



## **Heddon-on-the-Wall, Hadrian's Wall, April 2021: HW21, excavation across the Vallum**

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**The excavation site looking south-south-west, with the pale bands above the mounds clearly visible**

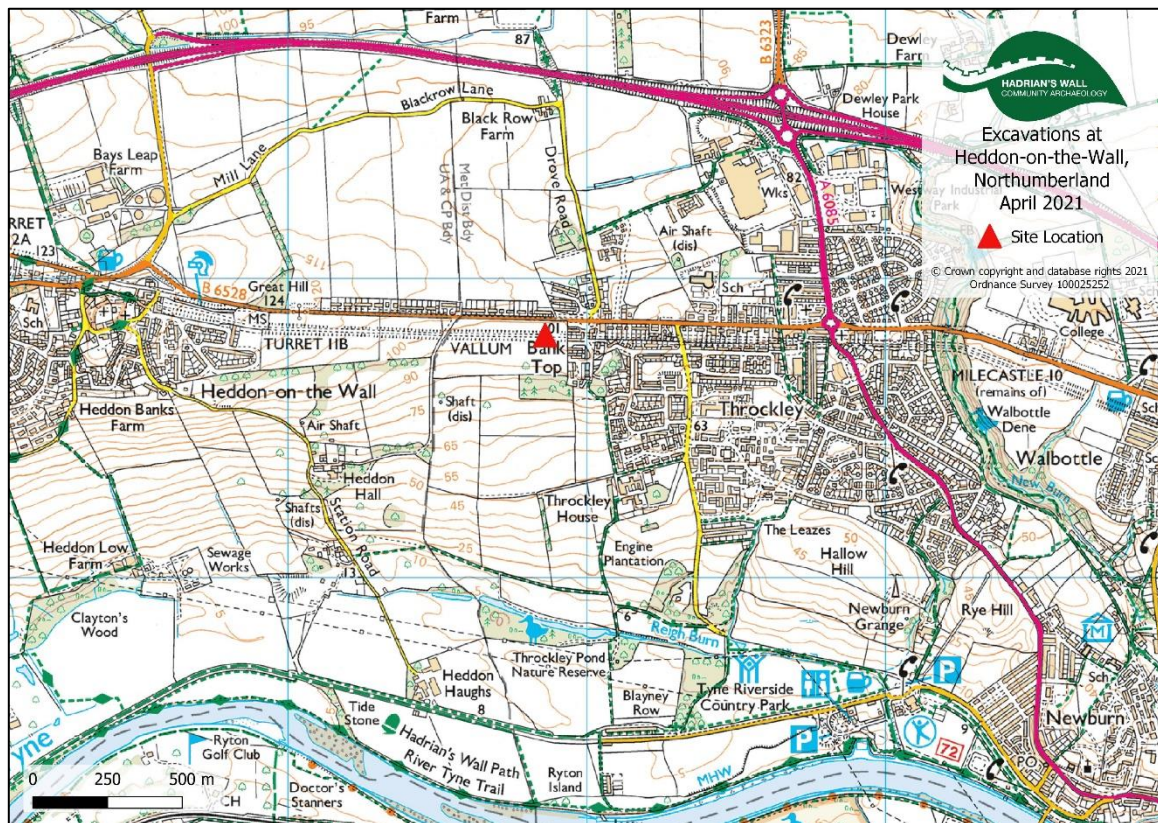
### **Hadrian's Wall Community Archaeology Project (WallCAP)**



## BACKGROUND

This reports on an excavation carried out by the Hadrian's Wall Community Archaeology Project (WallCAP) team across the Vallum of Hadrian's Wall, east of the village of Heddon-on-the-Wall (fig. 1). The Vallum complex runs through three fields lying immediately south of the B6528, between the villages of Bank Top and Heddon-on-the-Wall. The curtain Wall is buried beneath the road along this stretch but is then visible as a 250m length of standing remains in a field on the eastern edge of Heddon-on-the-Wall (NGR: 43698 566927, fig. 1). The Vallum ditch and banks can still be discerned as earthworks in the most westerly of the three fields, which is in pasture. The field within which the excavation took place is the most easterly of the three and has been cultivated for some time. The mounds and ditch can be traced as soil marks (figs 2a and 2b), in the gentle rise and dip of fencing on the field's western margin and as very slight earthworks (fig.17).

The excavation work took place over three days from 13-15 April 2021, with a team of two; no volunteers could be involved because of Covid-related restrictions. The site lies within Scheduled Monument (SM) 1010616.<sup>1</sup> The presumed gradual deterioration of the Vallum in the ploughed fields within the monument area prompted the inclusion of this stretch on the Heritage at Risk (HaR) register.



**Fig. 1: location of the Heddon-on-the-Wall site**

The original Project Design document for Heddon-on-the-Wall described a sequence of work planned to explore the condition and character of the Vallum between Throckley and Heddon-on-the-Wall within the scheduled monument area (WallCAP 2018). The intended programme had to be curtailed because of Covid-related restrictions and in response to the farmer's reluctance to permit any excavation in fields under pasture. Geophysical and topographical survey of transects in all three fields had been

<sup>1</sup> The SM is described as: Hadrian's Wall and vallum from Throckley to East Town House, Heddon-on-the-Wall in wall mile 11. See Project Design for maps of the monument area: figs 1-4 .

completed in 2018 and it was decided the most constructive way forward was to focus limited excavation on the most easterly field, where damage to the Vallum was expected to have been greatest. This assumption appeared to be borne out by the initial surveys, which showed that the topographical expression of the earthworks was slightest, and the geophysical anomalies associated with the Vallum least clear, in that field (figs. 3 and 4; fig. 14). A trench 40 metres long north-south by two metres wide was excavated to cut across the lines of the Vallum mounds and ditch, within the area covered by the most easterly geophysics transect in the field (fig. 3). A mechanical digger was used initially; the trench was then finished by hand.



