

Ravenstown WwTW to Grange Over Sands WwTW Transfer Pipeline, Cumbria



**Rapid Desk-Based
Research, Walkover and
Topographic Surveys,
Watching Brief and
Evaluation Trenching**



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SUMMARY

United Utilities proposed the construction of a new pipeline from Ravenstown to Grange-Over-Sands, Cumbria (SD 3615 7497 to 3904 7525; Fig 1). The scheme affects areas of archaeological potential from both the prehistoric and historic periods, and the Assistant County Archaeologist at Cumbria County Council Historic Environment Service (CCCHES) therefore recommended that rapid desk-based research and walkover survey should be undertaken for previously undisturbed sections of the pipeline and for areas where archaeological remains are known to exist.

In total, 43 sites were identified along the route of the proposed pipeline. Of these, 24 sites were identified through inspection of the Cumbria County Council Historic Environment Record (CCCHER) and other primary sources, which took place during March 2007. The sites consisted of ten findspots, four earthwork sites, and ten buildings or groups of buildings. Of these, eight (Sites **01-03**, **09**, **14**, **20**, **23** and **24**) were prehistoric in origin, one (Site **05**) was Roman, one (Site **22**) was early medieval, four (Sites **04**, **10**, **13**, **19**) were medieval, six (Sites **06**, **07**, **11**, **12**, **17**, **21**) were post-medieval, and a further four (Sites **08**, **15**, **16**, **18**) were of unknown date. Of the buildings, six were listed as either Grade II (Sites **04**, **06**, **07**, **11**, **12**, and **21**) or Grade II* (Site **19**), and one of the medieval/post-medieval buildings (Site **19**) has designated Scheduled Monument Status.

The walkover survey was undertaken in April 2007. It enabled the enhancement of the descriptions of Sites **06-08** and **19**, and identified 19 new sites (Sites **25-43**). These mostly comprised post-medieval agricultural features, such as boundaries, trackways, bridges and drainage features (Sites **25-27**, **30-33**, **35**, **36** and **38-43**). Six sites (**27**, **29**, **31**, **32**, **33** and **36**) comprised large embankments which most probably correspond to Site **08**, identified during the desk-based research. Site **28** is an earthwork feature which potentially represents the remains of a saltern. Reclaimed land, represented by a regular field pattern (Site **37**), is likely to relate to the Enclosure Act of 1796. An outcrop of natural limestone (Site **35**) was also identified, but proved to be of no archaeological significance. The subsequent topographic survey produced detailed drawings of Sites **26**, **27**, **31-33** and **36**.

Due to the potential for further archaeological features along the proposed pipeline corridor, as demonstrated by the initial two phases of works, a targeted watching brief programme to monitor the development was recommended by CCCHES. In addition, the evaluation of Site **36** was also specified. No archaeologically significant structures or features were observed during the course of the watching brief. The evaluation recorded make-up layers for the sea defence and a linear-type feature, which did not appear to relate to the embankment.

Development of the study area primarily comprises the historic growth of the villages of Flookburgh and Ravenstown, and the route of the Ulverston and Lancaster railway line, some of the course of which is followed by the proposed development corridor. The mid-nineteenth century railway construction works and the creation of the new village at Ravenstown in the latter years of the First World War represent the most significant disturbance in the study area, and both of these works may have resulted in the destruction of unknown archaeological deposits or features which were not recorded at the time.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to thank United Utilities for commissioning the project. Thanks are also due to the Assistant County Archaeologist and the staff at the Cumbria County Council Historic Environment Record (CCCHER) and the Cumbria County Council Record Office for their assistance.

Chris Healey undertook the rapid desk-based research and Mark Tidmarsh produced the drawings. Christina Robinson was responsible for the walkover survey, and Thomas Mace maintained the watching brief. Christine Howard-Davis assessed the finds. Richard Lee directed the evaluation fieldwork and was assisted by Annie Hamilton-Gibney. Richard Lee wrote the evaluation report, and the project was managed by Alison Plummer, who also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

- 1.1.1 United Utilities proposed the construction of a new pipeline from an existing Wastewater Treatment Works (WwTW) at Ravenstown to an existing WwTW to the immediate south-west of Grange-over-Sands, Cumbria (SD 3615 7497 to 3904 7525; Fig 1). A brief (*Appendix 1*) was issued by the Assistant County Archaeologist at Cumbria County Council Historic Environment Service (CCCHES) for a programme of archaeological research and survey in advance of the works, and following the acceptance of a Project Design (*Appendix 2*), Oxford Archaeology North were commissioned by United Utilities to undertake the recommended work.
- 1.1.2 The desk-based research comprised a search of both published and unpublished records held by the Historic Environment Record (HER) in Kendal, and also the County Record Office in Kendal, and the archives and library held at OA North. The subsequent walkover survey, conducted in April 2007, was carried out along the route of the proposed development, in order to relate the landscape and surroundings to the results of the desk-based research. The topographic survey provided detailed drawings of a number of the walkover survey sites.
- 1.1.3 Following on from the findings of the initial research and surveys, a watching brief and programme of evaluation trenching was recommended by the Assistant County Archaeologist at CCCHES. This phase of work was undertaken in July 2007. This report sets out the results of these five phases of work in the form of a short document outlining the findings.

1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

- 1.2.1 The study area is located on the Cartmel peninsula, straddling the Lancaster and Ulverston railway line between Flookburgh and Kents Bank (Fig 1). The Cartmel peninsula area is located between the South Cumbria Low Fells and the Morecambe Bay Limestones, and extends southwards into Morecambe Bay. The peninsula has been formed by the interaction of successive intertidal erosion and deposition over the underlying limestone of Lower Carboniferous date (Countryside Commission 1998, 69-72). The study area comprises a broadly similar range of lands at 1-5 metre aOD elevation predominantly composed of reclaimed tidal salt marsh. The land is predominantly used for agriculture, with stock rearing and rough grazing on the improved grassland. Field boundaries include drystone walls and hedgerows, and whilst woodland cover is sparse, it occurs in concentrations across the study area (*ibid*).

2. METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 A project design (*Appendix 2*) was submitted by OA North in response to a written brief (*Appendix 1*) issued by the Assistant County Archaeologist at the Cumbria County Council Historic Environment Service (CCCHES). The project design was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists, and generally accepted best practice.

2.2 RAPID DESK-BASED RESEARCH

2.2.1 The rapid desk-based research comprised a search of both published and unpublished records held by the Historic Environment Record (HER) in Kendal, the County Record Office (CRO) at Kendal and the archives and library held at OA North. For this purpose a study area comprising 0.5km either side of the proposed pipeline route was examined. All known archaeological sites identified have been included in the Site Gazetteer (*Section 5*) in order to assess the impact of the proposed development, and have been illustrated in Figure 2.

2.2.2 **Historic Environment Record (CCCHER):** the Historic Environment Record held in Kendal was consulted to establish the presence of sites of cultural heritage interest already known within a 0.5km radius centred on the proposed pipeline route. Secondary sources for the area were limited, but 'grey literature' and published sources were studied where available.

2.2.3 **County Record Office (CRO):** the Record Office in Kendal was consulted with a view to supplementing cartographic and other recorded information within the study area.

2.2.4 **Oxford Archaeology North:** OA North has an extensive archive of secondary sources relevant to the study area, as well as numerous unpublished client reports on work carried out both as OA North and in its former guise of Lancaster University Archaeological Unit (LUAU). These were consulted where necessary.

2.3 WALKOVER SURVEY

2.3.1 Following the desk-based research a walkover survey was undertaken to relate the existing landscape to research findings. The study area comprised a one hundred metre wide corridor either side of the pipeline route, traversed in a systematic fashion. Archaeological features identified within the landscape were recorded using the relevant OA North *pro forma*, and the features accurately using differential GPS survey, which can achieve an accuracy of $\pm 0.25\text{m}$ with respect to the OS national grid. The sites identified during this phase of works are shown in Figure 2.

2.4 TOPOGRAPHIC SURVEY

- 2.4.1 The survey comprised the investigation and recording of the topographic detail of six sites prior to the pipeline construction works. These comprised the earthwork features (Sites **26**, **27**, **31**, **32**, **33**, and **36**) in the fields to the south and east of Flookburgh. With the exception of Site **26**, these sites formed part of a medieval flood embankment (Site **08**).
- 2.4.2 The archaeological sites were mapped using Leica differential GPS equipment, which used real-time (RTK) corrections using mobile SmartNet technology to achieve an accuracy of $\pm 0.01\text{m}$. The digital survey data was transferred, via Leica Geo Office (V.3), as dxf drawing files into a CAD system (AutoCAD 2004), and was superimposed onto the embedded digital Ordnance Survey data (Fig 3).

2.5 WATCHING BRIEF

- 2.5.1 A programme of field observation recorded accurately the location, extent and character of any surviving archaeological features and/or deposits exposed during the course of the topsoil stripping activities within the pipeline easement. The work comprised 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.
- 2.5.2 All groundworks on the site were conducted under constant archaeological supervision and comprised the machine stripping of topsoil and subsoil. All exposed soil horizons were examined and described and spoil heaps were carefully checked for any unstratified finds.
- 2.5.3 A daily record of the nature, extent and depths of groundworks was maintained throughout the duration of the project. All archaeological contexts were recorded on OA North's *pro-forma* sheets, using a system based on that of the English Heritage Centre for Archaeology. A monochrome and colour slide photographic record was maintained throughout and, where appropriate, scaled profiles were produced of archaeological features at a scale of 1:20.

2.6 EVALUATION TRENCHING

- 2.6.1 Site **36**, as identified by the initial programme of archaeological work, was targeted by evaluation trenching, which consisted of two 20m x 2m trenches, positioned strategically to examine two separate areas of the same earthwork (Fig 2). The trenches were positioned to reflect the route of the pipeline, and were undertaken in consultation with the pipeline contractor. The work was confined to the area of the pipeline easement.
- 2.6.2 Topsoil had been removed under watching brief conditions prior to the evaluation. The subsoil was excavated with a mini-digger excavator fitted with a toothless ditching bucket, measuring approximately 1m in width.

2.6.3 Both trenches were excavated in stratigraphical manner to the surface of the first significant archaeological deposit. Subsequent deposits were cleaned by hand, using hoes, shovel scraping and trowels. Neither of the trenches was excavated below a maximum depth of 1.20m., and both trenches were backfilled on the day of excavation to accommodate health and safety constraints.

2.7 ARCHIVE

2.7.1 A full professional archive has been compiled in accordance with the project design (*Appendix 1*), and in accordance with current IFA and English Heritage guidelines (English Heritage 1991). The paper and digital archive will be provided in the English Heritage Centre for Archaeology format and will be submitted to the Cumbria County Record Office on completion of the project. The Arts and Humanities Data Service (AHDS) online database *Online Access index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

3. BACKGROUND

3.1 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

- 3.1.1 **Palaeolithic and Mesolithic Periods (c 40000 - 4000 BC):** the earliest known occupation in the region is found in the natural shelter of the cliffs along the coast. The Kirkhead cave, to the north-east of the study area, has produced evidence of occupation during the Later Upper Palaeolithic period (c 40,000 - 10,000 BC). Palaeolithic blades have also been recovered from Lindale Low to the north-east of Kirkhead (Salisbury 1992), which represents the most northerly recorded Palaeolithic site in the country (Hodgkinson *et al* 2000). There is evidence of coastal exploitation in the Mesolithic period (c 11000 - 4000 BC), with the creation of small-scale clearings and the use of fire to provide grassland to attract game (*ibid*). Findspots of Mesolithic flint tools have been recorded from Kents Bank, at the eastern end of the study area (Sites **23** and **24**; Site **23** is recorded as a flint-working site).
- 3.1.2 **Neolithic Period (c 4000 - 2500 BC):** the transition to the Neolithic is difficult to identify, as only limited ceramic and lithic assemblages are available and these are accompanied by few monuments; this is thought to be due to a genuine lack of activity in the area, though later agricultural activity has removed a lot of evidence. Early Neolithic pottery has been found at Rose Quarry and Holbeck Park. However, the Neolithic is chiefly characterised by polished stone axes, with several such found at the southern end of the Cartmel peninsula, including one example from Winder Moor (Site **14**) as well as possible examples from Nab Green (Site **01**), the Flookburgh area (Sites **02** and **09**) and Wraysholme Tower (Site **20**).
- 3.1.3 **The Bronze Age (2500 - 700 BC):** the first palynological evidence for forest clearance occurs during the late Neolithic and early Bronze Age, with the most significant forest clearance beginning in the Morecambe Bay area between 2300 and 1890 BC. This corresponds with the first appearance of Bronze Age Beaker burials; an early Bronze Age cremation cemetery comprising 12 to 15 burials accompanied by up to ten vessels in total, including four collared urns, was uncovered approximately 2 km to the east of Flookburgh in 2001 (Wild 2003). Settlement evidence in the lowlands is limited, although findspots of bronze palstaves of Bronze Age date have been recorded near Flookburgh (Site **02**) and Wraysholme Tower (Site **20**), as well as possible examples at Nab Green (Site **01**) and the Flookburgh area (Sites **02** and **09**). References to the Nab Green and Flookburgh area finds comprise somewhat vague antiquarian allusion: ‘*many hammers and battleaxes of different sizes, and of different kinds of stone, as well as celts of brass, copper and stone have from time to time been found in most parts of the Cartmel district, particularly at Nun’s Hill, Nab Green, Raisholm Tower, and in the meadows below Flookburgh*’ (Stockdale 1872, 250).
- 3.1.4 **The Iron Age (700 BC - AD 43):** Iron Age sites and remains are notoriously difficult to identify in the North West. Little evidence has been recovered for human activity in the area. This is mirrored by the lack of settlement evidence,

with most upland settlement also being abandoned about this time (Hodgkinson *et al* 2000). No Iron Age sites or findspots are recorded within the study area, although some of the cropmarks identified from aerial photography (Sites **15** and **16**; Plates 1 and 2 respectively) potentially relate to Iron Age activity.

