centuries, there was a burgeoning urbanism and Cheshire was no different to other parts of the country (*ibid*). This drive towards urbanism took one of either two forms. There were villages, which slowly grew in extent and population till they were granted 'borough status' (*ibid*), or there were those that were planted as new towns. Knutsford appears to fall into the latter category, and like Altrincham was a success, whilst others of similar standing at the time failed (*ibid*). However, there was no church built at Knutsford, as the putative fourteenth century Church of St Mary at Rostherne seems to have served as the parish church for much of the study area during the medieval period (Crosby 1996, 50; Higham 1993, 164).
- 3.3.10 The influence of the de Mascy family (a name of which there are several permutations) extended further south during the late thirteenth and early fourteenth centuries. At the beginning of the thirteenth century, the new priory at Mobberley acquired several parcels of land either side of the Knutsford road to the east of the Great Mere (Tatton Mere), and permission was given for fishing rights and the enclosure of this area (CHER 53697). This land, which was named Hazelhurst, was passed to Richard de Massey, who made it a park and obtained a royal licence in 1290 to divert the Knutsford Road from the east side of this new parkland to the west side (*ibid*). Through acquiring further land from William de Tatton and Nicholas de Alditheley, de Massey held all or most of Tatton by the reign of Edward I.
- 3.3.11 It is unclear whether or not de Massey resided in Tatton, but it appears to have been overcrowded nonetheless, with two generations of fullers, a tailor, a sawyer, a shepherd, a carver, a grachere, and a chaplain all dwelling within the

estate (CHER 53697). The recorded names of fields and furlongs suggests that the estate had an extensive open field system, which would mean widespread clearance of woodland, in keeping with the rest of the county (Crosby 1996, 47-48). In addition, the fourteenth century saw a general change in land use from arable to pasture across Cheshire.

- 3.3.12 This transition from arable to pasture was accelerated, in no small part, by the Black Death: a notable decline in operating farms occurred by the beginning of the fifteenth century, although the field boundaries remained intact, which would appear to correspond with wider trends (Crosby 1996, 45). The Black Death spread throughout Cheshire after 1349, rendering large swathes of arable land redundant. With such a catastrophic mortality rate, there was neither the manpower to produce the crops, nor the demand for the crops themselves and, subsequently, much of the arable land of Cheshire was converted to pasture (*ibid*).
- 3.3.13 A sherd of medieval pottery was found during the North West Wetlands Survey in 1997 (Leah *et al* 1997) in Rostherne parish, to the south of Rostherne village. The late medieval period is represented within the study area by a sherd of Midlands Purple Ware pottery and a carved stone head from Rostherne church. The medieval and late medieval period is also represented by numerous Township boundaries which cross the pipeline in several locations and a medieval/late medieval strip field. Flash Field was originally included in the neighbouring 'loont' meadow (OA North 2008). The northern and western boundaries exist, but the eastern boundary has been partly removed forming an L-shaped field.
- 3.3.14 ***The post-medieval period (c AD 1540 – 1750):*** during the post-medieval period Cheshire became an important part of the textile industry, with flax and hemp growing, and mills producing linen and canvas (*op cit*, 64). The silk industry took off in the mid-seventeenth century, with silk being hand thrown (twisted to make a weavable thread) in several areas in east Cheshire (*op cit*, 73).
- 3.3.15 The salt industry continued to grow in this period and coal was now used as a fuel in the evaporation process, with the nearest coal pits being located in the Macclesfield area and north of Newcastle-under-Lyme. The intensive salt mining of some areas resulted in subsidence, sometimes on such a large scale that flashes (saltwater lakes) appeared in the landscape and some of these continue to grow from underground watercourses (Cheshire County Council, 2005).
- 3.3.16 Enclosure of the open fields had begun in the fifteenth century and continued through the sixteenth and seventeenth centuries, to provide pasture, which sometimes resulted in the loss of hamlets and manors. The enclosure of land was largely complete by the eighteenth century (Crosby 1996, 64). This is exemplified by the volume of historic field names, farms, crofts, boundaries, woodland, and enclosures shown on early cartographic sources such as Broad (1800-16), Earl (1787) and Dunham Massey the tithe map (1839).

- 3.3.17 During the early sixteenth century, the Brereton family acquired part of the Tatton estate, and by the 1580s, they had expanded the Old Manor at Tatton to its present size. However, by 1598 the estate was the property of the Egerton family (Cheshire County Council 2005). Although, the Egertons continued to hold Tatton for the next century, it was never used by them, being leased to tenants instead. It was not until John Egerton (1679-1724) moved to Tatton, and built a new hall on the site of the modern one (HER 1298/2; Cheshire County Council 2005), that the Egerton family became permanent residents, whilst the old hall would eventually become the home of estate workers (*ibid*). A former brick-making site also lies within the study area, together with building foundations of a possible L-shaped structure which lies within a clearing of woodland on the western side of Tatton Park.
- 3.3.18 ***The Industrial Period (c AD 1750 – 1901):*** during the eighteenth and nineteenth centuries, the county of Cheshire underwent momentous changes. The economy, like the population, had always been rurally based, with a few small towns acting as urban focal points. However, during this period the population shifted to a predominantly urbanised society, precipitating the growth of new towns and the expansion of existing ones. As both a catalyst for, and as a by-product of this new urbanised society, the economy became predominantly focussed on industry, and the rural economy became marginalised (Crosby 1996, 86).
- 3.3.19 In this period, the fortunes of the Egerton family at Tatton Hall flourished and, subsequently, the hall, which had only been completed in 1716, was extensively rebuilt by a succession of architects including Samuel and Lewis William Wyatt (HER 1298/2; Cheshire County Council 2005). The estate, which at the time, was ten times larger (25,000 acres), was also comprehensively landscaped by several designers of repute, including Humphry Repton, William Eames and John Webb (Cheshire County Council 2005). This extensive landscaping included the erection of all of the buildings in the immediate grounds of the hall: the Orangery (HER 58476), Palm House (58478), Stables (58468) and Kitchen Gardens (HER 58467, 58481, 58482), and as well, the vases (HER 58472, 58473), terracing (HER 58469, 58470), terrace walls (HER 58469, 58474), and fountains (HER 58471, 58477) all date from the early to mid nineteenth century. As the estate became emparked during this landscaping process, many of the small farms that were notable in the earlier post-medieval period disappeared, leaving only a handful of residual farm and field names, and various boundaries. In order to counteract this, the Home Farm at Tatton Dale (HER 58539 (Dale Cottage)) was expanded to become the administrative centre of the estate, with the workshops of the farm (*ibid*) being situated there.
- 3.3.20 ***Modern Period (1901 – present):*** there are three sites from the Modern Period. These include a Second World War US Army Base that became a German PoW Camp towards the end of the war. The camp was divided into two parts (north and south), with each camp having identical facilities. Some buildings remained intact in the park until the 1960s when a new golf course was laid out, although a few traces remain within woodland close to the golf course.

- 3.3.21 In addition, there is a Royal Observer Corps Monitoring Post from the Cold War, whilst a water tower was situated near the reservoir at the northern terminus of the pipeline. This has since been removed during the second half of the twentieth century. A cottage and outbuilding dating to the modern period also lie within the study area.

## 4. FIELDWORK RESULTS

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### 4.1 EVALUATION TRENCHING

- 4.1.1 **Introduction:** the archaeological evaluation was undertaken alongside Dunham Road (A566) lying to the east, between Farm Walk, and the River Bollin (Figs 2c and 3). Five trenches were excavated in order to investigate the potential for remains of the Chester to Manchester Roman road (Watling Street).
- 4.1.2 **Trench 1:** Trench 1 was sited at the southern end of the site (Fig 3), adjacent to a wooded stream channel (Plate 2). The trench was linear, aligned approx east/west and measured 20m long, 1.5m wide, and 0.4m deep. A sondage was excavated at the eastern end to a depth of 1m. Natural yellow sand was encountered within the sondage at a depth of 0.7m, and this was overlain by a 0.3m thick layer of red sand subsoil that extended across the full length of the trench, and within which a sherd of pottery of probable seventeenth-century date was discovered. The subsoil was a maximum of 0.4m thick. Although not demonstrable, the sterility of the sand might indicate that this layer represented an imported make-up deposit. With the exception of this possibility, no features of archaeological interest were revealed within the trench.
- 4.1.3 **Trench 2:** Trench 2 was sited to the north-east of Trench 1, adjacent to the west side of the A556 (Fig 3). The trench was L-shaped, with the longest arm measuring a maximum of 21.5m and being orientated north-east/south-west, and the shorter arm measuring a maximum of 11.5m and being orientated north-west/south-east. Both arms measured 1.5m wide and were excavated to depths measuring between 0.9m and 1.2m. The short arm revealed a sequence of six deposits, comprising grey and orange natural clay at a depth of 1.2m, overlain by three layers of silty and clayey-sand with a combined thickness of 0.47m, which were overlain by a 0.4m thick layer of subsoil and a 0.35m thick layer of topsoil. The north/south arm revealed natural sand and clayey-sand at depths varying between 0.8m and 0.5m (Plate 3). The natural deposits were overlain by subsoil that ranged between 0.25m and 0.4m thick and topsoil that varied between 0.25m and 0.4m thick. No features of archaeological interest were revealed within the trench.
- 4.1.4 **Trench 3:** Trench 3 was sited north-east of Trench 1. The trench was linear, aligned north-east/south-west, and measured 21m long, 1.6m wide, and 0.46m deep. The geological natural comprised a deposit of sand, which was exposed at a maximum depth of 0.4m. This was overlain by a 0.2m thick layer of subsoil, which was overlain by a layer of topsoil with a maximum thickness of 0.36m. No features of archaeological interest were revealed within the trench.
- 4.1.5 **Trench 4:** Trench 4 was sited close to the northern end of the evaluation area. The trench was T-shaped, with a 5m long arm aligned slightly north-west/south-east and a 10m long arm aligned north-east/south-west. The trench had a maximum depth of 0.6m and natural clayey-sand and sandy-clay was encountered at a depth of 0.25m. This was overlain by a layer of topsoil with a

maximum depth of 0.25m. No features of archaeological interest were revealed within the trench.

- 4.1.6 **Trench 5:** Trench 5 was the northernmost trench within the evaluation area and was linear and aligned east-north-east/west-south-west. The trench measured 15m long and 1.5m wide and had a maximum depth of 0.45m. Natural clayey-sand and sandy-clay was encountered at a depth of 0.4m and this was directly overlain by topsoil. No features of archaeological interest were revealed within the trench.
- 4.1.7 **Conclusion:** no remains indicative of a Roman road were encountered within any of the evaluation trenches.

## 4.2 WATCHING BRIEF

- 4.2.1 **Introduction:** the watching brief was maintained throughout the duration of the majority of the stripping of topsoil from the pipeline easement (Figs 2a to 2c). The only extended portion of the pipeline that was not subject to the watching brief was the southernmost stretch, which ran for approximately 2.8km between Knutsford and the junction of Mereside Road and Ashley Road. The line of this stretch of the pipeline corresponded with Mereheath Lane. The remainder of the pipeline ran through agricultural fields.
- 4.2.2 **Results:** the topsoil strip in the part of the pipeline lying to the north of Rostherne Village (Figs 2b and 2c; Plate 1) revealed deposits of topsoil that varied between 0.3m and 0.6m thick. In some parts of this northern portion of the pipeline, the topsoil overlay subsoil deposits of sandy-clay, clayey-sand, and silty-sand, although in some places the topsoil directly overlay drift geological deposits, which varied between gravel, sand, and clay. The northern part of the watching brief area was separated from the southern part (Fig 2a) by the strip and record area (Fig 2b), which lay to the south-west of Rostherne village.
- 4.2.3 Very few man-made features of archaeological interest were encountered in the northern section. Several land drains, plough scars, and tree-throws were exposed, in addition to two possible stake-holes. Two trackways were encountered, the northernmost of these corresponded with the Mereside Farm and Hope Cottage access track and comprised a metalled surface formed by a 0.1m thick layer of cobbles and fragments of ceramic building materials. A second encountered trackway comprised the Newhall Cottages access road. This trackway consisted of a bedding layer of fuel ash and rubble, which underlay the current tarmac surfacing. A sub-ovoid clay-filled pit of unknown date and function, measuring 1.1m long and 0.22m deep, was also encountered in the northern section.
- 4.2.4 The southern portion of the pipeline (Fig 2a) revealed layers of topsoil that varied between 0.3m and 0.6m thick and overlay subsoil deposits of sand, clayey-sand and sandy-clay. No features of archaeological significance were revealed in this part of the pipeline.

- 4.2.5 ***Finds:*** in all 212 fragments of artefacts were recovered, comprising 142 fragments of pottery vessels, 20 of glass vessels, 14 of clay tobacco pipe, 14 of ceramic building material, two of metalwork, the remainder being stone. All are in relatively good condition, with some abrasion, especially in the case of the softer early post-medieval pottery fabrics, and the one iron object is badly corroded. In all cases, the groups recovered were mixed in date, most producing material of late seventeenth to late nineteenth-century date. As a result of this, it is not discussed in particular detail.
- 4.2.6 Most of the pottery collected was post-medieval in date, but unstratified, joining, but two heavily abraded body fragments in a very coarse reduced sandy fabric, were possibly Romano-British in origin, a third fragment in a very soft oxidised orange fabric, was probably of similar date. The bulk of the pottery could, however, be dated between the late seventeenth and the nineteenth century. Much of it was small body fragments from large kitchen vessels in black-glazed redwares, but there were also appreciable amounts of Staffordshire and other slip-decorated wares, both hand-thrown and press-moulded, with a date range from the late seventeenth to the late eighteenth century. A small jar in Staffordshire Yellowware, is most likely to be of late seventeenth to early eighteenth century date.
- 4.2.7 Vessel glass was collected but most fragments were undiagnostic body fragments, dated to the late nineteenth and early twentieth centuries.
- 4.2.8 Clay tobacco pipe was also recovered. The majority of the fragments were small, largely undiagnostic stem fragments, although the large bore of some suggests a relatively early date. Fragments of two late eighteenth to nineteenth-century bowls were recovered amongst the assemblage.
- 4.2.9 Small amounts of ceramic building material were collected. Only one item is of any interest, the remainder being small and undiagnostic fragments. A late Victorian glazed floor tile, made in Stoke upon Trent, was recovered as a surface find. Such pseudo-medieval floor tiles were in vogue in the second half of the nineteenth-century (Pearson 2000) and this example is likely to be of that date.
- 4.2.10 A large buckle loop was found, and was probably lost from a horse harness. A heavily corroded iron bar cannot be further identified, but could come from agricultural machinery. Fragments of unmodified flint and a single worked flake were found unstratified. A water-worn pink granite pebble had a heavily pecked surface, suggesting that it could have seen use as a hammer stone, presumably at a relatively early date.

