

## Gueswick Hills, Teesdale:

### *Interim report on 2021 excavation*



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**Louisa Gidney** reported on the bones.

**Archaeological Services Durham University** reported on palaeoenvironmental samples and charcoal species.

Radiocarbon dates by the **Glasgow (SUERC)** and **Belfast (Queens University)** laboratories.

Version 2.6 (20 Sep 2022) - updated to include CARD fund (SUERC) radiocarbon dates.

Site location: NZ 0036 2104, 1.5km north-west of the village of Cotherstone, Teesdale, in the parish of Hunderthwaite.

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The Lidar Landscapes survey was a project of the North Pennines AONB Partnership  
<http://www.northpennines.org.uk>

Drone images and processing of lidar data by Stephen Eastmead, <https://eastmead.com/>

QGIS Free and Open Source Software was used: <https://qgis.org>

**Please note:** The features described in this report lie on private farm-land with no public access

**Cover image:** Excavating Trench 3, looking east



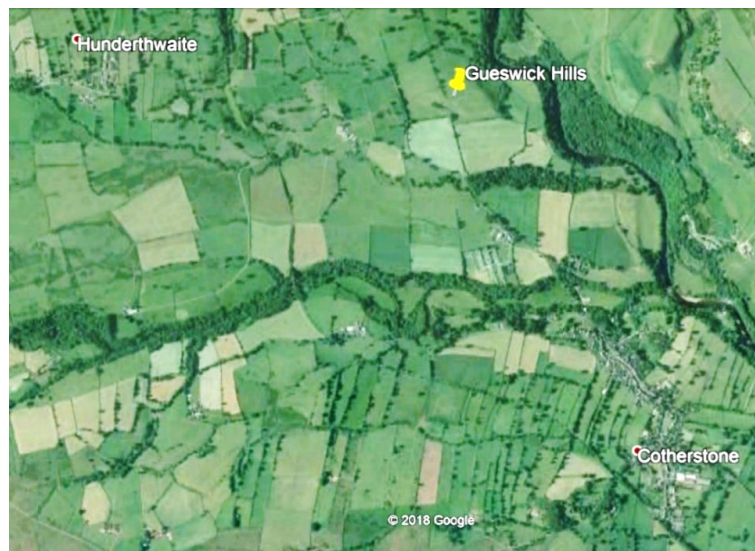
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## 1 INTRODUCTION

This is a report on excavations carried out over 3 weeks in 2021 (August 1<sup>st</sup> to 22<sup>nd</sup>) by the community group Altogether Archaeology (AA) to investigate a site on the Gueswick Hills. Participants are listed in the Acknowledgements Section. It followed on from an initial walkover survey, a magnetometry survey of the hilltop covering 0.55 hectares (extended in Spring 2022 to 1.1 hectares in total), and a brief evaluation excavation: all taking place in 2019. Reports of these, plus the Project Design, are published on the AA website (Eastmead 2022, Green 2019, 2020). Further excavation of the site is planned in August 2022.



**Figure 1: Location of the Gueswick Hills site on farmland now used for grazing. Surrounding the nearby villages are medieval field-systems, fossilised in the hedge pattern. The River Tees flows in the deep valley to the east of the site. (Google Earth)**

As extensive background information was included in those reports, it will not be repeated here. The evaluation excavation in 2019 had 3 small trenches. **Trench B1**, over an area to the west of the hilltop cairn, found no significant features. **Trench A1**, over the line of a probable ditch seen on magnetometry (but not visible on the ground), found a discontinuous flagstone and cobble surface extending across the line of the ditch, buried beneath 0.5m of topsoil. In the topsoil was a stony layer below turf level, covering the whole trench. The fill of the ditch itself was not excavated. Two pot-sherds were found in the soil above the paving. One was late medieval, the other of uncertain date. **Trench A2**, was located at the west end of a rectangular feature visible on the ground, and seen on lidar and magnetometry images. This exposed a stony surface in the southern half of the trench, to the north of which was a gravelly deposit which contained three Iron Age (IA) or Romano-British (RB) pot-sherds, a stone spindle whorl, and an iron blade.

Thus, although the summit cairn and rock-art suggested a Bronze Age presence, and the surrounding ridge and furrow suggested occupation in the medieval period, the excavation finds were mainly of the Iron Age or Romano-British (IA/RB) period.

Planned further excavation in 2020 had to be cancelled due to the pandemic. However, members of the TerrACE project team ([www.terrace.no](http://www.terrace.no)) were able to dig test-pits on the terraces below the site for samples in September 2020. This international project is investigating the soils of agricultural terraces in several countries of Europe, using Optically Stimulated Luminescence (OSL), ancient DNA, and other techniques.







**Figure 2: Tony Brown (Tromsø University) taking soil samples from a test-pit on the terraces.**

The Gueswick Hills are a line of terminal moraines across Teesdale, marking the position where the Teesdale glacier paused in its retreat up the dale at the end of the last Ice Age (Evans 2017, 2018). For a short period, the hills acted as a dam, causing the formation of a lake. Despite the glacial origin of the hills, the large terraces on their southern flank have a considerable depth of soil (as seen in the above photographs). The TerrACE team are yet to publish their results, so the age and use of the terraces is unclear. However, terraces investigated in Northumberland seem to have been in use (though not continuously) from the Bronze Age through to the Medieval period (Frodsham and Waddington 2004).