- 3.1.5 **Roman Period (AD 43 - 410):** there is almost no evidence of Roman activity within the region, with no confirmed roads or settlements. Antiquarian and modern references to a Roman road south of Flookburgh (Stockdale 1872; Sites **05** and **08**) remain archaeologically unproven.
- 3.1.6 **Early Medieval Period (AD 410 - 1066):** Cartmel is first mentioned in AD 677, when it was granted to St Cuthbert by King Ecgfith of Northumberland (Farrer and Brownbill 1914, 254). Ecgfirth refers to the native Britons of the area as slaves or as a serf population (Farrer and Brownbill 1914, 234; Dickinson 1945, 50). The name Flookburgh may have origins from the Old English for a type of fish '*floc*' (Mills 1976), or from the Old Norse name '*Floki*' (Wyld 1911), and the '*burh*' element may be a corruption of the Old Norse '*borg*' as much as its Old English equivalent '*burgh*'. Allithwaite appears to stem from the Old Norse (Eilifr's thwaite, or meadow), and the place-name evidence suggests some overlap between Anglian and Hiberno-Norse cultures within the area. The North West is thought to have accommodated groups of Norse immigrants (Winchester 1985, 99), although the extent of this is far from certain (*ibid*; Newman R 2006, 108). Although no sites or finds can be dated definitely to this period, a pre-Conquest chapel at '*Kierkepoll*', probably at Kirkhead (Site **22**) is mentioned in a charter of 1199 (Dickinson 1945, 50). Some of the cropmarks identified from aerial photography (Sites **15** and **16**; Plates 1 and 2 respectively) may potentially relate to early medieval agricultural activity.
- 3.1.7 **Medieval Period (AD 1066 - 1540):** in the early eleventh century most of present-day Cumbria was a disputed area between the expanding English and Scottish Kingdoms. Malcolm III of Scotland invaded Cumbria in 1070, and was still in possession of much of the area at the time of the Domesday survey of 1086. The area only came under Norman influence when William Rufus went north in 1092 to fortify land against the Scots, establishing both a castle and colony at Carlisle. There are suggestions that the Normans were encouraged to settle throughout Cumbria, and place-name evidence indicates either the adoption of Norman names or the establishment of new settlements. At the time of the Conquest, the lands of Cartmel, Walton and Newton were part of Earl Tostig's lordship of Hougoun (Millom) (Newman R 2006). These lands remained crown property after 1066 but were granted to William Marshall, the Earl of Pembroke, in 1186 by King Henry II. The Earl founded Cartmel Priory in 1190 as an Augustinian community, probably using black canons from Bradenstoke Priory in Wiltshire (Wild and Howard-Davis 2000, 161). Flookburgh and Allithwaite seem to have comprised part of the manor of Allithwaite, which was held in 1150 by Gospatrick, Lord of Workington (Farrer and Brownbill 1914, 266), whose grandson Thomas gave the vill of Allithwaite to Thomas son of Robert de Harrington. The entire manor of Allithwaite was granted to Robert de Harrington in 1298-1300, including all its

lands and the mills within it (Farrer and Brownbill 1914, 266). Although not mentioned by name until 1637, one of these may have been Allithwaite Mill itself, to the south of Allithwaite village. The evidence concerning land ownership is scant for the rest of the medieval period although it seems to have been broken up amongst the Harrington family (Farrer and Brownbill 1914, 266).

- 3.1.8 The late thirteenth to early fifteenth centuries appear to have been a period of economic depression in the area, caused by three major factors, both natural and manmade (Winchester 1987). The Wars of Independence with Scotland, which from 1296 onwards caused devastation to much of the North, was experienced as far south as Cartmel during the devastating raids of 1316 and 1322. Outbreaks of plagues and murrains among the human and animal populations coincided with a deteriorating climate, particularly damaging to the marginal areas that had been colonised for agriculture in the twelfth and thirteenth centuries. The combined effects of these factors appeared to have become more severe than might ordinarily have been the case, and economic recovery is not seen until the mid-fifteenth century.
- 3.1.9 The economy of the area was based on fishing, particularly cockling on the Morecambe bay sands, and agriculture (*op cit*, 270). A large well-preserved array of fish-weirs and fish-trap constructions in the sands at Cowp Scar represents a tradition which appears to date from the fourteenth century (Newman C 2006, 116-7). Given the size and substantial construction of these features, it is probable that they represent a monastic or a community undertaking (M Brennand *pers comm*). Historically wheat, barley, and oat cultivation was complemented by other activities including stock husbandry. Some of the cropmarks identified from aerial photography (Sites **15** and **16**; Plates 1 and 2 respectively) may relate to medieval agricultural activity.
- 3.1.10 Flookburgh village (Site **10**) is known to have existed by 1246, when it was recorded in the Assize Rolls (North Pennines Archaeology 2003). A grant from Edward I in 1278 allowed Flookburgh to hold a market, which suggests that it was a central settlement amongst a landscape scattered with dispersed farms (*ibid*). In 1412 Thomas de Lancaster was granted a charter to hold a weekly market and two annual fairs at Flookburgh (*ibid*). References to burgages are first recorded in 1508-9, which indicates that Flookburgh had attained borough status. Flookburgh is referred to variously as ‘Flokeburg’ in 1246-7; ‘Flokesburgh’ in 1394, ‘Flokeberew’ in 1395 and ‘Flukeburwe’ in 1412 (North Pennines Archaeology 2003, 8). Saxton’s County Map (*Section 3.3.1 below*).
- 3.1.11 Mireside House (Site **04**) is first mentioned in 1504 as a group of three tenement holdings, held by Nicholas Gardner, William Kellet, and Thomas and William Caton (Farrer and Brownbill 1914, 274). Wraysholme Tower (Site **20**) appears to date from at the late fifteenth century (Farrer and Brownbill 1914, 267), when its original incarnation as a peel tower comprised part of Wraysholme Manor in Lower Allithwaite (*ibid*). This manorial estate had been granted by the crown to George Lord Strange prior to 1521 (*ibid*).
- 3.1.12 Nun’s Hill (Site **13**) may represent the site of a medieval nunnery. However, beyond the obscure place-name and an inconclusive cropmark photograph

showing possible building footprints (Plate 3), which may or may not relate to the site, there is little evidence to support this. Kirkhead Chapel (Site 22) may have continued to be used during this period, although Dickinson (1945, 50) considered that it had probably moved to higher ground following the attentions of the Norse in the tenth century.

- 3.1.13 **Post-medieval Period (AD 1540 - 1900):** the sixteenth and seventeenth centuries saw the rebuilding of many structures in the region in stone as a result of economic prosperity, changing tastes and, in the case of Flookburgh, a fire which occurred through the village at about 1686 (Stockdale 1872). The Lilac Cottage Restaurant (Site 06) in Flookburgh probably represents such an early eighteenth century town house, and Field Head (Site 07), on the opposite side of Winder Lane, appears to date from the same period. Cartmel priory was dissolved in 1536, although it was temporarily restored in the same year during the Northern Rebellion (Farrer and Brownbill 1914, 255). The lands formerly belonging to the priory passed through inheritance from the Preston family, the purchasers of the estates in 1537, to the Lowther family, and thence into the ownership of the Cavendish family.
- 3.1.14 The study area predominantly comprised field systems, the low-lying nature of which required extensive drainage systems. The majority of this activity seems to have followed the 1796 Enclosure Act. This precipitated a massive programme of works which reclaimed 8000 acres of farmland accompanied by road and bridge building, and an embankment to protect Wyke, Bank Moor and Winder Moor (North Pennines Archaeology 2003, 9). Subsequent reclamation by embankment in 1817 appears to have been followed by a minor marine transgression in 1828, to which an area of the 'West Plain' was lost. Flookburgh Model Farm (Site 12), allegedly designed by Frederick Webster of Kendal, comprises a classic model farm built after the reclamation of 1796. Flookburgh Farmhouse (Site 11) similarly comprises early- to mid-nineteenth century buildings, although the description reproduced in the gazetteer is identical to the description given for the Model Farm and, as such, may need reappraisal.
- 3.1.15 Mireside Hall (Site 04), one of the three tenements comprising the medieval site (*Section 3.1.11*) was, by 1600, owned by Robert Curwen, although it later became a component of the Cark Hall Estate. The current building, however, appears to be completely modern, and no older fabric survives.
- 3.1.16 Wraysholme Tower (Site 19) appears to have been converted to more agricultural and domestic purposes with the addition in the sixteenth and nineteenth centuries of additional buildings on the western and northern sides. The manor of Wraysholme was sold in 1594 after the death of Ferdinando, the fifth Earl of Derby and heir of George Lord Strange (*Section 3.1.11*), to the Dicconson family through which it passed by inheritance until the Civil War, when Hugh Dicconson's Royalist stance caused Parliament to sequester the estate (Farrer and Brownbill 1914, 267). In 1756 a John Carter of Cart Lane bought Wraysholme Tower and it passed through private hands until the present day. A new farmhouse was added to the north elevation in the twentieth century, and it is now both a cattle farm and dairy. Wraysholme

Tower was the location of two post-medieval findspots: a Civil War period rapier (Site 17) and a cannonball (Site 18) of uncertain date and provenance.

- 3.1.17 The arrival of the Ulverston and Lancaster Railway in 1856-7, and the construction of the Cark station buildings (at SD 3560 7640), finished in 1857, represented substantial investment in the area by William Cavendish, Duke of Devonshire, the owner of much of southern Cumbria's mineral assets. The remains of the exploitation of these mineral assets are also represented by the Limekiln (Site 21) at the eastern end of the study area, which is most probably nineteenth century.
- 3.1.18 Cark Airfield, to the south of the study area, was conceived in 1917 as an airship factory, with the adjacent settlement at Ravenstown built to house its workers (North Pennines Archaeology 2003, 10). The airfield opened in 1941 and provided Anti-Aircraft training as well as Flying Training Command and a Pilot Training Unit (*ibid*). It became the base for the Royal Air Force Mountain Rescue Unit before it shut down at the close of the Second World War (*ibid*). It later reopened as a private airfield (*ibid*).

3.2 MAP REGRESSION ANALYSIS

- 3.2.1 ***Saxton's Map of the County Palatine of Lancashire 1577:*** Flookburgh ('*Flokesbarro*'), Cartmel ('*Cartmell*') priory, Holker Hall ('*Howker*') and Wraysholme Tower are shown on this map, although the peninsula is at too great a scale to display any finer detail (Plate 4). A settlement at Winder seems to correspond to Cannon Winder Hall to the south-west of the study area, which is thought to date from the sixteenth century (Hudleston 1987, 159). An unnamed settlement is shown at the position of the Cartlone passage, which may represent Allithwaite.
- 3.2.2 ***Mercator's Map of North West England and Wales 1595:*** this large-scale map shows the peninsula as entirely bare (Plate 5) except for Cartmel Priory and the Cartlone passage.
- 3.2.3 ***Bowen's Map of the County of Lancashire divided into its Hundreds 1752:*** Cark and Flookburgh ('*Flookburg*') villages are shown, as is a settlement on the east coast called '*Carters*'. Allithwaite is shown on the map occupying a position to the east of Flookburgh, on a road aligned east/west through both settlements and extending across the sands in either direction, to Lancaster in the east and to Ulverston in the west (Plate 6). Settlements at 'C Winder' and at 'R Winder' are shown on the west and south sides of the peninsula respectively. Wraysholme Tower is shown to the south of Allithwaite, and to the north and east of a large inlet.
- 3.2.4 ***Yates' Map of Lancashire 1786:*** this is the first useful cartographic representation of the study area showing settlements at Cark and Flookburgh ('*Flookborough*', and outlying settlements at Cannon Winder and Ravens Winder (Plates 7 and 8). An unnamed settlement is shown to the north of Ravens Winder, which possibly represents Mireside Hall, and also a group of buildings in the Kents Bank area. A water-wheel symbol is shown south of what appears to be a millpond, which presumably represents Allithwaite Mill

(Section 3.1.7). Winder Moor is shown as an extensive area surrounding Holme and the peninsula of Humphrey Head, the site of a Holy Well.

3.2.5 **Ordnance Survey Map, Lancashire 1st edition 1851, 6" to 1 mile:** the field systems in the study area are shown for the first time on this illustration (Plate 9), as are the roads and bridges which seem to have been constructed following the 1796 Enclosure Act (Section 3.2.15). Although not built until 1856-7 the Ulverston and Lancaster Railway (Section 3.2.18) had been added by the time that this map had been published.

3.2.6 **Ordnance Survey Map, 1894, First Edition, 1:2500:** Wraysholme Tower (Site 23) is shown as a group of ten buildings on the west side of the tower (Plate 10), and Flookburgh (Site 11) is also far more clearly illustrated (Plate 11). None of the field boundaries appear to have moved since the previous survey, and the coastline on the southern end of the peninsula has changed negligibly.

3.3 ARCHAEOLOGICAL INTERVENTIONS

3.3.1 Flookburgh has seen one archaeological intervention in recent years (OA North 2006; North Pennines Archaeology 2003); the excavations revealed medieval and post-medieval pottery and other domestic artefacts amongst ploughsoil and other similar agricultural deposits. No other archaeological interventions have occurred within the study area.

4. WALKOVER AND TOPOGRAPHIC SURVEY

4.1 INTRODUCTION

- 4.1.1 The walkover survey assessed the survival of above ground remains relating to sites identified during the desk-based research, and also identified previously unrecorded sites along the proposed pipeline corridor. All fields containing and adjacent to, the pipeline were traversed systematically along the pipeline route, and ground conditions were good for identifying sites throughout the walkover. The majority of fields encountered were under pasture, with short-to medium-height grass coverage, and the remaining fields comprised either scrub or marshland.
- 4.1.2 Five sites (Sites **06-08**, **19** and **20**) identified during the rapid desk-based research lay within the walkover survey study area. Of these, the detail of sites **06-08** and **19** was enhanced by the walkover survey, and 19 new sites (Sites **25-43**) were identified. The subsequent topographic survey recorded the extant surface topography of Sites **26**, **27**, **29**, and **31-33**, as identified during the walkover (Fig 3).

4.2 RESULTS

- 4.2.1 *Agricultural Features:* Sites **25**, **26**, **29**, **30**, **34**, **38-42** are agricultural features, and all are post-medieval in date, comprising raised trackways, relict field boundaries, drainage features, bridges and field systems.
- 4.2.2 A number of raised trackways were present (Sites **25**, **26**, **29**, **40** and **42**). Two of these (Sites **25** and **26**) were accompanied by additional earthworks. To the north-east corner of Site **26** a hill appears to have been landscaped with a platform at its base. Site **25** comprises a raised track leading to a relict field boundary in the form of a ditch, associated with two banks occupying north/south alignments. Site **40** (Plate 12) seems to represent the original access to Holme prior to the reclamation of Winder Moor and the advent of the railway line.
- 4.2.3 Site **37** is a field system comprising a regular pattern of rectangular fields, drainage features (Sites **38** and **39**) and a bridge (Site **34**; Plate 14). These would have been established subsequent to the reclamation of Winder Moor in 1796. Site **41**, a shallow depression, is interpreted as the remains of a field boundary.
- 4.2.4 A stone roller (Site **30**) was also identified during the walkover, situated immediately outside Lilac Cottage (Site **06**). The roller would have been used to roll the surrounding fields for the purpose of controlling damaging populations of insect larvae.
- 4.2.5 *Sea Defences:* Sites **27**, **31**, **32**, **33** and **36** comprise stretches of upstanding earthworks which together form a large bank (Site **08**). The bank begins to the east of Ravenstown (Site **27**), and is the only part of the sea defence to

incorporate a ditch. This is located on the northern side of the bank. The bank heads in a north-easterly direction before turning east just to the south of Flookburgh. Sites **32** and **33**, located to the east, are truncated by Moor Lane. The bank then continues in a south-easterly direction as Site **36** (Plate 15), to the immediate south of the railway, and this is the best preserved section of the bank feature. The feature as a whole appears to be medieval or post-medieval sea defences rather than a Roman road as previously thought.