### 4.3 STRIP AND RECORD INVESTIGATION

- 4.3.1 ***Introduction:*** the programme of strip and record was undertaken, to the south-west of the southern end of Rostherne village, within the angle formed by New Road and Rostherne Lane (Figs 4a and 4b; Plate 4). The area measured approximately 198m long and up to 13m wide, although most of the trench

had a maximum width of 8.75m as the result of a 4.25m wide strip along the north-eastern side being set aside for subsoil storage.

- 4.3.2 **Results:** the underlying drift geological natural consisted of sandy-clay, with varying patches that featured higher proportions of sand and occurrences of iron pan. Sixteen features were revealed that had been cut into the natural deposits. These consisted of five linear ditches (**703**, **713**, **720**, **725**, and **771**), seven postholes (group number **705** and posthole **763**), one pit (**719**), and two features that were only partially revealed at the edge of the excavation area but also might have represented pits (**727**, **730**). Numerous land drains, plough scars, tree throws, and areas of disturbance indicative of root action were also revealed in this area. A sandy-clay topsoil that was approximately 0.25m thick overlay these features and underlay a layer of topsoil that measured between 0.3m and 0.5m deep.
- 4.3.3 There were fewer physical relationships between most of the identified features and, therefore, there were very few demonstrable stratigraphic relationships. Consequently, it is difficult to construct a relative chronology for the features, and a meaningful and reliable phasing scheme is not possible. Therefore, the features will be discussed by type.
- 4.3.4 **Ditches:** ditch **725** (22m x 1m) was aligned north-west/south-east and was filled by **726**, a brownish-grey silty-sand 0.08m in depth. It was cut by several land drains of probable twentieth-century origin but its stratigraphic relationship to ditch **720** (12m x 0.95m), which was aligned north-east/south-west, could not be determined. This second ditch was filled by **721**, a light brown-grey silty-sand, 0.20m in depth (Plate 5). Ditches **725** and **720** are likely to represent field boundaries or drainage features.
- 4.3.5 Ditch **713** measured 14m x 0.8m, and was filled by **714**, a dark brownish-grey sandy-silt, 0.18m in depth. It appeared to have been either re-cut, **716**, or was perhaps two separate features with similar alignments that gradually converged as they ran south-west/north-east (Plate 6). The fills of the ditches were very similar sandy-silts and the stratigraphic relationship between the features was not visible in cross-section. They are likely to represent two phases of a boundary ditch.
- 4.3.6 Ditch **703** to the north-west was aligned north-east to south-west and ran across the northern end of the site (Plate 7). It measured 13m in length by 1.5m in width and was filled by a friable dark brown sandy-clay, **704**, being 0.20m in depth. This ditch appeared to have been truncated by plough scars, and it is likely to represent a former boundary ditch. This function is also likely to apply to ditch **771**, which ran north-east/south-west across the southern part of the site (Fig 4b).
- 4.3.7 **Pits:** one sub-triangular pit (**719**; Plate 8) and two possible pits (**727** and **730**) were located adjacent to, and in close proximity to, ditches **713** and **725**. Pit **727** measured 0.4m in depth and Pit **730** measured 0.3m in depth. Pit **727** was filled with friable dark grey clay-silt, **711**, and **730** was filled with friable brownish grey sandy-silt **731**. Very little of pits **727** and **730** was exposed and a comprehensive understanding of their nature and extent was not ascertained.

Pit **719** was very regular in form, in terms of both profile and shape, as viewed in plan. The pit contained a layer of charcoal-rich soil (**718**), which had been overlain by an upper fill of homogenous sandy-silt **717**. The presence of burnt material suggested a possible function as a charcoal-burning pit, and the pinkish colour and hard compaction of the yellow natural clay forming the base and sides of the feature suggested that it had been affected by heat. Heat-affectation also appeared to have modified the natural forming the sides of pit **727**. Environmental samples were taken from deposits **717** and **718** (see Section 5.5.6).

- 4.3.8 **Postholes:** a linear group of six postholes (**705**), each measuring approximately 0.6m in diameter, ran north-west/south-east across the northern part of the site (Plate 9). The uniformity of the line formed by the postholes suggested that they represented a single structure, which is likely to have been a fenceline. Only one posthole (**763**) lay outside of this linear grouping, and the relationship between this feature and postholes **705** is unclear.
- 4.3.9 **Finds:** In all 100 fragments of artefacts were recovered, comprising 73 fragments of pottery vessels, nine of glass vessels, 14 of clay tobacco pipe, three of ceramic building material, the remainder being stone. All are in relatively good condition, with some abrasion, especially in the case of the softer early post-medieval pottery fabrics. The assemblage was mixed date, most producing material of late seventeenth to late nineteenth-century date. As a result of this, it is not discussed in particular detail.
- 4.3.10 Pottery was collected from contexts **701** (subsoil), **704** (fill of ditch **703**), **714** (fill of ditch **713**), and **715** (fill of ditch **716**). Most of the pottery collected was post-medieval in date, but unstratified, joining, but heavily abraded body fragments in a very coarse reduced sandy fabric, were possibly Romano-British in origin, and a small fragment from subsoil **701** of a similar date. Two small and abraded fragments of medieval pottery came from ditch **716** (fill **715**), and fragments of fifteenth-sixteenth-century Midlands Purple-type fabric were found unstratified. The bulk of the pottery could, however, be dated between the late seventeenth and the nineteenth century. Much of it was small body fragments from large kitchen vessels in black-glazed redwares, but there were also appreciable amounts of Staffordshire and other slip-decorated wares, both hand-thrown and press-moulded, with a date range from the late seventeenth to the late eighteenth century. A small jar in Staffordshire Yellowware, is most likely to be of late seventeenth to early eighteenth century date. A fragment of a white salt-glazed stoneware teacup dating to the mid-late eighteenth century came from ditch **703** (fill **704**), as did a fragment from the rim of a late eighteenth-century Creamware plate, their presence perhaps suggesting a cessation to deposition about that time.
- 4.3.11 Vessel glass was collected from contexts **701**, **704**, and **714** (fill of ditch **713**). A little over half of the fragments recovered (7) were from sea green or dark olive green wine bottles. Most were undiagnostic body fragments, but those from ditch **703** (fill **704**) can be dated to the late seventeenth or early eighteenth century, and a well-preserved neck fragment found unstratified is of similar, if not slightly earlier date. The remainder of the group can be dated to the late nineteenth and early twentieth centuries.

4.3.12 Clay tobacco pipe came from contexts **701**, **704**, and **766** (fill of ditch **713**), and was also recovered unstratified. The majority of the fragments were small, largely undiagnostic stem fragments, although the large bore of some suggests a relatively early date. Fragments of two late eighteenth to nineteenth-century bowls were recovered unstratified, whilst the decorated but unstamped heel of a (probably) late seventeenth-century bowl came from ditch **703** (fill **704**), and small fragments of later eighteenth to nineteenth-century bowls were from subsoil **701**.

4.3.13 Small amounts of ceramic building material were collected from contexts **701**, **704**, and **766**. Only one item is of any interest, the remainder being small and undiagnostic fragments.

Context	OR number	Category	Description	Period
<b>701</b>	1022	vessel	Twelve body fragments and one heavy rim fragment black-glazed redware, one base fragment yellow ware, one base fragment white salt-glazed stoneware teacup, six body fragments cream fabric, brown slipped blackware, two base fragments cream fabric brown-slipped blackware, five fragments slip-decorated ware (two very ornate moulded forms), one body fragment unglazed redware, one body fragment manganese streaked ware, one body fragment brown stoneware, one body fragment Mocha ware, one fragment coarse sand reduced fabric - Romano-British?	Romano-British  Late seventeenth-eighteenth century
<b>701</b>	1023	tobacco pipe	Two small fragments of plain bowls, 12 stem fragments.	
<b>701</b>	1026	building material	Small, undiagnostic fragments.	
<b>701</b>	1024	vessel	Two body fragments dark olive green wine bottle, one neck fragment with sheared top and applied triangular string rim. Abraded.	Eighteenth century
<b>701</b>	1025	coal	Fragment of coal	
<b>704</b>	1014	vessel	Five body fragments black-glazed redware, one fragment white moulded porcelain, one scalloped rim fragment creamware, one base fragment brown stoneware, four small body fragments slip-trailed ware, one fragment cream stoneware, one fragment salt-glazed brown stoneware, two small body fragments yellow ware, three fragments cream fabric with brown slip but greenish pale glaze, one coarse cream fabric with brown self-glaze, one fragment very hard-fired sandy oxidised dark cream fabric, one fragment unglazed redware, one base, one handle, and one rim fragment cream fabric brown slip black-glazed ware,	Sixteenth-eighteenth century?
<b>704</b>	1014	building material	Small, undiagnostic fragment	
<b>704</b>	1014	tobacco pipe	Small plain bowl fragment.	Late sixteenth-eighteenth century?
<b>704</b>	1015	tobacco pipe	One stem fragment with short spur, one heel fragment with impressed decoration, four stem fragments.	Seventeenth century

<b>704</b>	1016	vessel	Three body fragments amber-green bottle, one worn neck fragment dark olive green wine bottle	Late seventeenth century
<b>713</b>	1017	vessel	One body fragment manganese mottled ware	Eighteenth century
<b>714</b>	1009	vessel	Body fragment dark olive green wine bottle.	Eighteenth century
<b>715</b>	1019	vessel	Two small abraded body fragments oxidised orange sandy fabric with darker external surface.	Medieval
<b>766</b>	1020	building material	Small, undiagnostic fragments.	
<b>766</b>	1021	tobacco pipe	Stem fragment.	
<b>u/s</b>		vessel	Two heavily abraded body fragments in a very coarse reduced sandy fabric	Romano-British

Table 2: Finds catalogue from contexts

## 5. PALAEOENVIRONMENTAL ASSESSMENT

### 5.1 INTRODUCTION

- 5.1.1 Twelve environmental samples were taken during the strip and record for the purpose of environmental assessment and possible analysis. The samples comprised eight bulk samples for the assessment and analysis of charred and waterlogged plant remains, and four monolith samples for palynological assessment and analysis.
- 5.1.2 The bulk samples comprise four ditch fills (from ditches **713**, **716**, **725** and **720**), two posthole fills (postholes **755** and **759**), and two fills from a possible charcoal burning pit (**719**). The four monolith samples were taken from the single fills of ditches **713** and **716**, the two fills from ditch **720** and the two fills from pit **719**. Although no dating evidence has been produced from the site, the ditches are considered likely to be medieval in date. The date of the possible charcoal-burning pit is unknown but could also be medieval in date.

Feature type/No	Associated Context No	Bulk Sample No	Monolith No
Ditch <b>713</b>	<b>714</b>	8	2
Ditch <b>716</b>	<b>715</b>	9	1
Ditch <b>720</b>	<b>721</b> (secondary fill)	5	4
	<b>722</b> (primary fill)		4
Ditch <b>725</b>	<b>726</b>	6	
Pit <b>719</b>	<b>717</b> (secondary fill)	7	3
	<b>718</b> (primary fill)	12	3
Posthole <b>755</b> (part of group No <b>705</b> )	<b>756</b>	10	
Posthole <b>759</b> (part of group No <b>705</b> )	<b>760</b>	11	

Table 3: The sampled features showing associated context numbers and sample types.

5.1.3 The Research Framework for North West England states the need for considerable further work for environmental analyses, especially on deposits dated to the later prehistoric and historic periods (Chitty and Brennand 2007) plus Hall and Huntley (2007) elude to the paucity of palaeobotanical data from the North West. More specifically, Newman and Newman (2007, 99) suggest that ‘There has been little use made of palaeoenvironmental analyses to evaluate developments in land-use and resource exploitation’ for the medieval period, and this is especially true for pollen data partly due to poor preservation in the upper levels of peat deposits. Any palaeoenvironmental remains surviving in the Dunham Tank samples could help address this extreme lack of data by providing information on the agricultural/economic practices and resource exploitation in operation at the nearby settlement of Rostherne. In addition, any surviving pollen within the fills should provide information on the surrounding landscape and changes therein.

## 5.2 RESULTS OF THE PLANT REMAINS AND CHARCOAL ASSESSMENT

5.2.1 The results of the assessment are given in Table 4 (below). These show that contexts **717**, **718**, **721**, **726**, and **760** contained charred plant remains. However, only **717** and **718**, from pit **719** contained appreciable amounts. Context **717**, taken from the upper fill of pit **719**, contained common cereal grains of *Hordeum vulgare* (barley), and some possible *Triticum* sp (wheat) grains. Both fills contained a number of charred weed seeds associated with rough/waste or cultivated ground.

5.2.2 All of the contexts contained rare to frequent waterlogged plant remains, however many were likely to represent modern contaminants. All of the samples contained common to abundant coal fragments and HAVM (heat-affected vesicular material), which was especially abundant in the two posthole fills **756** and **760**. Context **760** also contained possible fragments of slag.

5.2.3 Charcoal was common to abundant in all of the contexts and comprised a range of taxa including *Alnus glutinosa*/*Corylus avellana* (alder/hazel), *Quercus* sp (oak), *Acer campestre* (field maple), and small roundwood including that of possible *Calluna vulgaris*/*Erica* sp (heather/heath). Context **714** from ditch **713**, and **718** the basal fill of pit **719** also contained one or two fragments of coniferous wood. The two pit fill contexts, **717** and **718** were especially charcoal-rich.

5.2.4 **Plant Remains and Charcoal Discussion:** given the nature of the features and their associated fills, it is likely that much of the CPR and charcoal represents general background debris, which was washed into the features during their infilling. A possible exception to this is the sample from the basal fill (**718**) of the possible charcoal-burning pit **719**, which contained plant remains incorporated into the fill along with the abundant wood or charcoal. The charcoal present within the ditches and postholes could be suggestive as to the resources available during the use of the site, however this is of limited value if no definitive function can be ascertained for those features. The abundant coal and HAVM in all of the samples, plus the identification of a possible

fragment of slag in posthole **760** may imply that some sort of industrial activity was carried out nearby, however this is tentative given the lack of other evidence.

5.2.5 The charcoal flot from the base of pit **719** was generally highly fragmented, however larger pieces (>10mm) were retained in the residue along with occasional lumps of coal and calcined bone. The form of early charcoal-burning pits were either circular if the wood is stacked, or rectangular if the wood is layered horizontally (Edlin 1949). Pit **719** was boat-shaped, and, although its use as a charcoal-burning pit is possible, it may contain the remains from some other activity, which utilised wood or charcoal.