Fig. 2a: Vallum ditch and banks soil and grass marks, with the WallCAP trench in orange



Fig 2b: Vallum ditch and banks soil marks with trench features

The WallCAP excavation was intended to discover more about the condition and character of the Vallum; the excavation design also targeted the following research questions, as set out in the 2009 *Hadrian's Wall Research Framework* (HWRF):

- To investigate the process of the silting and backfilling of the Vallum ditch (HWRF: Section 3.5.7, Vol 2, p. 11);
- To sample, where possible, soils and sediments associated with the Vallum ditch and mounds (HWRF: Section 5.6.3, Vol 2, p. 18).

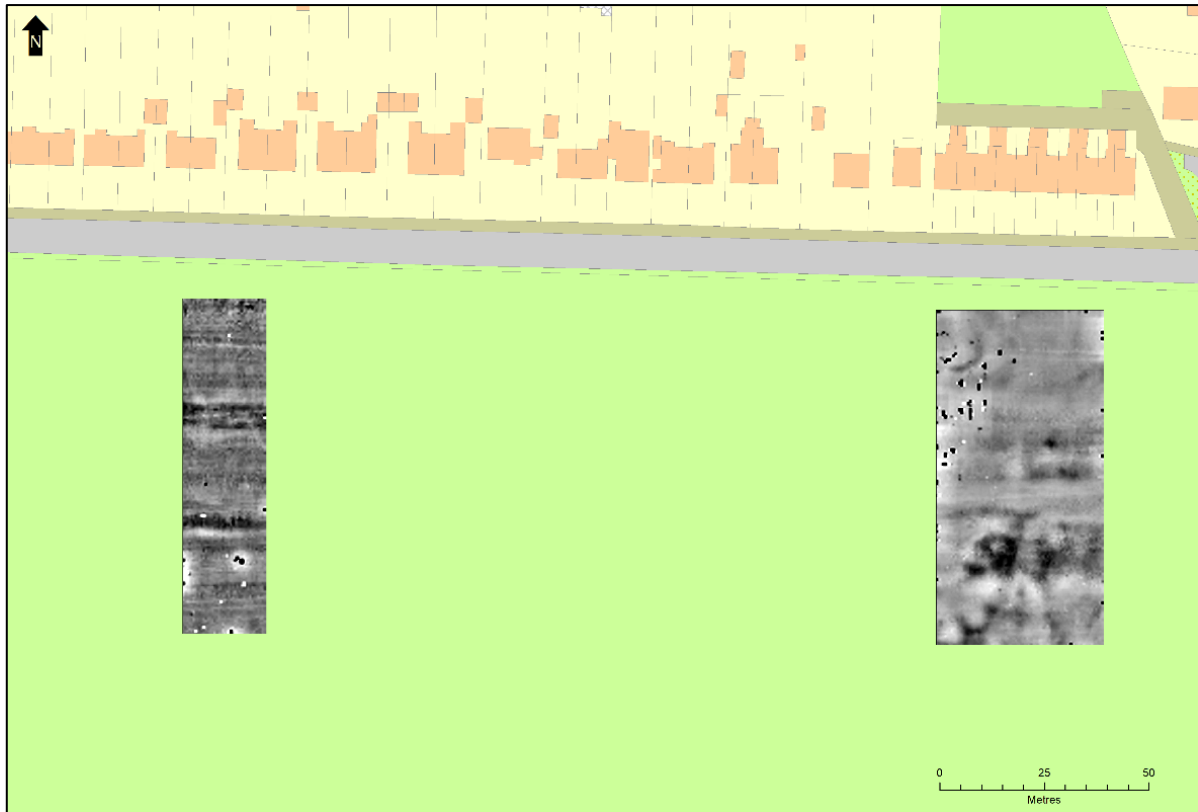
### ARCHAEOLOGICAL BACKGROUND

Within wall mile 11, Turret 11b was located during a 1919 excavation on Great Hill to the west of the site, and survives as a buried feature below the B6528 (fig. 1; NCH 13, 534). The location of Turret 11a has not been confirmed, but is likely to be under the road in the vicinity of the small stand of trees and lane between the site field and the field to the west (fig. 2a). In 1879 a hoard of over 5000 silver Roman coins was found just south of the Wall and east of the likely location of Turret 11a (Clayton 1879). In 1962 limited excavation just south-west of the exposed section of the curtain Wall at Heddon found the south mound of the Vallum. Here the mound was c. 4.5m wide, kerbed with large stones up to half-a-metre long, with a core of sand and stone (Tait 1962, pp. 142-3). Other excavations of the Vallum complex along the Wall are discussed below, including of the ditch at Throckley (Bennett 1983).

Excavations ahead of a new water main investigated a narrow, 2.2km length of the northern carriageway of the B6528 at Throckley and included trenches at the presumed sites of Milecastle MC11, Turret 11a, and Turret 11b; no structural evidence was found but between MC11 and Turret 11b 145 pits, presumed to be for obstacles, were recorded on the berm north of the curtain Wall (Frain et al 2005).