## 2 EXCAVATION

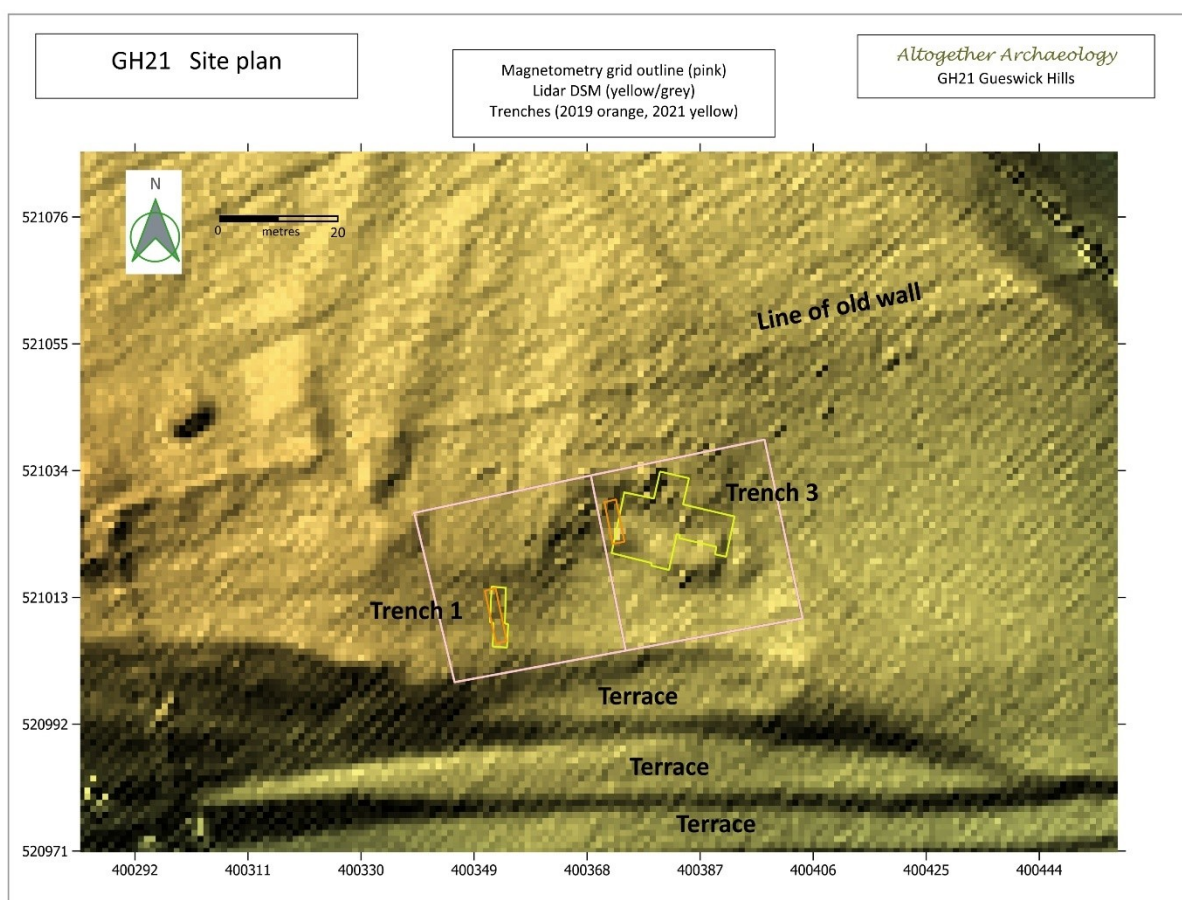
### 2.1 Aims

The evaluation excavation in 2019 proved that there was an IA/RB era presence on the site, with pot-sherds and a spindle whorl. The excavation also confirmed the existence of the large ditch suggested by the magnetometry survey; the ditch was overlain by a flagstone and cobble surface, suggesting that this was a multi-phase site. It is “special” in that it is a high point of the valley floor, commanding views up and down the river valley and dominating the road along the valley that connects a chain of villages. Thus, further research into the Gueswick Hills site is clearly warranted, with aims:

- to enable dating of the phases of the site: the ditch digging, paving over, and occupation
- to clarify the size of the ditch and the purpose for which it was dug
- to investigate the surface features seen on lidar, originally suspected to be a medieval longhouse or enclosure, but more likely on the evidence of the 2019 excavation to be IA/RB.
- to locate and investigate evidence of domestic occupation.
- to enhance engagement of people (both AA members and local residents) with their historic environment.

## 2.2 Trench siting

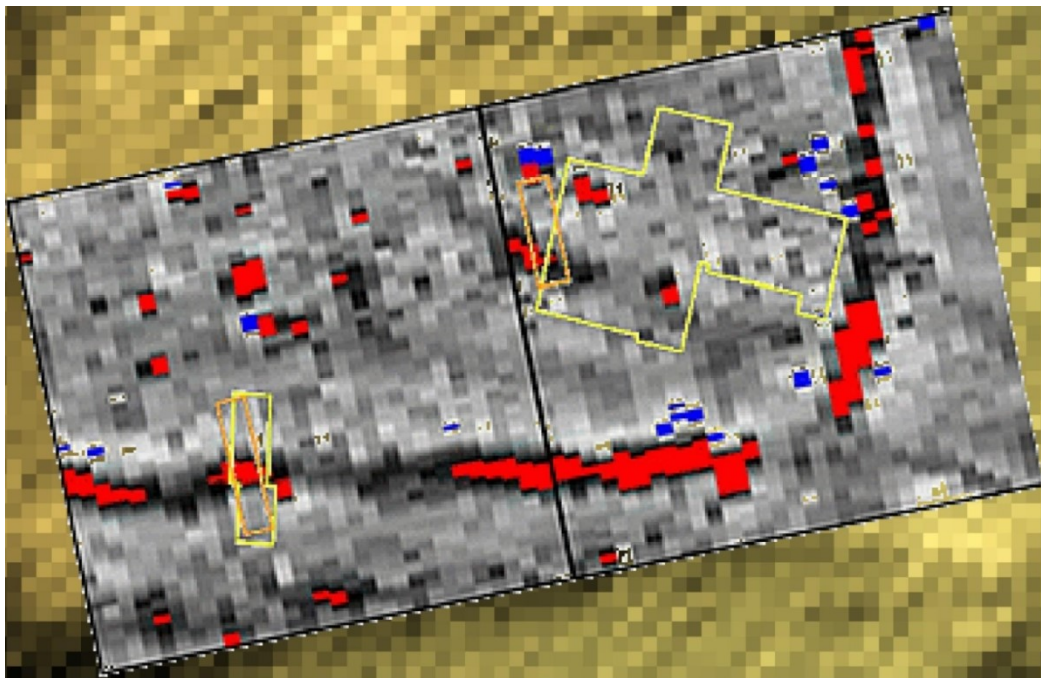
Two trenches were excavated, in total about 200 square metres. They were about 20m apart. They were both excavated throughout the three-week season.



**Figure 3: Lidar image of the site, with the 2021 trenches shown in yellow and labelled. The position of the 2019 trenches A1 and A2 are shown in orange. Two 30mx30m magnetometry survey grids are outlined in pink. An enlarged view is given in the next figure.**

**Trench 1:** This was a re-opening and extension of 2019 Trench A1, which had been dug across the line of the large ditch seen on magnetometry. As accurate GPS was not available at the start of the dig, it was rotated by a small angle relative to the previous trench. The trench was 2.5m (E-W) x 10m (N-S), but with a step 4m from its southern edge displacing the trench westward by 0.5m. The deeper eastern half of the 2019 trench had been protected by geo-textile before back-filling, and this was found and removed during the 2021 excavation.

**Trench 3:** This was excavated to explore the ill-defined rectangular feature seen on lidar, on magnetometry, and visible on the ground. It lay to the east of 2019 Trench A2, though with a small overlap (see Figure 3). The overlap was almost entirely on the eastern half of A2, which had only been de-turfed, not cleaned down to archaeology. Trench 3 was 19m (E-W) x 15m (N-S), although not all of that area was excavated.



**Figure 4: Magnetometry (two 30mx30m squares) shown in grey, with trench positions (as in previous figure).**

### **2.3 Excavation of trenches**

See the Project Design (Green 2019) for details of excavation methods, access, and health and safety. The trenches were both excavated by hand. Turf, stones, and soil were stacked separately. The site was fully restored at the end of the dig. Recording was by high-definition drone photography and by photogrammetry using a hand-held camera. Photogrammetry enables scale-correct images to be obtained, but definition is not as good as obtained from drone images. In addition, hand drawing was used for important sections.

Professional supervision was by Rob Young who also was part of the excavation team for Trench 1. Management of the dig was by Martin Green and Tony Metcalfe, with surveying and drone photography by Stephen Eastmead (all members of the AA fieldwork task group).

Context numbers are given in *italics*: see the context tables (Appendix 1) for further details.