Bulk Sample No	Associated /Context No	Feature type/No	Flot volume (ml)	Plant Remains	Charcoal	Other	Plant remains/ charcoal potential	Dating potential
5	<b>721</b>	Ditch <b>720</b>	100	CPR: weed seeds (1) Poaceae, Tubers (1); WPR (1)	(4) >2mm (2) <i>Quercus</i> , <i>Alnus/Corylus</i> incl poss <i>Calluna</i>	Modern roots (2), Coal (2), HAVM (2)	None	Yes
6	<b>726</b>	Ditch <b>725</b>	100	CPR: indet cereals (1); WPR (1)	(4) >2mm (3) <i>Quercus</i> , diffuse porous incl small roundwood	Modern roots (2), Coal (2), HAVM (3)	None	Yes
7	<b>717</b>	Pit <b>719</b>	630	CPR: Cereals (2) <i>Hordeum</i> and cf <i>Triticum</i> , weed seeds (2) Small Fabaceae, large Poaceae, Lamiaceae, unknown; WPR (2)	(4) >2mm (4) Mixed assemblage incl <i>Quercus</i> , <i>Acer</i> , <i>Prunus</i> sp, and poss <i>Calluna</i> .	Coal (3), HAVM (4)	Charcoal and CPR	Yes
8	<b>714</b>	Ditch <b>713</b>	230	WPR (2) <i>Sambucus</i>	(4) >2mm (3) Mixed assemblage incl <i>Acer</i> , <i>Alnus/Corylus</i> , <i>Quercus</i> and <i>Prunus</i> sp, coniferous wood and small roundwood	Modern roots (2), Coal (4), HAVM (4)	None	Yes
9	<b>715</b>	Ditch <b>716</b>	170	WPR (2)	(4) >2mm (3) Mostly <i>Quercus</i> . <i>Alnus/Corylus</i> incl small roundwood	Modern roots (4), Coal (3), HAVM (3)	None	Yes
10	<b>756</b>	Posthole <b>755</b>	200	WPR: (2) Chenopodiaceae	(4) >2mm (2) Diffuse porous incl <i>Alnus/Corylus</i> and small roundwood	Modern roots (4), Coal (4), HAVM (4)	None	Yes
11	<b>760</b>	Posthole <b>760</b>	150	CPR: weed seeds (1) large Poaceae; WPR: (3) Chenopodiaceae	(4) >2mm (2) Diffuse porous incl <i>Alnus/Corylus</i> and small roundwood	Modern roots (4), Coal (4), havm (4), slag? (1)	None	Yes
12	<b>718</b>	Pit <b>719</b>	1,350	CPR: weed seeds	(4) >2mm (4)	Havm (4)	Charcoal	Yes

				(3) <i>Fallopia lapathifolia</i> , Brassicaceae, Chenopodiaceae, <i>Rumex</i>	Mixed assemblage dominated by small roundwood. Incl coniferous, <i>Alnus/Corylus</i> , <i>Acer</i> , <i>Quercus</i> / <i>Fraxinus</i> and poss <i>Calluna</i>		and CPR	
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Table 4: Assessment of charred and waterlogged plant remains recorded on a scale of 1-4, where 1 is rare (up to 5 items) and 4 is abundant (>100 items). WPR = waterlogged plant remains, CPR = charred plant remains, havm = heat affected vesicular material and cbm = ceramic building material.

5.2.6 Material suitable for radiocarbon dating was recorded in all of the contexts, however, material from only one of the contexts, the basal fill from pit **719**, was securely stratified and would date its use.

### 5.3 RESULTS OF THE POLLEN ASSESSMENT

5.3.1 The data listed in Table 5 below, provides a summary of the context and depth from which samples were taken for pollen assessment, in addition to a brief lithological description and indication of pollen recovery. The data presented in Tables 6(a) – 6(d) list raw counts for total land pollen (trees, herbs, shrubs). Additional taxa, such as those indicative of environmental conditions are listed but do not comprise the main pollen sum. Charcoal fragments are recorded as present +, common ++ or abundant +++. Fungal spores are differentiated where present.

Monolith Number / Feature type and number	Associated Context No	Depth (mm)	Description	Pollen Recovery
Monolith 1, Ditch <b>716</b>	<b>701</b>	90-100	Crumbly red brown soft silt with soft sand. Occasional charcoal.	Good
Monolith 1, Ditch <b>716</b>	<b>701</b>	190-200	Crumbly red brown soft silt with soft sand. Occasional charcoal.	Good
Monolith 1, Ditch <b>716</b>	<b>715</b>	290-300	As above but with small stones.	Moderate / Good
Monolith 1, Ditch <b>716</b>	<b>715</b>	330-340	As above but with small stones.	Good
Monolith 2, Ditch <b>713</b>	<b>701</b>	90-100	Red/brown crumbly slightly sandy-clay silt with pebbles.	Moderate
Monolith 2, Ditch <b>713</b>	<b>701</b>	190-200	Red/brown crumbly slightly sandy-clay silt with pebbles.	Moderate
Monolith 2, Ditch <b>713</b>	<b>701</b>	290-300	Red/brown crumbly slightly sandy-clay silt with pebbles.	Good
Monolith 2, Ditch <b>713</b>	<b>714</b>	430-440	As above but with some larger pebbles	Poor
Monolith 3, Pit <b>719</b>	<b>717</b>	140-150	Crumbly mottled red/light brown clay silt with charcoal and small pebbles.	Moderate

Monolith 3, Pit <b>719</b>	<b>717</b>	240-250	Crumbly mottled red/light brown clay silt with charcoal and small pebbles.	Poor
Monolith 3, Pit <b>719</b>	<b>717</b>	390-400	Crumbly mottled red/light brown clay silt with charcoal and small pebbles.	Poor
Monolith 3, Pit <b>719</b>	<b>718</b>	540-550	Black wood /charcoal.	Poor
Monolith 4, Ditch <b>720</b>	<b>721</b>	130-140	Red/brown mottled silt clay with occasional stones.	Good
Monolith 4, Ditch <b>720</b>	<b>722</b>	230-240	Increasingly humic grey clay, traces of charcoal and some sand.	Good
Monolith 4, Ditch <b>720</b>	<b>722</b>	290-300	Increasingly humic grey clay, traces of charcoal and some sand.	Good
Monolith 4, Ditch <b>720</b>	<b>722</b>	330-340	Increasingly humic grey clay, traces of charcoal and some sand.	Good

Table 5: Lithology of monolith samples and summary of pollen potential

- 5.3.2 **Monolith 1, Ditch 716, Contexts 701 and 715:** the pollen recovery from this ditch was very good with 75% of samples productive for full analysis and 25% possible for full analysis. The pollen spectra indicate damp meadow environments. Abundant grass pollen was recorded and meadowsweet, dandelions, daisies, buttercups, sedges and bog moss spores were present. Evidence of cultivation was suggested by recovery of cereal-type pollen. Areas of nearby woodland/scrub cover were indicated by significant quantities of alder/hazel pollen, with other tree pollen types present in lower quantities. Pondweed and bullrush pollen provide evidence for standing water in the area.
- 5.3.3 Fungal spores were not recorded in abundance within these samples but the presence of Fungal Type 4 (*Anthostomella*) may indicate wetter environments often associated with sedges (Blackford *et al* 2006). *Podospora* fungal spores (although again present in very low numbers) are often found in sites associated with animals or people (van Geel and Aptroot 2006).
- 5.3.4 **Monolith 2, Ditch 713, Contexts 701 and 714:** the preservation of the palynomorphs within the ditch proved fair rather than good because so many of the grains were damaged/broken. Two of the four samples would provide sufficient data for full analysis, although the sample at 90-100mm also yielded abundant reworked Carboniferous spores and pollen (possibly derived from pebbles). The pollen indicated open grassy meadows with some nearby cereal cultivation and a background cover of alder/hazel woodland.
- 5.3.5 Interestingly, a greater diversity of fungal spores has been recorded from this ditch. *Gelasinospora* spp have been linked with microcharcoal recovery and charred plant remains (Simmons and Innes 1996; Innes *et al* 2004) and Type 6 has also been associated with increased charcoal content (Blackford *et al* 2006). Type 18 has been used to infer wetter conditions and *Diporotheca* spp are generally found in wet environments (van Geel 1986). Type 172 is best seen as a “background” indicator of decaying wood, common on dung and wood (Innes and Blackford 2003).

**5.3.6 Monolith 3, Pit 719, Contexts 717 and 718:** only the top sample from the pit proved productive enough for possible full analysis. The palynomorphs indicate similar environmental conditions to those already elucidated for the ditches (above). A dominantly grassy meadow with a diverse herb flora was recorded. Crop cultivation was indicated by the presence of cereal-type grains. Bulrush provides evidence for wetter (standing water) environments. The dominant tree/shrub cover was provided by alder with subsidiary amounts of hazel and heather.

Context No		701	701	701	715
PRESERVATION		<i>Good</i>	<i>Good</i>	<i>Good</i>	<i>Good</i>
POTENTIAL		<i>Yes</i>	<i>Yes</i>	<i>Possible</i>	<i>Yes</i>
Depth (mm)		90-100	190-200	290-300	330-340
TREES/SHRUBS					
<i>Alnus</i>	Alder	4	9	8	8
<i>Acer</i>	Sycamore / Field Maple	1	-	-	-
<i>Betula</i>	Birch	-	1	1	-
<i>Tilia</i>	Lime	-	1	-	-
<i>Quercus</i>	Oak	1	-	-	-
<i>Calluna</i>	Heather	-	-	1	-
<i>Corylus</i>	Hazel	7	6	5	14
<i>Rubus</i>	Blackberry	1	1	-	-
<i>Salix</i>	Willow	1	-	-	-
CROP PLANTS					
<i>Cerealia</i>	Cereal-type	3	1	-	1
HERBS					
<i>Aster</i> type	Daisy-type	11	6	2	3
Brassicaceae	Cabbage family	4	5	3	6
Caryophyllaceae	Pink family	-	-	2	2
Cyperaceae	Sedge	2	5	1	-
<i>Filipendula</i>	Meadowsweet	-	1	-	-
<i>Plantago lanceolata</i>	Ribwort Plantain	1	1	1	1
<i>Plantago major/media</i>	Greater/Hoary Plantain	-	1	-	4
Poaceae	Grass Family	66	49	41	50
<i>Ranunculus</i> -type	Buttercup	-	-	1	1
<i>Taraxacum</i> -type	Dandelion type	13	13	10	8
<i>Urtica</i>	Nettle	1	-	-	-
<i>Vicia</i> -type	Vetch-type				2
Unknown herbs		2	1	-	-
	Total land pollen	<b>116</b>	<b>100</b>	<b>76</b>	<b>100</b>
	Number of traverses	4	4	10	3
FERNS & MOSSES					
<i>Polypodium</i>	Undifferentiated fern spores	1	1	-	3
<i>Pteridium</i>	Bracken	1	-	-	-
<i>Pteropsida</i> (monoete)	Undifferentiated fern spores	-	-	4	5
<i>Sphagnum</i>	Bog moss spores	2	3	1	1
Broken grains		15	8	8	2
Concealed grains		-	5	5	1
Corroded grains		-	-	-	-
Crumpled grains		1	-	-	-
AQUATICS					
<i>Potamogeton</i>	Pondweeds	-	3	-	-
<i>Typha angustifolia</i>	Lesser Bulrush	-	-	3	-

Microscopic charcoal		+	-	+	+
Fungal spores					
Type 4		3	1	-	-
Podospora		1	-	1	1
Reworked pollen		-	-	1	-

Table 6(a): Raw counts for the pollen from Monolith 1: Ditch **716** (Contexts **701** and **715**)

Context No		701	701	701	714
PRESERVATION		<i>Fair</i>	<i>Fair</i>	<i>Fair</i>	<i>Good</i>
POTENTIAL		<i>Good/Poss.</i>	<i>Possible</i>	<i>Good</i>	<i>No</i>
Depth (mm)		90-100	190-200	290-300	430-440
TREES/SHRUBS					
<i>Alnus</i>	Alder	2	5	10	2
<i>Acer</i>	Sycamore / Field Maple	-	1	1	-
<i>Betula</i>	Birch	1	-	-	-
<i>Tilia</i>	Lime	-	-	-	-
<i>Quercus</i>	Oak	1	-	-	-
<i>Calluna</i>	Heather	1		4	2
<i>Corylus</i>	Hazel	7	6	11	2
<i>Rubus</i>	Blackberry	-	-	-	-
<i>Salix</i>	Willow	1	-	2	1
<i>Sambucus</i>	Elder	1	-	-	-
CROP PLANTS					
<i>Cereal</i>	Cereal-type	2	-	1	-
HERBS					
Aster type	Daisy-type	13	3	5	4
Brassicaceae	Cabbage family	6	1	3	-
Caryophyllaceae	Pink family	5	2	-	-
Cyperaceae	Sedge	-	1	-	-
<i>Filipendula</i>	Meadowsweet	-	-	-	-
<i>Plantago lanceolata</i>	Ribwort Plantain	-	1	2	-
<i>Plantago major/media</i>	Greater/Hoary Plantain	-	-	-	-
Poaceae	Grass Family	35	30	47	9
<i>Ranunculus</i> -type	Buttercup	-	-	-	-
<i>Taraxacum</i> -type	Dandelion type	5	11	13	2
<i>cf. Trifolium</i> -type	Clover	-	-	2	-
<i>Urtica</i>	Nettle	1	-	-	-
<i>Vicia</i> -type	Vetch-type				
Unknown herbs					
	Total land pollen	<b>91</b>	<b>61</b>	<b>101</b>	<b>22</b>
	Number of traverses	10	10	9	5
FERNS & MOSSES					
<i>Polypodium</i>	Undifferentiated fern spores	1	2	-	-
<i>Pteridium</i>	Bracken	6	7	8	11
<i>Pteropsida</i> (monoete)	Undifferentiated fern spores	3	2	5	4
<i>Sphagnum</i>	Bog moss spores	3	1	6	2
Broken grains		2	3	17	4
Concealed grains		5	-	4	-
Corroded grains		-	-	6	1
Crumpled grains		-	1	-	1
AQUATICS					
<i>Potamogeton</i>	Pondweeds	-	-	-	-
<i>Typha angustifolia</i>	Lesser Bulrush	-	-	-	-
Microscopic charcoal		++	++	++	

Fungal spores					
Type 4		11	-	8	-
Podospora spp.		6	5	2	-
Type 6		9	-	1	-
Diporotheca spp.		3	-	1	-
Gelasinospora		1	-	-	-
Type 191		5	-	-	-
Type 18		-	1	-	-
Type 172		-	2	-	-
Reworked pollen		194			

Table 6(b): Raw counts for the pollen from Monolith 2: Ditch **713** (Contexts **701** and **714**)

