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The watching brief did not reveal any absolute proof that the course of Hadrian's Wall had been encountered. Dumping of household refuge and ash occurred to a depth of at least 2.00m, a horizon that was below the invert level of the cable trench. It still remains quite possible for remnants of Hadrian's Wall to exist, probably close to the entrance to the electricity sub-station but such remains would be over 2.00m below the current ground surface.

1 INTRODUCTION

1.1 Project origins

As part of refurbishment of the electricity transmission system, an archaeological watching brief was requested by Historic England in order to ascertain whether sensitive past cultural features and deposits may be extant relating to the potential remains belonging to Hadrian's Wall (figure 1). This defence formed part of the Roman frontier defences; a probable turf wall, protecting the Cumbrian coast from Bowness-on-Solway to Carlisle, contemporary with the stone wall east of Carlisle.

Because of the archaeological significance and sensitivity of this location, the curatorial planning authority stated that development was subject to the "developer" securing the implementation of a formal programme of archaeological observation and investigation (archaeological watching brief) prior to the forthcoming development.

Prior to commencement for any development, this formal programme required approval by Historic England, which was duly applied by Historic England

Gerry Martin was commissioned by Scott Richardson nand then later Gareth Banton, Electricity North West (the client) to prepare a Specification of Works for a Programme of Archaeological Watching Brief Action relating to groundworks along Willowholme Road, Carlisle.

The development of the study area involved the installation of cable ducts.

Fieldwork took place between January 17th and 24th 2023.

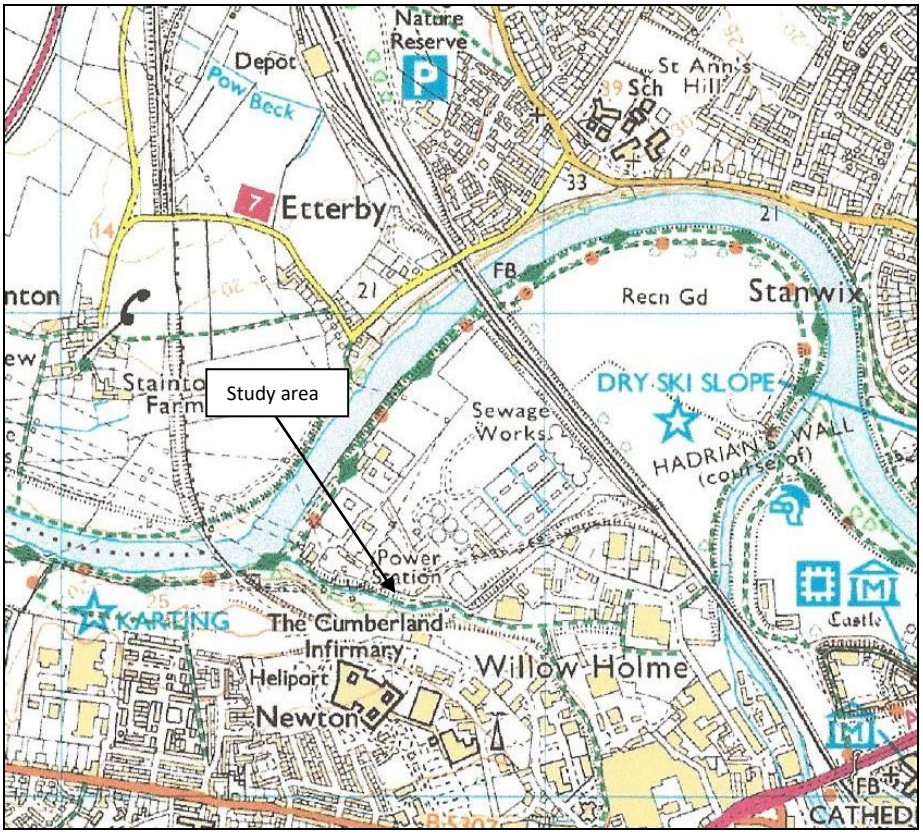

Figure 1. Location of the study area. *(OS Copyright, Licence no. 100044205)*

1.2 Project outline

In response to a request by Historic England, Gerry Martin Associates Ltd undertook a desk-based assessment that targeted the archaeological and past cultural landscape pertaining to a buried electricity cable from Willowholme to Morton (GMA Report 345, 2021).

Only the area (Stage 1) around Willowholme required an archaeological response. Scheduled Monument Consent was requested and a project design (Working Scheme of Investigation), based on the desk-based enquiry was submitted for the subsequent archaeological watching brief and duly approved by Historic England.

The development of the study area (figure 2) involved the clearance of existing road fabric and other extraneous material in order to reduce the current ground and install new cable ducts.