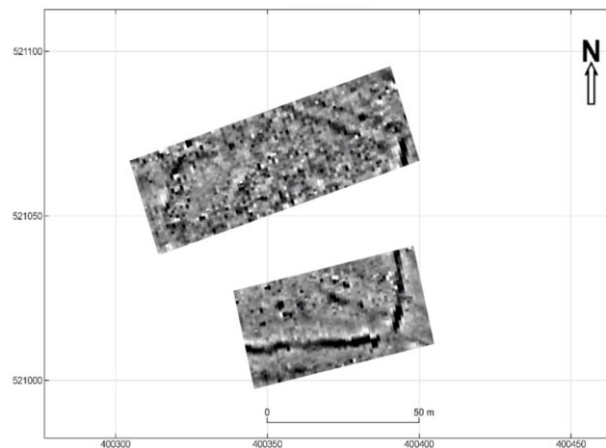


### 3 EXCAVATION FINDINGS, TRENCH 1

#### 3.1 Trench 1: excavation

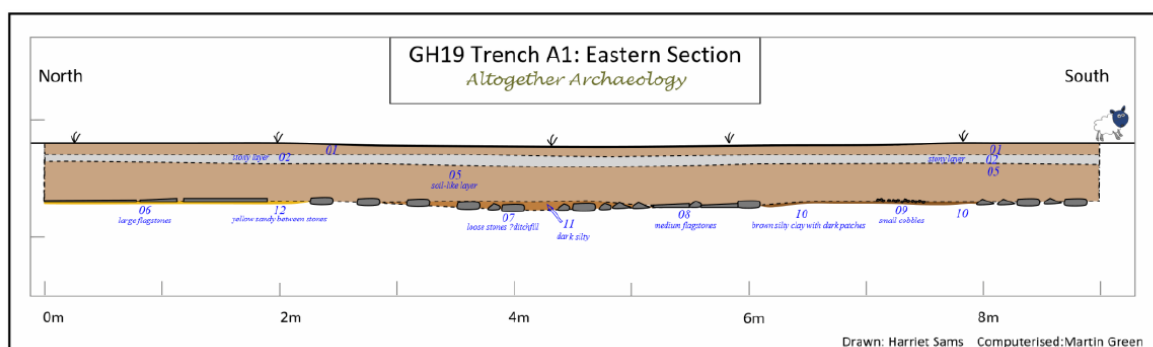
Vertical drone shots of the trench at intervals through the excavation are given in Appendix 7, and plans and sections are shown in Figures 11 and 17.

A detailed programme of geophysical fieldwork, had produced evidence for a rectilinear enclosure on the site, although the western side was not clearly defined (Figure 5). The ditch is not seen on lidar or on the ground, suggesting it was unlikely to be modern.



**Figure 5: Magnetometry grids showing the ditch (C at top, A at bottom).**

In light of this, Trench A1 (measuring 9m x 2m) was placed in 2019 to produce a section across an arbitrarily chosen part of the enclosure ditch. Two-digit context numbers in this discussion are from 2019, four-digit from 2022. Turf removal revealed a layer of rounded cobbles set in a topsoil-like matrix 02. This overlaid a brown soil 05, which showed no evidence of cultivation. This layer produced two sherds of pottery, one of which was clearly of medieval date. Beneath 05, at the north end of the trench was a layer of laid flat 'flagstones' 06. South of this, a deposit of rounded stones in a dark silty matrix 07 was observed and it was suggested that this was part of the upper fill of the enclosure ditch. Beyond this deposit two further layers of compacted stones 08 and 09 were recorded; 08 produced a fragment of a possible quern stone. Full details are given in the report on the 2019 excavation (Green 2020), but for convenience, the plan and section are reproduced below. At the end of the 2019 excavation, the trench base was covered in geotextile membrane.



**Figure 6: North-south section of eastern side of 2019 Trench A1.**

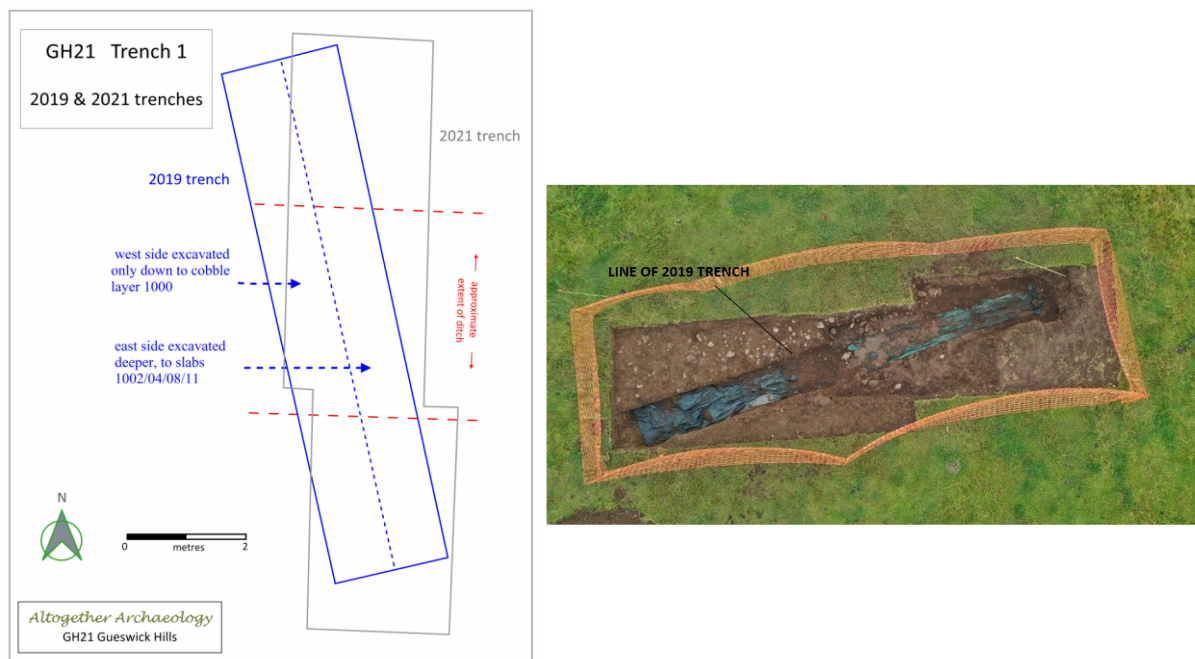






**Figure 7: 2019 Trench A1 final photogrammetry vertical view.**

The 2021 excavations necessitated the re-location of the 2019 trench. This was done with GIS equipment temporarily unavailable, leading to the 2021 trench was laid out at a small angle to the earlier excavation. Backfill, geotextile membrane and topsoil in the new trench area were removed.



**Figure 8: Relationship of the 2019 and 2021 trenches, with drone photograph (north to the left) of the 2019 trench geotextile uncovered at the start of the 2021 excavation.**

The topsoil was some 10-20cm thick and overlay the spread of cobbles *1000* (2019:02) noted across the whole trench in 2019. It comprised rounded cobbles ranging from 10-25cm in maximum dimension, set in a mid/dark brown sandy silt matrix to a depth of c. 10-15cm. This layer had clearly been deposited in one episode. *1000* directly overlay *1001* (2019:05). This was a fine, well sorted, light brown silty sand/loam, with many small angular and rounded pebble inclusions. These were fairly evenly distributed throughout the layer and the deposit, which lay across the whole of the excavated area, showed no signs of having been cultivated. The maximum depth of *1001* was about 50cm.



**Figure 9: Trench 1 after removal of 2019 geotextile and backfill. North is to the left.  
The white disc is a marker to show the ditch position predicted by magnetometry**

At the northern end of the trench *1001* was directly above the carefully set slab layer *1002* (2019:06) (Figures 9 and 10). This consisted of well-worn flat slabs (? fine grained sandstone), ranging in size from 75cm x 55cm to 23cm x 18cm. Slab thickness ranged from about 9cm to 15cm. At the southern end of the trench, again directly beneath *1001*, was a further area of carefully laid slabs *1004*.

In the centre of the trench, between *1002* and *1004*, further areas of slabbing *1008* and *1011* were recorded under *1011*. The gap between *1004* and *1011* was partly filled by a spread of small cobbles (2cm to 5cm diameter) *1015* at the same level. This is best seen in the image of the 2019 excavation, at the end of which it was mostly removed, but a remnant is still visible in the 2021 views. A thin deposit of fawn/dark brown sandy silty material with small grit-like inclusions and rounded cobbles *1003* covered *1011*. The ditch was underneath *1011*. It may well be that *1002*, *1004*, *1008* and *1011* (and possibly *1015*) represent one phase of 'slab' laying, extending across the whole trench. See Figure 11 for a plan of these layers.

The difference in height between layers *1002* and *1004* was only about 10cm. However, there was evidence of slumping where the paving crossed the ditch (see levels in Figures 11 and 12).