Context No		<b>717</b>	<b>717</b>	<b>717</b>	<b>718</b>
PRESERVATION		<i>Fair</i>	<i>Fair</i>	<i>Fair</i>	-
POTENTIAL		<i>Possible</i>	<i>No</i>	<i>No</i>	<i>No</i>
Depth (mm)		140-150	240-250	390-400	540-550
TREES/SHRUBS					
<i>Alnus</i>	Alder	10	1	3	-
<i>Acer</i>	Sycamore / Field Maple	1	-	-	-
<i>Betula</i>	Birch	-	-	1	-
<i>Tilia</i>	Lime	-	-	-	-
<i>Quercus</i>	Oak	-	-	-	-
<i>Calluna</i>	Heather	-	-	4	-
<i>Corylus</i>	Hazel	2	6	5	-
<i>Rubus</i>	Blackberry	-	-	-	-
<i>Salix</i>	Willow	-	-	-	-
<i>Sambucus</i>	Elder	-	-	-	-
CROP PLANTS					
<i>Cerealia</i>	Cereal-type	2	-	-	-
HERBS					
<i>Aster</i> type	Daisy-type	3	1	1	-
Brassicaceae	Cabbage family	1	1	-	-
Caryophyllaceae	Pink family	1	-	-	-
Cyperaceae	Sedge	2	-	1	-
<i>Filipendula</i>	Meadowsweet	-	-	-	-
<i>Plantago lanceolata</i>	Ribwort Plantain	-	-	-	-
<i>Plantago major/media</i>	Greater/Hoary Plantain	1	3	-	-
Poaceae	Grass Family	57	5	17	-
<i>Ranunculus</i> -type	Buttercup	1	-	-	-
<i>Taraxacum</i> -type	Dandelion type	6	1	1	-
<i>cf. Trifolium</i> -type	Clover	-	-	-	-
<i>Urtica</i>	Nettle	-	-	-	-
<i>Vicia</i> -type	Vetch-type	2	-	1	-
Unknown herbs					
	Total land pollen	<b>89</b>	<b>18</b>	<b>34</b>	<b>0</b>
	Number of traverses	10	5	10	5
FERNS & MOSSES					
<i>Polypodium</i>	Undifferentiated fern spores	3	-	1	-
<i>Pteridium</i>	Bracken	1	-	-	-
<i>Pteropsida</i> (monolete)	Undifferentiated fern spores	3	-	-	-
<i>Sphagnum</i>	Bog moss spores	1	-	-	-
Broken grains		10	2	2	-
Concealed grains		1	3	1	-
Corroded grains		-	-	-	-
Crumpled grains		8	-	-	-
AQUATICS					
<i>Potamogeton</i>	Pondweeds	-	-	-	-

<i>Typha angustifolia</i>	Lesser Bulrush	6	-	-	-
Microscopic charcoal		+	+	-	++
Fungal spores					
Type 4		-	1	-	-
Podospora spp.		-	-	-	-
Type 6		-	-	-	-
Diporotheca spp.		-	-	-	-
Gelasinospora		-	-	-	-
Type 191		-	-	-	-
Type 18		-	-	-	-
Type 172		-	-	-	-
Reworked pollen		-	1	-	-

Table 6(c): Raw counts for the pollen from Monolith 3, Pit **719** (Contexts **717** and **718**)

Context No		721	722	722	722
PRESERVATION		<i>Fair</i>	<i>Good</i>	<i>Fair</i>	<i>Fair</i>
POTENTIAL		<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Depth (mm)		103-140	230-240	290-300	330-340
TREES/SHRUBS					
<i>Alnus</i>	Alder	25	26	33	18
<i>Acer</i>	Sycamore / Field Maple	-	-	1	1
<i>Betula</i>	Birch	-	1	-	-
<i>Tilia</i>	Lime	-	-	-	1
<i>Quercus</i>	Oak	-	-	-	1
<i>Fraxinus</i>	Ash	2	-	-	-
<i>Pinus</i>	Pine	-	-	-	1
<i>Calluna</i>	Heather	3	2	5	2
<i>Corylus</i>	Hazel	19	29	22	20
<i>Rubus</i>	Blackberry	-	-	-	-
<i>Salix</i>	Willow	-	-	1	-
<i>Sambucus</i>	Elder	-	-	-	-
CROP PLANTS					
<i>Cerealia</i>	Cereal-type	1	1	4	1
HERBS					
<i>Aster</i> type	Daisy-type	-	1	1	-
Brassicaceae	Cabbage family	1	-	-	-
Caryophyllaceae	Pink family	3	-	-	-
Cyperaceae	Sedge	-	1	1	-
<i>Filipendula</i>	Meadowsweet	1	-	-	-
<i>Plantago lanceolata</i>	Ribwort Plantain		1	1	1
<i>Plantago major/media</i>	Greater/Hoary Plantain	1	1	-	-
Poaceae	Grass Family	42	38	37	59
<i>Ranunculus</i> -type	Buttercup	-	-	-	-
<i>Taraxacum</i> -type	Dandelion type	-	-	1	1
cf. <i>Trifolium</i> -type	Clover	-	-	-	-
<i>Urtica</i>	Nettle	-	-	-	-
<i>Vicia</i> -type	Vetch-type	-	-	-	-
<i>Mentha</i> -type	Mint family	1	-	-	-
<i>Succisa</i>	Scabious	1	-	-	-
Chenopodiaceae	Goosefoot family	-	1	1	-
<i>Lathyrus</i> -type	Pea family	-	1	-	-
Unknown herbs					
	Total land pollen	<b>100</b>	<b>103</b>	<b>102</b>	<b>106</b>

	Number of traverses	3	2	1	3
<b>FERNS &amp; MOSSES</b>					
<i>Polypodium</i>	Undifferentiated fern spores	-	2	4	4
<i>Pteridium</i>	Bracken	1	-	-	-
<i>Pteropsida</i> (monoete)	Undifferentiated fern spores	1	-	-	-
<i>Sphagnum</i>	Bog moss spores	-	1	1	-
Broken grains		6	6	11	9
Concealed grains		7	-	-	3
Corroded grains		-	-	-	-
Crumpled grains		1	9	8	5
<b>AQUATICS</b>					
<i>Potamogeton</i>	Pondweeds	-	-	-	-
<i>Typha angustifolia</i>	Lesser Bulrush	1	-	-	-
Microscopic charcoal		+	+	+	+
<b>FUNGAL SPORES</b>					
Type 4					
<i>Podospora</i> spp.		1	-	-	-
Type 6		-	-	-	-
<i>Diporothea</i> spp.		-	-	-	-
<i>Gelasinospora</i>		-	-	-	-
Type 191		-	-	-	-
Type 18		-	-	-	-
Type 172		-	-	-	-
Reworked pollen					

Table 6(d): Raw counts for the pollen from Monolith 4, Ditch 720 (Contexts 721 and 722)

5.3.7 **Monolith 4, Ditch 720, Contexts 721 and 722:** all the samples from this ditch would be suitable for full analysis. Pollen preservation was generally fair – good (many of the grains were fragmented or broken). Pollen showed a slightly denser tree/shrub cover than seen in the other ditches, in particular hazel and heather and a greater variety of tree pollen types (including alder, oak, pine, lime, birch and sycamore). Cereal pollen was again present, suggesting land cultivation. A diversity of meadow/pasture plants, such as pea, scabious and mint, were also recorded.

5.3.8 **Pollen Discussion:** pollen assessed from each of the ditches provides a similar vegetational record of damp meadows and grassland with some tree/shrub cover and possibly cereal cultivation. The best recovery is undoubtedly from Monolith 4, ditch 720, contexts 721 and 722. Full analysis of this monolith would provide detailed information supporting and enhancing the assessment findings. Results for Monolith 1, ditch 716, contexts 701 and 715 are similar to those for Monolith 4, but with some environmental differences such as greater diversity of herb flora in Monolith 1, and greater tree pollen density in Monolith 4. Samples from Monolith 3, pit 719, contexts 717 and 718, proved the least productive and further analysis would not add substantially to what is already known.

5.3.9 Monolith 2 is potentially interesting because of the variety (albeit relatively low numbers) of fungal spores present in the assemblage. Fungi are adapted to

living on specific substrates such as coprolite, rotting wood, fire and host plants, and can provide a very local signal of any given environment (Blackford *et al* 2006). Coprophilous fungi are of particular use in environmental reconstruction because they may provide indicators of herbivore density and land-use, such as manuring (Davis and Shafer 2006) or the extent to which a landscape has been grazed or burned. Fire is key to the life cycle of carbonicolous fungi – it provides the substrate they grow on, so some types of fungal spores can be used to identify fire events in archaeological records. Fungal spores can provide information about the health, composition and ecological condition of woodlands, as some fungal types can exert a pathogenic influence on tree populations. Fungal data can help to understand human presence and land-use practices in archaeological settings (Hoaen and Coles 2000).

## 5.4 PALAEOENVIRONMENTAL CONCLUSION

- 5.4.1 The assessment of the plant remains, charcoal and pollen data from the bulk samples and monolith samples complement each other very well. The pollen data supports the tree and shrub types identified during the charcoal assessment, and confirm the presence of *Calluna vulgaris* (heather). Conversely, the assessment of the plant remains identified particular cereal types, thus improving the accuracy of the pollen assessment work. The fungal spores identified in Monolith 2 contribute additional detail to the palaeoecology of ditch **713**, whereas the CPR data from the two pit fills, **718** and **717**, provided palaeoecological data in the absence of good pollen recovery from Monolith 3.
- 5.4.2 It has been tentatively suggested that Pit **719** was possibly utilised as a charcoal-burning pit, although its unusual shape suggests it may contain the remains from some other activity, which utilised wood or charcoal. Therefore, although the preserved state of the charred material would allow further work, due to the uncertainty of the function of the pit it does not warrant full analysis. Similarly, although the preservation of the pollen and other microspores is suitable for further analysis, none of the ditches are thought to be of such significance archaeologically to warrant this.

## 6. DISCUSSION

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### 6.1 INTRODUCTION

- 6.1.1 The archaeological programme comprised three distinct elements of fieldwork - the evaluation, watching brief, and strip and record investigation. Most of the features of archaeological interest encountered throughout the investigations were revealed during the strip and record investigations. The length and linear nature of the pipeline route does not allow direct relationships to be made between archaeological features encountered along the route, and therefore a separate discussion is presented for each element of the fieldwork.

### 6.2 EVALUATION TRENCHING (CHESTER TO MANCHESTER ROMAN ROAD)

- 6.2.1 *Evaluation of the Chester to Manchester Roman Road:* no archaeological evidence for a Roman road was encountered. The Dunham Road (A556), alongside which the evaluation trenching was located, bows slightly to the east, and it is possible that the original route of the Roman road followed the bow of the current road. This was cartographically depicted at least as early as the tithe map of 1848 and the Dunham Massey tithe map of 1839, and did not ever lie as far to the west as the evaluation area.
- 6.2.2 Indeed, the Dunham Massey tithe map of 1839, and the OS maps of 1872 and 1909, depicted stream channels within the area avoided by the bowed road, both to the north and south of the River Bollin, which demonstrate that a straight road in the late nineteenth century would have encountered wet ground. The southernmost of these stream channels corresponds precisely with the point of diversion from the straight line of the road. The antiquity of the northernmost stream channel is suggested by the occurrence on the tithe map of the field names of Clough Wood and Clough Field, which are likely to derive from the Old English '*cloh*', relating to a slight valley or stream channel (see Gelling 1984, 88). The waterlogged tendency of the locale is also suggested by the field name Little Moor, which is also depicted on the Dunham Massey tithe map of 1839.
- 6.2.3 It is tentatively suggested that the Roman road bowed to the east to avoid the valley or stream channel, and is therefore located within the line of the modern road.
- 6.2.4 During the evaluation, a sherd of pottery of possible seventeenth-century date was revealed within a layer of sterile sand in Trench 1. It is possible that this layer might represent an imported make-up deposit, although it is also possible that the sherd was intrusive in a natural context, or that the layer represented a sandy subsoil. The ruined foundations of a building were observed within a narrow wooded strip immediately to the south of Trench 1 and, if this layer was associated with landscaping, it is possible that it was associated with this structure. Historic OS mapping of 1975 showed a lodge within this wooded area, although this structure had not been depicted on the Dunham Massey tithe map of 1839. The pottery might, therefore, have been associated with activity undertaken at the probable late nineteenth-century lodge or,

alternatively, might be the result of manuring practices associated with arable cultivation.

### **6.3 WATCHING BRIEF**

- 6.3.1 All of the archaeological features encountered during the watching brief were agricultural in nature. The finds assemblage, which included pottery, clay pipe, metalwork and building material, ranged in date from the seventeenth to nineteenth centuries. However, a few sherds of Romano-British pottery were retrieved, but unfortunately these were unstratified finds. A further object with early origins was water-worn pink granite pebble with a heavily pecked surface, suggesting that it could have seen use as a hammer stone, presumably at a relatively early date.
- 6.3.2 The results of the watching brief largely correspond with the findings of the documentary research, which suggests largely rural landscapes from the early medieval period onwards.

### **6.4 STRIP AND RECORD INVESTIGATION**

- 6.4.1 Although a number of archaeological features (ditches and pits) were encountered, there were very few demonstratable stratigraphic relationships between the features. Therefore, it is not possible to compile a reliable phasing. Similarly, it was difficult to ascribe a specific function to the features and what follows is a tentative interpretation of the site. The finds assemblage was mixed date, most producing material of late seventeenth to late nineteenth-century date.
- 6.4.2 Of particular interest is pit **719** which featured a charcoal-rich basal fill, suggestive of charcoal production. However, the form of early charcoal-burning pits were either circular if the wood is stacked, or rectangular if the wood is layered horizontally (Edlin 1949). Pit **719** was boat-shaped, and, although its use as a charcoal-burning pit is possible, it may contain the remains from some other activity, which utilised wood or charcoal.
- 6.4.3 Although direct dates have not been derived from ditch **725**, pit **719**, and possible pits **730** and **727**, it is possible, as a result of their misalignment with historic field boundaries, that they represent the earliest encountered features at the site, and might pre-date the historically and archaeologically attested field sub-divisions in this area.
- 6.4.4 Cartographic evidence would suggest that the remaining ditches **703**, **713**, **716**, **720**, **725**, and **771** pre-date the construction of New Road. The depiction of the fields lying to the north-east of Rostherne Lane on the tithe map of 1848, shows a series of four parallel strip fields with the slightly curving shapes typical of medieval ploughing. Such an apparently early style of cultivation in the near vicinity, might suggest that medieval cultivation was also undertaken within this field. If this was the case, then ditches **703**, **713**, **716**, and **771** might represent the boundaries of medieval strip fields, which would account for the slight curvature that was observed within ditch **703**. The ditches also appear to share a similar alignment as those strip fields to the north of

Rostherne Lane. Ditch **703** appears to represent the continuation of a shortened field that was depicted on the tithe map and OS First Edition 1872 map. Although the curvature observed as a feature of this ditch was not noted as a characteristic of the other ditches, the length of the exposed portions of each ditch did not exceed 13m and, unless the end of a boundary was revealed, such curving would be not necessarily be conspicuous within such short stretches.