- 4.2.6 **Miscellaneous Features:** a putative saltern (Site **28**) was identified in the former salt marsh on the southern side of the sea defences (Sites **27**, **31-33** and **36**), which would have been the ideal location for such a structure. A natural outcrop of limestone (Site **35**) was identified but this proved to have no archaeological significance. A hollow way or footpath (Site **43**; Plate 16) was also identified, leading southwards from Allithwaite to the position of the Kirkhead Chapel (Site **22**) and Holy Well Lane.
- 4.2.7 **Topographic Survey:** the sites subject to the topographic survey included a raised trackway (Site **26**) and the five sites (**27**, **31**, **32**, **33** and **36**) forming elements of the sea defence earthwork (Site 08). The results of the topographic survey are presented as Figure 3.

5. GAZETTEER

Site number 01
Site name Nab Green, Flookburgh Axe Find
NGR SD 336300 475000
Site type Findspot
Period Prehistoric (Neolithic/Bronze Age)
SMR No 4375
Sources HER
Description “Many hammers and battle axes of different sizes and of several different kinds of stone, as well as celts of brass, copper and stone, have been found in Cartmel district, particularly at... Nab Green”.
Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number 02
Site name Flookburgh Palstave Find
NGR SD 336000 475000
Site type Findspot
Period Prehistoric (Bronze Age)
SMR No 2427
Sources HER
Description Two or three bronze palstaves ploughed up in a field near Flookburgh before 1886. They were sold in Liverpool. Present whereabouts unknown, but it is thought that an unpublished MBA (Middle Bronze Age) flanged axe at British Museum Acc No 56.7-1 5020 may be one of these.
Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number 03
Site name Axe, Celts Finds Flookburgh Area, Lower Holker
NGR SD 336000 475000
Site type Findspot
Period Prehistoric (Bronze Age)
SMR No 15123
Sources HER
Description According to OS Index, “many hammers and battle axes of different sizes and of several different kinds of stone, as well as celts of brass, copper and stone, have been found in Cartmel district, particularly in the meadows before Flookburgh”.
Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number 04
Site name Mireside House, Flookburgh, Lower Holker
NGR SD 336310 475460
Site type Building
Period Medieval/Post-medieval
SMR No 2412
Statutory Designation Listed Building (Grade II)
Sources HER
Description In 1504 Mireside was divided into three separate tenements. Nicholas Gardner held the part known as Mireside Hall, which c 1600 was in the hands of Robert Curwen and later became part of the Cark Hall Estate. According to Ordnance Survey, the present Mireside Farmhouse is completely modern and does not appear on a 1st Edition OS Map 1847-51. The older building may have been incorporated into the farm buildings on the south side of the yard. The Ordnance Survey Inspector could find no evidence for this.
Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number	05
Site name	Back Lane, Flookburgh Site of Road
NGR	SD 336300 475500
Site type	Road
Period	Roman
SMR No	4979
Sources	HER
Description	Alleged line of Roman road referred to by Stockdale. Looks to be the same earthwork as that comprising Site 8.
Assessment	Part of the site is crossed by the proposed development and will be affected.

Site number	06
Site name	Lilac Cottage Restaurant
NGR	SD 336524 475555
Site type	Building
Period	Post-medieval
SMR No	26772
Statutory Designation	Listed Building (Grade II)
Sources	HER
Description	House. Probably early C18. Roughcast stone with slate roof. Symmetrical central entrance plan. 2 storeys, 3 bays. Windows have casements. Entrance has gabled porch, inner door is glazed and panelled. Gable-end stacks. Rear has lean-to outshut. Interior has fielded-panelled partition wall with dado rail and one 2-panel door with dado. Some plank and muntin partitioning; ovolo beam and 6-panel door. Stair has square newels.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	07
Site name	Field Head
NGR	SD 336540 475565
Site type	Building
Period	Post-medieval
SMR No	26771
Statutory Designation	Listed Building (Grade II)
Sources	HER
Description	House. Probably mid C18. Roughcast stone with slate roofs. Central entrance plan. 2 storeys, 4 bays, the fourth bay recessed and lower. Windows have plaster surrounds, that above entrance with key, and small-panelled top-hung casements. Entrance to second bay has ovolo-moulded reveals, flat pilasters, frieze with inscription "Field Head" and consoled pediment; glazed door with overlight. Gable-end stacks. Rear has lean-to outshut to first bay, second and fourth bays have large 2-light single-chamfered-mullioned windows, those to ground floor with small-panelled fixed glazing with opening lights and thick ovolo-moulded glazing bars; first floor sashes and casements. Third bay has stair window, glazing as ground floor. Interior has open string stair with Tuscan newels and balusters: 3 to each tread, ramped headrail.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	08
Site name	Flookburgh Bank/Roman Road
NGR	SD 336700 475500
Site type	Earthwork
Period	Unknown (Medieval?)
SMR No	5746
Sources	HER

Description	Remains of a bank (comprising Sites 27 , 31-33 and 36) can be seen crossing fields just outside Flookburgh. There is a slight rise to the modern road where the bank/agger runs under it. Suggested by local farmers as the remains of former sea defences, but Mr Fitton thinks it may be the remains of a Roman road which possibly crossed the river estuaries of the Kent and Leven. Mr Fitton was going to “probe” the area, but no further information has come back from him.
Assessment	Parts of the site are crossed by the proposed development area and will be affected.

Site number	09
Site name	Flookburgh Axe Find
NGR	SD 336700 475700
Site type	Findspot
Period	Prehistoric (Neolithic/Bronze Age)
SMR No	4149
Sources	HER; <i>Trans Cumberland and Westmorland Antiq and Arch Soc</i> , XXVI 38
Description	A stone axe hammer found at Flookburgh.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	10
Site name	Flookburgh Medieval Village
NGR	SD 336700 475800
Site type	Village
Period	Medieval
SMR No	3571
Sources	HER
Description	<p>Area for Flookburgh medieval village. The small town of Flookburgh, first mentioned <i>c</i> 1246, was developed on land belonging to Cartmel priory and may have had a market by 1292. It has Regalia from <i>c</i> 1600 (probably in the parish church). The first reference to burgages appears to be 1505-9 with 65 recorded in 1609-10. The town had no parish church of its own, but there was an open market and a market cross.</p> <p>Possible embankment earthwork visible on aerial photograph (CCC3015, 38), running east/west to the south-east of Flookburgh village (centred on SD372 755); this could possibly relate to sea defences in the medieval period. Fieldwork would be required to verify this suggestion.</p> <p>The place name Flookburgh (Flookborough) derives from Floki’s Hill, or fortified mound, with the earliest record of this name from 1246. Flook could also refer to a type of fish caught in the sea, fluke (OE <i>‘floc’</i>), the second name elements from the Old Norse <i>‘borg</i>. <i>Cark</i> derives from the Old Welsh <i>‘carrec’</i> meaning rock (<i>ibid</i>).</p>
Assessment	The majority of the site lies outside of the proposed development area and is unlikely to be affected.

Site number	11
Site name	Flookburgh Farmhouse and Buildings
NGR	SD 336683 475756
Site type	Buildings
Period	Post-medieval
SMR No	26791
Statutory Designation	Listed Building (Grade II)
Sources	HER
Description	Farmhouse and buildings. Early C19, the farmhouse mid C19. Stone rubble with dressed stone dressing and slate roof, house is roughcast; rest probably was intended to be. Courtyard plan: house to north-west angle now includes north range. House of 2 storeys and 2 bays, the second two bays projecting under gable.

Quoins. Windows have rock-faced lintels and are sashed with glazing bars; entrance to first bay. North range, now single storey extension to house, has inserted casements and later lean-to building. West return to street of 4 bays, windows sashed; entrance with overlight; cross-axial stack. East range of 2 storeys and 5 bays, the central bay breaks forward under pedimented gable, the end bays project under hipped gables. Ground floor has several cow house entrances, 2 to end bays with one to inner returns; 3 to second and fourth bays; central bay has large elliptical-headed entrance with rusticated surround; some has pitching eyes, most glazed, with projecting edges to surrounds; inserted loading door to first bay. Round opening to gable. South end of four bays, the first bay recessed with roof carried across on braces, the third breaking forward under pedimented gable. Quoins. Openings as above, one entrance altered to second bay; third bay has elliptical-headed barn with rusticated surround. West range of single storey sheds under single-pitch roofs. Blind walls to street curved inward to gate piers; one stack. Elevations to courtyard altered, with later lean-to extension; elliptical-headed large entrances to east and south, the latter blocked. Farmhouse included for group value.

Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number	12
Site name	Flookburgh Model Farm, Lower Holker
NGR	SD 336700 475750
Site type	Buildings
Period	Post-medieval
SMR No	16999
Statutory Designation	Listed Building (Grade II)
Sources	HER
Description	Flookburgh Farm is listed by English Heritage as a model farm. Described as a classical quadrangle built when moss on the edge of Morecambe Bay was reclaimed. The architect was said to be Frederick Webster, Kendal. Now converted to housing (English Heritage). Farmhouse and buildings. Early C19, the farmhouse mid C19. Stone rubble with dressed stone dressing and slate roof, house is roughcast; rest probably was intended to be. Courtyard plan: house to north-west angle now includes north range. House of 2 storeys and 2 bays, the second two bays projecting under gable. Quoins. Windows have rock-faced lintels and are sashed with glazing bars; entrance to first bay. North range, now single storey extension to house, has inserted casements and later lean-to building. West return to street of 4 bays, windows sashed; entrance with overlight; cross-axial stack. East range of 2 storeys and 5 bays, the central bay breaks forward under pedimented gable, the end bays project under hipped gables. Ground floor has several cow house entrances, 2 to end bays with one to inner returns; 3 to second and fourth bays; central bay has large elliptical-headed entrance with rusticated surround; some has pitching eyes, most glazed, with projecting edges to surrounds; inserted loading door to first bay. Round opening to gable. South end of four bays, the first bay recessed with roof carried across on braces, the third breaking forward under pedimented gable. Quoins. Openings as above, one entrance altered to second bay; third bay has elliptical-headed barn with rusticated surround. West range of single storey sheds under single-pitch roofs. Blind walls to street curved inward to gate piers; one stack. Elevations to courtyard altered, with later lean-to extension; elliptical-headed large entrances to east and south, the latter blocked. Farmhouse included for group value.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	13
Site name	Lower Holker, Nun's Hill
NGR	SD 337300 475300

Site type	Nunnery
Period	Medieval
SMR No	6854
Sources	HER
Description	The place name “Nun’s Hill” may or may not indicate the location of a convent.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	14
Site name	Winder Moor Axe Find
NGR	SD 33760 475400
Site type	Findspot
Period	Prehistoric (Neolithic/Bronze Age)
SMR No	4148
Sources	HER
Description	A polished stone axe, butt broken (probably Group VI), measuring 16.5cm long and 6.3cm width of cutting edge, found when ditching NW of Holme Farm by B Dickinson in 1955. On loan to Barrow Museum, Acc No 5274.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	15
Site name	Lower Allithwaite, Outerthwaite Unclassified Cropmarks
NGR	SD 337600 475800
Site type	Cropmarks
Period	Unknown
SMR No	6911
Sources	HER
Description	Unclassified cropmark.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	16
Site name	Lower Allithwaite, Outerthwaite Unclassified Cropmarks
NGR	SD 337900 475800
Site type	Cropmark Site
Period	Unknown
SMR No	6910
Sources	HER
Description	Possible linear feature appearing as a cropmark.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	17
Site name	Wraysholme Tower Rapier Find, Lower Allithwaite
NGR	SD 338300 475500
Site type	Findspot
Period	Post-medieval (Stuart I)
SMR No	4376
Sources	HER
Description	A rapier, probably used at the time of the Civil War, found near Wraysholme Tower in 1831. Last in the possession of J Newby Wilson, the Landing Windermere.
Assessment	The site lies close to the proposed development area but is unlikely to be affected.

Site number	18
Site name	Wraysholme Tower Cannon Ball Find, Lower Allithwaite
NGR	SD 338300 475500
Site type	Findspot

Period	Unknown
SMR No	4377
Sources	HER
Description	A cast-iron cannon ball, 7 inches in diameter and weighing 44 1/4 pounds, having a well-developed ridge round the centre, was found c 1831 near Wraysholme Tower. It was placed near the door of the adjoining farmhouse, but was later purchased by Dr Beardsley of Grange (1860s). Present whereabouts unknown.
Assessment	The site lies close to the proposed development area but is unlikely to be affected.

Site number	19
Site name	Wraysholme Tower
NGR	SD 338312 475418
Site type	Building
Period	Medieval/Post-medieval
SMR No	24289
Statutory Designation	Scheduled Monument; Listed Building (Grade II*); no Number allocated
Sources	HER
Description	Peel tower, now barn over cowhouse. Probably late C15. Dressed stone with slate roof. Square tower, originally of 3 storeys, 1st floor now rises to gabled roof. North elevation has corbelled parapet, some corbels pierced to form water spouts, and angle turrets with corbelled embattled parapets, both damaged to south side. Large C20 building attached, and 2nd floor flat-headed window of 2 cusped lights. East elevation has entrance with rough head and small window to right, probably both inserted. 1st floor has hollow chamfered light, and large inserted entrance, approached by ramp and bridge, to north end. 2nd floor has 2 hollow chamfered lights. South elevation has projecting garderobe to east end, rising to full height, the turret now missing, but with traces of corbelling to returns; small lights to west return. Ground floor has chamfered light and lean-to privy next to garderobe turret; 1st floor has flatheaded window of 2 cusped lights; corbelled parapet and gable, remains of turret to west angle. West façade has attached farmhouse (datestones of C17 and C19, much altered). Stairlights to south end. Pointed entrance to north end has hollow chamfered opening and jamb missing; hollow chamfered light to each floor above. Pointed entrance, now leading to house opens onto lobby, with spiral stair in south-west angle; pointed entrance to main space. Ground floor has cowhouse partitions. Stair has straight-headed entrance with hollow chamfered reveals to each floor; Tudor-headed fireplace to each floor, that to ground floor now window. A good example of peel tower unaltered by post-medieval domestic use. A Scheduled Ancient Monument.
Assessment	The site lies close to the proposed development area but is unlikely to be affected.