Levels averaged (relative to TBM):

- 0.15 to north of ditch on paving *1002*
- 0.40 in centre of ditch on paving *1011*, and -0.30 on cobble layer *1013* over paving *1011*
- 0.25 to south of ditch on paving *1004*

Hence the slabbed layers had slumped by 20cm, though deposition of *1013* over *1011* had reduced the slump to 10cm. Similarly, levels taken after removal of the slabs and cobbles (Figure 12), showed that the ditch-fill had slumped, relative to the top of the natural on each side.

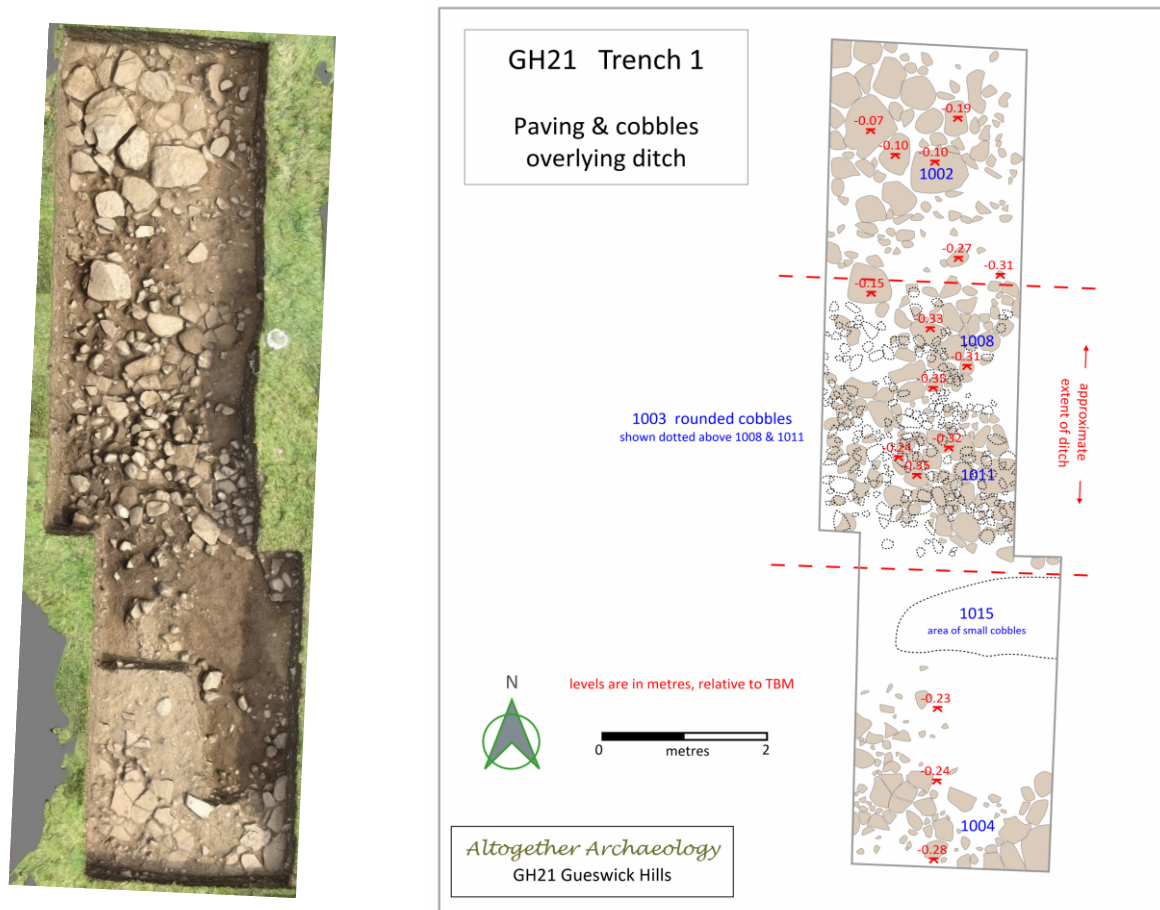


Figure 10 (left): Trench 1 vertical photogrammetry view showing slabbed layers. Small cobbles 1015 have been removed, but the cobbles of layer 1003 are still in place over slabs 1011.

Figure 11 (right): Plan of slab layers with context numbers. Levels are on cobbles 1003

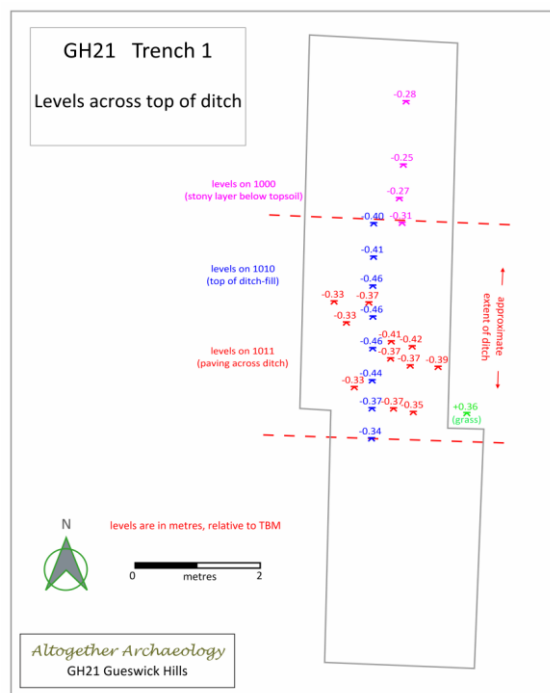


Figure 12: Levels across the top of the ditch after removal of slab layers, showing slumping of fill.



Removal of 1002 revealed that the slabs were sitting on a layer of friable golden/mid-brown, sandy silt, soil 1007 containing small angular and rounded inclusions measuring 22mm x 10mm (max.) to 3mm x 2mm (min.) in size. A rim fragment from a possible Crambeck Ware jar (c. Late 2<sup>nd</sup> – 3<sup>rd</sup> century AD) was recovered from this layer directly beneath the slabs. 1007 in turn overlay the 'natural', a sticky, golden brown gravelly clay silt 1009. A similar phenomenon was noted at the southern end of the trench where the slabs 1004 overlay 1006, a friable, mid-brown, silty, almost loam-like soil, again with small angular and rounded inclusions, (probably sandstone), of the same rough dimensions as those observed in 1007.



**Figure 13: Vertical photogrammetry image of the central section of the trench during removal of slabs 1011 to expose upper ditch-fill 1010. North to the left. The white disc marks the location of ditch as predicted by the magnetometry survey.**