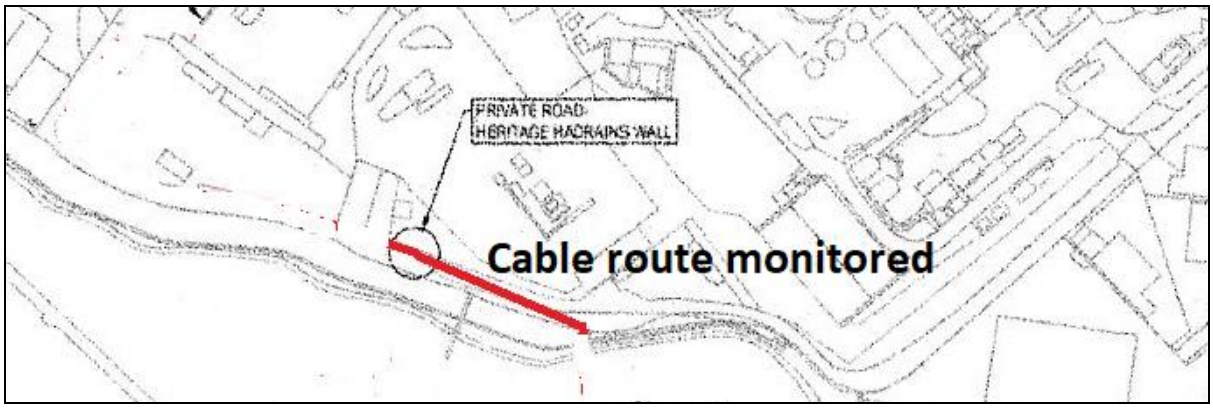

Figure 2. Location of study area and access (courtesy Electricity NorthWest)

The study area is partly scheduled as an ancient monument and lies wholly within the Hadrian's Wall Buffer Zone (figure 3). It has the potential to possess significant archaeological remains. Fieldwork required Historic England approval, subsequently granted by Historic England.

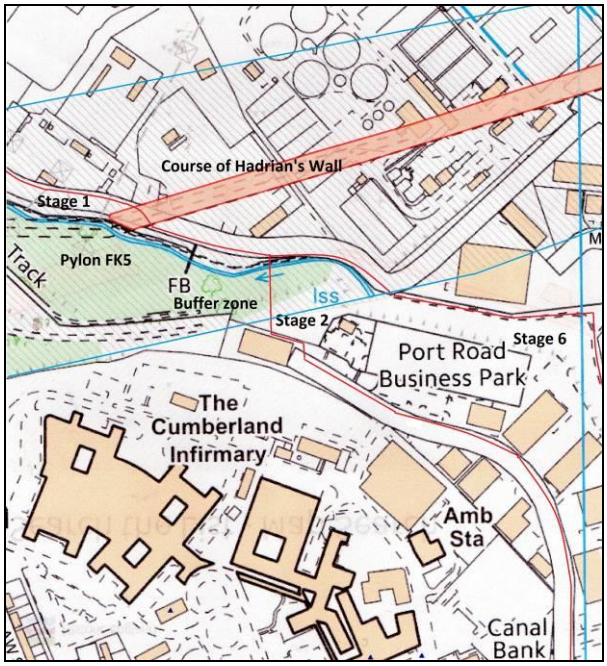

Figure 3. Course of Hadrian's Wall in relation to the cable trench

All archaeological projects are carried out in accordance with National Planning Policy Framework (2021) and the guidelines and recommendations issued by the former Institute of Field Archaeologists (2014) and Management of Research Projects in the Historic Environment (Historic England 2015).

Gerry Martin has achieved the accreditation level of MCIfA (Member) with the Chartered Institute of Archaeologists (CIfA).

1.3 Desk-based assessment

In accordance with the Design Brief, the desk-based assessment investigated primary and secondary historical sources, maps and other literature in order to set the survey results into their past cultural, historical and topographic context.

Centred on NY 38681 56421, the study area consisted of a 500m radius from the development at Willowholme, Carlisle.

The desk-based assessment required a search of three archival repositories:

- Carlisle Library provided sources for published works including newspaper articles, archaeological and antiquarian reports and trade journals.

- Cumbria Record Office, Carlisle provided the earliest tithe map for the parish, details of landowners and occupiers and cartographic evidence.

- The Historic Environment Record, Kendal provided the Sites and Monuments Record and aerial photographs describing previous archaeological observations within the study area.

1.4 Archive

The archive has been compiled in accordance with the project design and the guidelines set out by Management of Archaeological Projects (English Heritage, 1991) and the Institute of Field Archaeologists (1994, 2007 and 2014).

The archive will be deposited with an appropriate repository, Tullie House Carlisle and a copy of the report donated to the County Sites and Monuments Record, as requested by the curatorial authority, Historic England.