Site number	20
Site name	Wraysholme Tower Axe/Palstave Find, Lower Allithwaite
NGR	SD 338430 475330
Site type	Findspot
Period	Prehistoric (Neolithic/Bronze Age)
SMR No	2413
Sources	HER
Description	“many hammers and battle axes ... found in Cartmel district, particularly at ... Raisholm”. One, a bronze flanged palstave, was dug out of the bottom of a ditch in Eller Meadow c 150 yards south of Wraysholme Tower in 1831. Donated to Barrow Museum in 1962 and reclassified as an MBA (Middle Bronze Age) convex flanged axe (Coles Class III).
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	21
Site name	Wike Farm Limekiln

NGR	SD 338869 474945
Site type	Limekiln
Period	Post-medieval
SMR No	24249
Statutory Designation	Listed Building (Grade II)
Sources	HER
Description	Limekiln. Probably early C19. Dressed stone. West elevation has segmental arched fire hole and narrow projecting course above.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	22
Site name	Kirkhead Chapel, Lower Allithwaite
NGR	SD 339000 475000
Site type	Chapel
Period	Early Medieval
SMR No	2381
Sources	HER
Description	The existence of a pre-Conquest chapel is implied by the earliest known charter pertaining to the Allithwaite area; the name ‘ <i>Kierkepoll</i> ’ or Churchpool is mentioned, which must have been in the Kirkhead area. Stockdale also refers to the “relics of a chapel and some skeletons” found at Kirkhead in the C18, which may be related (See also SMR 2416, the site of an earlier Abbot Hall, the supposed residence of the Priors of Cartmel). Grange/Lower Allithwaite parishes. Possible chapel site at Kirkhead, near the place mentioned in 1199 as Kierkepol (<i>Trans Cumberland and Westmorland Antiq and Arch Soc</i> , XXVI 38).
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	23
Site name	Kents Bank Flint Finds
NGR	SD 33950 475300
Site type	Findspot
Period	Prehistoric (Mesolithic)
SMR No	2381
Sources	HER
Description	Mesolithic flint working site.
Research	The site lies outside the proposed development area and is unlikely to be affected.

Site number	24
Site name	Kents Bank Flint Finds
NGR	SD 339100 475600
Site type	Findspot
Period	Prehistoric (Mesolithic)
SMR No	3334
Sources	HER
Description	Mesolithic flints recorded found here.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	25
Site name	Near Ravenstown
NGR	Central point 336216 475070
Site type	Earthworks, former boundary and raised track
Period	Post-medieval
Sources	Walkover

Description	A complex of earthworks comprising three banks and a ditch, of which the ditch comprises a former field boundary, which appears to have been recently removed. The ditch is approximately 2 metres wide and 120 metres long. This ditched field boundary appears on current Ordnance Survey cartography, but can also be seen on the 1st Edition Ordnance Survey, forming part of a boundary belonging to an earlier larger field, possibly medieval in date. One of the banks leads from the north-eastern entrance into the field towards the former ditched field boundary, and is likely to represent a relatively modern raised trackway. The other two banks in this area respect the former boundary, and may be associated with it. Both are aligned north/south and measure approximately 30 metres long and 0.5 metres wide.
Assessment	The site lies within the proposed development area in parts and will be affected.

Site number	26
Site name	Near Ravenstown
NGR	336294 475141
Site type	Earthworks
Period	Post-medieval
Sources	Walkover
Description	A raised trackway leading from the entrance of the field on Jutland Avenue into the south-eastern corner of the field was 5m wide (across the top) and 45m long. At the north-eastern corner of the trackway a small landscaped hill appears to have a 14m long platform at its base.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	27
Site name	South of Flookburgh
NGR	336364 475192 - 336433 475458
Site type	Earthwork bank
Period	Unknown (Medieval?)
Sources	Walkover
Description	These are all parts of an embankment, which winds its way around the south-east side of Ravenstown and the south side of Flookburgh. The bank is incomplete but it is possible to trace its route of the bank for a considerable length. Its width varies from 17 metres to 5 metres. This is the only part of this embankment which retains a ditch, which is situated on the north side of the bank. This embankment is likely to be the site thought to comprise the former medieval sea defences (Site 08). The bank is 38 metres long and 0.5 metres wide and is aligned east/west. Sites 27, 29, 31, 32, 33 and 36 all appear to comprise component parts of Site 08.
Assessment	Parts of the site are crossed by the proposed development area and will be affected.

Site number	28
Site name	South of Flookburgh
NGR	336407 475310
Site type	Earthwork (Saltern)
Period	Unknown
Sources	Walkover
Description	This is an earthen mound measuring 20 metres by 13 metres in plan. It is situated 43 metres east of the centre of Site 27. The features may possibly comprise the remains of a saltern.
Assessment	The site lies outside the proposed development area and is unlikely to be affected.

Site number	29
Site name	Mire Side Farm
NGR	336419 475519 - 336442 475527

Site type Earthwork/Raised track
Period Unknown (Medieval?)
Sources Walkover
Description A trackway leads from Mire Side Farm to a derelict barn at the end of Moor Lane. It is cut into the side of a hill and measures approximately 3 metres wide and 117 metres long, traversing two fields. Sites **27**, **29**, **31**, **32**, **33** and **36** all appear to comprise component parts of Site **08**, an earthwork feature identified during the desk-based research as possible former medieval sea defences.
Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number **30**
Site name Lilac Cottage Restaurant
NGR 336539 475550
Site type Stone roller
Period Post-medieval
Sources Walkover
Description A stone roller located outside Site **06**. It measures 1.22 metres long and 0.26 metres in diameter, with a metal rod protruding from one end. The other end has broken off but would probably have housed a similar protruding rod. This may comprise part of an agricultural grass-roller.
Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number **31**
Site name South of Flookburgh
NGR 336486 475496 - 336532 475497
Site type Earthwork bank
Period Unknown (Medieval?)
Sources Walkover
Description Part of an embankment which winds it way around the south-eastern side of Ravenstown and the southern side of Flookburgh. Sites **27**, **29**, **31**, **32**, **33** and **36** all appear to comprise component parts of Site **08**, an earthwork feature identified during the desk-based research as possible former medieval sea defences.
Assessment The parts of the site are crossed by the proposed development area and will be affected.

Site number **32**
Site name South of Flookburgh
NGR 336486 475496 - 336532 475497
Site type Earthwork bank
Period Unknown (Medieval?)
Sources Walkover
Description Part of an embankment which winds it way around the south-eastern side of Ravenstown and the southern side of Flookburgh. Sites **27**, **29**, **31**, **32**, **33** and **36** all appear to comprise component parts of Site **08**, an earthwork feature identified during the desk-based research as possible former medieval sea defences.
Assessment The parts of the site are crossed by the proposed development area and will be affected.

Site number **33**
Site name South of Flookburgh
NGR 336486 475496 - 336532 475497
Site type Earthwork bank
Period Unknown (Medieval?)
Sources Walkover
Description Part of an embankment which winds it way around the south-eastern side of Ravenstown and the southern side of Flookburgh. Sites **27**, **29**, **31**, **32**, **33** and **36**

Assessment all appear to comprise component parts of Site **08**, an earthwork feature identified during the desk-based research as possible former medieval sea defences.
The parts of the site are crossed by the proposed development area and will be affected.

Site number 34
Site name Moor Lane, Flookburgh
NGR 336732 475510
Site type Bridge
Period Post-medieval
Sources Walkover
Description A disused and overgrown stone bridge crossing a stone-built open culvert. The span of the bridge is just over 1 metre and it is just over 2 metres wide.
Assessment The site lies within the proposed development area and will be affected.

Site number 35
Site name Near Moor Lane, Flookburgh
NGR 336926 474669
Site type Outcrop
Period -
Sources Walkover
Description A stone outcrop of limestone, likely to be natural, over 2 metres long and 1 metre wide. This appears to be the only outcrop in the study area.
Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number 36
Site name South of Flookburgh
NGR 336486 475496 - 336532 475497
Site type Earthwork bank
Period Unknown (Medieval?)
Sources Walkover
Description Part of an embankment which skirts the south-eastern side of Ravenstowm and the southern edge of Flookburgh. Sites **27**, **29**, **31**, **32**, **33** and **36** all appear to comprise component parts of Site **08**, an earthwork feature identified during the desk-based research as possible former medieval sea defences.
Assessment Parts of the site are crossed by the proposed development and will be affected.

Site number 37
Site name Winder Moor
NGR Central point, 337375 474853
Site type Field system
Period Post-medieval
Sources Walkover
Description A regular field system situated to the south-east of Flookburgh. The pattern of the field system suggests that it was established following the 1796 Enclosure Act and the subsequent reclamation of Winder Moor.
Assessment The proposed development skirts the northern edge of the field system but is unlikely to affect it as it follows existing roads and the railway line.

Site number 38
Site name Near Holme
NGR 337683 475513
Site type Drainage capping
Period Post-medieval
Sources Walkover

Description A large stone drain cap, overlying the position of a linear feature, probably a ditched field boundary, marked on the 1st Edition Ordnance Survey map of 1851. The feature measures 3 metres by 1.60 metres, and comprises three to four slabs of stone and is aligned north/west.

Assessment The site lies directly in the path of the proposed development and will be affected.

Site number 39
Site name Near Holme
NGR 337695 475465
Site type Drainage capping
Period Post-medieval
Sources Walkover
Description A large stone drain cap, overlying the position of a linear feature, probably a ditched field boundary, marked on the 1st Edition Ordnance Survey map of 1851. The feature measures 3 metres by 1.60 metres, and comprises three to four slabs of stone and is aligned north/west.

Assessment The site lies outside of the proposed development area and will not be affected.

Site number 40
Site name Near Holme
NGR 337809 475411 - 337938 475415
Site type Raised track
Period Post-medieval
Sources Walkover
Description A raised trackway measuring 7 metres wide leads from Willow Lane, in the vicinity of Holme. The track leads north-east towards the Lancaster to Flookburgh railway line, which it appears to have been cut by. This may represent a former access route, prior to the nineteenth century land reclamation.

Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number 41
Site name South of Allithwaite Road
NGR 337262 475571 - 337231 475611
Site type Former field boundary
Period Post-medieval
Sources Walkover; OS 1851
Description An earthwork in the form of a shallow depression, which appears to have been a ditch for a former boundary. The boundary is shown on the 1st Edition Ordnance Survey map of 1851, and is probably part of the post-reclamation field system (Site 37), thus dating from the post-medieval period.

Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number 42
Site name Wyke Farm
NGR 33884 475067 - 338839 475127
Site type Raised track
Period Post-medieval
Sources Walkover; OS 1851
Description A raised trackway allows access to a field at the south-east corner of the farm beyond the railway. The track appears to be built on the hillside, appearing as an earthwork. Access to the field was not possible due to work taking place at the time of the walkover. A feature is shown in this location on the 1st Edition Ordnance Survey map of 1851, although it is not annotated.

Assessment The site lies outside the proposed development area and is unlikely to be affected.

Site number	43
Site name	Wyke Farm
NGR	338965 475185 - 339007 475043
Site type	Hollow Way
Period	Post-medieval (possibly earlier)
Sources	Walkover
Description	A hollow way or footpath follows a limestone outcrop covered by trees, along the top of the limestone ridge. The footpath is crossed by the railway and it may have been cut by it. The feature is marked on the 1st Edition Ordnance Survey map 1851 as a footpath, although it may date to an earlier period. The footpath appears to continue northwards towards Jack Hill on the outskirts of Allithwaite.
Assessment	The site lies directly in the path of the proposed development and will be affected.

6. WATCHING BRIEF RESULTS

6.1 INTRODUCTION

6.1.1 Following the results of the desk-based research, walkover survey and topographic survey, Cumbria County Council's County Historic Environment Service (CCCHES) recommended that a programme of permanent presence monitoring, in the form of a watching brief, accompany groundworks in the vicinity of Sites **33** and **36** (Fig 2). The watching brief was conducted during July 2007 and observed the removal of topsoil within the 10m wide pipeline easement. Monitoring took place within five fields to the east of Moor Lane, observing topsoil stripping activity and retrieving artefacts from the topsoil and the spoil-heaps. A summary of the finds is presented in *Appendix 3*.

6.2 RESULTS

6.2.1 **Field 1:** topsoil, **1**, comprising a friable mid greyish-brown silt was removed to a maximum depth of 0.15m throughout the pipeline easement. The finds from the topsoil (**1**) included 22 ceramic sherds, one clay tobacco pipe stem and seven fragments of glass (*see Section 6.3 below*). Beneath this the subsoil, **2**, comprised a gravel-rich silt, measuring 0.10m thick. A light yellowish-grey clay layer, **3**, was observed beneath the subsoil **2**. This clay probably represented the underlying natural geology.

6.2.2 **Field 2:** topsoil, **4**, comprising a friable dark brown friable silt, was removed to a maximum depth of 0.20m. A layer of light yellowish-grey silty clay, **5**, was observed below the topsoil (**4**), and represented the natural geology.

6.2.3 **Field 3:** the topsoil, **6**, comprised a 0.15m thick layer of friable mid greyish-brown silt, with infrequent stone inclusions. A layer of natural geology being a mid orangey-brown clayey-silt, **7**, with stone inclusions was observed beneath the topsoil.

6.2.4 **Field 4:** the topsoil, **8**, which was removed to a maximum depth of 0.25m, comprised a friable mid- to dark greyish-brown silt. A loose mid yellowish-brown clayey silt, **9**, was present beneath the topsoil, probably representing natural geology. A further deposit of light yellowish-grey clay, **10**, was observed in the lower-lying sections of the easement within this field, and this is likely to represent variations in the natural geology.

6.3 FINDS

6.3.1 In all, 86 fragments of artefacts were recovered during the investigation. They were recovered from contexts **1**, **4**, and **6**, and all are effectively unstratified. Most (68) of the fragments recovered were pottery, with only eight small fragments of clay tobacco pipe, and ten of glass. Their distribution is shown below.

Context	Pottery	Glass	Other	Totals
<i>1</i>	22	1	1	24
<i>4</i>	18	7	0	25
<i>6</i>	28	2	7	37
<i>Totals</i>	68	10	8	86

Table1: Summary of artefactual assemblage

6.3.2 All of the material recovered was post-medieval in date, generally dated to the later eighteenth and early nineteenth century. The pottery represented a limited range of vessels, mainly kitchen and tablewares, of eighteenth century or later date. There are few diagnostic sherds and none of the vessels represented can be dated with precision. The earliest fabric represented is hard-fired black-glazed wares in the Cistercian tradition, which probably persisted into the early eighteenth century, and tin-glazed wares and white salt-glazed stoneware both point to an eighteenth century date for much of the deposition. The presence of Creamwares and Pearlware suggest that it continued throughout the century, however. None of the tobacco pipe fragments can be dated with any precision, being all featureless stem fragments. The finds are of little significance to an understanding of the site.

7. EVALUATION RESULTS

7.1 INTRODUCTION

7.1.1 Following the results of the desk-based research, walkover survey and topographic survey, Cumbria County Council's County Historic Environment Service (CCCHES) recommended that a programme of targeted evaluation trenching be undertaken for a section of the site of a possible medieval flood embankment, Site **36**, identified along the proposed pipeline route. The work was carried out on July 31st and August 1st 2007.