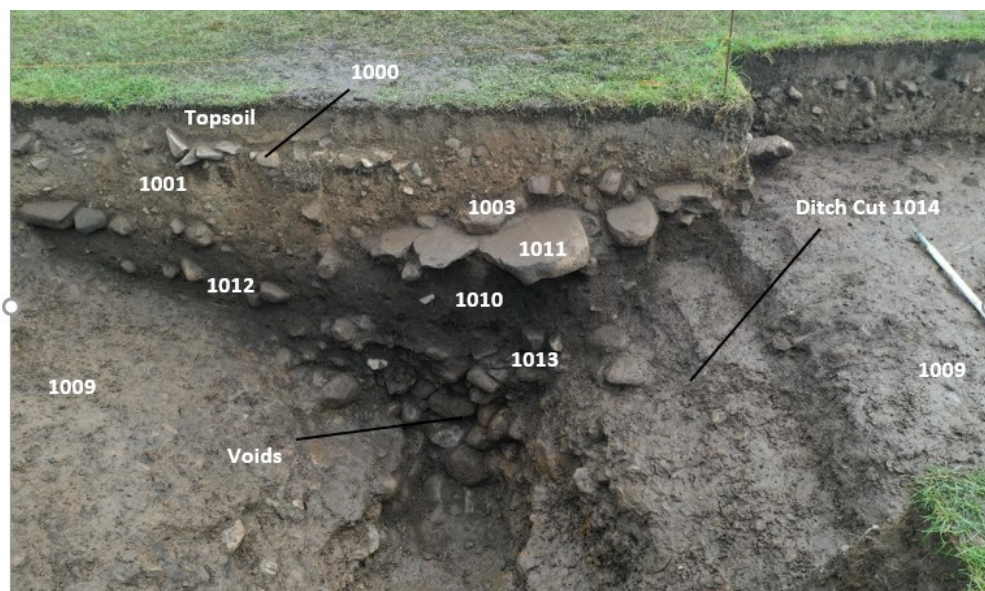
In the central section of the trench, over where the geophysical survey had indicated the presence of the ditch proper, 1011 was removed to reveal 1010, a thick, dark brown/black fine sandy silt loam. This soil retained moisture during the whole period of its excavation and clearly contained fine organic material in the matrix, including readily observable flecks and chunks of charcoal. Its maximum thickness was about 40cm and in turn it overlay 1012. Clearly distinguishable in excavation, this was a dark brown, sandy, silt with some obvious clay particles present. 1012 also exhibited some very small gravel-like fragments and rare larger rounded stones within the matrix. Again, this deposit remained damp during the whole of its excavation (Figures 10 and 13). A sherd of Black Burnished Ware pottery (circa 100 AD date) was recovered from the interface between 1010 and 1012.

As Figures 14, 15, 16 and 17 (below) show, 1012 overlaid a narrowing of the ditch profile which was filled with 1013. The cut for the ditch 1014 narrowed dramatically towards the base, with almost step-like vertical sides at the bottom. The lower 80-90cm of the ditch section was well packed with round and angular stones and butchered animal bones 1013 set in a yellow/brown sandy clay matrix.

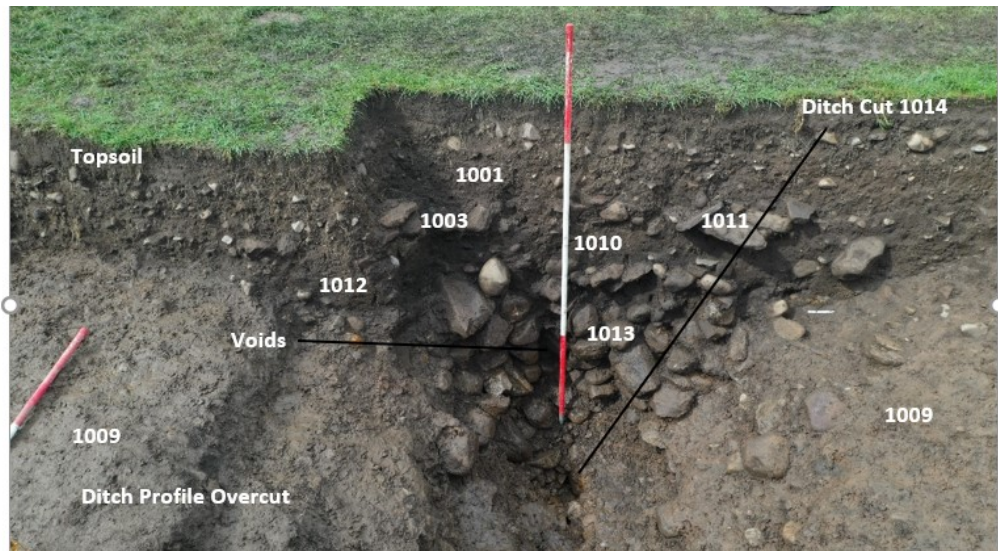




**Figure 14: View looking east during excavation of the ditch-fills. showing 'natural' 1009, ditch-fills 1010 and 1012, with beehive quern emerging in stone packing 1013. The cut is 1014.**



**Figure 15: View looking east of the ditch after removal of fill. Showing, in the section, fills and the basal packing 1013 (with voids) for palisade timbers. Figure 17 (below) is a drawing of this section.**



**Figure 16: Similar to previous figure, but looking west, showing the other section through the ditch. Again, the fills and basal packing 1013 (with voids) for palisade timbers are shown.  
Ranging pole is 2m high**

A fragment from an unfinished beehive quern was recovered from high in the tight edge packing on the southern edge of this section of the ditch (Figures 14 and 21). This quern is illustrated and discussed below. A central strip of this packing, some 20cm to 30cm wide, was clearly loose and full of voids. This probably represents the positions of large timbers, inserted into the ditch to form a palisade around the enclosure. The voids were probably caused when the timbers either eroded and collapsed naturally or were physically removed from the ditch section. Butchered animal bones were recovered from the disturbed area of 1013. They are of a variety of livestock: see Section 3.4 for a report on this bone assemblage.

Radiocarbon dates were obtained for two of the animal bones and a tooth from the ditch-fills. A rib from the bottom of the lowest fill 1013 was dated to 20calBC. A horse femur from the centre of the same context gave a date of 10calAD, and a horse tooth from the upper fill 1010 gave a date of 60calAD. These dates are rounded to the nearest 10 years and have uncertainties of approximately  $\pm 40$  years. See Appendix 6 for full details, including C-N isotope values and the date ranges.

Thus, radiocarbon dating shows that the lowest ditch-fill (probably packing for the palisade timbers) was deposited in the late Iron Age. However, the uppermost fill, 1010, is somewhat later, probably in the very early R-B period. This is consistent with an early R-B Black-Burnished Ware sherd having been found in it. Unfortunately, there is a dip in the radiocarbon calibration curve around 85calAD, so that radiocarbon dating can't distinguish between samples from around 70calAD and around 100calAD.

Bulk samples were sent for lab analysis from ditch-fills 1010 and 1012. Full results are given in the lab report (Appendix 8). In summary, both contexts contained coal, cinder, and charcoal (heather and hazel). Charcoal found during the dig in both fills was identified as birch and malvaceae (e.g. hawthorn). Also in the samples were charred plant remains: hazel nutshells, spelt wheat, and heath grass (all in both contexts), plus: brome, dock, sedge, and redshank (all only in 1012, the lower context). Some calcined bone and tooth and semi-vitrified fuel waste was also found in 1012. The laboratory report notes that these findings are typical of IA and RB sites in the area. Spelt was the principal wheat crop, and the charred plant remains are interpreted as from burnt turves.

## **Suggested sequence of events for Trench 1**

A ditch was dug around the perimeter of potential settlement in the Late Iron Age. It had a broad upper profile to permit working space for the erection of a palisade in its narrow base. The timbers were packed by *1013*, mostly stones with some butchered animal bones and a partly-completed quern. Later, the palisade either collapsed or was removed, leaving voids in *1013*. None of the charcoal found in the ditch-fill samples was of large timber species suitable for a palisade; hence it is unlikely that the palisade timbers were charred before erection (for rot-proofing) or burnt down at any time.