2. BACKGROUND

2.1 Location, topography and geology

The study area is located approximately at a height of 20m OD on relatively flat ground beside the Parham Beck inlet.

The disposition of the study area would have provided an unimpeded view across the River Eden and the confluence with the River Caldew just to the north-east.

The ground surface has been raised by successive dumping of household and building waste. By 1932 the existing surface appears to have been established as the present road to the old power station was extant (figure 4).

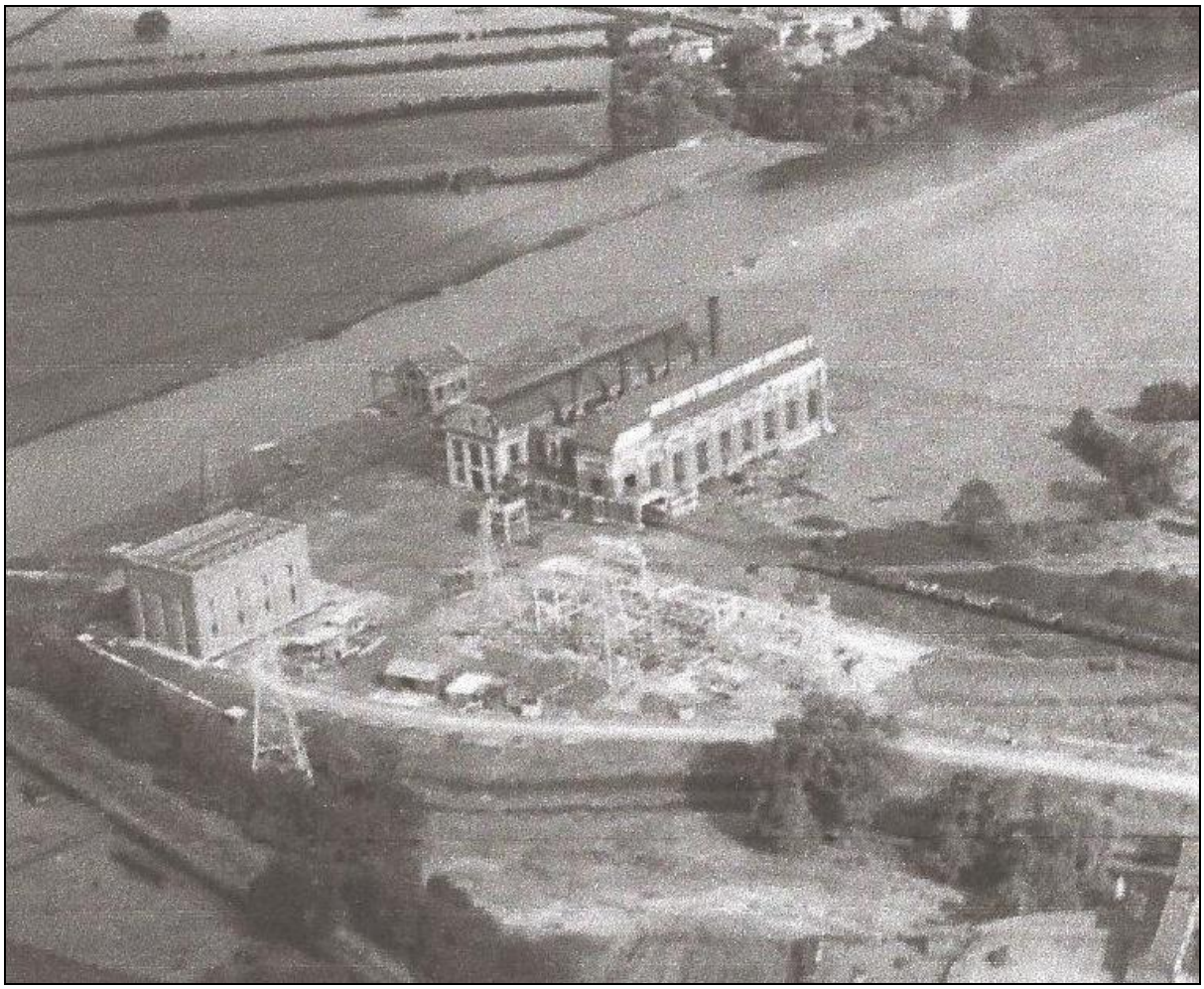

Figure 4. The power station under construction, 1932 courtesy: http://www.britainfromabove.org.uk/image/eaw000302

The drift geology comprises of a series of interleaved pink and grey clays and alluvial sands that reduces into a Devensian Till that overlies red sandstone solid geology. .