- 6.4.5 If these fields are of medieval origin then it is possible that they pre-date the field sub-division represented by New Road. Indeed, it is possible that the location and orientation of New Road was influenced by the presence of strip fields in this area. This suggested antiquity for these field boundaries might account for their extinction prior to the production of the nineteenth-century mapping.
- 6.4.6 The northern edge of the ditch **713** was ill-defined and irregular, and was filled with darker soil than the southern side of the ditch. This suggests that vegetation had been present at this side of the ditch and that the associated root action had damaged this edge of the ditch. This implies that a hedge, likely to have been associated with an upcast bank, had been present along this edge of the ditch and, therefore, that the feature is likely to have represented a boundary, in addition to any drainage function. It is possible therefore, that the northernmost ditch represented the earlier of the two features (**713** and **716**) and that the remnants of hedging might have continued to preserve the general line of the boundary after the ditch had become entirely infilled. This would have provided a rough guide for the re-establishment of a ditch, that would not necessarily have precisely conformed with the original alignment.
- 6.4.7 Ditch **720** is likely to represent the continuation of a field boundary that was depicted on the tithe map and on the OS mapping of 1909, and which featured a slightly different alignment to ditches **703**, **713**, **716**, and **771**. The survival of the north-eastern end of this boundary into the present day, and the misalignment with the possible medieval boundaries, suggests that this ditch represents the imposition of newly aligned plots that post-dated the medieval field systems.
- 6.4.8 The line of postholes (**705**) coincides with the location of a former field boundary that was shown on the tithe map of 1848, and was present until at least as late as an oblique aerial photograph from 1951, which is displayed in Rostherne Hall.

## **6.5 RECOMMENDATIONS**

- 6.5.1 The archaeological programme of work undertaken to date has served to provide a comprehensive record of the archaeological sites, both known and previously unknown, which affected by the pipeline works. Therefore, no further archaeological investigations are recommended for this route.
- 6.5.2 The palaeoenvironmental assessment undertaken demonstrated the potential for a programme of analysis of the charred plant remains and charcoal from pit **719**, which could shed light on the function of the feature and, potentially, on any woodland management undertaken in the landscape. The assessment also demonstrated the potential to undertake pollen analysis of the fills from

ditches **713** and **720**. However, these analyses are not recommended due to the uncertainty in the function of the pit, and the low significance of the ditches.

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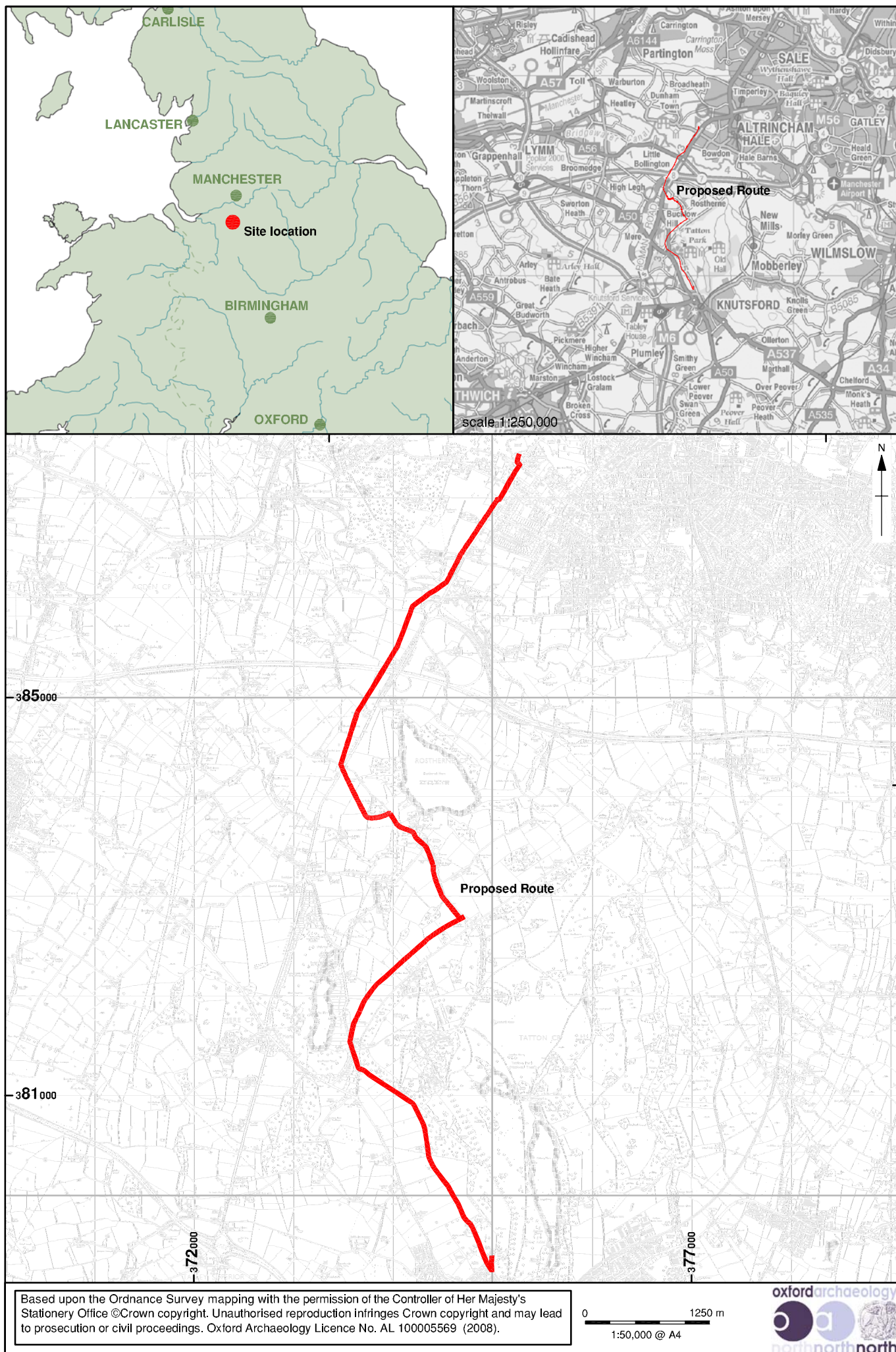
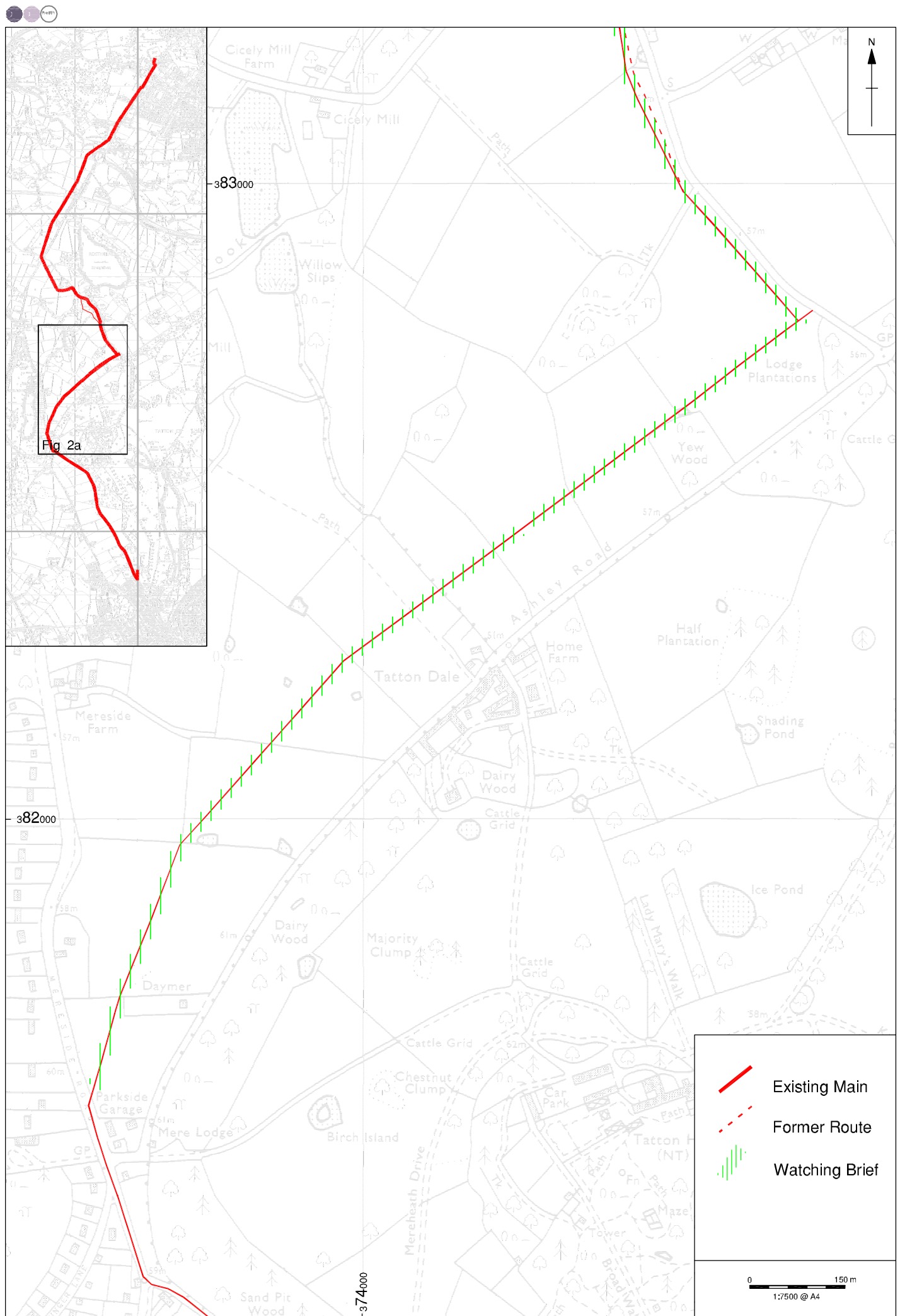


Figure 1: Site location



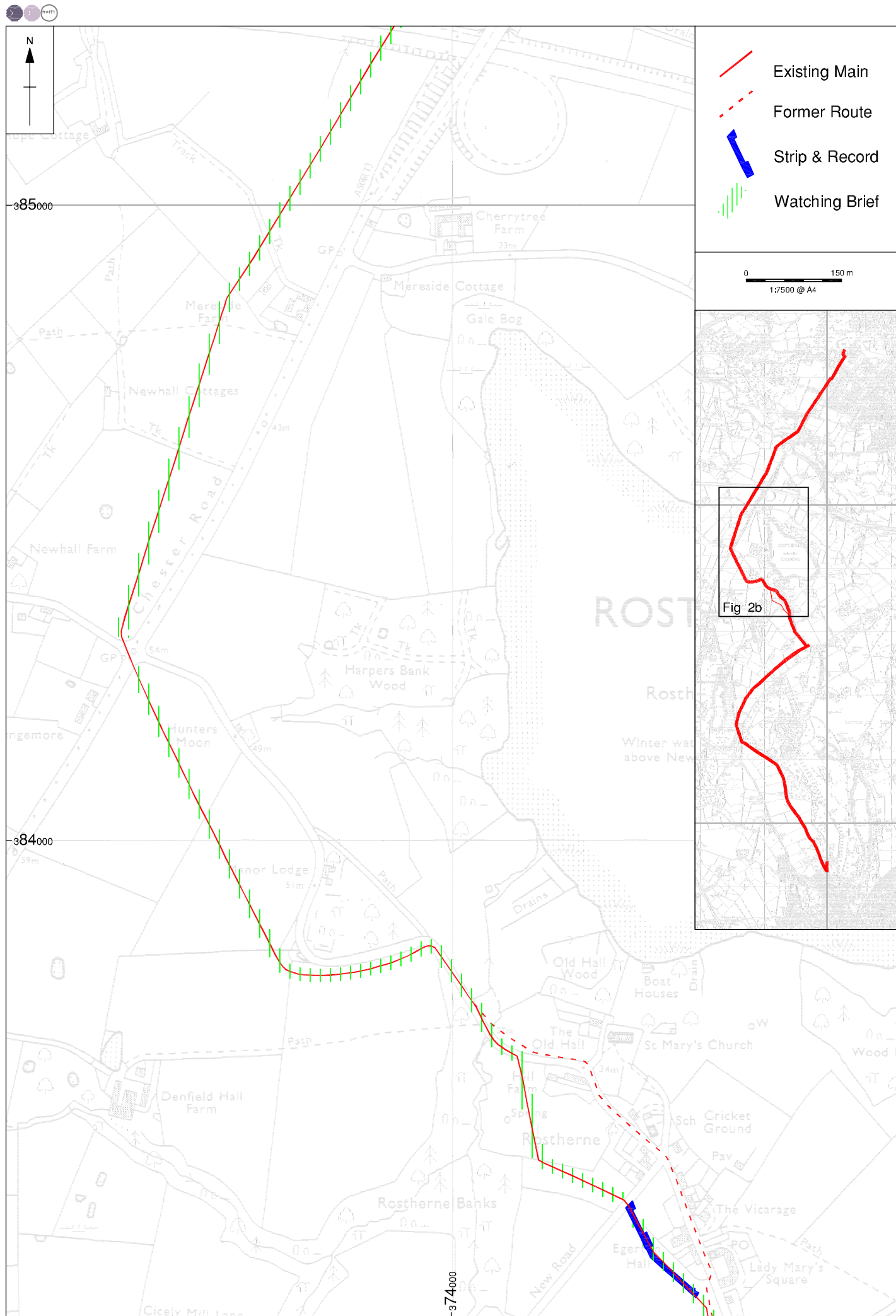


Figure 2b: Location of archaeological investigations (central)