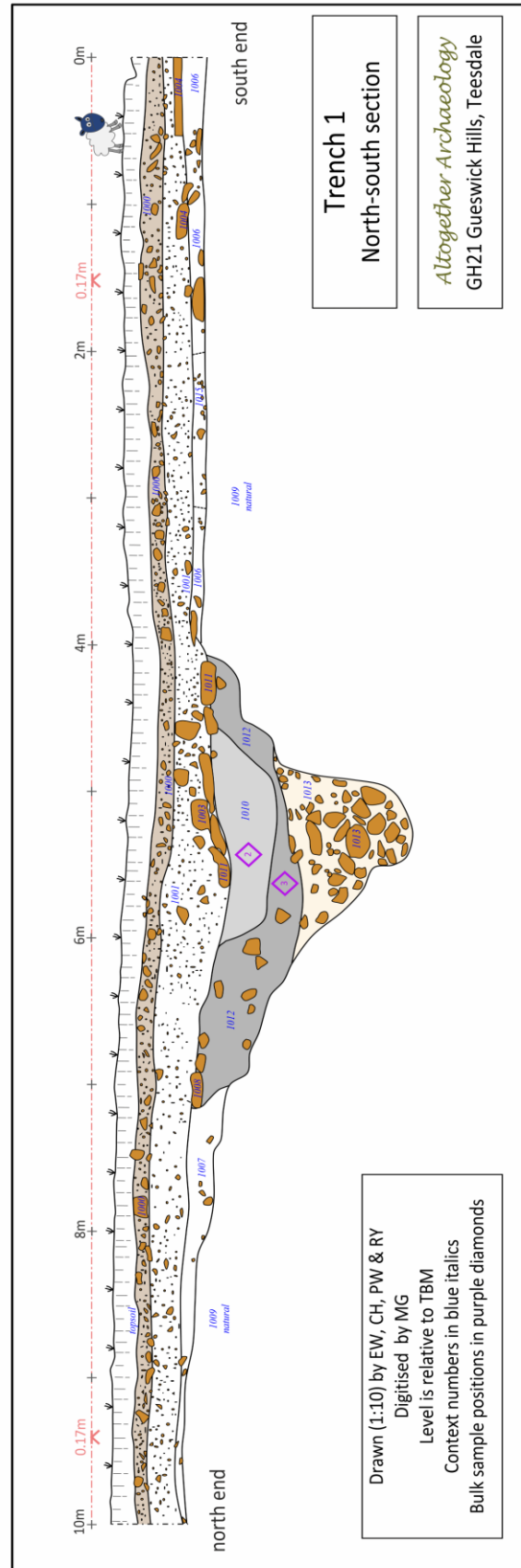
The ditch started to fill with deposit *1012*. Later, around the end of the 1<sup>st</sup> century or start of the 2<sup>nd</sup> century AD, further fill *1010* accumulated, dated by the Black Burnished Ware pottery at interface of *1010* and *1012*. These fine layers may have resulted from agricultural activity in the immediate area.

Slabs *1002/04/08/11* were laid across the ditch in the late 2<sup>nd</sup>-early 3<sup>rd</sup> century AD or after (on the basis of Crambeck Ware beneath slabs *1002*). This may have been to create a working surface across the area of the ditch, linked to a period of Roman/Romano-British open settlement. As the ditch had only recently been filled, and the fill had voids, the fill slumped under the paving. To remedy this, rounded cobbles *1003* were deposited over the paving where it crossed the ditch.

Well sorted soil *1001* developed over the slabbed area and cobbles *1003*. This has no evidence of cultivation but produced one fragment of possible medieval pot in the 2019 excavations. It may be related to the medieval agriculture (ridge-and-furrow, and possible re-use or extension of the terracing) in the vicinity. A cobbled layer *1000* was deposited over the soil *1001* (? post-medieval) and the modern turf line developed over this.







**Figure 17: Trench 3 Section across ditch (east side of trench).**





### 3.2 Trench 1: finds

#### *Pottery etc*



Figure 18: *Left*: Iron Age type sherd, find 121 from middle ditch-fill **1012**.  
*Right*: Black Burnished ware (late 1<sup>st</sup> to early 2<sup>nd</sup> cent AD), find 111 from base of upper ditch-fill. **1010**.



Figure 19: *Left*: Crambeck ware rim-sherd (late R-B), find 109 in context **1007** (under slabs **1002**).  
*Right*: stone stopper, find 106 from context **1004** (slab layer).

### ***Roman coin***

A copper-alloy Roman era coin (2<sup>nd</sup> century AD) was found by metal detection on the spoil heap of Trench 1. The date of its recovery, Aug 10<sup>th</sup>, was before the lifting of the slabbed layers and before excavation of the ditch fill. Hence it must have been derived from one of the 2021 contexts above the slab layer (or from the 2019 backfill which similarly was all from contexts above the slabs). It appears to be a coin of Marcus Aurelius (emperor from 161 -180 AD)



**Figure 20: The coin, find 104, after cleaning and conservation**



## Quern

A rough-out of a quern was found in the lower part of the ditch-fill 1013. This was of gritstone shaped into a truncated cone, with diameters 37cm (base) and 20cm (top). It was 17cm high. No holes had been drilled in it. It is the upper stone of a beehive quern. Although of typical height it is rather wider than average. Beehive querns probably came into widespread use in Britain in the 4<sup>th</sup> century BC (middle Iron Age), largely replacing saddle querns. This may have been because drilling holes in stone became less time-consuming as metal technology advanced. See Watts (2012, p53) for references and a discussion of the introduction of beehive querns into England.



**Figure 21: The quern in situ (looking SW), and after cleaning.**

**Figure 22 (following page): The quern: drawing by Rob Young.**





### 3.3 The bone assemblage (report by Louisa Gidney)



**Figure 23: The bone assemblage.**

The majority of the faunal remains were recovered from Trench 1: out of the fills of a large ditch, possibly an IA palisade trench. Preservation of the bones is poor. Many teeth have disintegrated into enamel fragments. Jaws, or skulls, are represented only by the teeth, as the surrounding bone has totally decayed. Robust limb bones of cattle and horse have become brittle and fragmented on lifting. This small assemblage is therefore unlikely to be representative of the original patterns of husbandry, consumption and waste disposal.

The finds from contexts 1001-1009 were small, poorly preserved fragments. These were mostly calcined scraps from 1001, 1006 and 1007. Some of those from 1006 were from sheep/goat size rather than cattle size bones. Fragments of tooth enamel from 1001 are probably from a cattle tooth but are too fragmented for a positive attribution. The tooth enamel fragments from 1009 were clearly from a cattle tooth, probably maxillary.

The upper ditch fills produced a damaged horse maxillary tooth from context 1010. Context 1012 had enamel fragments from sheep/goat teeth, with one maxillary molar 3 reconstructed from fragments. Enamel from cattle size teeth was present in two separate bags. A calcined fragment of cattle size long bone shaft was also found.

The majority of the assemblage was recovered from ditch fill 1013, among the stones possibly used for packing palisade timbers. Cattle remains are most numerous, followed by sheep/goat, horse and pig. The presence of dog is indicated by gnawing marks on cattle and horse bones. Body part representation differs between the species. For cattle, there are five elements from the head,



including a disintegrated portion of frontal with horncore, two each from fore and hind limbs, one toe and one vertebra. All four horse elements are from the hind leg. There is one bone from the fore leg and one from the hind leg, with the remaining sheep/goat elements all from the head. The pig remains are one cervical vertebra and one skull fragment. The cattle and horse femora and the horse tibia had been deposited largely intact, apart from the canid gnawing damage, but have disintegrated on lifting. It is clear that both species were of small stature but no measurements are possible, to estimate their height. These bones all had fused epiphysial ends and were from adult animals. One intact cattle maxillary tooth row with molar 3 at an early stage of wear indicates slaughter about three years old. The sheep/goat teeth indicate an absence of aged animals. A lamb beginning to eat grass is represented by one mandible which has deciduous premolar 4 with wear just starting on the enamel. This find is an indication that the ditch was open and receiving fill during, or at the end of, the spring lambing time. Animals about a year old, with molar 2 coming into wear are represented by two mandibles and a group of three matching molars 2 which probably represent the remains of a skull with both mandibles in articulation. One animal about two years old is indicated by a maxilla with molar 3 at an early stage of wear. The fused distal humerus and unfused distal femur are compatible with an age range of over a year but less than three years. The pig remains represent immature animals as the vertebral epiphysis are unfused and the maxilla with molar 1 in wear has a crypt for an unerupted molar.

The lowest part of 1013, produced a rib shaft fragment of cattle size.