3 HISTORICAL BACKGROUND

3.1 Immediate historical background

The earliest map depicting the study area dates to 1610 entitled the Carlisle and the Socrage Manor (D U.L.-SP, Howard of Naworth Papers, C49/1). The map illustrates the study area as lying just outside the Socrage, Parham beck forming the western boundary.

George Smith's map of 1746 illustrates the study area as a series of small peaks denoting that a precipitous cliff was present where the site borders the Eden and Parham Beck (described as Poddon

Bank). The elevated and tactically superior location of the study area is corroborated by stationing offensive batteries during the Jacobite Rebellion (figure 5).

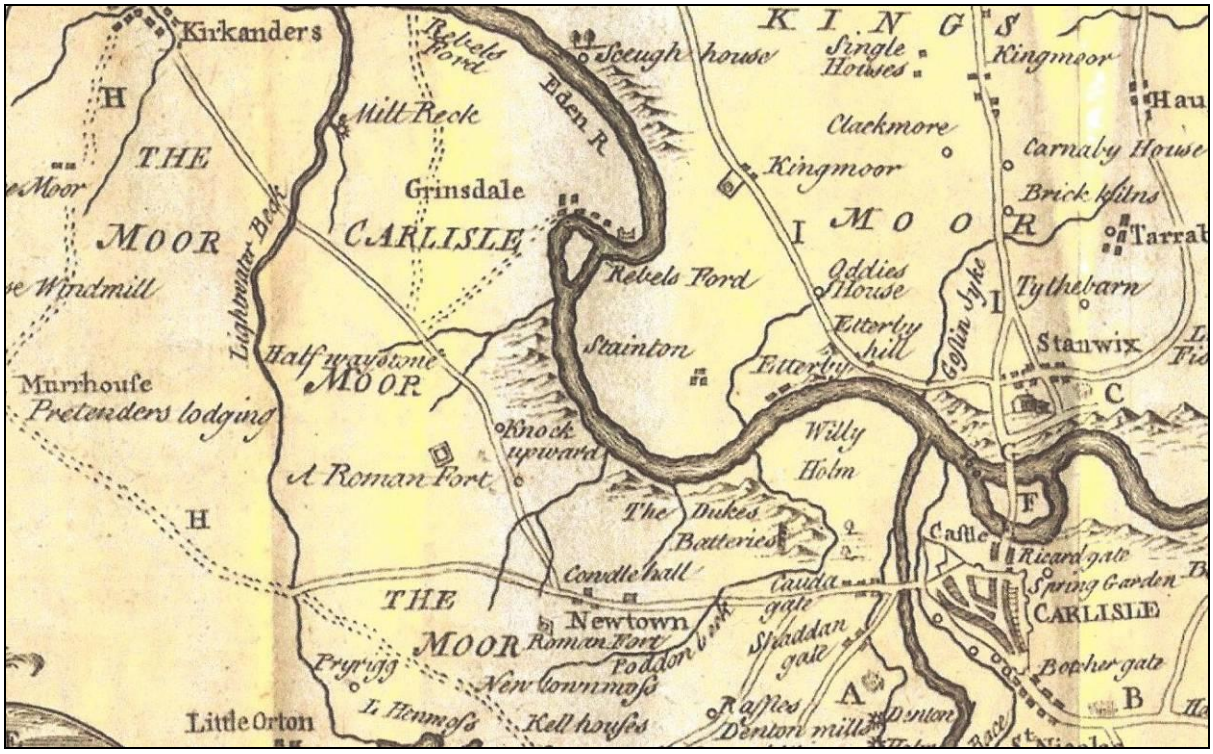

Figure 5. Smith map of 1746 illustrating the environs of the study area

An engraving by M.E.Nutter and published in 1835 by Charles Thurnham (figure 6) shows a view of Caldewgate and Willowholme that appears to have been viewed from higher ground in relatively close proximity to the study area.