Fig. 3: gradiometry results from 2018-19. The 2021 trench is marked in orange



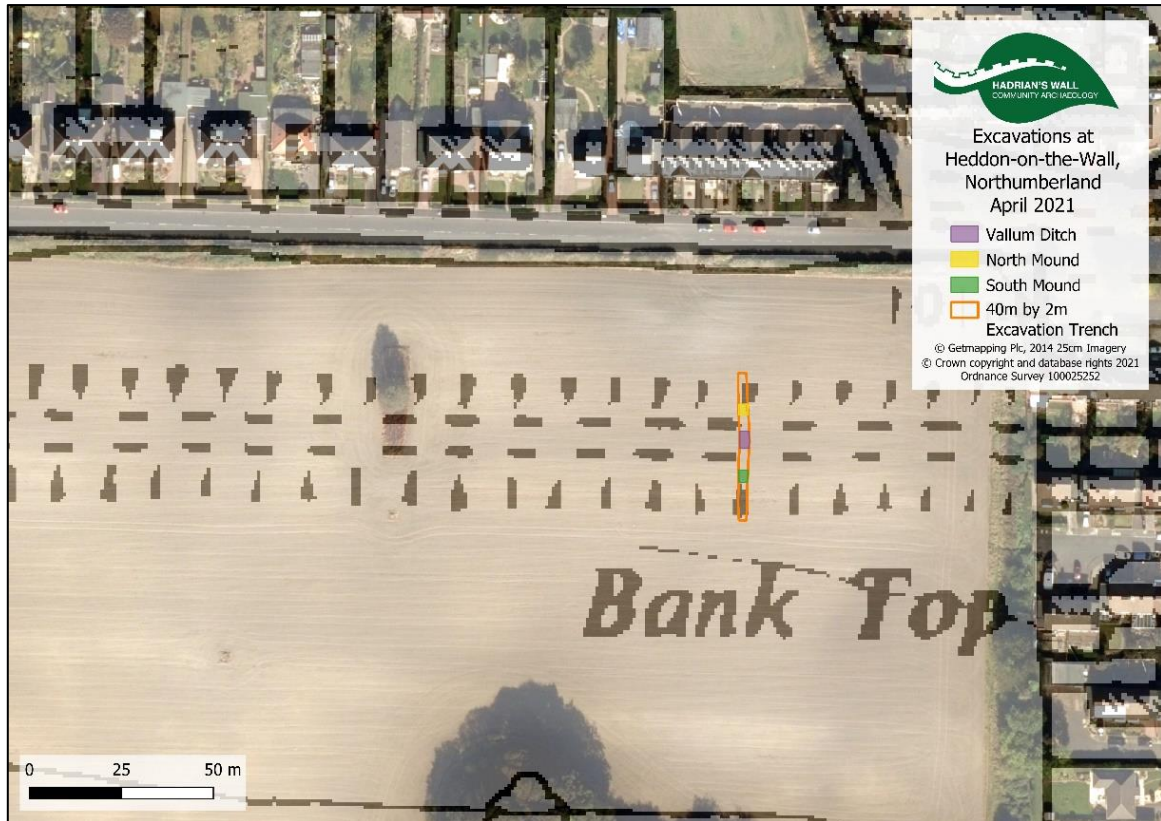
**Fig. 4: resistivity results from 2018-19**

### **EXCAVATION METHODOLOGY**

A single, long trench was excavated by WallCAP in 2021, running forty metres north-south down the slope of the field by two metres wide (fig. 6, figs 14 and 15). The ground surface drops by c. 2.30m from the north to the south end of the trench, beyond and to the south the ground falls away more steeply. The trench was located to cut through the assumed lines of the ditch and mounds of the Vallum complex. A mechanical digger with a metre-wide, toothless, sharpened ditching bucket was used to dig down between 0.5-0.7m to the interface with undisturbed upper geological layers. This interface was seen throughout the trench except where the fill of the ditch was located. In that location a sondage was dug against the east-facing section of the trench to investigate the ditch. This intervention, reaching 1.5m from the current ground surface, allowed the recording to that depth of the Vallum ditch profile and an environmental sample to be taken of ditch fill.

The sides and base of the trench were also cleaned by hand, and the very slight remains of the north and south mounds, the full east-facing section of the trench and the ditch profile were drawn and recorded, along with an overall plan of the base of the trench. The plough soil, a relatively poorly draining sandy silt, varied in depth between 0.2-0.3m.

The local underlying geology is composed of the mudstones, siltstones and sandstones of the Lower Coal Measures Formation with drift geology of heterogeneous glacial till comprising clay, sand, gravel and cobbles of a range of sizes.



**Fig. 5: the trench location and feature plotted with historic ordnance survey mapping**

## EXCAVATION RESULTS

### *Excavation summary*

The Vallum ditch was located in the excavation trench along with likely traces of the largely destroyed north and south mounds. No marginal mounds or other features were detected. The ditch survived to a depth of c. 1.4m below ground level, and was about five metres wide at its spread and truncated top. The ditch was almost certainly deeper, but excavation could not continue safely below the depth reached. The south mound remains had been reduced to a maximum height of 0.4m and c. 3.7m in width, although a downslope spread of more stony material may have been mound foundations, taking the width to more like six metres (fig. 11: east-facing section). The north mound was of a similar width, up to 3.65m wide (fig 10 and fig 13: west-facing section) but survived to only c. 0.2m high. The nature of the mound traces is discussed further below. The ditch was cut through the sandy clay of glacial till. The south mound was founded on an area of sandstone, the north mound on an area of gravelly sand and clay within the very varied till. Slight traces of a possible lower ground surface survived under both mounds, but the turf appeared to have been stripped from the area before the mounds were raised, possibly to be used in the construction of mound cheeks.