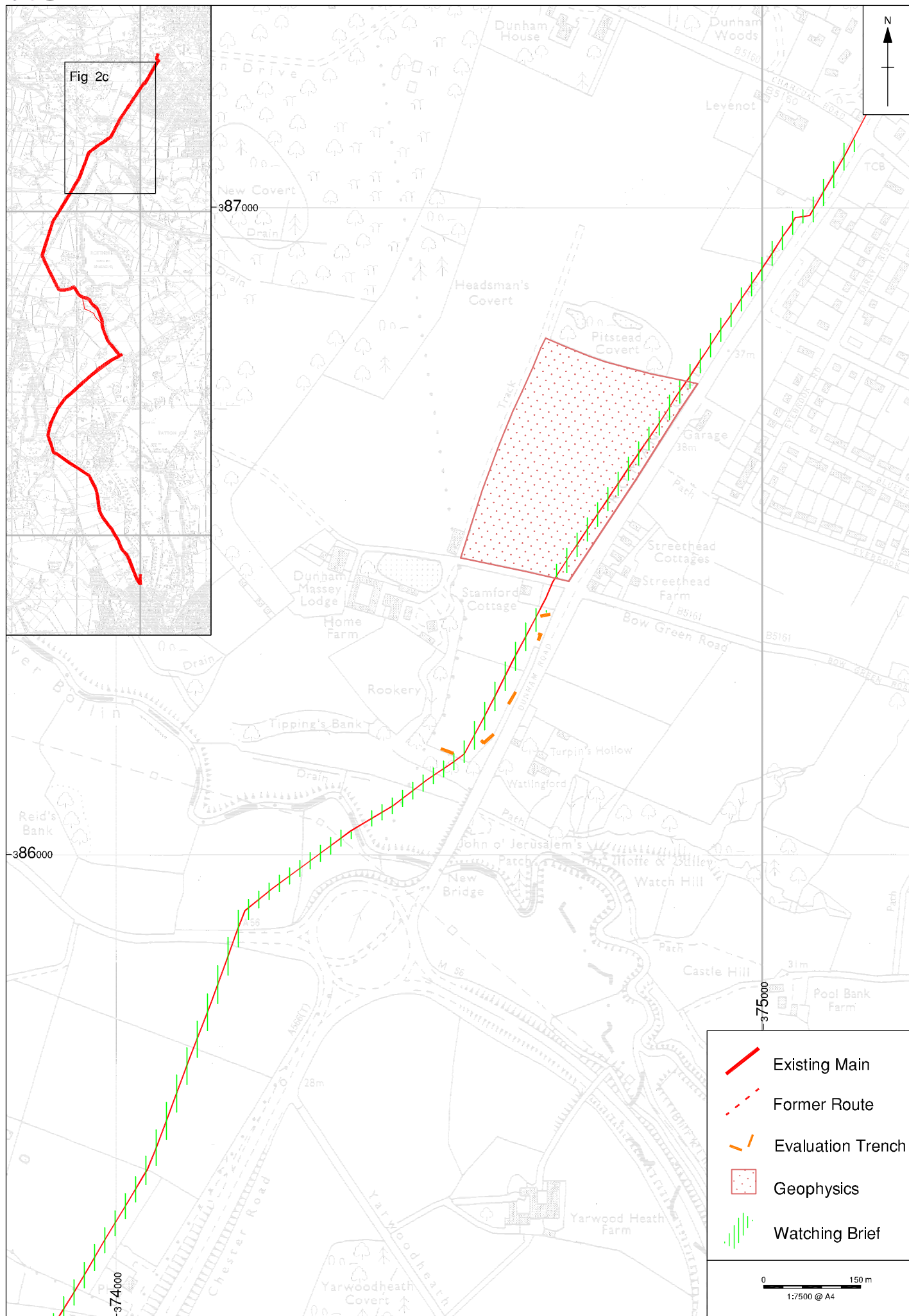


Figure 2c: Location of archaeological investigations (north)

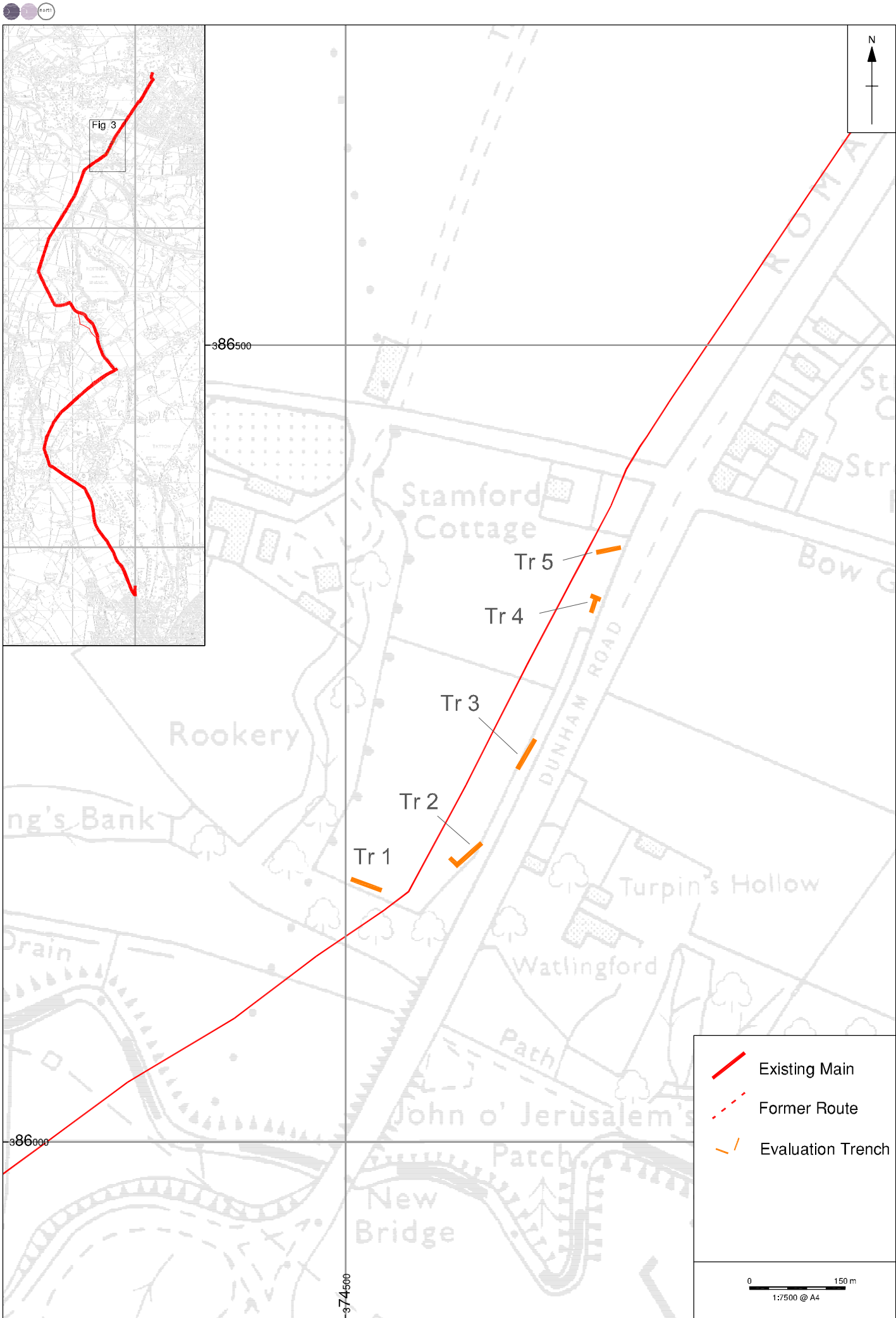


Figure 3: Location of evaluation trenches

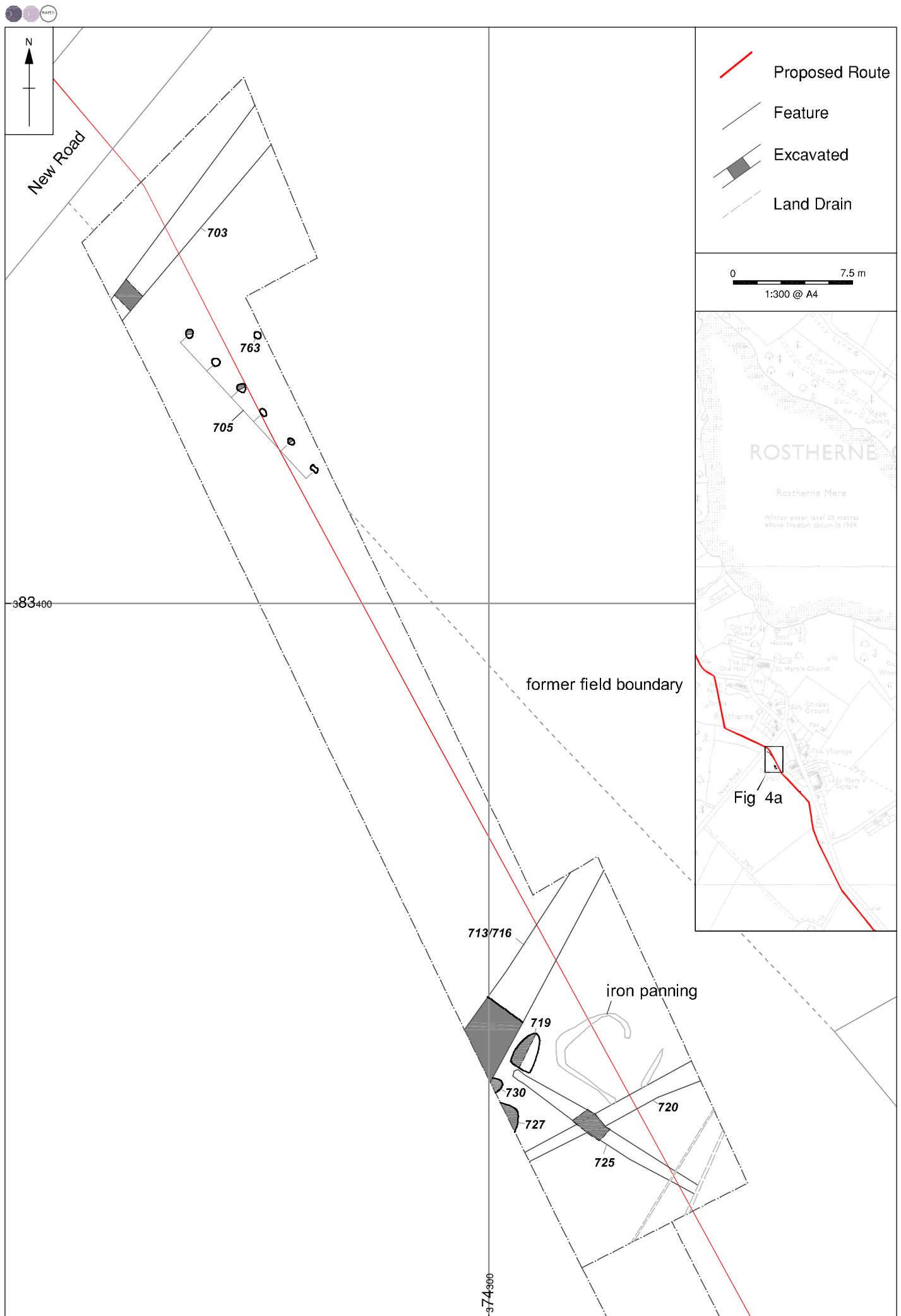


Figure 4a: Results of the strip and record investigation (north)

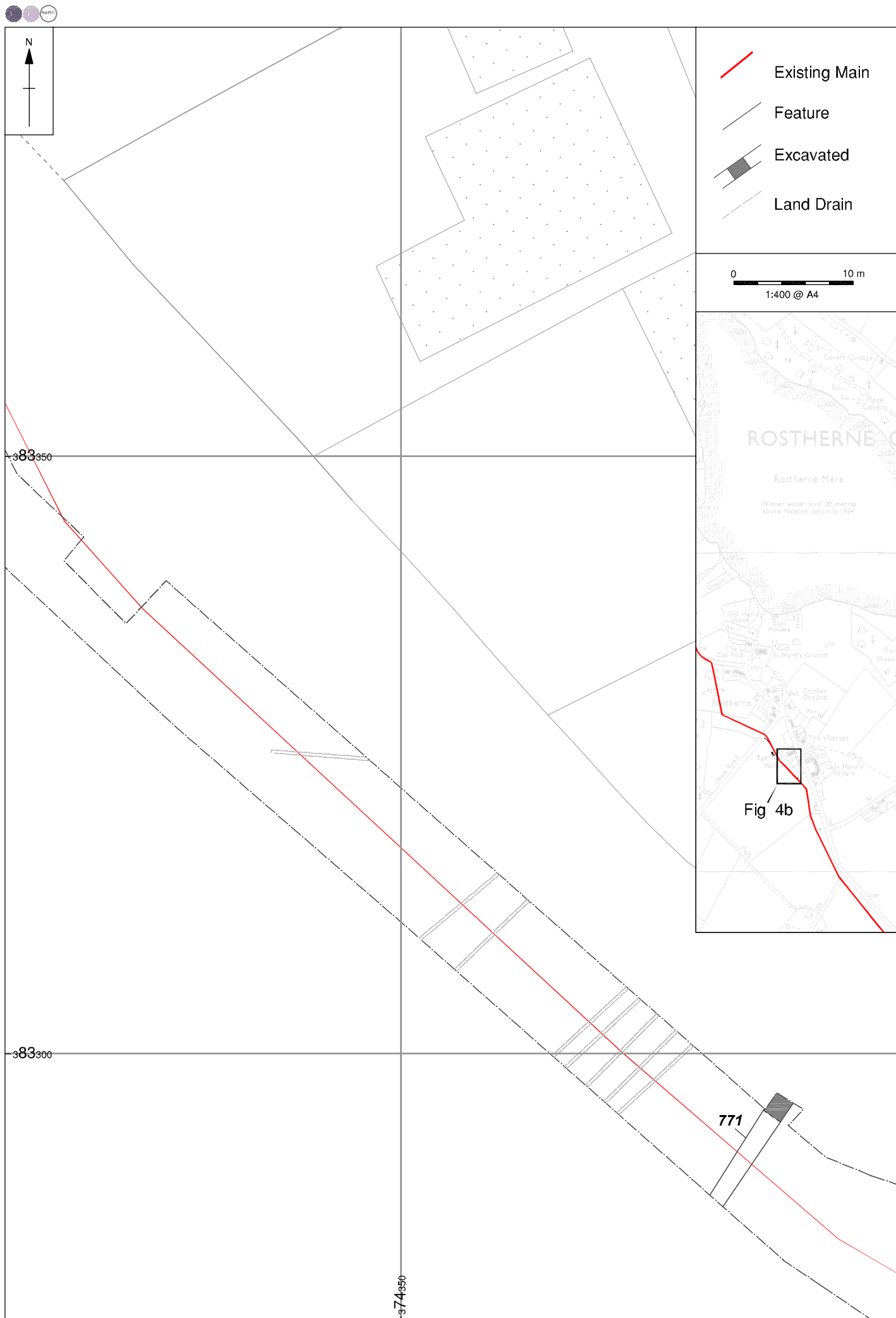


Figure 4b: Results of the strip and record (south)