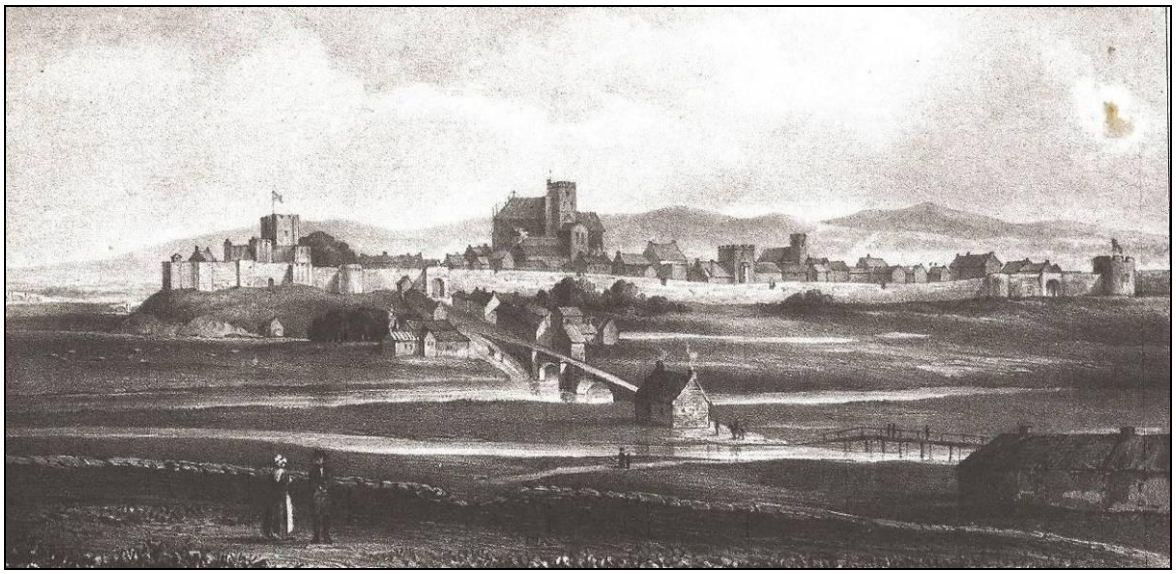

Figure 6. Carlisle from Primrose Bank, published in 1835

The picture was based on a sketch of "upwards of one hundred years ago" suggesting a record of the area dating from at least the early 18th century.

The vista illustrates in the foreground, ostensibly meadow and wet ground with little management of the water courses. Caldewgate possesses a formal stone bridge but the bridge above Parham Beck comprises a wooden trestle bridge.

Figure 7. Tithe map of Caldewgate, 1842 (DRC 8/37)

The Caldewgate tithe map of 1842 (DRC 8/37) shows the study area as a formalized channel for Parham Beck but no adjacent road (figure 7).

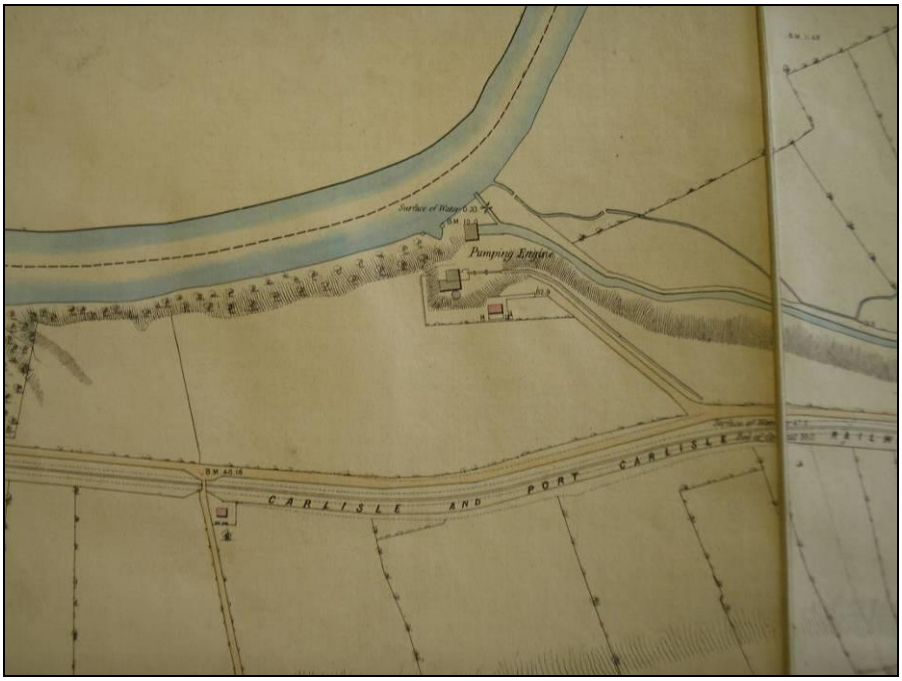

Figure 8. Asquith map of 1853 (DX 1819/1)

The 1853 Asquith map (DX1819/1) was executed on behalf of the Board of Health and led to the public health improvements that resulted in the construction of a mains sewer in 1854 which located Hadrian's Wall in close proximity to the study area.

The canal has been converted as a track bed for the Carlisle and Port Carlisle Railway but there is no access to the north of Parham Beck (figure 8).