**Fig. 6: overall view of the trench looking near south**

### ***The Vallum ditch***

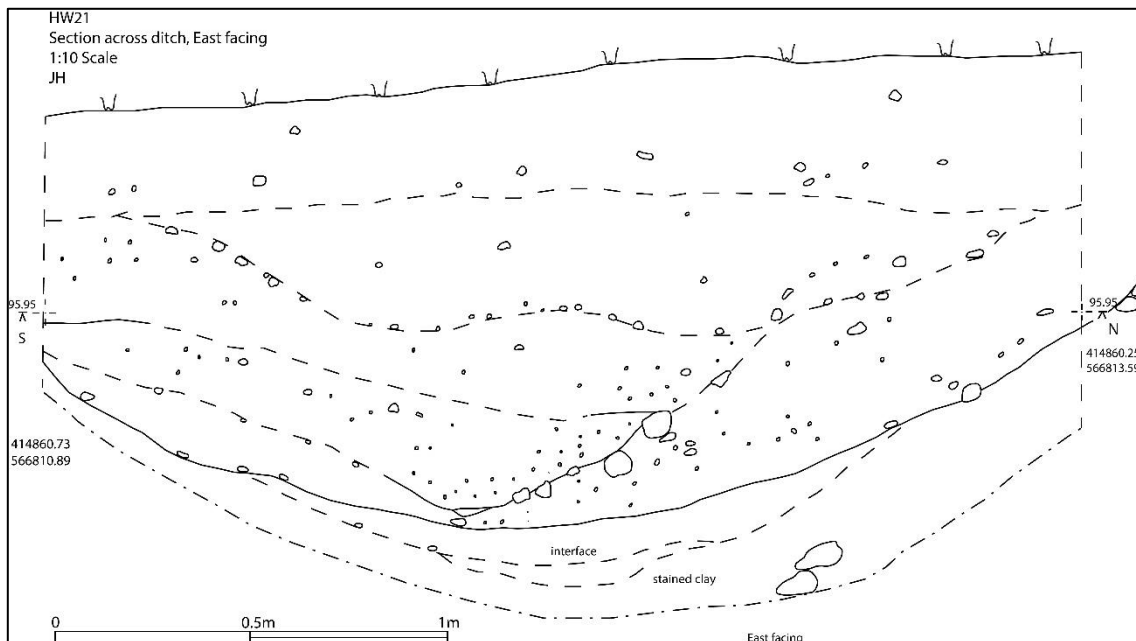
The ditch was located at between 14.5-19.5m from the north end of the trench, its darker siltier fill very clear against the yellowish colours of the varied till deposits to the north and south (fig. 7 and figs 14 and 15: full east-facing section and overall plan). The maximum width of the ditch just below ploughsoil was at least 4.5m, but the sides had been disturbed by the insertion of two parallel nineteenth-century ceramic field drains 4.5m apart running west-east along the margins of the ditch (see H on overall plan, fig. 15). The ditch's profile had also been disrupted and truncated by repeated ploughing and possibly also by the traffic of heavy machines associated with coal mining as well as agriculture. Excavation had to stop at nearly 1.5m down from ground surface, at which level the ditch was c. 2.5m wide. Until c. 0.9m down from ground surface both the sides were gently sloping at about 45°. The southern side was much less clear and appeared to continue on that gradient. The northern side thereafter became steeper at about 70°. This was likely to be closer to the original lower profile of the ditch.

In section the silty fills of the ditch were a maximum of 0.85m deep below the plough soil, with a 0.15m deep stained interface with 0.1m of redeposited boulder clay evident below (figs 7 and 8). That lowest visible fill of the ditch – the silty, stained sandy clay – may well have been material slumped and settled from the upper sides of the ditch. The silty fills above were organic, mid to dark blackish brown sandy silts (20:80) with c. 5% clay and 20% poorly sorted gravel, pebbles and occasional small cobbles. The gravel, pebble and small cobble content and the compaction varied slightly within the fill, and there were clear tip lines. The ditch fill was gravellier than the u-shaped ploughing infill at the top of the recorded section. There was some charcoal in the fill and an environmental sample was taken from 0.7m down in the ditch, in the fill interpreted as deliberate backfill.



**Fig. 7: west facing photo of the ditch profile, mid-excitation, left; post-excitation, right. The light and angles rendered the ditch very difficult to photograph satisfactorily.**

The first ditch fill of stained clay may have been slump from the sides, after which the ditch seems to have begun to silt up naturally, predominantly from the north and up-slope. This silting was marked on its upper surface by a trickle of larger pebbles and small cobbles between 40-80mm. The ditch then appeared to have been partially, and deliberately, backfilled from the south, with the tip line-marked silts being less compact and stonier. The truncation of the ditch, if – as elsewhere – the ditch was around three metres deep (Breeze 2015, 1), meant the complete process of filling and levelling could not be traced and any interpretation must be viewed with caution because of the level of disturbance. But after the backfilling, subsequent ploughing completed the job of obscuring and infilling the ditch. There was no evidence for the ditch having been revetted in either turf or stone, or being recut. The ditch almost certainly survives to a greater depth than recorded.