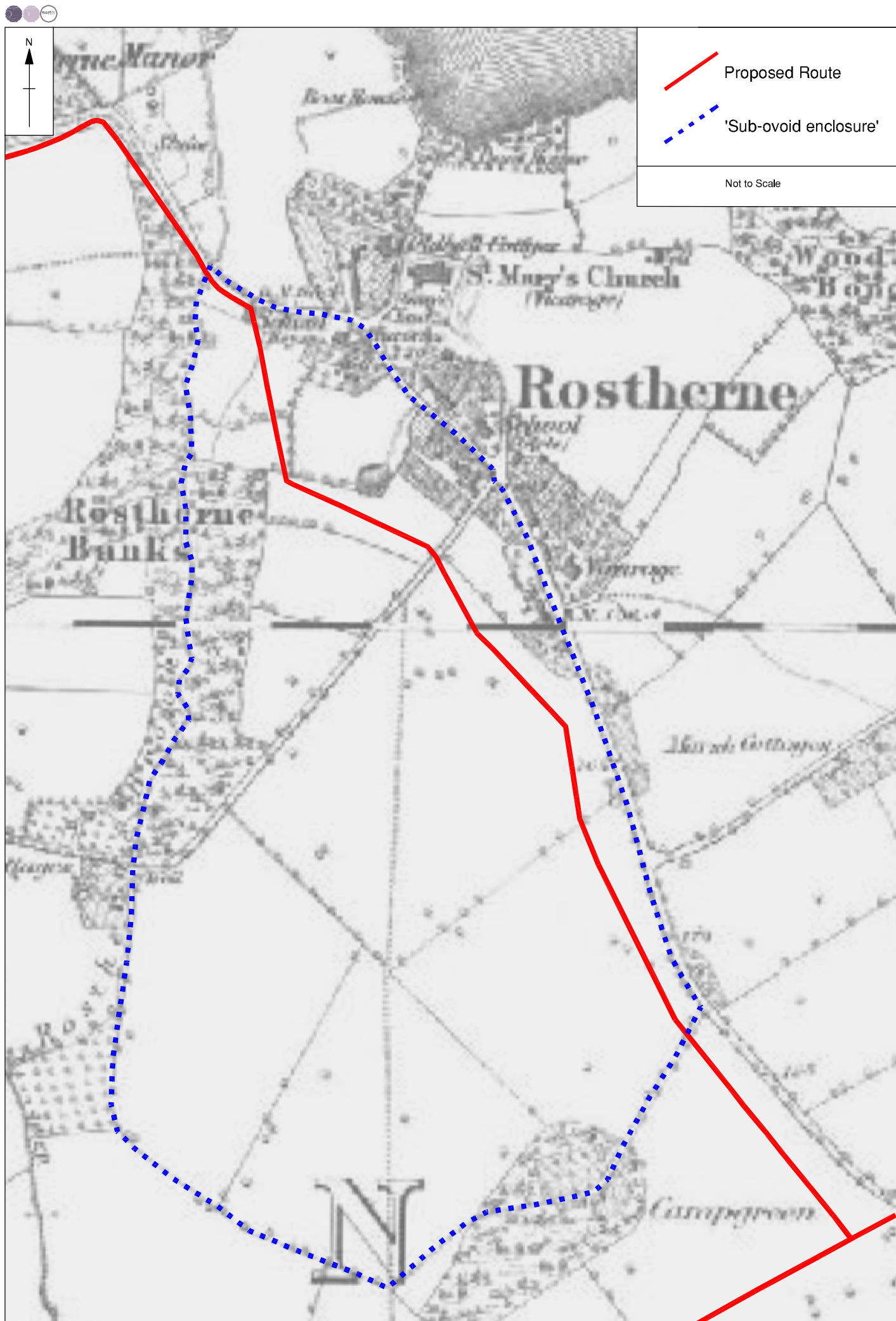


Figure 5: Rostherne, as depicted on the Ordnance Survey First Edition 6"- 1 mile map, 1872

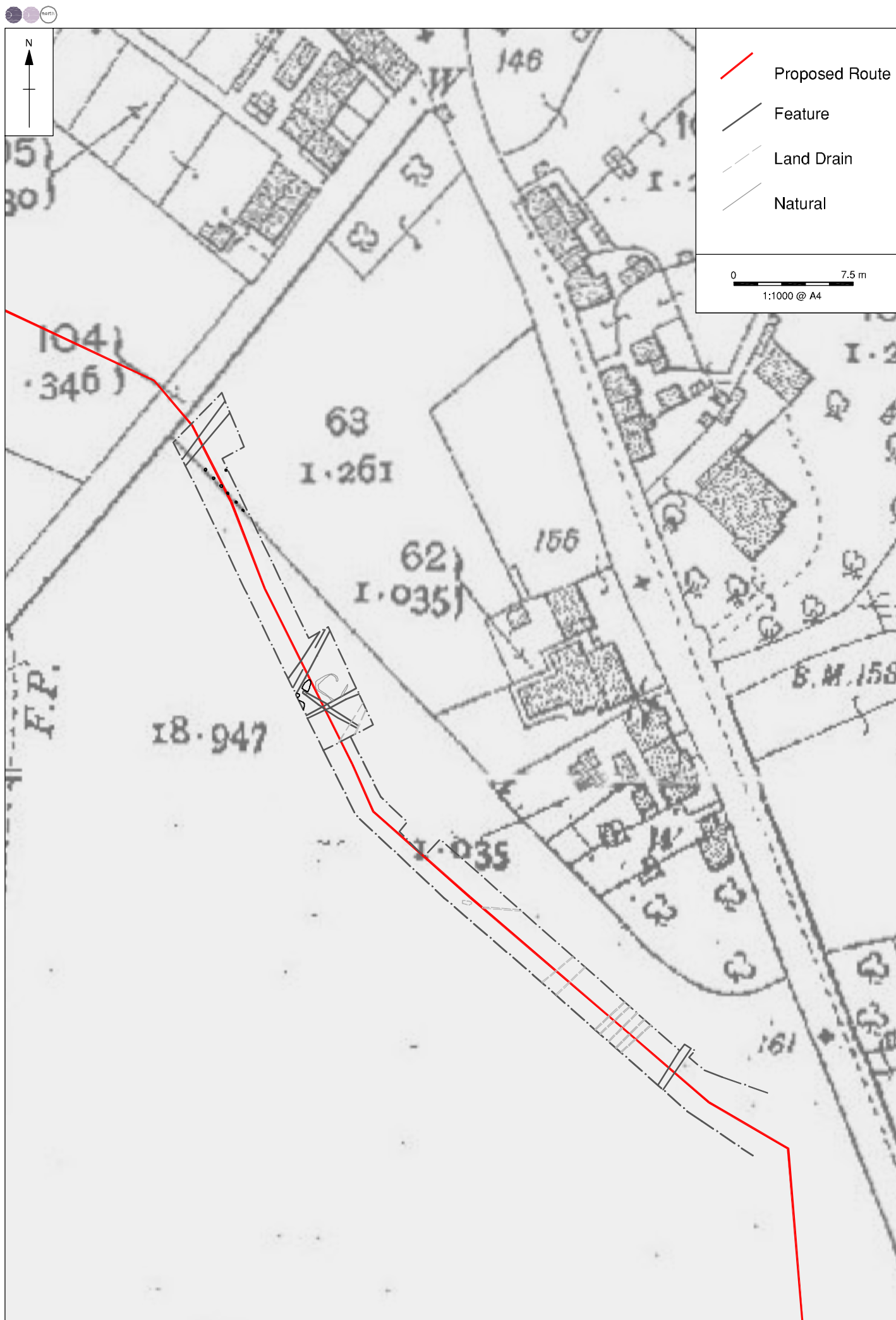


Figure 6: Results of the strip and record investigation, superimposed upon the Ordnance Survey First Edition 25"-1 mile map, 1909



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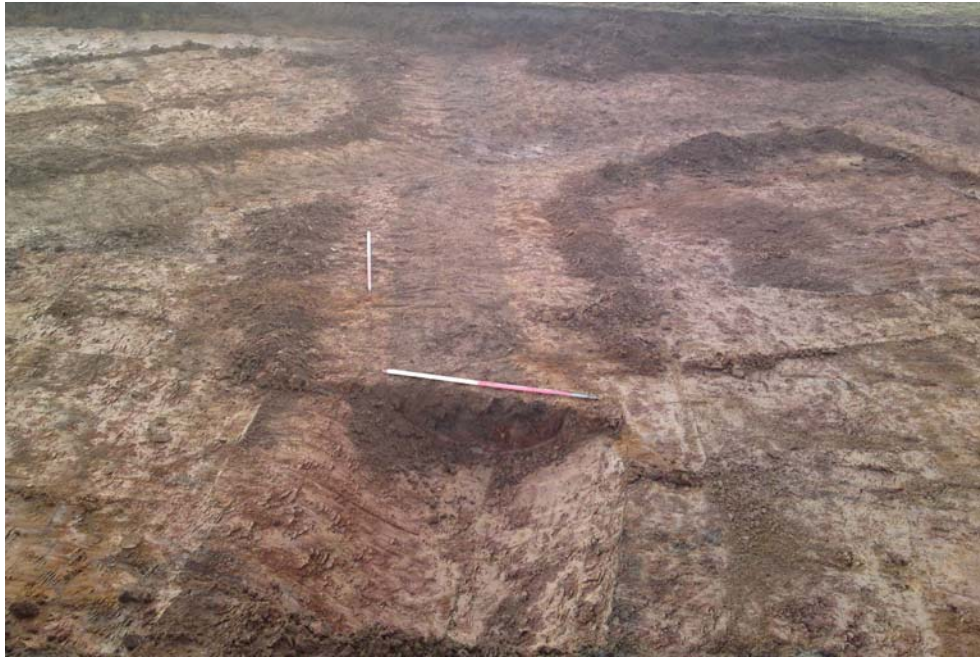


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## APPENDIX 1: PROJECT DESIGN

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### 1 INTRODUCTION

#### 1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 United Utilities (hereafter the client) propose the construction of a pipeline from Knutsford Waterworks (SJ 74995 79396) in Cheshire to Dunham Reservoir (SJ 75284 87414) in Greater Manchester. The total length of the proposed pipeline is approximately 14km. Following recommendations made by the Cheshire County Council Historic Environment Officer, the County Archaeologist for Greater Manchester and the National Trust Archaeologist, United Utilities commissioned Oxford Archaeology North (OA North) to undertake historic research and a walkover survey of the proposed development area (OA North 2009). This was followed by a supplementary research (also 2009) as requested by the National Trust Archaeologist.
- 1.1.2 Following discussions with a representative of the client, the County Archaeologist for Greater Manchester and the National Trust Archaeologist, a programme of archaeological works was agreed. This document presents a methodology for evaluation trial trenching along the projected line of the Chester to Manchester Roman road and a permanent presence watching brief during all ground disturbance including within the A556 as it follows the course of the Roman road.

#### 1.2 HISTORICAL BACKGROUND

- 1.2.1 The sites identified within the surrounding locality of the proposed pipeline route included both potential Palaeolithic and Neolithic sites, as well as eight confirmed Bronze Age sites, comprising six ring ditches, a findspot and a cremation burial. In addition, there were five Roman sites, of which four were associated with the route of the Chester to Manchester Road, whilst the fifth was the findspot of an amphora handle. The medieval period was well represented with 13 sites, the most significant being the Scheduled Monument at Watch Hill (Greater Manchester HER 1.1.0); a motte and bailey fortification reputedly dating to the baronial rebellion against Henry II in 1173.
- 1.2.2 The post-medieval period had 68 sites, which were predominantly former historic fields or cottages and farms, whilst the industrial period was more varied, featuring 35 sites, including boundaries, woodland management features, and a Wesleyan Chapel and attached graveyard. In addition, three modern sites were encountered comprising a Royal Observer Corps Monitoring Post; a Second World War US Army base that later became a German PoW, and a water tower. A further five sites have not been ascribed a period due to insufficient data in their respective HER entries.
- 1.2.3 The northern end of the proposed pipeline lies within National Trust land, being located within the Dunham Massey estate.

### **1.3 OXFORD ARCHAEOLOGY NORTH**

- 1.3.1 Oxford Archaeology North has considerable experience of sites of all periods, having undertaken a great number of small and large-scale projects throughout Northern England during the past 24 years. Evaluations, assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables.
- 1.3.2 OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an Institute of Field Archaeologists (IFA) **registered organisation, registration number 17**, and all its members of staff operate subject to the IFA Code of Conduct (1994).
- 1.3.3 OA North has an Archaeological Services Framework Agreement with United Utilities, and has worked closely with United Utilities for over eight years.

## **2 OBJECTIVES**

- 2.1 The following programme of work has been designed in accordance with discussions held with the County Archaeologist for Greater Manchester and the National Trust Archaeologist, and comments received from the Cheshire County Council Historic Environment Officer. It comprises a range of fieldwork encompassing evaluation trenching, and a permanent presence watching brief. All of fieldwork will take place within the working easement of the pipeline.
- 2.2 The main research aim of the fieldwork, will be to assess the presence or absence of the archaeological remains across the site as identified by the historic research, and to provide a good understanding of their potential. The specific objectives of the project may be summarised as follows:
- to determine or confirm the general nature of any remains present;
  - to determine or confirm the approximate date or date range of any remains;
  - to determine or confirm the approximate extent of any remains;
  - to determine the condition and state of preservation of any remains;
  - to determine the degree of complexity of the horizontal and/or vertical stratigraphy present;
  - to determine or confirm the likely range, quality and quantity of any artefactual evidence present;
  - to determine the potential of the site to provide palaeo-environmental and/or economic evidence and the forms in which such evidence may be present;
  - to recommend an appropriate programme of mitigation works for any remains encountered;

- 2.3 The required stages to achieve these ends are as follows:
- 2.3.1 **Evaluation:** a programme of targeted trial trenches will investigate the presence or otherwise of the Chester to Manchester Roman road.
- 2.3.2 **Watching brief:** a permanent presence will be maintained during all topsoil stripping activities and ground disturbance associated with the pipeline works. In addition, the trench open-cut along the course of the Roman road lying within the A556 will be monitored.
- 2.3.3 **Report and Archive:** a fully illustrated report and archive will be produced following completion of the fieldwork. In the event that significant archaeological remains are encountered, discussions will be held with the client and curators as to the appropriate mitigation required.

### 3 METHOD STATEMENT

#### 3.1 EVALUATION TRENCHING

- 3.1.1 The following work programme is submitted in line with the aims and objectives summarised above. The programme of evaluation trenching will establish the presence or absence of any archaeological deposits and, if established, will then test their date, nature, depth and quality of preservation. It is proposed that a total of four 25m trenches will be excavated, with a combined total length of 100m. Trenches will be dug by machine using a toothless ditching bucket, followed by hand cleaning and recording, with selective excavation to determine depth and character of features and deposits. All arisings from the excavation of the trenches will be stockpiled temporarily adjacent to the trenches, and will be backfilled upon completion of the archaeological works.
- 3.1.2 **Methods:** prior to excavation, the precise location of each trench will be surveyed using a Leica differential Global Positioning System (dGPS), locating them according to Ordnance Survey (OS) co-ordinates. The dGPS uses real-time corrections (RTK) using mobile SmartNet technology to achieve an accuracy of approximately  $\pm 0.01\text{m}$ .
- 3.1.3 The uppermost surface/topsoil and overburden deposits will be subject to sample excavation, involving the careful excavation by machine of spits. These will be excavated mechanically down to the depth of significant archaeological deposits, and will be carried out in such a manner as to avoid or minimise damage to the archaeological remains. This deposit will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions, and inspected for archaeological features. Thereafter all excavation will proceed by hand in a stratigraphic manner. Should the trenches be excavated to depths in excess of 1.20m, they will be stepped in or battered back to accommodate health and safety constraints.
- 3.1.4 Any investigation of intact archaeological deposits will attempt not to destroy their integrity, and will be exclusively manual. Selected pits and postholes will

normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal. It is hoped that in terms of the vertical stratigraphy, maximum information retrieval will be achieved through the examination of sections of cut features. All excavation, whether by machine or by hand, will be undertaken with a view to avoiding damage to any archaeological features, which appear worthy of preservation *in-situ*.