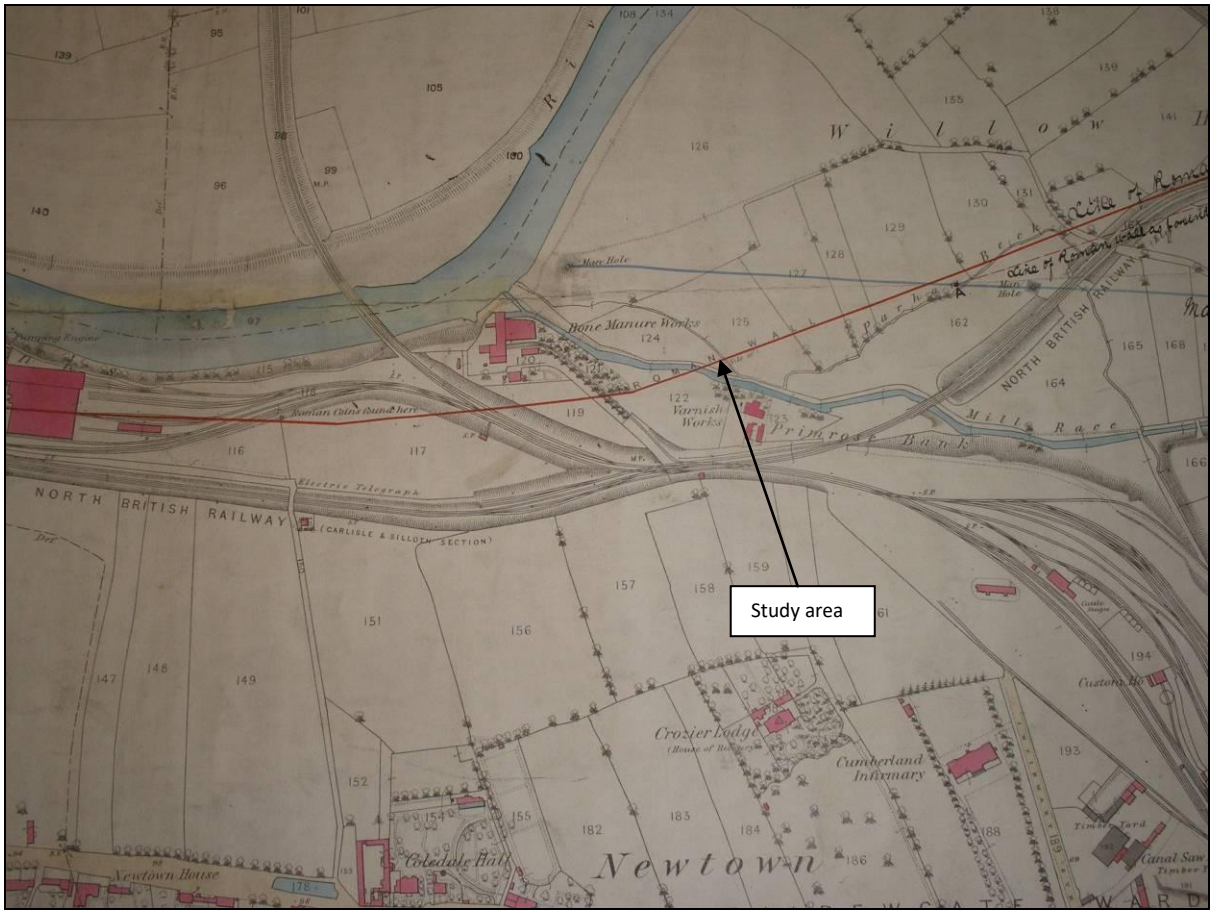

Figure 9. First Edition 1874 Ordnance Survey map

The 1874 first edition Ordnance Survey map depicts the course of Hadrian's Wall that has remained largely unchallenged (figure 9).

3.2 Wider implications of Hadrian's Wall and the crossing of the River Eden

The location of the Wall is poorly understood within this locality but is of considerable academic interest as the confluence of rivers and low-lying and marshy ground would have a represented a vulnerable point within the defensive system.

The panoramic view of Carlisle (figure 6) clearly illustrates the prominence of the castle, a fortification built directly above a major Roman fort. Either side of this location was Hadrian's Wall: to the north at Stanwix Bank, the stone wall and cavalry fort of *Ala Petriana* and to the west by the Wall along Davidson's Bank, the intervening area being largely conjectural.

The stone wall (Hadrian's Wall) was first observed at Willowholme in 1854 during the construction of a sewer and was observed again in two places in 1886, within the angle between the main railway line and branch line to Port Carlisle as a foundation resting upon river gravels and measuring 2.36m in width. The remains of the Wall were covered by alluvial silt to a depth of 2.44m (Ferguson 1887, 171-174).

In 1932, a further stretch of stone wall was uncovered close to the 1854 intervention revealing a foundation 2.69m in width, comprising a layer of rough sandstone flags bedded in puddled clay and laid directly onto the natural gravel subsoil. Above foundation level, two north-facing stones remained interpreted as the superstructure overlain by a thick deposit of alluvium (Weigel 2010, 11).