**Fig. 8: east-facing section through the Vallum ditch**

No finds were made digging the ditch sondage and cleaning its profile but, in the subsoil just to the south of the ditch, were found a fragment of clay pipe bowl and an abraded sherd of roman pottery, Corbridge White Ware (COR WH) (location: 414860.20, 566807.85).

### ***The north mound***

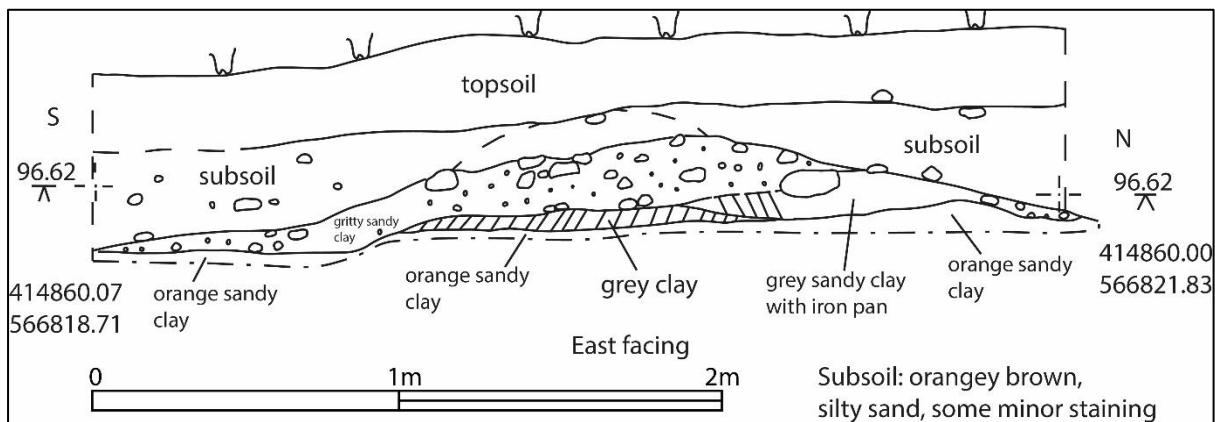
The mounds survived as ghosts of their original surface construction. Excavation caught the effects of the settling and build-up of water and damper soil against the upslope foundations of the mounds (fig.



12), and the altering of the soil around due to the incorporation of material used in the foundations, core and possible turf and stone revetting. The north mound's remnants were located between seven and ten metres from the north end of the trench. The mound had been constructed above gravel and pebble-rich sandy clay, with a band of grey clay possibly representing traces of a buried land surface. The surviving tail of the mound was only around five metres north of the spread northern edge of the Vallum ditch, suggesting that the north mound was relatively close to the ditch (see discussion below).



**Fig. 9: west-looking photo of the remains of the north mound**

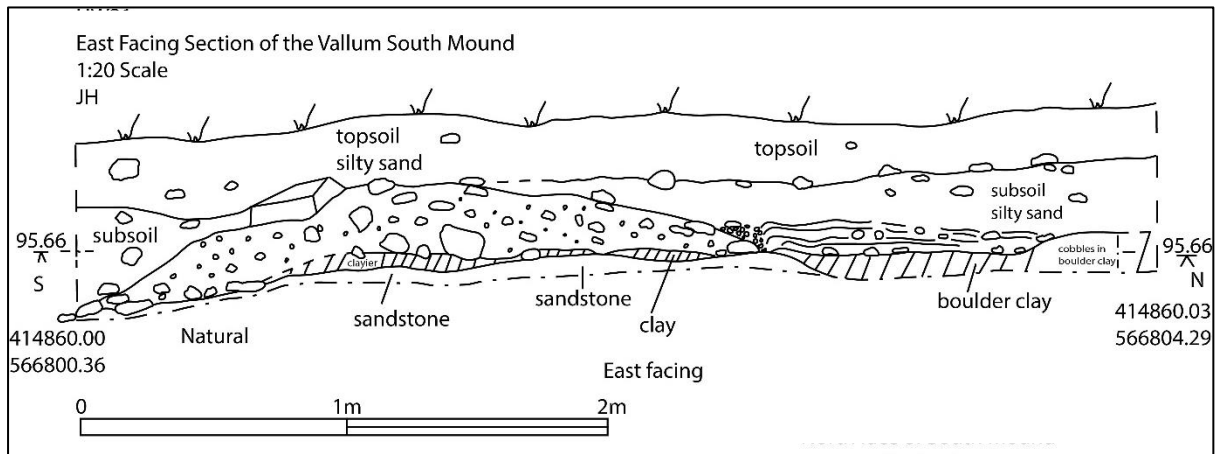


**Fig. 10: east-facing section of the north mound**

It is difficult to be certain of construction of the likely north mound from the traces uncovered. The mound foundations may have had a sandy boulder clay base, with a gravelly, silty sand core (figs 9 and 10). Core material survived to a maximum of 0.2m, possibly somewhat displaced from its original location in the mound, and may have been glacial till deposits excavated from the ditch-line. There were many larger pebbles, and the occasional larger cobble up to 0.3m long, in the core material. The occasional flatter cobble provided slight evidence for revetting, or stone kerbs. More convincing evidence, given the hugely degraded character of the mounds, was unlikely to have survived. The clayey, northern edge of the remains was marked by iron panning, presumably caused by iron-rich water trickling down-slope and pooling against less permeable mound material. The grey silty sand laminated with the iron panning might suggest use of turf cheeks in the construction of the mound foundations.