7.2 LOCATION OF SITE 36

7.2.1 Site **36** (associated with Sites **27**, **31**, **32** and **33**) is located to the south of Flookburgh (NGR 336486 475496 - 336532 475497), and appears to be a bank or earthwork of possible medieval date. The site was initially identified during the desk-based research (Site **08**), although this was enhanced during the walkover survey by the division of the earthwork into the surviving sections. The possible sea-defence embankment follows a circuitous route from the south-eastern side of Ravenstown past the southern side of Flookburgh and eastwards towards Nun's Hill (Site **14**) and Wraysholme (Site **19**). Although the bank is no longer a complete section of earthwork, enough sections survive to enable its route to be traced. The earthwork varies in width from 17m to 5m. Site **27** is the only part of the embankment that retains a ditch, which appears on the north side of the bank. Topsoil comprised the uppermost layer, although this was removed prior to the excavation of the two evaluation trenches.

7.3 TRENCH 1

7.3.1 Trench 1, measuring 20m long by 2m wide, was located to the north side of the visible earthwork on a north/south alignment (Fig 2). The easement appeared to cut directly through the earthwork at this point, which inclined upwards towards the south. The trench was positioned in order to encompass the area to the immediate north of the earthwork and to provide an opportunity to examine a section across the line of Site **36**.

7.3.2 The uppermost layer encountered comprised a 0.50m thick layer of friable silty brown clay subsoil (**106**). Immediately beneath this layer, at the northern end of the trench, a 0.20m thick dark brown highly organic layer, **103**, was observed (Fig 4). This layer extended across the full width of the trench and a 30l environmental sample (<**1**>) was taken from it.

7.3.3 A 0.20m thick layer of friable, compact, yellowish-grey clay, **107**, was observed immediately below organic deposit **103** (Fig 4). Inclusions within the deposit comprised less than 25% sub-angular stones. The deposit extended beyond the trench limits eastwards and westwards.

- 7.3.4 At the southern end of the trench, and beneath the subsoil **106**, a 0.60m thick layer of coarse, light brown gravel, **105**, was identified. Beneath this, an extremely loose, light grey gravel deposit, **104**, was observed (Plate 17). The deposit extended southwards beyond the excavation limit, and also extended below the maximum depth of the trench. Trench 1 could not be excavated to a depth greater than 1.20m given the loose character of the deposits comprising the section.
- 7.3.5 A 0.12m thick layer of firmly compacted, brownish-grey clay, **102**, was observed along a 9.40m section of the base of the trench. This layer appeared to extend beyond the limits of the trench eastwards and westwards, and appeared to lie directly above natural geology (**101**), which comprised boulder clay. Towards the centre of the trench it was seen to be beneath **104**.

7.4 TRENCH 2

- 7.4.1 Trench 2 measured 20m long by 2m wide, and was located to the west of Trench 1 at the most westerly point of the earthworks comprising Site **36** (Fig 2). In this location the earthwork appeared to traverse the easement on a north/south alignment, and the ground surface inclined upwards towards the east. The 20m trench was positioned in order to highlight the area immediately west of the earthwork, but also to observe a section through the feature.
- 7.4.2 Topsoil sealing the trench had already been removed during the earlier topsoil-stripping phase monitored by the watching brief (*Section 4*). A 0.29m thick layer of mid- to dark brown silty clay subsoil (**109**) sealed the entire length of the trench. The layer of subsoil became progressively thinner towards the eastern end of the trench, where it was approximately 0.15m thick. A 0.23m thick layer of grey gravel (**110**) was observed beneath subsoil **109**. This appeared to represent some form of levelling activity, perhaps associated with the embankment seen in Trench 1.
- 7.4.3 A linear feature (**111**), probably comprising a ditch, was located towards the western end of the trench (Plate 19). The feature was aligned north/south, it traversed the full width of the trench and cut into the natural geology. The cut of the feature (**111**) comprised a shallow U-shape measuring 0.96m wide and 0.20m deep at its centre (Plate 18). The fill (**112**) within the feature appeared to comprise re-deposited natural including small pieces of wood, which appeared to be fragments of tree branches. The wood component of the fill was very small (approximately 1%) and an environmental sample (<2>) was retrieved. Some of the former ground near to the sides of the ditch had small patches of charcoal pressed into the surface.

8. DISCUSSION

8.1 DESK-BASED RESEARCH, WALKOVER AND TOPOGRAPHIC SURVEYS

- 8.1.1 In total, 43 sites were identified through the rapid desk-based research and subsequent walkover survey. The rapid desk-based research identified 24 gazetteer sites (*Section 5*) within 0.5km of the proposed pipeline corridor, all of which were already recorded in the Historic Environment Record. A further 19 sites within 100m of the proposed pipeline route were identified during the walkover survey.
- 8.1.2 There is a single designated Scheduled Monument, Kirkhead Chapel (Site **22**), within the study area, and seven other buildings with Statutory Listed Building Designations within the study area (Sites **04, 06-07, 11-12, 19** and **21**).
- 8.1.3 The table below summarises the sites by period. Sites dating from the prehistoric, Roman, medieval and post-medieval periods were present, with some of unknown date. Figures given in parentheses include possible multi-phase sites.

Period	Number of sites	Sites
Prehistoric	8	Findspots (Sites 01-03, 09, 14, 20, 23 and 24)
Roman	1	Roman road (Site 05)
Medieval	9 (11)	The village of Flookburgh (Site 10); a nunnery (Site 13); a chapel (Site 22); possible sea defences (Sites 08, 27, 31-33 and 36); buildings with possible medieval origins (Sites 04 and 19); and a possible saltern (Site 28)
Post-medieval	13 (15)	Five buildings (Sites 06-07, 11-12 and 21); one findspot (Site 17); raised trackways (Sites 25-26, 29, 40 and 42); removed field boundaries (Sites 25 and 41); a stone roller (Site 30); a disused bridge (Site 34); the regular field pattern (Site 37); drainage-related features (Sites 38 and 39); buildings with possible medieval origins (Sites 04 and 19); and a hollow way (Site 43)
Unknown	5	Two cropmarks (Sites 15 and 16); a cannon ball (Site 18); and an outcrop of limestone (Site 35)

Table 2: Number of sites by period

- 8.1.4 The rapid desk-based research established that sites within the study area chiefly involved prehistoric findspots and post-medieval domestic and agricultural buildings, some of which had medieval origins. The walkover survey revealed a landscape characterised by post-medieval agriculture, identifying features such as raised trackways (Sites **25-26**, **29** and **42**), field boundaries (Sites **25** and **41**), drainage features (Sites **38** and **39**) and a regularly arranged field system (Site **37**).
- 8.1.5 The walkover survey also identified five sites of possible medieval origin, comprising the sections of earthwork bank (Sites **27**, **31-33** and **36**) which correspond to Site **08**. The topographic survey confirmed that the feature lay between two different field systems, suggesting that it was a medieval sea defence. It may approximate to the limit of the salt marsh marked on Yates map of 1786 (Plate 8).
- 8.1.6 Site **28** may represent a saltern, which tend to date from the medieval period, although it may be earlier. ‘Saltern’ is the term generally used for the clay structures in which salt was evaporated from brine, but it is also used for the waste product of the salt evaporation process.
- 8.1.7 The raised trackway (Site **40**) leading to the small hill beneath the farm buildings at Holme would formerly have traversed the salt marsh on Winder Moor (Plate 8), probably towards Wraysholme Tower (Site **19**). The track has been cut by the line of the Ulverston and Lancaster railway and no longer appears to continue beyond it. This probably represents the former farm access prior to the salt marsh reclamation, and although it is not marked on Yates’ 1786 Map (Plate 8) it may predate the map.
- 8.1.8 Sites **34** and **37** represent the reclamation and enclosure processes which had taken place in the post-medieval period. The regular field pattern (Site **37**) and the new roads and bridge (Site **34**) were only able to occupy the salt marsh once it had been reclaimed, an activity facilitated by new drainage (Sites **38** and **39**). All of this activity is most probably a direct result of the 1796 Enclosure Act (*Section 3.2.14 above*).

8.2 WATCHING BRIEF AND EVALUATION

- 8.2.1 The watching brief recorded some very limited evidence for the construction of the putative medieval sea defence structure in the form of gravel deposit **2** in Field 1. Whilst some artefactual evidence was also retrieved, this originated from topsoil contexts and is of very limited potential. Both of the evaluation trenches targeted the earthwork at Site **36**, the possible medieval flood defence. The section of this earthwork exposed in both trenches appeared to comprise a man-made archaeological feature (Plate 20), albeit gravel dumps forming an embankment of indeterminate date. No evidence was identified to suggest that the features were components of a Roman road, and the linear ditch (*III*) bore no obvious relationship to the embankment comprising Site **36**.

8.2.2 The environmental samples recovered during the evaluation were subject to rapid research. It was considered that neither had any potential for further analysis as they both appeared to comprise relatively modern flood deposits.

8.3 CONCLUSIONS AND IMPACT

8.3.1 The pipeline corridor followed the line of modern field boundaries which had previously truncated earthwork Site **08** (comprising Sites **27**, **31-33** and **36**). This route minimised any negative impact, therefore, on the probable sea defence embankment. No other archaeological features, structures or deposits were encountered during the course of the pipeline works, and any potential impact upon features identified during the desk-based research, walkover survey and topographic survey were mitigated by the watching brief and evaluation phases. The artefactual assemblage could, with the appropriate permissions, be discarded.

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10. ILLUSTRATIONS

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- Figure 2: Location of gazetteer sites, watching brief areas and evaluation trenches
- Figure 3: Topographic Survey of Sites **26**, **31-33** and **36**
- Figure 4: Trench 1, east-facing section

10.2 LIST OF PLATES

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- Plate 2: Site **17** (unidentified earthwork to the west of Ollerthwaite), facing south-east
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- Plate 4: Extract from Saxton's Map of 1577
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- Plate 7: Extract of Yates' Map of Lancashire, 1786, northern half of study area
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- Plate 14: Disused Bridge (Site **34**) over stone-built culvert
- Plate 15: Site **36**, large earthwork bank representing possible medieval sea defences
- Plate 16: Site **43**, the possible hollow way cut by the railway
- Plate 17: Trench 1, east-facing section, showing gravel deposits **104** and **105**

Plate 18: Slot across linear feature ***III***, in Trench 2

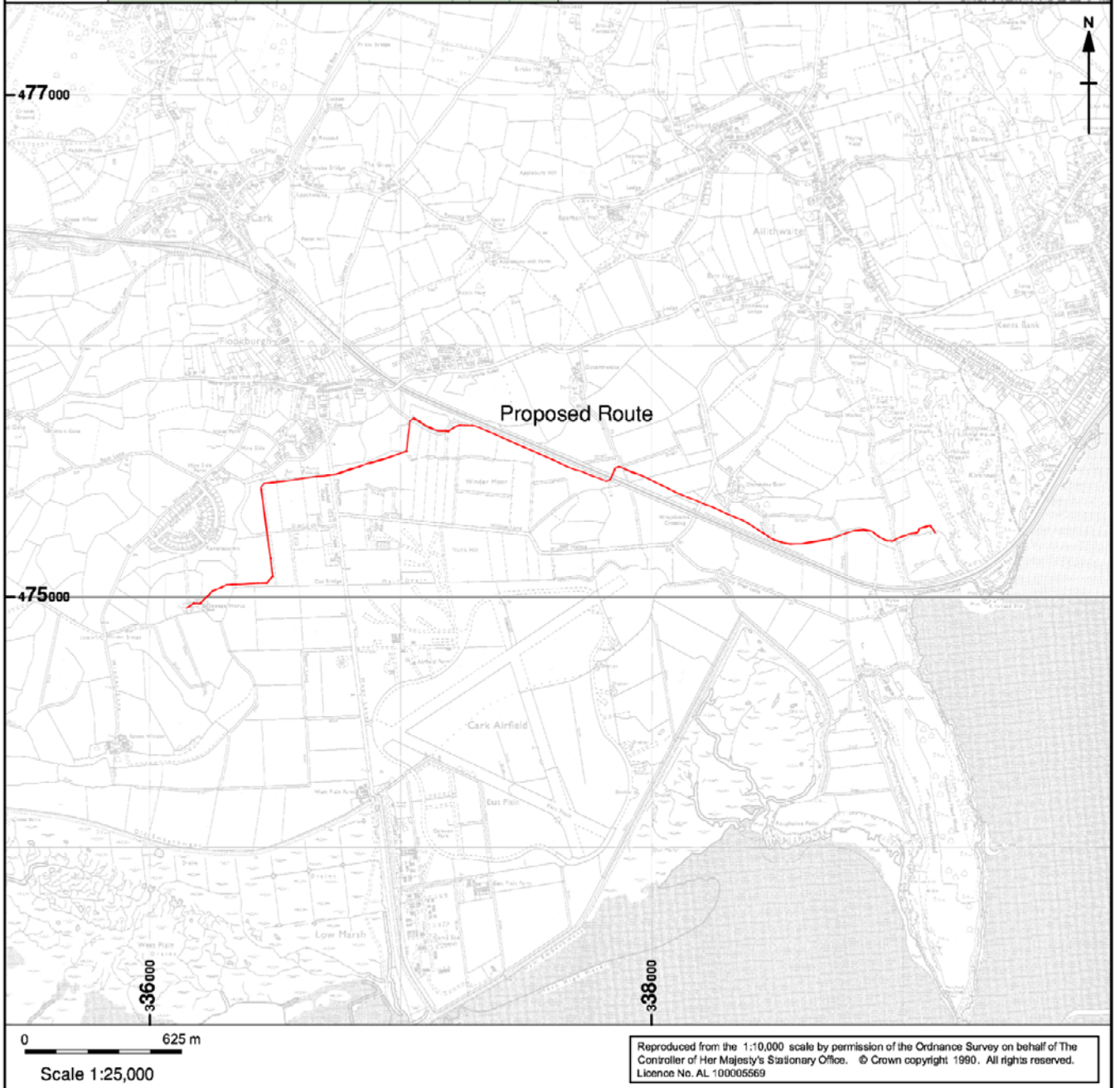
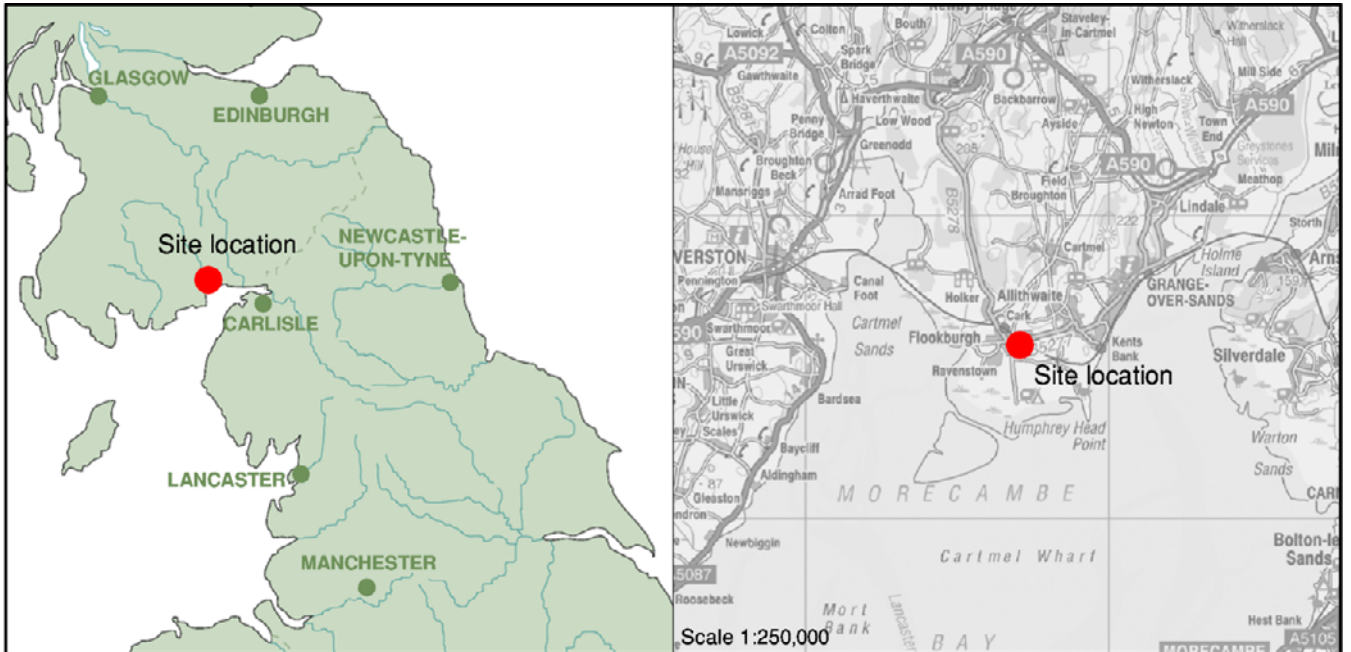