Few finds were recovered from Trench 3. The rabbit femur from the topsoil 303 is of recent origin. 304 produced a fragment of a horse tooth. A small fragment from 307 is possibly from a cattle size ulna.

The Iron Age ditch has produced evidence for cattle, sheep/goat, horse and pig and indirect evidence for the presence of dog. The cattle and horse were adult and small in stature. Although no butchery marks were clearly visible, there is nothing to suggest that horse was not deemed edible. None of the sheep were aged but a range of juvenile to young adult animals are represented, with the lamb jaw suggesting sheep were kept in the vicinity of the site during spring. The scant pig remains also indicate younger animals.

	1001	1006	1007	1009	1010	1012	1013	1013 lowest		303	304	307
Cattle				1			10					
Cattle?	X					2						
Horse					1		4				1	
Cow/Horse size						1	2	1				1
Sheep/goat						3	5					
Sheep size							6					
Pig							2					
Rabbit										1		
Indeterminate		X	X									
Calcined	X	X	X			X	X					

**Bone assemblage: Table of species represented**

X = present but not quantifiable





## 4 EXCAVATION FINDINGS, TRENCH 3

### 4.1 Trench 3: excavation

This was excavated to explore the ill-defined rectangular feature seen on lidar, on magnetometry, and visible on the ground. It lay to the east of 2019 Trench A2, though with a small overlap (see Figure 4). In practice the overlap was almost entirely on the eastern half of A2, which had only been de-turfed, not cleaned down to archaeology. Trench 3 was 19m (E-W) x 15m (N-S), although not all of that area was excavated. Vertical drone shots of the trench at intervals through the excavation are given in Appendix 7, and plans and sections are shown in Figures 28 to 31.

The trench was positioned to examine the ill-defined rectangular feature seen on magnetometry (Figure 4), lidar (Figure 3), and on the ground. The feature consisted of a slight rectangular depression, on the south side (downhill) of which was a low bank with a dip half-way along. The ridge and furrow ploughing (seen on lidar to the north) stopped short of the feature, so a good state of preservation was hoped for. The 2019 Trench A2 (across the western end) had shown that the bank was a spread of small stones and the finds (pottery and a stone spindle whorl) suggested occupation in the IA/RB period. The feature lay inside the line of the large ditch examined by Trench 1, so it seemed possible that this was a structure that was part of a defensible settlement.

Removal of the turf and cleaning of the surface of the bank, 307/310, showed that it was composed of coarse gravel and cobbles, mostly rounded, about 2cm to 10cm diameter. These were in yellow/brown sandy loam matrix, not compacted. There were no signs of any features on the bank, nor any ruts. The bank was 5m wide and rounded in profile, from 70cm high along its centre-line to 20cm or 30cm at the edge. The dip halfway along was not an entrance (as suspected) but simply a slightly lower (by 10cm) part of the bank with the stones less densely packed in the matrix. Hence the eastern, 307, and western, 310, sections of the bank were essentially continuous with each other. Under the bank was the natural grey/brown clay-rich subsoil.

There were bands of larger stones (10cm to 40cm) edging the bank's margins. These are seen in the N-S section drawing across the trench (Figure 31). On the north margin the band (305) was 50cm high, 50cm wide at the top, 100cm at its base. On the south margin the band was 80cm wide and 30cm high. In both bands, the stones were loosely and irregular placed, not forming a well-built kerb or revetment. Further south, beyond the bank and the edging stone band, the trench was essentially featureless, with a thin (8cm) silty loam including gravel and a few small cobbles, not clearly differentiated from the topsoil or the underlying glacial till.

An early medieval annular brooch (discussed below) was found lying on the stones of the bank, with no evidence of damage from plough-transport. The topsoil over the bank also contained some IA/RB sherds; hence the bank is unlikely to be more recent than the RB era. In the bank itself, there was only one dateable find, a probable IA/RB sherd. See the finds section (below) for more details of finds. Two fragments of charcoal were recovered during the dig from the bank 307; these have been identified (Appendix 8) as being birch and maloidae (e.g. hawthorn).





**Figure 24: Vertical drone view of Trench 3 (Aug 10<sup>th</sup>). North at top. The stony bank 307/310 with its flanking bands of stones is obvious, with the gravelly surface 304 north of it.**

On the north side of the bank, there was a boat-shaped gravel-rich compacted surface, 304, about 7m (E-W) by 2m (N-S). It consisted of gravel up to 1cm diameter (a few larger stones) in an orange/brown sandy matrix, to a depth of up to 15cm. It overlay the lower part of the stony bands surrounding it. Underneath this surface was the probable natural: a clay-rich grey/brown glacial till subsoil. There were no post-holes or other features in this surface and the context had few finds: a very corroded iron blade, two non-diagnostic flints, and a single sherd of coarse unglazed pottery. A similar, though smaller, gravelly surface 321 was found to the west of 304, separated from it by an irregular patch of stones, 322, up to 40cm diameter. This surface included some small sherds of pottery and a large decorated blue glass bead (discussed below), all probably IA/RB.

Analysis of bulk samples from the two gravel surfaces is detailed in Appendix 8. 304 contained a few small pieces of coal and charcoal (birch, elm, willow) and some calcined bone. Two charcoal fragments recovered during the dig are identified as hazel and prunus (e.g. blackthorn). Notably, there were no charred plant remains (such as the nutshells found in the other three bulk samples from the site). 321 also contained a few small fragments of coal and charcoal (birch, oak, elder, hawthorn, prunus) plus a couple of charred hazelnut shells, a cleavers seed, and some calcined bone. These results represent the “background” noise produced by a farming settlement. Some of the material may be suitable for radiocarbon dating.





**Figure 25: Context 304, a gravelly surface. *Left*: looking east. *Right*: looking west from the baulk. A N-S slot has been cut through it, exposing it in section. (see trench plan, Figure 28).**

To the north of the gravel patches 304 and 321, there was another wide irregular E-W band 311 of larger stones up to 30cm diameter. This was more substantial than the E-W bands of stones, 305 and 306, on the margins of the bank further south. The stones were (like most found in the trench) sandstone, apart from a few of limestone, and irregular shaped, some rounded. They were loosely piled to 45cm in a matrix of yellow/brown sandy/silty loam, with the lowest stones flat on the subsoil. They would have acted as a low revetment to the soil uphill (i.e. to the north). Finds were few: a single pot-sherd, and iron pin and a possible smoothing stone. Further sherds were found in the topsoil overlying 311 at the west end of the trench.

The northernmost part of the trench was relatively featureless with a stonier E-W band, 315, between less stony areas 313 and 316 overlying subsoil. No features could be discerned, and the finds were few: just a couple of possible broken whetstones, with no pottery, metal or charcoal.



**Figure 26: Looking west (Aug 20<sup>th</sup>). In the left foreground is the rounded end of stony bank 307. At the far end of the trench an E-W slot has been excavated along the crest of the bank. Gravelly surface 304 has been removed on both sides of the N-S baulk.**



As a surface feature (seen in lidar in Figure 3 and on the ground), the broad bank 307 came to a rounded end just beyond the eastern margin of the trench. The excavation was consistent with this, with the northern margin of the bank beginning to turn to the south and the density of stones becoming sparser. To the north of the east end of the bank, (and to the east of gravelly surface 304) the two stony bands to the north and south of 304 merged. The merged bands, 319, contained some larger rounded stones, up to 50cm diameter, as well as stones of all smaller sizes. As with the other stony bands it was loosely organised with no clear structure. The finds in this area included only two pot-sherds (both likely to be IA/RB) but three corroded iron fragments and a glass droplet. This suggests that this part of the site was a working area, rather than domestic in nature. The band of stones terminated just before the eastern edge of the trench, with the easternmost 10cm of the trench relatively stone-free.