### *The south mound*

The south mound had been constructed above an area of sandstone bedrock and the traces were found between 25 and 32 metres from the northern end of the trench. The surviving remains were therefore around five-and-a-half metres south of the southern edge of the Vallum ditch. This gap is similar to that recorded between the northern edge of the ditch as found and the likely north mound.



**Fig. 11: east-facing section of the south mound**

As to the north, the south mound archaeology is best described as representing the materials used in construction rather than providing structural detail. Again both the west- and east-facing sections (figs 11 and 12) suggested the foundations may have included redeposited natural sandy clay, with a core of gravelly, cobble-rich silty sand. The southern mound remains were perhaps better preserved and contained a higher proportion of larger sub-angular cobbles up to 0.25m and one angular flatter stone c. 0.4m long that may have been kerbing or revetting. The mound material survived to a height of c. 0.4m and 2.6m in width, although a downslope spread of more stony material may have been mound material, taking the width to more like six metres. A grey clay layer above the sandstone may have been a thin layer of the subsoil onto which the mound was constructed. Even more clearly than at the edge of the northern mound remains, the clayey, northern edge of the south mound was richly laminated with sandy clay, gritty silt deposits and iron panning (fig.12: right-hand side of the photograph). This may represent the remains of turf cheeks altered by post-depositional processes and in particular the effects of iron-rich water.

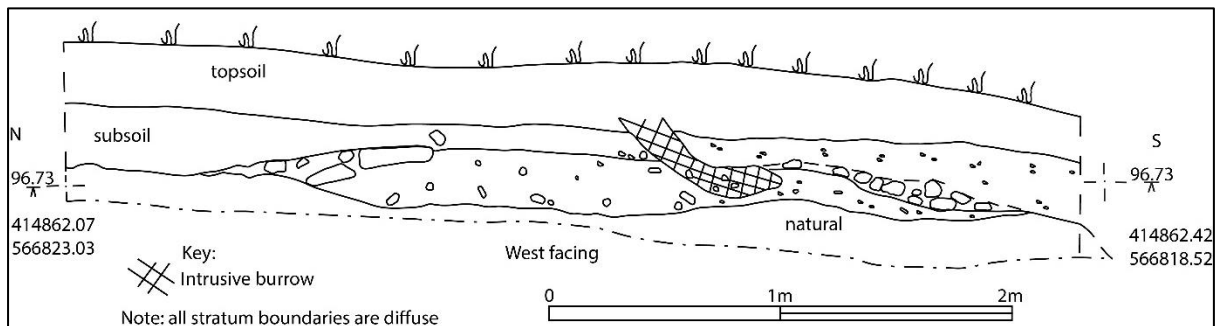


**Fig. 12: west-looking photo of the remains of the northern end of the south mound**

## Conclusions

The excavation demonstrated that the Vallum elements survive very poorly in the furthest east of the fields under investigation. The field has been ploughed and worked in modern times from west to east, and from north to south (seen in sequence of historic Goggle Earth images) and this – along with earlier agricultural use – has flattened and nearly eradicated the mounds. The area was also mined for coal (see fig. 1). The disturbed mound remains are clearly visible as broad, lighter bands of soil in figures 2a and 2b, suggesting considerable spreading, shifting and turning of the mound material; the below-ground deposits proved to be little more than collapsed and displaced vestiges of the original earthworks. Those vestiges did provide evidence for the natural material – glacial till and clay – excavated in creating the ditch being used as foundation and core material for the mounds. The mounds seem to have been carefully constructed with probable use of turf cheeks and possibly stone kerbing or revetting. The surviving edge of the north mound was recorded only around 40m from the likely line of the curtain Wall running under the B6528, in a stretch where the Vallum does on the whole run closer to the curtain Wall than elsewhere. (To the west in the field with the standing stretch of Wall the north mound may be closer to 20m south of the curtain.) The north mound as found was c. 3.2m wide, the berm to the spread north lip of the ditch only about 4.5m wide, and the berm from the southern edge of the ditch to the south mound around 5.2m. The south mound remains may have been as wide as six metres, if a southern tail of stones is included, but the more convincing survival of core elements was c. 3.7m wide. It cannot be reiterated firmly enough that these measurements capture only damaged remnants of the original earthworks.

It was very difficult to estimate the original depth and width of the ditch, especially as land drains had been inserted east-west along the ditch margins, but it may have been relatively narrow as the surviving spread if also truncated top was only about five metres wide. Below the land drains the ditch narrowed to only around 2.5m. Originally the ditch sides may have been angled at 70° and possibly included some clay lining. The ditch was at least partly backfilled deliberately, after initial slumping of the upper clay sides and some natural silting, before being finally infilled and all but levelled by the effects of repeated ploughing. The ditch bottom was not reached in this excavation, but the ditch survived to a depth of c. 1.4m below the current ground surface. The overall width of the Vallum complex at this location is difficult to determine but may have been closer to the thirty metre width found at Wallhouses than the 37.5m of the Vallum at Appletree in Cumbria (Willmott and Bennett 2009, 134).



**Fig 13: west facing section through the north mound**

## Hadrian's Wall: Wider Context

Even in their much diminished state, the components of Vallum complex recorded here can be compared to other investigations of the ditch and mounds. In a recent review of Vallum studies David Breeze noted that research to date had revealed there was 'little in the way of uniformity in the various

elements of the Vallum' (2015, 17). This excavation has added to that picture of local diversity in the details of construction and layout.