This alignment has recently been challenged by research undertaken by The Archaeological Practice Ltd, whilst producing the desk-based assessment for the Carlisle Flood Alleviation Scheme during 2007. Examination of the Cumberland Excavation Committee 1886 excavation results (the most extensive survey conducted in this area) suggests that the course of Hadrian's Wall may be slightly northwards towards the west, traversing the Ordnance Survey alignment and being slightly south of the scheduled area before kicking back northwards, crossing the projected line of the Wall on the Ordnance Survey map and crossing both the Caldew and Eden rivers at their confluence (The Archaeological Practice 2006, Figure 35).

This assertion is based on largely negative evidence, the failure in 1978 and 1988 to discover the Wall along its predicted course whilst the destructive effects of flood and river erosion may explain an absence of solid material evidence.

Moreover, there has been a failure to accurately map the alignment of the Wall. The 1932 Simpson observation was not located and the model proposed above is reliant on a "best fit" location whilst the marker stones that outlined the Ferguson 1886 alignment may have been subsequently moved (The Archaeological Practice 2006, 33).

Accurately locating the Wall within the study area is important in order to a) protect the monument and b) to locate the monument should it be outside the protected area (there is no formal scheduling) and therefore currently left unguarded.

Although a credible case is presented, criticism is based on the spatial accuracy and reliability of each observation. On Figure 30 a watching brief marked 12 is inaccurately located in Willowholme Industrial Estate whereas the actual location was within the spur of the Port Carlisle Branch Junction. Extrapolating alignments from relatively ambiguous data sets to complete a 1km stretch of Wall remains unreliable; a minor error perhaps causing a major dislocation further along its course.

A further doubt regards the suitability of bridging the confluence of two rivers where high flood levels and headwaters would provide unnecessary challenges; better to span across two separate rivers.

Failure in subsequent fieldwork to encounter the remains of Hadrian's Wall or any trace of the Vallum to the south (Weigel 2010, 5, 12) has suggested that, not all this low-lying flood plain may have been subject to formal fortification. Moreover, any Vallum would have filled with water, effectively a moat or canal rather than a ditch.

The confluence of the rivers Caldew and Eden, perhaps at a more southerly point than now, suggest the following topographic elements could be relevant:

1. The unmanaged flood plain was a greater area than present
2. That complicated engineering problems would be encountered within this area should formal fortification be required
3. The area was overlooked on a central bluff by a Roman fort
4. An alternative, important function may be occurring e.g. a navigable river, the Caldew, leading to an unloading facility or entrepot

Evaluation at the confluence of the rivers Little Caldew and the Caldew (TAP Report 111) demonstrated that to the south the natural geology comprised orange coarse clean gravel with large river cobbles, evidence that the river was broader and deeper than at present.

Filling the channel and observed by the author, was a horizon of dark grey ash and then organic silt, covered by a bar of brown silt, deposited during the 19th and early 20th Century (The Archaeological Practice 2007a).

Although a row of wooden stakes was present, representing the "Willowholme Leet", cut in 1825 (Weigel 2010, 16), this east-west alignment of stakes lies counter to the present and other relatively recent channel courses noted on Ordnance Survey maps. Therefore, it is conceivable that this alignment respects an earlier river course, perhaps when the river was not formalised and when the river had a wider, expansive breadth (Martin 2007).

During 2009, a series of boreholes at 3m intervals conducted by Oxford Archaeology failed to intercept the projected line of the Vallum, the conclusion being that the Vallum was not present to the east of the present study area (Weigel 2010, 19).

There is a strong suggestion therefore, that either

- The Wall fortifications did not exist because the area was low-lying
- That the Wall fortifications had been removed by subsequent flood damage or changes in the course of the river
- There was no need for fortifications as the area was protected by the fort or another important function was occurring, precluding fortification

Recent archaeological investigations within the Willowholme area have been particularly fruitless.

In 2005, a watching brief within the study area conducted during the erection of a phone mast within the grounds of the study area revealed only made-up ground to a depth of approximately 3.00m consistent with the ash and gravel that formed the Port Carlisle spur from the mainline railway.

No *in situ* archaeological feature, deposits or cultural artefacts were encountered during the watching brief exercise. Therefore, a strong possibility exists that either no archaeological remains were present or that later modern activity has removed any earlier cultural evidence (Martin 2005).

An evaluation at Earls Osborne Yard, Willowholme in 2011, also failed to identify the presumed course of the Wall despite trenching to a depth whereby natural alluvial deposits lain in the remote past were encountered (Martin, 2011).