Figure 1: Site Location

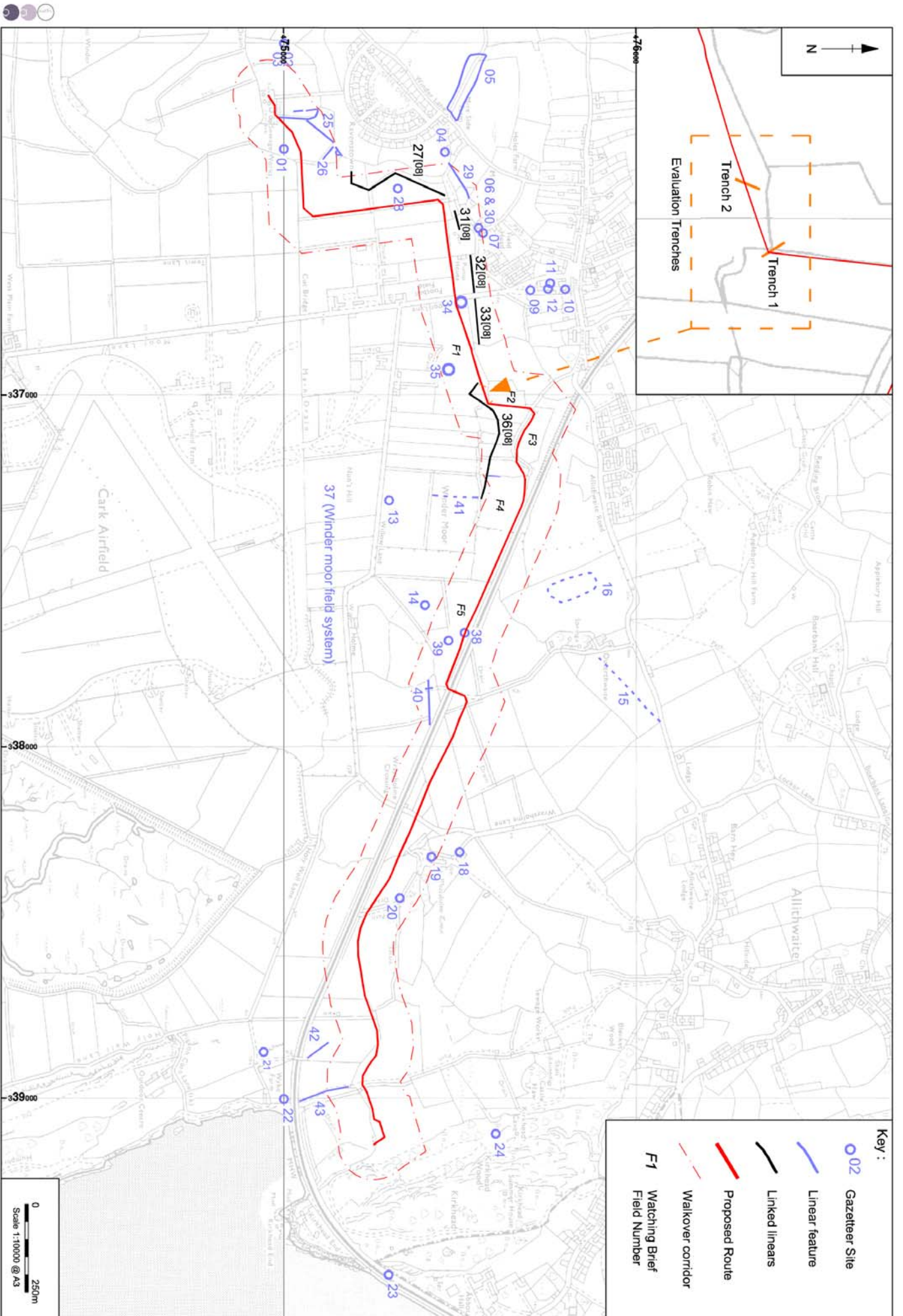


Figure 2: Location of gazetteer sites, watching brief areas and evaluation trenches

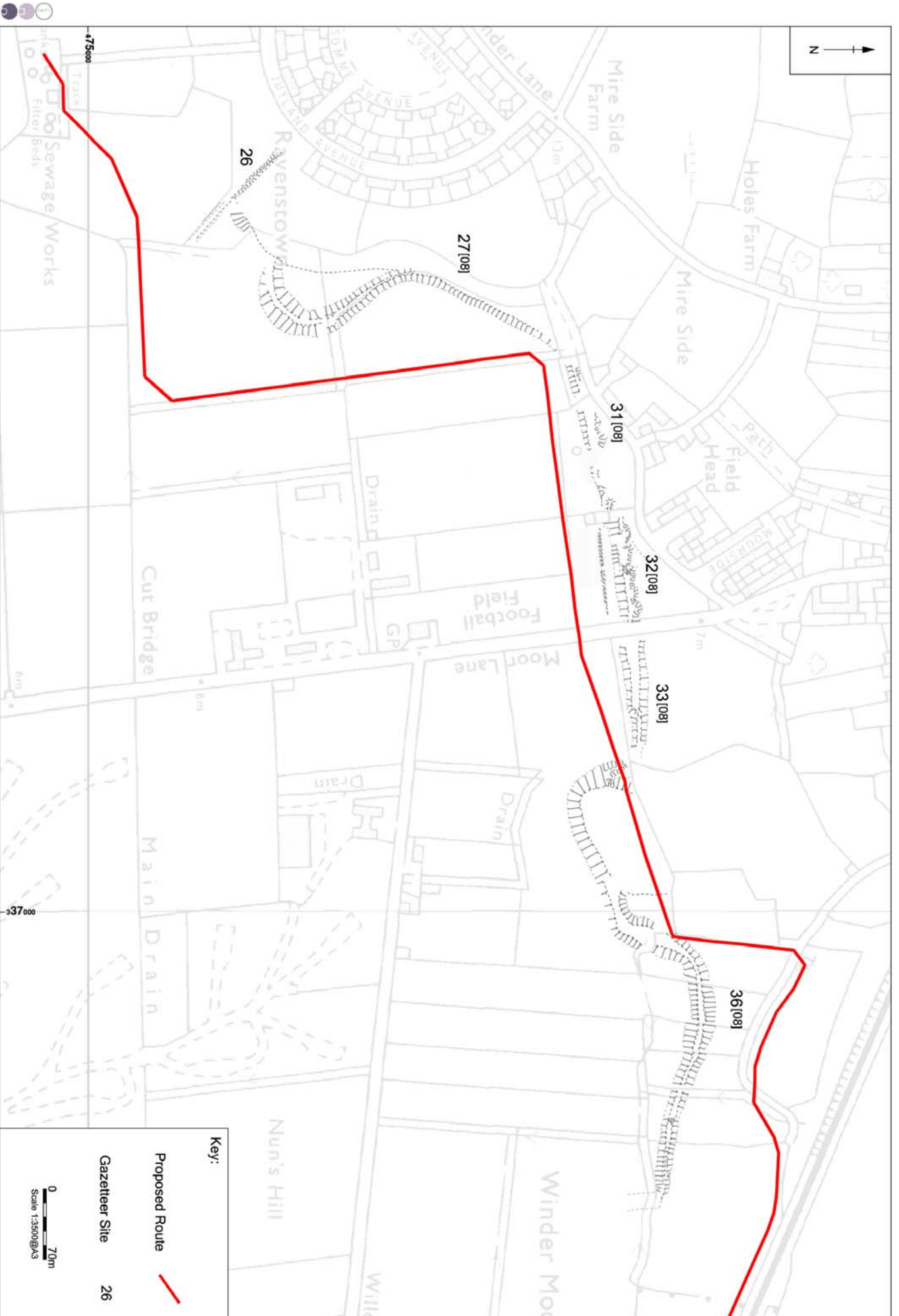





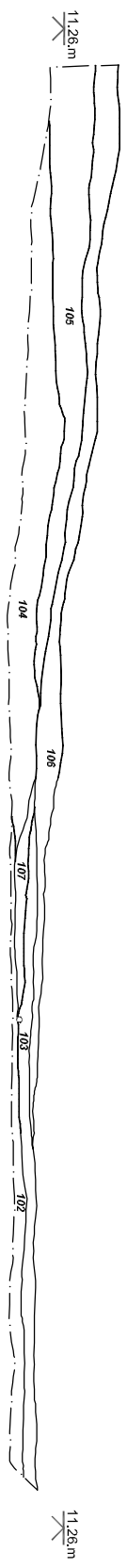


Figure 3: Topographic survey of sites 26, 27, 31, 32, 33 and 36

Key:

-  cut
-  edge of excavation
-  edge of context
-  uncertain edge
- 108** context number
-  stone




0  2.5m
Scale 1:100@A4

Figure 4: Trench 1, east-facing section



Plate 1: Site **16** (unidentified earthwork) to the north-east of Ollerthwaite, facing west



Plate 2: Site **17** (unidentified earthwork) to the west of Ollerthwaite, facing south-east



Plate 3: Site 8 (unidentified bank earthwork) and unidentified cropmarks near Site 14 (Nun's Hill), facing north



Plate 4: Extract from Saxton's Map of 1577



Plate 5: Extract from Mercators Map of 1586

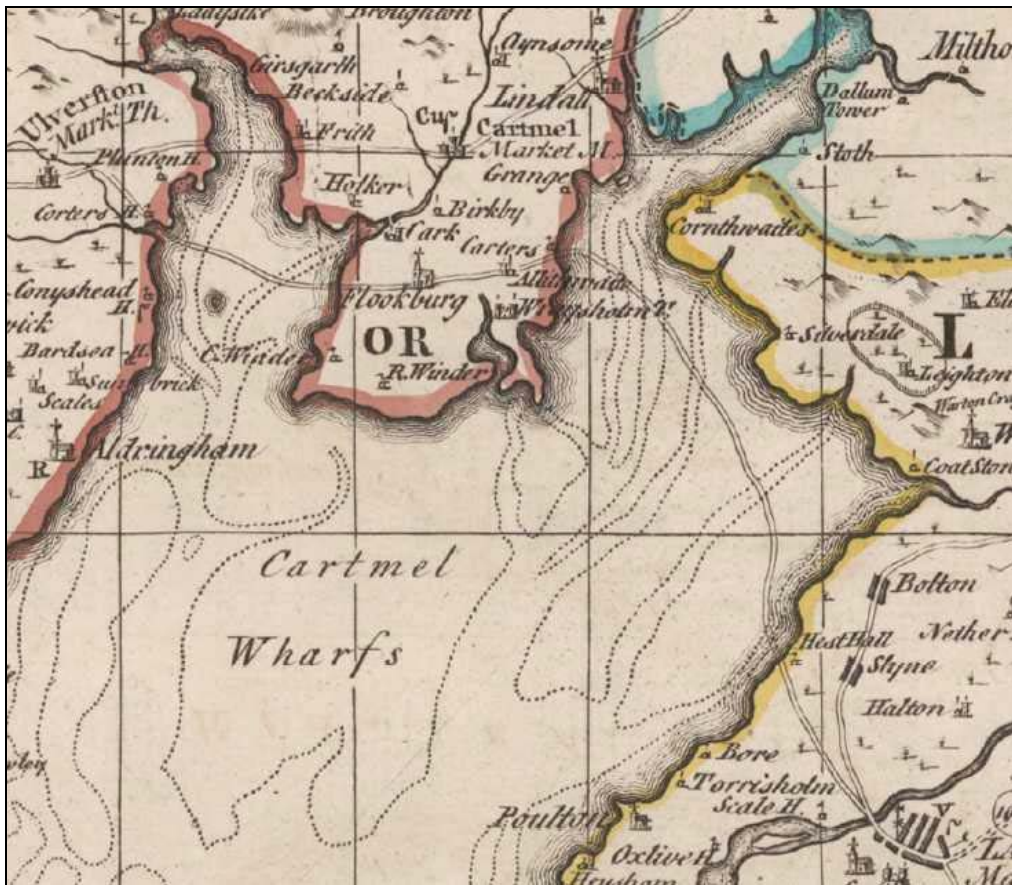


Plate 6: Extract from Bowen's Map of 1752

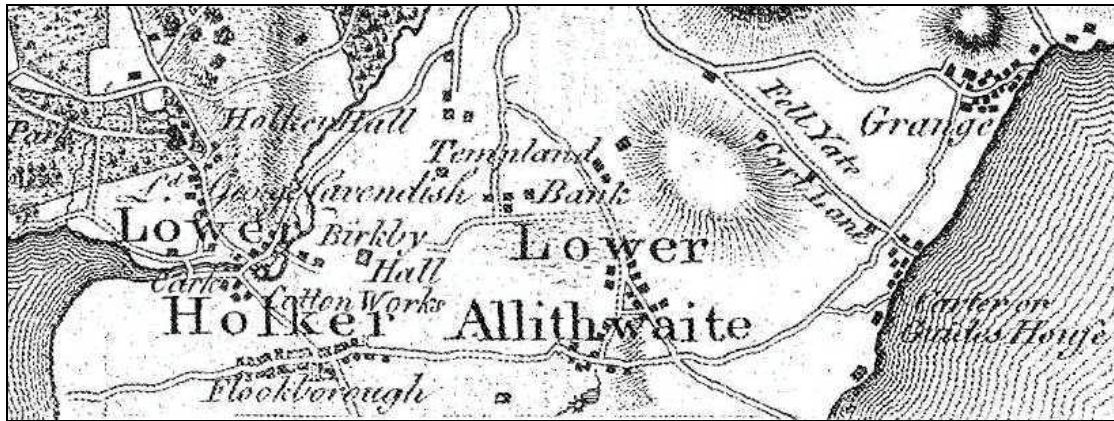


Plate 7: Extract of Yates' Map of Lancashire, 1786, showing northern half of study area