The model against which Vallum measurements have been compared (overall width 35.5m, mounds six metres wide, with nine metre berms either side of a six metre wide, three metre deep ditch e.g. Breeze 2006, 54-5), while giving a general impression of scale, has been challenged by almost every investigation of the Vallum. This observation comes with the obvious caveat that dimensions have been variously and differently affected by the afterlife of the monument in the several locations. Rather than sticking slavishly to a brief, the Vallum surveyors modified the design of the Vallum in response to local soils and landscape (Bennett and Turner 1983, 74). This is well-illustrated by the results gathered in seven more recent Vallum excavations (Willmott and Bennett 2009). While many mound width measurements accord reasonably well with the model, north mound widths range from 4.4m recorded at Wallhouses to 9.2m at Appletree (Cumbria), the south mound from 5.5m at West Denton to 8.5m at Appletree, berms from less than five to over nine metres and the ditch width from less than six to over ten metres (*ibid.*, 134).

More locally, to the west of the current site and just south-west of the exposed stretch of curtain Wall in Heddon, the south mound was found to be only about 4.6m wide, and founded on clay subsoil with the core constructed from sand and stone taken from the rock-cut ditch (Tait 1962, 142-3). At Throckley to the east, the Vallum berms were only about five metres wide (Bennett 1983, 41). The Vallum mounds investigated in Wall Mile 9 – as here at Heddon – had been virtually levelled in a ploughed field but were visible as pale bands in the soil surface. The mounds survived to similar heights to those at Heddon and were also composed of sandy clay and silty sands (Willmott and Bennett 2009, 77-79). Again, as at Heddon, further afield at Appletree (Cumbria) the mounds were constructed on ground stripped of turf and topsoil (Willmott and Bennett 2009, 111). Evidence for stone revetting and/or kerbing and for the use of containing and guiding turf cheeks has been found at several sites including Heddon (Breeze 2015, 5 and 17); builders used local turf and clay, stone and other subsoils dug from the ditch for the mounds creating an inevitable diversity in mound construction materials, reflecting the local soil and geology.

The Heddon Vallum elements while in poor condition add to the picture of the Vallum as a construction driven by the determination to engineer a considerable ditch flanked at some distance by mounds, but the details of construction were shaped by the local landscape. The relatively narrow overall Vallum at Heddon, with the monument also sitting close to the curtain Wall, may have been designed to situate the ditch and mounds on the brow of a slope which immediately to the south becomes a much steeper drop towards the Tyne (figs 1 and 6). The less-steep crest location, while providing good views, would have made constructing the Vallum less challenging. The steeper hillside later contributed to the erosion of the Vallum exacerbating soil movement downslope under the impact of the ploughing.

The excavation at Heddon-on-the-Wall, although limited in scope, has provided some significant information about the condition and character of the Vallum in this stretch of Hadrian's Wall. Ploughing and possibly also mining have had a huge impact on the monument's condition and if the agricultural regime is unchanged the mounds will disappear within a few years and the ditch will continue to be eroded.