4 METHODOLOGY

4.1 Project design

The objective of the watching brief investigation was to carry out a formal programme of archaeological observations and investigations during any operations on site that may disturb or destroy archaeological or architecturally informative deposits or remains. The specific aims of the work were to:

- Provide a record of those works associated with the removal of the topsoil
- Provide a record of any significant archaeological or architectural features encountered by intrusive activities

In order to achieve these objectives, a record of all archaeological informative deposits encountered during the ground operations were made consisting of detailed context records on individual pro-forma sheets and field drawings, according to the protocols set out in the GMA manual.

The ground-works were undertaken by machine under archaeological supervision. This action consisted of observation of the spoil removal and monitoring the displaced overburden. Any past cultural activity was recorded according to the protocols of the GMA manual.

5 RESULTS

5.1 Study area

In order to keep the road operational, the cable-laying had to be conducted during the late evening. The contractors had reached an agreed point along the road (NY 38722 56404) where archaeological sensitivity was deemed to begin and where the archaeological watching brief was invoked on 17th January 2023. Four episodes of investigation were undertaken.

17th January 2023

The cable trench measuring 1.20m in depth and 1.00m in width was between NY 38722 56404 and NY 38703 56417, a total distance of 22.60m. After cutting the tarmacadam surface, 0.40m thickness of concrete road fabric was gunned out. The invert level was 1.20m, so a further 0.80m in depth of orange ash, building material and sand was removed (figure 10). This material dated to the early 20th century, as it included numerous bottles including State Management beer bottles which can be no earlier than 1916.

Natural drift geology was not observed, the dump continued in depth beyond the limit of excavation (figure 12).

20th January 2023

The cable trench measuring 1.20m in depth and 1.00m in width was between NY 38703 56417 and NY 38683 56425, a total distance of 23.30m. After cutting the tarmacadam surface, 0.40m thickness

of concrete road fabric was gunned out. The invert level was 1.20m, so a further 0.80m in depth of orange ash, building material and sand was removed. This material dated to the early 20th century. Located between 6.50m and 13.50m along the trench, a modern concrete and brick sluice was evident between NY 38700 56417 and NY 38696 56419 (figure 11) that probably discharged into Parham Beck.

Natural drift geology was not observed, the dump continued in depth beyond the limit of excavation (figure 13).

Figure 10. Section in the cable trench

Figure 11. Sluice in the trench

23rd January 2023

The cable trench measuring 1.20m in depth and 1.00m in width was between NY 38681 56421 and NY 38664 56430, a total distance of 20.20m. After cutting the tarmacadam surface, 0.40m thickness of concrete road fabric was gunned out. The invert level was 1.20m, so a further 0.80m in depth of orange ash, building material and sand was removed. This material dated to the early 20th century.

Natural drift geology was not observed, the dump continued in depth beyond the limit of excavation (figure 14).

Figure 12. Start of trench

Figure 13. Trench on second night

Figure 14. Third night excavation

24th January 2023

The cable trench measuring 1.20m in depth and 1.00m in width was between NY 38664 56429 and NY 38647 56439 (14.30m along the trench) where it veered into the electricity sub-station at NY 38646 56444, a total distance of 20.20m. After cutting the tarmacadam surface, 0.40m thickness of concrete road fabric was gunned out. The invert level was 1.20m, so a further 0.80m in depth of orange ash, building material and sand was removed. This material dated to the early 20th century. Occasional cable trenches were encountered.

On entry of the trench into the electricity sub-station, the trench was dropped to a depth of 2.00m yet only early 20th century rubbish was recovered (figure 15).

Natural drift geology was not observed, the modern dump continued in depth beyond the limit of excavation (figure 16).

Figure 15. Depth of dumping on bend

Figure 16. Excavated trench on the last night

5.2 Finds and ecofacts

No artefacts of any antiquity were present and no deposit warranted an environmental sample. Bottles and ceramic jars were encountered that dated to the late 19th to early 20th centuries, probably deposited in the early 20th century and no later than *circa* 1932 when deposition probably closed.

5.3 Discussion

As anticipated, the watching brief did not reveal any absolute proof that the course of Hadrian's Wall had been encountered. Dumping of household refuge and ash occurred to a depth of at least 2.00m, a horizon that was below the invert level of the cable trench. It still remains quite possible for remnants of Hadrian's Wall to exist probably close to the entrance to the electricity sub-station but such remains would be over 2.00m below the current ground surface.

6 ACKNOWLEDGMENTS

I would like to thank the staff of Carlisle Library with my research into the local history of the area and the staff at Cumbria Record Office, Carlisle with the map regression and documentary material.

I am also very grateful for the help and knowledge of the client, Scott Richardson who provided the initial background information regarding this project and to Gareth Barton and George Manton for the expedition of the fieldwork for Electricity North West.

Finally, I am most grateful for the co-operation of Network Plus and their staff when the cable ducts were laid.

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