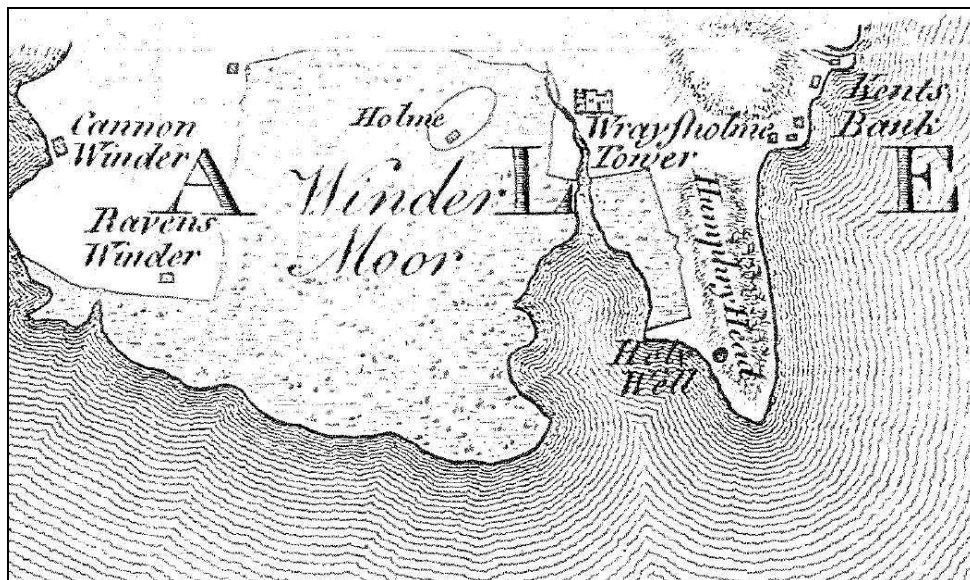


Plate 8: Extract of Yates' Map of Lancashire, 1786, showing southern half of study area



Plate 9: Extract from Ordnance Survey, 1851

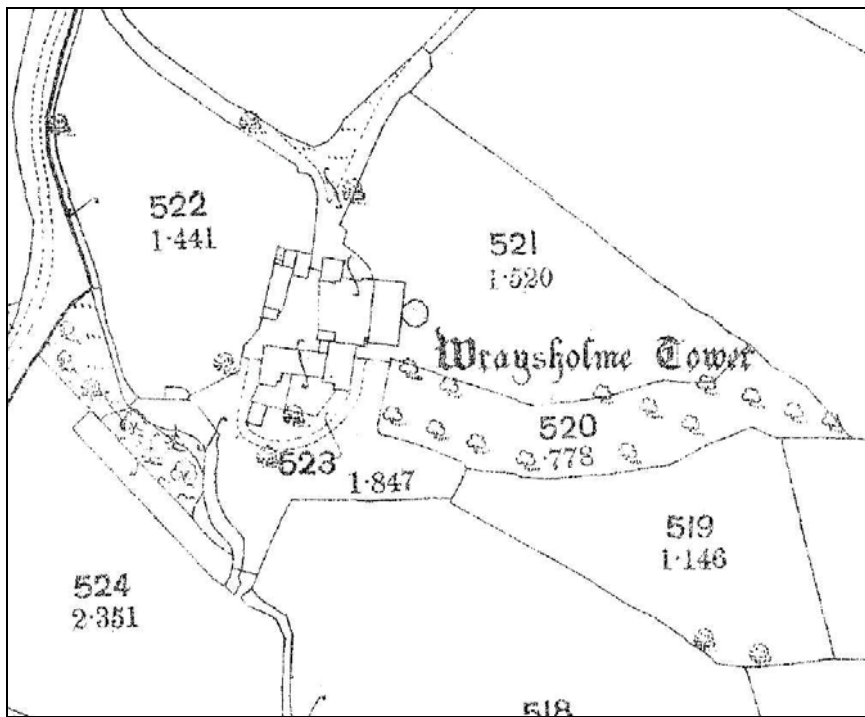


Plate 10: Wraysholme Tower as depicted on Ordnance Survey, 1894

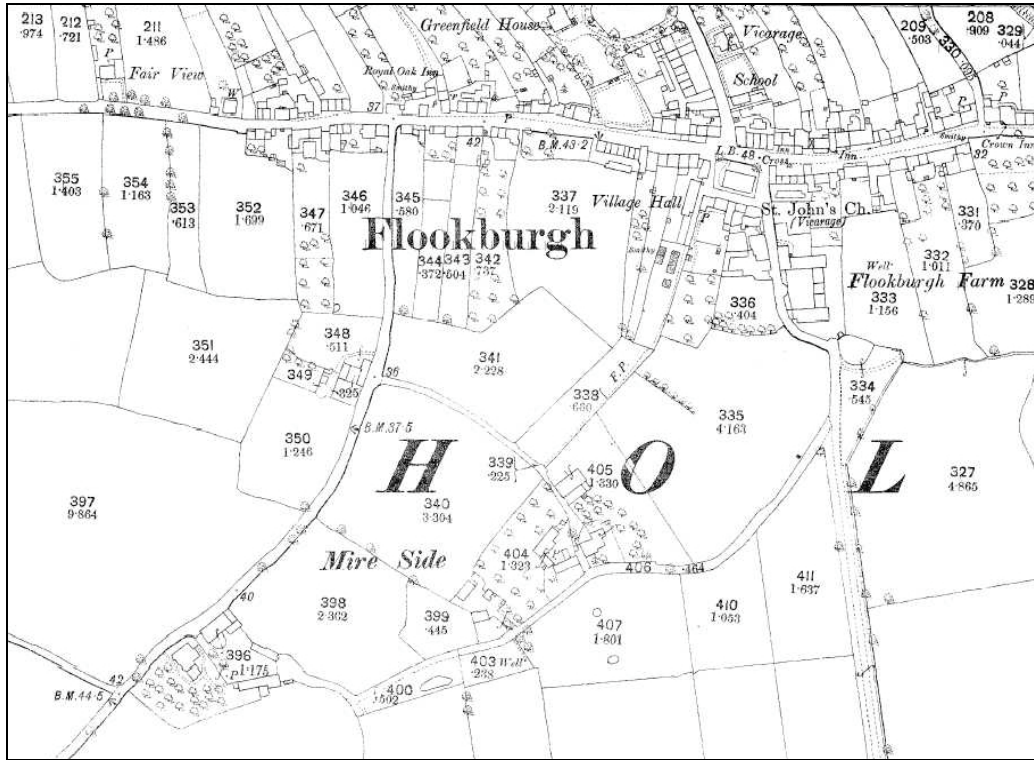


Plate 11: Flookburgh as depicted on Ordnance Survey, 1894



Plate 12: Site 36, large earthwork bank representing possible early sea defences



Plate 12: Site **40**, the raised trackway to Holme



Plate 13: Site **38**, large stone-capping over possible drainage channel

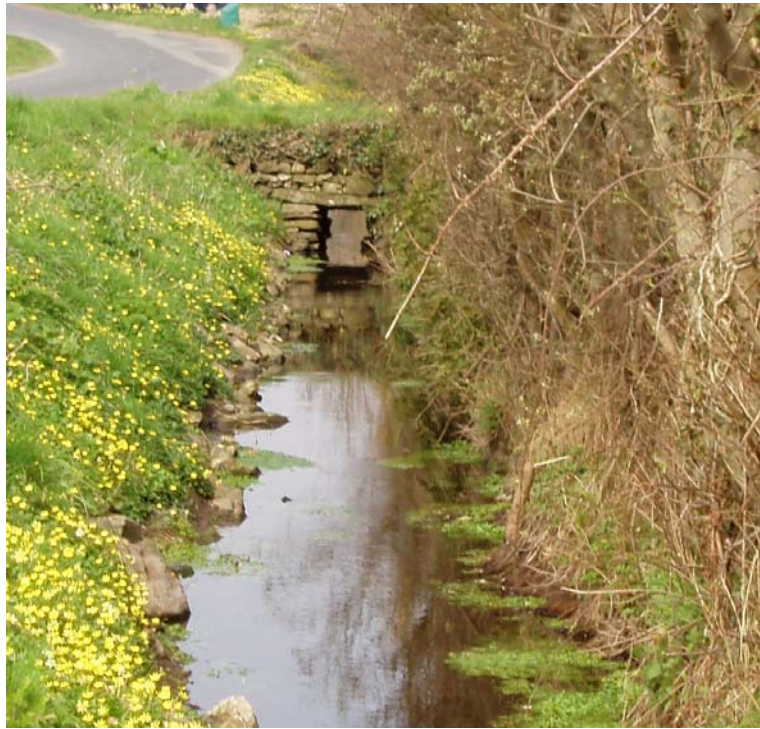


Plate 14: Disused bridge (Site 34) over stone-built culvert



Plate 15: Site 36, large earthwork bank representing possible medieval sea defences



Plate 16: Site **43**, the possible hollow way cut by the railway



Plate 17: Trench 1, east-facing section, showing gravel deposits **104** and **105**



Plate 18: Slot across linear feature *III*, in Trench 2

APPENDIX 1: PROJECT BRIEF

**BRIEF FOR A DESK-BASED ASSESSMENT & WALKOVER SURVEY
ON THE PIPELINE ROUTE BETWEEN
RAVENSTOWN WWTW AND GRANGE OVER SANDS WWTW, CUMBRIA**

Issued by the

County Historic Environment Service

Environment Unit, Economy, Culture and Environment



Date of Brief: 09 January 2007

This Design Brief is only valid for 1 year after the above date. After this period the County Historic Environment Service should be contacted. Any specification resulting from this Brief will only be considered for the same period.

1. SITE DESCRIPTION AND SUMMARY

Site: Pipeline route between Ravenstown WWTW and Grange over Sands WWTW

Grid Reference: SD 3615 7497 to SD 3904 7525

Approximate length of pipeline: approximately 3.7km

Detailed specifications and tenders are invited from appropriately resourced, qualified and experienced archaeological contractors to undertake the archaeological project outlined by this Brief and to produce a report on that work. The work should be under the direct management of either an Associate or Member of the Institute of Field Archaeologists, or equivalent, and any response to this Brief should follow IFA Standard and Guidance for Archaeological Desk-Based Assessments, 1994. The project should not commence until approval of a specification has been issued by the County Historic Environment Service.

2. PLANNING BACKGROUND

- 2.1 Cumbria County Council's County Historic Environment Service (CCCHES) has been consulted by United Utilities regarding a proposed pipeline route between Ravenstown WWTW and Grange over Sands WWTW.
- 2.2 The proposed scheme affects an area considered to have a high archaeological potential and so a programme of archaeological works comprising a desk-based assessment and walkover survey is required in the first instance to provide information on the impact of the proposal upon archaeological remains. An archaeological evaluation and/or a watching brief will also need to be undertaken as a subsequent phase of archaeological investigation. The scope of this next phase will be dependant upon the results of the desk-based assessment and walkover survey.
- 2.3 This advice is given in accordance with the advice of the Code of Practice on Conservation, Access and Recreation 2000.

3. ARCHAEOLOGICAL BACKGROUND

- 3.1 The pipeline passes through an area of archaeological potential. A considerable number of prehistoric flint and bronze implements (eg. HER nos. 2413, 4148 & 4375) have been recovered in the immediate proximity to the proposed route and the possible Palaeolithic site at Kirkhead Cave lies nearby. The proposed route also passes an earthwork bank that has been variously interpreted as the remains of a Roman road or sea defences (HER no. 5746). Wraysholme Tower, a 15th century peel tower, also lies close to the route (HER no. 2414).

4. SCOPE OF THE PROJECT

4.1 Objectives

- 4.1.1 To collate and assess existing information about the archaeology of the site and to determine as fully as possible from the available evidence the nature, survival, quality, extent and importance of any archaeological remains within the development area.
- 4.1.2 To provide a detailed assessment of areas of archaeological potential and survival based on the above research and assess the potential for the use of particular investigative techniques in order to aid the formulation of any necessary mitigation strategy, including further evaluation and/or preservation of archaeological remains.
- 4.1.3 To assess the potential state of preservation for any archaeological deposits that may exist on the site, and where possible to model those deposits.
- 4.1.4 To identify and record the location of any significant archaeological remains that survive above ground along the line of the proposed pipeline.

4.2 Work Required

4.2.1 Desk-Based Assessment

- ❖ Collation and assessment of any relevant information held in the County Historic Environment Record.
 - to identify important sites
 - to assess the potential of *known* sites
- ❖ A reassessment of aerial photographic evidence and, where relevant, a replotting of appropriate archaeological and topographical information by a suitably qualified specialist at a scale of 1:2500.
- ❖ Assessment of relevant published sources including articles in national, regional and local journals.
- ❖ Assessment of relevant unpublished documents including, where appropriate, reports compiled by heritage conservation professionals and students theses.
- ❖ Collation and assessment of all cartographic information relevant to the area.
 - to identify historic landuse
 - to provide an assessment of the potential extent of disturbance to the archaeological resource
- ❖ Assessment of available geotechnical data (e.g. bore holes, test pits): relevant logs must be included as appendices
 - to assess the condition and status of buried deposits
- ❖ Assessment of the topography and landuse of the area through maps and site visits.
 - to assess the **archaeological potential** of areas not identified through the County Historic Environment Record

4.2.2 Walkover Survey

- ❖ A walkover survey of the pipeline route, encompassing the proposed working easement as a minimum, before any ground works commence.
- ❖ Any surface features of potential archaeological interest should be recorded together with areas of potentially significant disturbance, and hazards and constraints to undertaking further archaeological work on site (including the siting of live services, Tree Preservation Orders and public footpaths).
- ❖ The extent (for sites over 10m in size) and location of the archaeological sites should be recorded at an accuracy of +/- 1m.