Heddon-on-the-Wall 2021: HW21

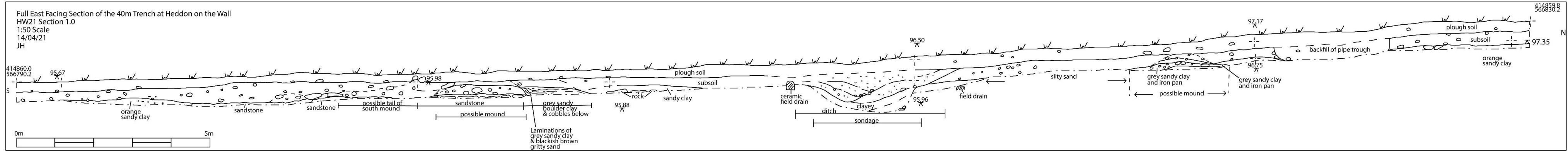


Fig 14: east-facing section of entire trench, post-excitation

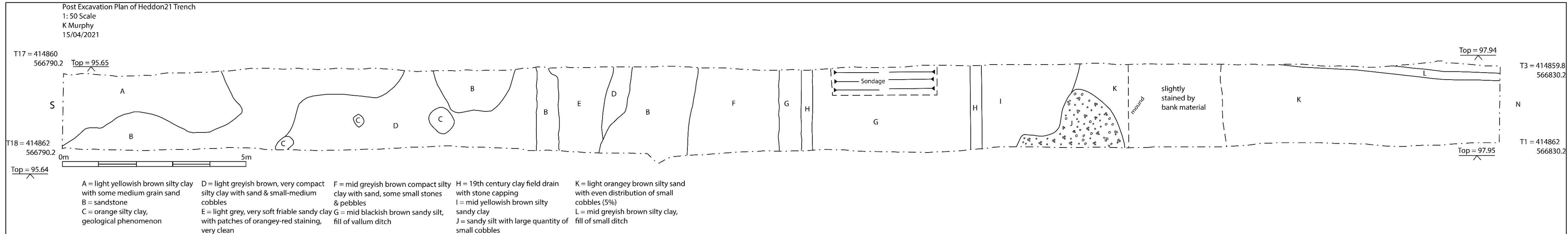
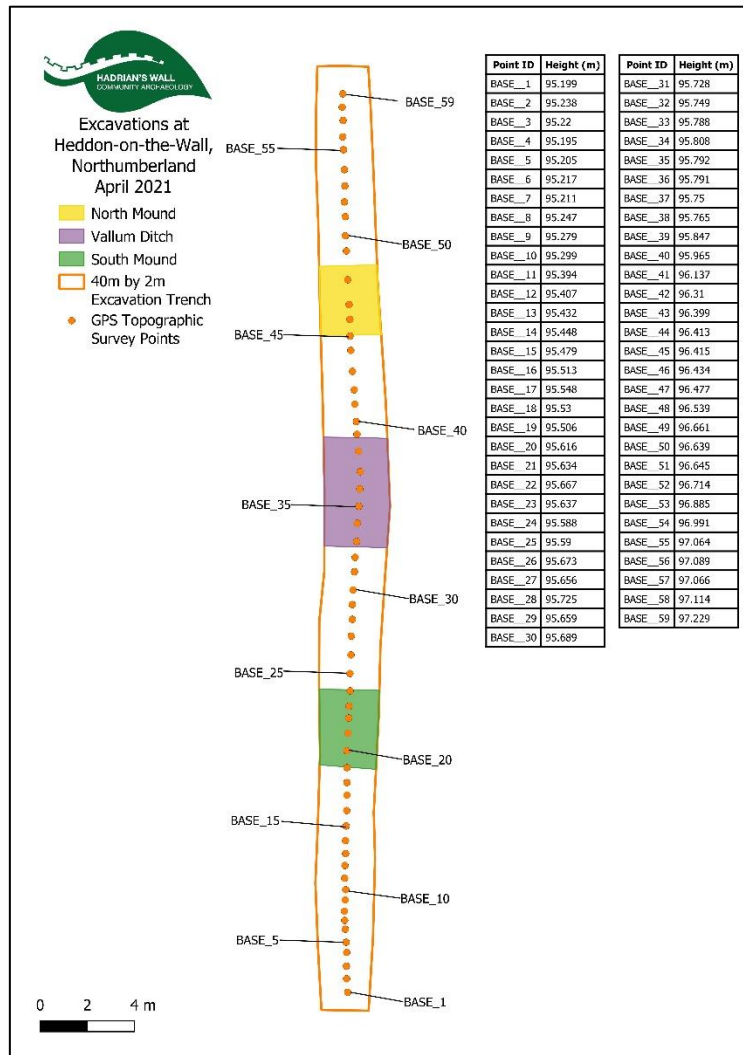
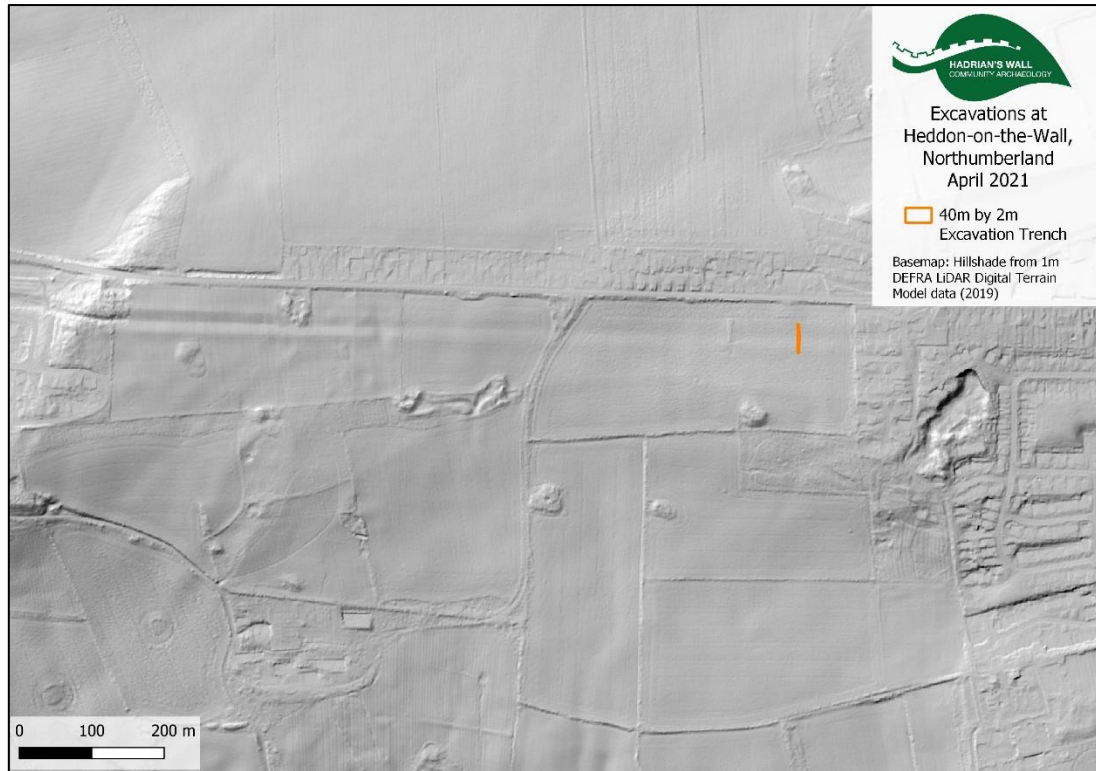


Fig 15: plan of entire trench, post-excitation



**Fig. 16: trench base elevations with features**



**Fig. 17: LiDAR showing diminished earthworks in the two eastern ploughed fields, especially in the area of the 2021 trench, with better survival in the western field**

## APPENDIX C

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**Fig. 18** photogrammetry of the trench post-excitation, looking south-west