- 3.1.5 The precise location of the evaluation trenches, and the position of all archaeological structures encountered, will be surveyed by EDM tacheometry using a total station linked to a pen computer data logger. This process will generate scaled plans within AutoCAD software, which will then be subject to manual survey enhancement. The drawings will be generated at an accuracy appropriate for 1:20 scale, but can be output at any scale required. All information will be tied in to Ordnance Datum.
- 3.1.6 **Recording:** all information identified in the course of the site works will be recorded stratigraphically, using a system, adapted from that used by Centre for Archaeology Service of English Heritage, with sufficient pictorial record (plans, sections and both black and white and colour photographs) to identify and illustrate individual features. Primary records will be available for inspection at all times.
- 3.1.7 Results of all field investigations will be recorded on *pro-forma* context sheets. The site archive will include both a digital photographic record and accurate large-scale plans and sections at an appropriate scale (1:50, 1:20 and 1:10). All artefacts and ecofacts will be recorded using the same system, and will be handled and stored according to standard practice (following current Institute of Field Archaeologists guidelines) in order to minimise deterioration.
- 3.1.8 On completion of the evaluation, the trenches will be backfilled in a stratigraphical manner, unless instructions are given to the contrary.
- 3.1.9 **Finds Policy:** OA North employs artefact and palaeo-ecology specialists with considerable expertise in the investigation, excavation and finds management of sites of all periods and types, who are readily available for consultation. In addition, OA North maintains close relationship with Ancient Monuments Laboratory staff at the University of Durham, and access to conservation advice and facilities can be made available if necessary. Finds recovery will be in accordance with best practice (following current Institute of Field Archaeologists guidelines) and subject to expert advice in order to minimise deterioration. Finds storage during fieldwork and any site archive preparation will follow professional guidelines (UKIC). The deposition and disposal of any artefacts recovered in the evaluation will be agreed with the legal owner, the National Trust. The Trust intends to retain any finds retrieved.
- 3.1.10 **Environmental Sampling:** environmental samples (bulk samples of 30 litres volume, to be sub-sampled at a later stage) will be collected from stratified undisturbed deposits and will particularly target negative features (gullies, pits and ditches). In general terms, the sampling strategy will be aimed at recovering palaeo-botanical, palaeo-zoological and pedological evidence,

although the precise scope of the programme will be agreed with the Client prior to commencement of the fieldwork. All samples will be processed at OA North's offices in Lancaster, and will be subject to a rapid preliminary analysis by the in-house palaeo-environmentalist in order to allow an assessment of their potential.

- 3.1.11 **Human Remains:** human remains are not expected to be present, but if they are found they will, if possible, be left *in-situ* covered and protected. If removal is necessary, then the relevant Home Office permission will be sought, and the removal of such remains will be carried out with due care and sensitivity as required by the *Burials Act 1857*.
- 3.1.12 Any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996.

## 3.2 WATCHING BRIEF

- 3.2.1 A programme of field observation will record accurately the location, extent, and character of any surviving archaeological features and/or deposits within all easement stripping activities and ground disturbance associated with the development works, and within the excavation for the pipe trench where no easement exists. In particular, a presence will be maintained during excavation within the A556 as it follows the course of the Roman road. This work will comprise observation during the excavation for these works, the systematic examination of any subsoil horizons exposed during the course of the groundworks, and the accurate recording of all archaeological features and horizons, and any artefacts, identified during observation.
- 3.2.2 Putative archaeological features and/or deposits identified by the machining process, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions, and where appropriate sections will be studied and drawn. Any such features will be sample excavated (ie selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).
- 3.2.3 If significant archaeological deposits or features are identified that might be affected by machine tracking or the pipe trench cutting, then the area will be sealed off to protect it. A site meeting would be held between the interested parties (including the relevant curators and United Utilities Project Manager) to discuss use of the contingency fund to allow a rescue excavation and recording exercise to take place.
- 3.2.4 It is assumed that OA North will have the authority to stop the works for a sufficient time period to enable the recording of important deposits. It may also be necessary to call in additional archaeological support if a find of particular importance is identified or a high density of archaeology is discovered. This would only be called into effect in agreement with the Client, the County

Archaeology Service and the National Trust and will require a variation to costing.

- 3.2.5 The finds policy, environmental sampling and treatment of human remains will be undertaken as above (*Sections 3.1.9 to 3.1.12*)

### 3.3 ARCHIVE/REPORT

- 3.3.1 **Archive:** the results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2nd edition, 1991). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. OA North conforms to best practice in the preparation of project archives for long-term storage. This archive will be provided in the English Heritage Centre for Archaeology format and a synthesis will be submitted to the relevant HERs (the index to the archive and a copy of the report). OA North practice is to deposit the original record archive of projects (paper, magnetic and plastic media) with the appropriate County Record Offices, and a full copy of the record archive (microform or microfiche) together with the material archive (artefacts, ecofacts, and samples) with an appropriate museum. Wherever possible, OA North recommends the deposition of such material in a local museum approved by the Museums and Galleries Commission, and would make appropriate arrangements with the designated museum at the outset of the project for the proper labelling, packaging, and accessioning of all material recovered. All artefacts retrieved from National Trust land will be deposited with the National Trust.
- 3.3.2 The Arts and Humanities Data Service (AHDS) online database project *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.
- 3.3.3 **Report:** at this stage it is envisaged that one report will be compiled. The results of the evaluation trenching and the watching brief will be combined into one report. The reports will be presented as drafts for comments to the relevant curators within twelve weeks of completion of the fieldwork. In the event that archaeological remains are encountered of such significance that would warrant MAP2 post-excavation assessment, then individual assessment reports would be compiled.
- 3.3.4 The report will include a copy of this project design, and indications of any agreed departure from that design. It will present, summarise, and interpret the results of the programme detailed above. A full index of archaeological features identified in the course of the project will be included, along with an assessment of the overall stratigraphy, appropriate illustrations, including detailed plans and sections indicating the locations of archaeological features. Any finds recovered will be assessed with reference to other local material and any particular or unusual features of the assemblage will be highlighted and the potential of the site for palaeo-environmental analysis will be considered. The

report will also include a complete bibliography of sources from which data has been derived.

- 3.3.5 This report will identify areas of defined archaeology. An assessment and statement of the actual and potential archaeological significance of the identified archaeology within the broader context of regional and national archaeological priorities will be made. Illustrative material will include a location map, section drawings, and plans.

### 3.4 OTHER MATTERS

- 3.4.1 **Health and Safety:** OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. A written risk assessment will be undertaken in advance of project commencement and copies will be made available on request to all interested parties for inclusion in the safety file. OA North uses a CAT scan device prior to any excavation to test for services as a matter of course. It is assumed that the Client will provide any available information regarding services within the study area, if available. It is also assumed that the Client will provide secure fencing. The client is also expected to provide welfare facilities.
- 3.4.2 **Confidentiality:** the report is designed as a document for the specific use of the Client, for the particular purpose as defined in the project design, and should be treated as such; it is not suitable for publication as an academic report, or otherwise, without amendment or revision. Any requirement to revise or reorder the material for submission or presentation to third parties beyond the project design, or for any other explicit purpose can be fulfilled, but will require separate discussion and funding.
- 3.4.3 **Insurance:** the insurance in respect of claims for personal injury to or the death of any person under a contract of service with the unit and arising out of an in the course of such person's employment shall comply with the employers' liability (Compulsory Insurance) Act 1969 and any statutory orders made there under. For all other claims to cover the liability of OA North, in respect of personal injury or damage to property by negligence of OA North or any of its employees, there applies the insurance cover of £2m for any one occurrence or series of occurrences arising out of one event.
- 3.4.4 **Project Monitoring:** OA North will consult with the Clients representative and the clients contractor, regarding access to the site. The Client will be kept fully informed of the work and its results, and any proposed changes to the project design will be agreed in consultation with the Greater Manchester County Archaeologist and the National Trust Archaeologists, both of whom will be informed of start dates.
- 3.4.5 **Contingencies:** if there are more complex or generally deeper deposits than can be anticipated from the evidence available, there may need to be a corresponding increase in costs, which will be subject to agreement with the Client and the archaeological curators. Similarly, there will be recourse to a contingency if there is any requirement to fully excavate any human remains

that may be present. This would also apply to the full excavation of sites not covered by the schedule of costs. These contingency costs are in accordance with the Institute of Field Archaeologists guidance and are defined in the costings

- 3.4.6 **Access:** liaison for basic site access will be undertaken through the clients' representative and, where appropriate, the National Trust.

## **4 WORK TIMETABLE AND STAFFING**

### **4.1 PROGRAMME**

- 4.1.1 **Evaluation Trenching:** approximately three days will be required for this element. A start date of Thursday 15th of October has been agreed.
- 4.1.2 **Watching Brief:** the duration of the watching brief will be dictated by the progress of the contractor. A start date of Thursday 8th of October has been arranged for the monitoring of land drainage. A date for the commencement of the highway trench cut and easement topsoil stripping has yet to be finalised.
- 4.1.3 **Report and Archive:** the report and archive will be produced following the completion of all the fieldwork. The final report will be available within twelve weeks of completion of the fieldwork, and the archive deposited within twelve months.

### **4.2 STAFFING**

- 4.2.1 The project will be under the direct management of **Alison Plummer BSc (Hons)** (OA North Senior Project Manager) to whom all correspondence should be addressed. Alison manages all of the United Utilities projects undertaken by the Unit and has done so for an extensive period of time.
- 4.2.2 Present timetable constraints preclude detailing at this stage exactly who will undertake the archaeological work, but each element of the project is likely to be supervised by an OA North project officer experienced in such projects.

## **BIBLIOGRAPHY**

English Heritage, 1991 *Management of Archaeological Projects*, 2nd edn, London

Institute of Field Archaeologists, 1994 *Code of conduct* (revised edition)

OA North, 2009 *Dunham Tank to Knutsford Pipeline, Greater Manchester and Cheshire, Supplementary Report: Historic Research*, unpubl rep

United Kingdom Institute for Conservation (UKIC), 1990 *Guidelines for the preparation of archives for long-term storage*, London

## APPENDIX 2: CONTEXT LIST

Context number	Site	Description
<b>700</b>	Field 7	Topsoil: dark brown and friable
<b>701</b>	Field 7	Subsoil: light greyish-brown friable clayey-sand containing sub-rounded stones
<b>702</b>	Field 7	Natural: firm light reddish-brown mixed deposits of sand and predominant clay
<b>703</b>	Field 7	Cut of linear ditch. Filled by <b>704</b>
<b>704</b>	Field 7	Fill of ditch <b>703</b> : friable dark brown sandy-clay
<b>705</b>	Field 7	Group number for postholes <b>751, 753, 755, 757, 759, 761, 763</b>
<b>706 to 710</b>	Field 7	Not Used
<b>711</b>	Field 7	Fill of possible pit <b>727</b> : friable dark grey clayey-silt
<b>712</b>	Field 7	Not Used
<b>713/767</b>	Field 7	Cut of ditch. Filled by <b>714/766</b>
<b>714</b>	Field 7	Fill of ditch <b>713</b> : friable dark brownish grey sandy-silt with occasional angular stones
<b>715</b>	Field 7	Fill of ditch <b>716</b> : friable light brownish grey sandy-silt with occasional angular stones
<b>716</b>	Field 7	Cut of ditch. Filled by <b>715</b>
<b>717</b>	Field 7	Secondary fill of pit <b>717</b> : friable light greyish brown sandy-silt
<b>718</b>	Field 7	Primary fill of pit <b>717</b> : friable greyish black clayey-silt with a very high density of charcoal staining, flecks, and fragments, in addition to small fragments of unburnt wood
<b>719</b>	Field 7	Cut of sub-triangular pit. Filled by <b>718</b> and <b>719</b>
<b>720</b>	Field 7	Cut of ditch. Filled by <b>721</b> and <b>722</b>
<b>721</b>	Field 7	Secondary fill of ditch <b>720</b> : friable light brownish grey silty-sand
<b>722</b>	Field 7	Primary fill of ditch <b>720</b> : friable dark brownish grey silty-sand with occasional rounded stones

<b>723/724</b>	Field 7	Not Used
<b>725</b>	Field 7	Cut of ditch. Filled by <b>726</b>
<b>726</b>	Field 7	Fill of ditch <b>725</b> : friable medium brownish grey silty-sand
<b>727</b>	Field 7	Cut of possible pit. Full extent not exposed. Filled by <b>711</b>
<b>728/729</b>	Field 7	Not Used
<b>730</b>	Field 7	Cut of possible pit. Full extent not exposed. Filled by <b>731</b>
<b>731</b>	Field 7	Fill of possible pit <b>730</b> : friable light brownish grey sandy-silt with occasional angular stones
<b>732</b>	Field 7	Cut of ditch terminus. Filled by <b>732</b>
<b>733</b>	Field 7	Fill of ditch terminus <b>732</b>
<b>734 to 750</b>	Field 7	Not Used
<b>751</b>	Field 7	Cut of posthole. Filled by <b>752</b>
<b>752</b>	Field 7	Fill of posthole <b>751</b>
<b>753</b>	Field 7	Cut of posthole. Filled by <b>754</b>
<b>754</b>	Field 7	Fill of posthole <b>753</b>
<b>755</b>	Field 7	Cut of posthole. Filled by <b>756</b>
<b>756</b>	Field 7	Fill of posthole <b>755</b>
<b>757</b>	Field 7	Cut of posthole. Filled by <b>758</b>
<b>758</b>	Field 7	Fill of posthole <b>757</b>
<b>759</b>	Field 7	Cut of posthole. Filled by <b>760</b>
<b>760</b>	Field 7	Fill of posthole <b>759</b>
<b>761</b>	Field 7	Cut of posthole. Filled by <b>762</b>
<b>762</b>	Field 7	Fill of posthole <b>761</b>
<b>763</b>	Field 7	Cut of posthole. Filled by <b>764</b>
<b>764</b>	Field 7	Fill of posthole <b>763</b>

<b>765</b>	Field 7	Mixed deposit of subsoil and natural disturbed by plough and root action
<b>768</b>	Field 7	Fill of ditch <b>769</b>
<b>769</b>	Field 7	Cut of ditch. Filled by <b>768</b>
<b>770</b>	Field 7	Fill of ditch <b>771</b>
<b>771</b>	Field 7	Cut of ditch. Filled by <b>770</b>