5. SPECIFICATION

5.1 Before the project commences a project proposal must be submitted to and approved by the County Historic Environment Service.

5.2 Proposals to meet this Brief should take the form of a detailed specification prepared in accordance with the recommendations of *The Management of Archaeological Projects*, 2nd ed. 1991, and must include:

- ❖ A description of the methodology to be employed
- ❖ A description of the report that will be produced
- ❖ Details of key project staff, including the names of the project manager, supervisor and any other specialist sub-contractors to be employed
- ❖ Details of project staffing, expressed in terms of person days
- ❖ A projected timetable for all work including the production of the report

- 5.3 Any significant variations to the specification must be agreed by the County Historic Environment Service in advance.

6. REPORTING AND PUBLICATION

- 6.1 The archaeological work should result in a report, this should include as a minimum:
- ❖ A site location plan, related to the national grid
 - ❖ A front cover/frontispiece which includes the planning application number and the national grid reference of the site
 - ❖ A concise, non-technical summary of the results
 - ❖ A description of the methodology employed, work undertaken and the results obtained, including maps and other illustrations, as appropriate
 - ❖ A discussion of the archaeological implications of the proposed development, identifying areas of greatest archaeological potential within the development site
 - ❖ Clear identification of any hazards to undertaking further archaeological work on site
 - ❖ Recommendations for further archaeological work.
 - ❖ The dates on which the project was undertaken
- 6.2 Three copies of the report should be deposited with the County Historic Environment Record within two months of completion of fieldwork. This will be on the understanding that the report will be made available as a public document through the County Historic Environment Record.
- 6.3 The involvement of the County Historic Environment Service should be acknowledged in any report or publication generated by this project.
- 6.4 Should further archaeological work result from the desk-based assessment, the results may need to be made available for inclusion in a summary report to a suitable regional or national archaeological publication.
- 6.5 Cumbria HER is taking part in the *Online Access to Index of Archaeological Investigations* (OASIS) project. The online OASIS form at <http://ads.ahds.ac.uk/project/oasis> must therefore also be completed as part of the project. Information on projects undertaken in Cumbria will be made available through the above website, unless otherwise agreed.

7. THE ARCHIVE

- 7.1 An archive must be prepared in accordance with the recommendations of *The Management of Archaeological Projects*, 2nd ed. 1991, and arrangements made for its deposit with an appropriate repository. A copy shall also be offered to the National Monuments Record.

8. FURTHER REQUIREMENTS

- 8.1 It is the archaeological contractor's responsibility to establish safe working practices in terms of current health and safety legislation, to ensure site access and to obtain notification of hazards (eg. services, contaminated ground, etc.). **The County Historic Environment Service bears no responsibility for the inclusion or exclusion of such information within this Brief or subsequent specification.**
- 8.2 The Code of Conduct of the Institute of Field Archaeologists must be followed.
- 8.3 One weeks notice must be given to the County Historic Environment Service prior to the commencement of the project.

9. FURTHER INFORMATION

For further information regarding this Brief, contact

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For further information regarding the County Historic Environment Record, contact

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APPENDIX 2: PROJECT DESIGN

1 INTRODUCTION

- 1.1 This project design has been compiled for United Utilities (hereafter the client). It presents proposals for the evaluation of a proposed new transfer pipeline from Ravenstown to Grange Wastewater Treatment Works, Cumbria. Section 2 of this document states the objectives of the project, Section 3 deals with OA North's methodology. Section 4 addresses other pertinent issues including details of staff to be involved, and project costs are presented in Section 5.
- 1.2 Following the results of a recent desk-based assessment, walkover survey and topographic survey undertaken by OA North (2007), Cumbria County Council's County Historic Environment Service (CCCHES) has recommended that a programme of targeted evaluation trenching be undertaken for a section of the site of a possible medieval flood embankment (Site 36) identified along the proposed pipeline route.
- 1.3 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.

2 OBJECTIVES

- 2.1 **Evaluation:** to implement a programme of trial trenching examining two areas of Site 36, as it is truncated by the pipeline easement.
- 2.2 **Report and Archive:** a written report will assess the significance of the data generated by the evaluation within a local and regional context.

3 METHOD STATEMENT

- 3.1.1 Site 36, as identified by the initial programme of archaeological work, will be targeted by the evaluation trenching. In total, 40m of trench will be excavated, and this will comprise two 20m x 2m trenches. These trenches (or the equivalent area) will be positioned to examine two areas of the same earthwork. The trenches will be located so as to reflect the line of the pipeline. This will be undertaken in consultation with the clients pipeline contractor, and will be confined to the working easement.
- 3.1.2 **Evaluation Methodology:** the topsoil will be removed by machine (fitted with a toothless ditching bucket, approximately 1.6m in width) under archaeological supervision to the surface of the first significant archaeological deposit. 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. All features of archaeological interest must be investigated and recorded unless otherwise agreed by the CCCHES. The trenches will not be excavated deeper than 1.20m to accommodate health and safety constraints; any requirements to excavate below this depth will involve recosting.
- 3.1.3 All trenches will be excavated in a stratigraphical manner, whether by machine or by hand. Any investigation of intact archaeological deposits will be exclusively manual. A minimum sample of 50% of archaeological features must be examined by

excavation. Selected pits and postholes will normally only be half-sectioned, linear features will be subject to no less than a 25% 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*.

- 3.1.4 The evaluation trenches will be backfilled, although no further reinstatement will take place. The CCCHES Assistant Archaeologist will be notified as to the presence of any significant archaeology.
- 3.1.5 **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). Subject to the results of the evaluation an assessment of any environmental samples will be undertaken by the in-house palaeoecological specialist, who will examine the potential for further analysis. The assessment would examine the potential for macrofossil, arthropod, palynological and general biological analysis. The costs for the palaeoecological assessment are defined as a contingency and will only be called into effect in agreement with the CCCHES Assistant Archaeologist and the Client.
- 3.1.6 Samples will also be collected for technological, pedological and chronological analysis as appropriate. If necessary, access to conservation advice and facilities can be made available. OA North maintains close relationships with Ancient Monuments Laboratory staff at the Universities of Durham and York and, in addition, employs artefact and palaeozoological specialists with considerable expertise in the investigation, excavation and finds management of sites of all periods and types, who are readily available for consultation.
- 3.1.7 **Recording:** all information identified in the course of the site works will be recorded stratigraphically, 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.
- 3.1.8 Results of the field investigation will be recorded using a paper system, adapted from that used by Centre for Archaeology of English Heritage. The archive will include both a photographic record and accurate large-scale plans and sections at an appropriate scale (1:50, 1:20, and 1:10). Levels will be tied into the Ordnance Datum. 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.
- 3.1.9 **Treatment of finds:** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.
- 3.1.10 **Treasure:** 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. Where removal

cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

- 3.1.11 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum's archive curator.
- 3.1.12 **Contingency plan:** in the event of significant archaeological features being encountered during the evaluations, discussions will take place with the CCCHES Assistant Archaeologist, as to the extent of further works to be carried out, and in agreement with the Client. All further works would be subject to a variation to this project design. In addition, a contingency costing may also be employed for unseen delays caused by prolonged periods of bad weather, vandalism, discovery of unforeseen complex deposits and/or artefacts which require specialist removal, use of shoring to excavate important features close to the excavation sections etc. This has been included in the costing and would be in agreement with the client.

3.2 REPORT/ ARCHIVE

- 3.3.1 **Interim Statement:** in the event that further work is recommended an interim statement will be issued. In this instance or in the event that the client specifically requests an interim statement it should be noted that all illustrations will be copies of field drawings and not completed CAD drawings.
- 3.3.2 **Final Report:** two copies of the final report will be submitted to the client and a further two to CCCHES Both paper and digital copies will be provided on CD-ROM in pdf format. The report will present the following information:
- (i) **Summary:** a summary statement of the findings;
 - (ii) **Introduction:** the background to the project including location details;
 - (iii) **Methodology:** an outline of the methodology of all elements of the programme of work;
 - (iv) **Historical Background:** an historical background to the site;
 - (v) **Results:** an account of the past and present land use of the study area;
An account of archaeological features identified during the course of the evaluation trenching;
 - (vi) **Discussion:** a discussion of the relative significance of archaeological remains revealed within the study area;
A description of the significance of the archaeological remains revealed in study area in a local and regional context;
 - (vii) **Impact/Recommendations:** the identification of areas where further development will impact upon the archaeological resource in addition to the impacts of the current development;

- (viii) **Illustrations:** maps, plans, sections and copies of the site photographic archive;
 - (ix) **Appendices:** a copy of the brief and this project design;
- 3.3.3 Provision will be made for a summary report to be submitted to a suitable regional or national archaeological journal within one year of completion of fieldwork, if relevant results are obtained.
- 3.3.4 **Confidentiality:** all internal reports to the Client are designed as documents for the specific use of the Client, for the particular purpose as defined in the project brief and project design, and should be treated as such. They are not suitable for publication as academic documents or otherwise without amendment or revision.
- 3.3.5 **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. This archive will be provided in the English Heritage Centre for Archaeology format and a synthesis will be submitted to the SMR (the index to the archive and a copy of the report). Arrangements for deposition of the full site archive will be made the Cumbria County Record Office.

4 OTHER MATTERS

- 4.1 **Project Monitoring:** whilst the work is undertaken for the Client, the CCCHES Assistant Archaeologist will be kept fully informed of the work. Any proposed changes to the project design will be agreed with the Assistant Archaeologist and the Client.
- 4.1.1 **Access:** OA North will consult with the Client regarding access to the site.
- 4.1.2 **Health and Safety:** OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). A written risk assessment will be undertaken in advance of project commencement and copies will be made available on request to all interested parties.
- 4.1.3 **Work Timetable:** the evaluation trenching is expected to take approximately four days to complete. The report will be completed within approximately eight weeks following completion of the fieldwork.
- 4.1.4 **Staffing:** 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.
- 4.1.5 Present timetabling constraints preclude who will be undertaking the evaluation trenching, although it is likely that this will be undertaken by an OA North supervisor suitably experienced in this field.

4.1.6 **Insurance:** OA North has professional indemnity to a value of £2,000,000, employer's liability cover to a value of £10,000,000 and public liability to a value of £15,000,000. Written details of insurance cover can be provided if required.

APPENDIX 3: SUMMARY FINDS CATALOGUE

Context	OR no	Material	Category	No frags	Description	Period
<i>1</i>	1000	Ceramic	Tobacco pipe	1	Stem fragment	Post-medieval
<i>1</i>	1001	Glass	Window	1	Greenish mid-pane fragment.	Eighteenth century?
<i>1</i>	1002	Ceramic	vessel	1	Terra-cotta garden ware	Post-medieval
<i>1</i>	1002	Ceramic	vessel	6	Late industrial slipwares.	Nineteenth century or later
<i>1</i>	1002	Ceramic	vessel	3	Blue and white underglaze transfer-printed ware	Nineteenth century or later
<i>1</i>	1002	Ceramic	vessel	1	White salt-glazed stoneware.	Later eighteenth century
<i>1</i>	1002	Ceramic	vessel	4	Self-glazed redwares, some with simple slip decoration	Eighteenth – nineteenth century
<i>1</i>	1002	Ceramic	vessel	3	Early hard-fired, black-glazed redware.	Late seventeenth-early eighteenth century
<i>1</i>	1002	Ceramic	vessel	4	Black-glazed redware	Nineteenth century or later
<i>4</i>	1003	Glass	Window	3	Modern colourless sheet glass.	Nineteenth century or later
<i>4</i>	1003	Glass	vessel	1	Brown fragment.	Nineteenth century or later
<i>4</i>	1003	Glass	vessel	1	Colourless fragment.	Nineteenth century or later
<i>4</i>	1003	Glass	vessel	1	Natural bluish fragment.	Nineteenth century or later
<i>4</i>	1003	Glass	vessel	1	Dark green fragment.	Nineteenth century or later
<i>4</i>	1004	Ceramic	vessel	2	Creamware.	Late eighteenth-early nineteenth century
<i>4</i>	1004	Ceramic	vessel	1	Plain white tin-glazed paste pot.	Eighteenth-nineteenth century
<i>4</i>	1004	Ceramic	vessel	3	Early hard-fired, black-glazed redware.	Late seventeenth-early eighteenth

						century
4	1004	Ceramic	vessel	3	Self-glazed redware with simple slip decoration	Eighteenth-nineteenth century
4	1004	Ceramic	vessel	1	Black-glazed redware pancheon	Eighteenth-nineteenth century
4	1004	Ceramic	vessel	1	Self-glazed redware pancheon.	Eighteenth-nineteenth century
4	1004	Ceramic	vessel	1	Late yellow ware.	Eighteenth-nineteenth century
4	1004	Ceramic	vessel	1	Late grey stoneware.	Eighteenth-nineteenth century
4	1004	Ceramic	vessel	2	White salt-glazed stoneware.	Later eighteenth century
4	1004	Ceramic	vessel	1	Hand-painted creamware	Eighteenth century
4	1004	Ceramic	vessel	1	Blue and white underglaze transfer-printed Pearlware	Late eighteenth-early nineteenth century
4	1004	Ceramic	vessel	1	White earthenware teacup.	Eighteenth-nineteenth century
6	1005	Ceramic	Tobacco pipe	7	Stem fragments.	Post-medieval
6	1006	Glass	vessel	1	Dark green beer bottle.	Late nineteenth-twentieth century
6	1006	Glass	vessel	1	Opaque white fragment, possibly pyrex.	Mid-twentieth century or later
6	1007	Ceramic	vessel	4	Black-glazed redware, heavily laminated fabric.	Eighteenth-nineteenth century
6	1007	Ceramic	vessel	1	Red stoneware	Eighteenth century
6	1007	Ceramic	vessel	1	Slip-decorated plate.	Eighteenth century
6	1007	Ceramic	vessel	4	Self-glazed redwares, some with simple slip decoration	Eighteenth – nineteenth century
6	1007	Ceramic	vessel	1	Creamware.	Late eighteenth-early nineteenth century
6	1007	Ceramic	vessel	2	Early hard-fired, black-glazed redware.	Late seventeenth-early eighteenth

						century
6	1007	Ceramic	vessel	1	Manganese mottled ware.	Late seventeenth-eighteenth century
6	1007	Ceramic	vessel	1	Late Yellow ware.	Nineteenth century or later
6	1007	Ceramic	vessel	1	Dark brown salt-glazed stoneware.	Late seventeenth-eighteenth century
6	1007	Ceramic	vessel	9	Blue and white underglaze transfer-printed ware. Heavily spalled.	Nineteenth century or later
6	1007	Ceramic	vessel	1	White earthenware cup.	Eighteenth-nineteenth century
6	1007	Ceramic	vessel	1	One fragment plain white tin-glazed ware.	Eighteenth-nineteenth century