**Figure 27: Vertical drone view (Aug 20<sup>th</sup>). North at top. Gravelly surface 304 has been removed. A slot has been excavated along the crest of the stony bank, with stones of the bank to the south of the slot removed.**

### Summary of Trench 3

It is notable that no post-holes, beam slots, drip gullies, or stone settings were found; hence there is no evidence of buildings. The gravelly area 304 was clearly deposited as a surface for some purpose, with well-defined edges: most likely a working or storage surface in view of the lack of “domestic” finds, the comparative sterility of the bulk sample, and the lack of any evidence of building.

The broad stony bank at first sight looks like a cambered Roman-type roadway, with kerbstones. This is unlikely to be the case for several reasons: 1) the edging stones are just irregular bands, not forming true kerbs, 2) the surface of the bank shows no sign of rutting, so hasn't had much use by wheeled vehicles, 3) the bank doesn't continue beyond the trench margin, coming to a rounded end, 4) there is no evidence on lidar of a routeway across the hilltop.

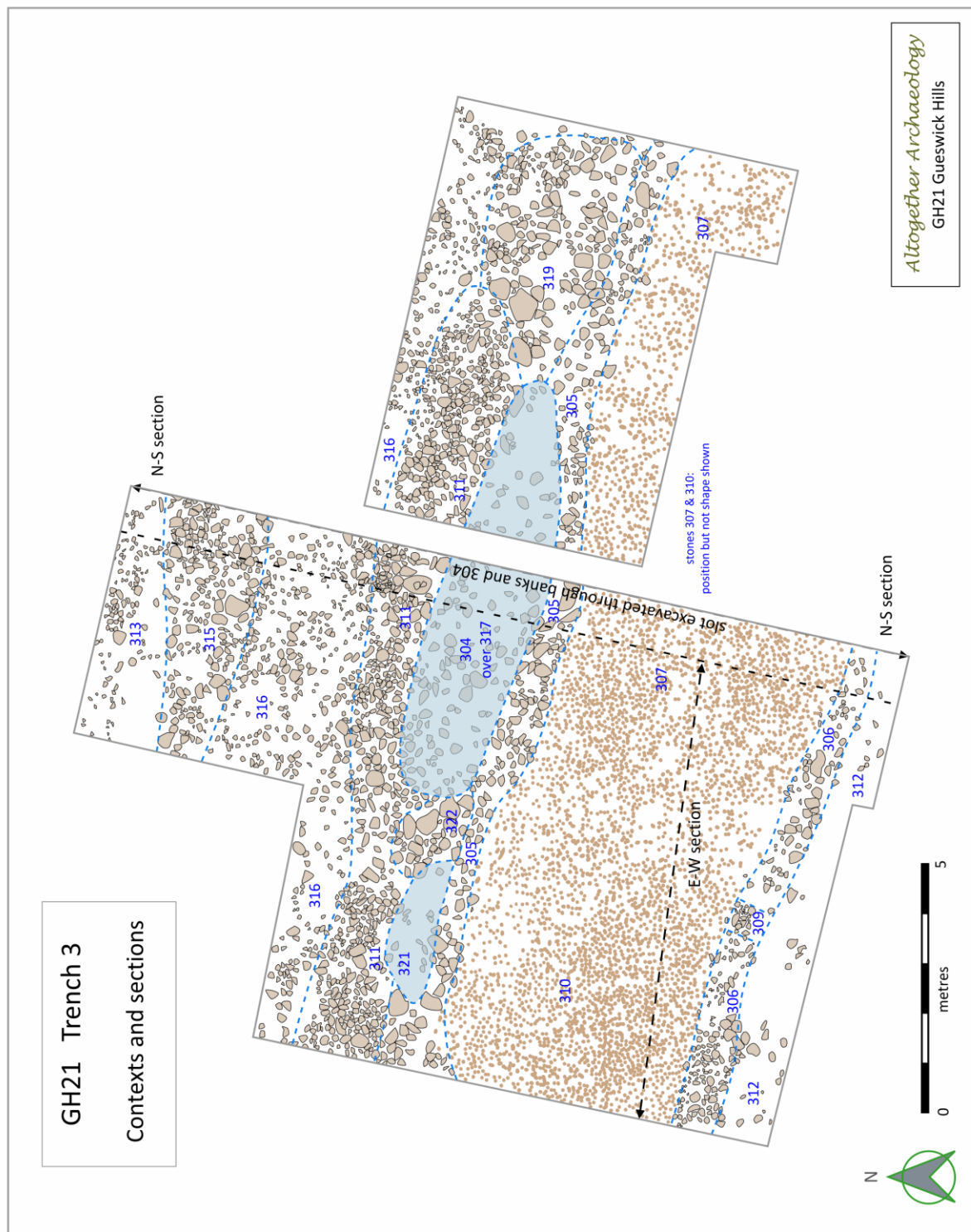
On the other hand, the bank clearly isn't natural. Possible uses could be: as a raised dry stack-stand for hay etc, as a walking route into a settlement, as a dry working area, or as a remnant of a defensive bank from an earlier phase of a settlement. None of these explanations are entirely satisfactory, but hopefully further excavation of the site will give additional information.

The western end of the trench, particularly the NW segment, was rich in finds: many IA/RB potsherds, a spindle whorl, a glass bead, and an iron pin and iron blade. There are no structures to explain this density of finds, so presumably they have scattered from nearby domestic buildings. There is some indication on lidar and on the ground of building platforms, 5m to 10m to the east of the trench, scooped into the hill-slope. These may be a target of future excavation.

The northern (highest) part of the trench was comparatively featureless, with just a band of stones revetting the north side of gravelly surface 304, and another ill-defined stony band passing E-W across the area. The lack of finds suggests that this was an unoccupied area, possibly the stony band represents partial clearance for agricultural use.





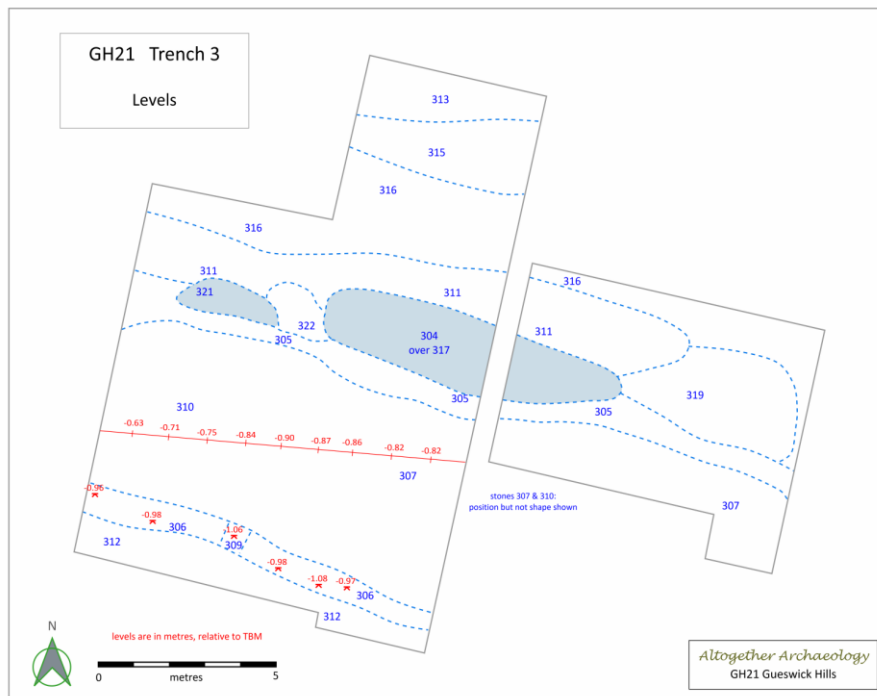


**Figure 28: Plan of Trench 3.**

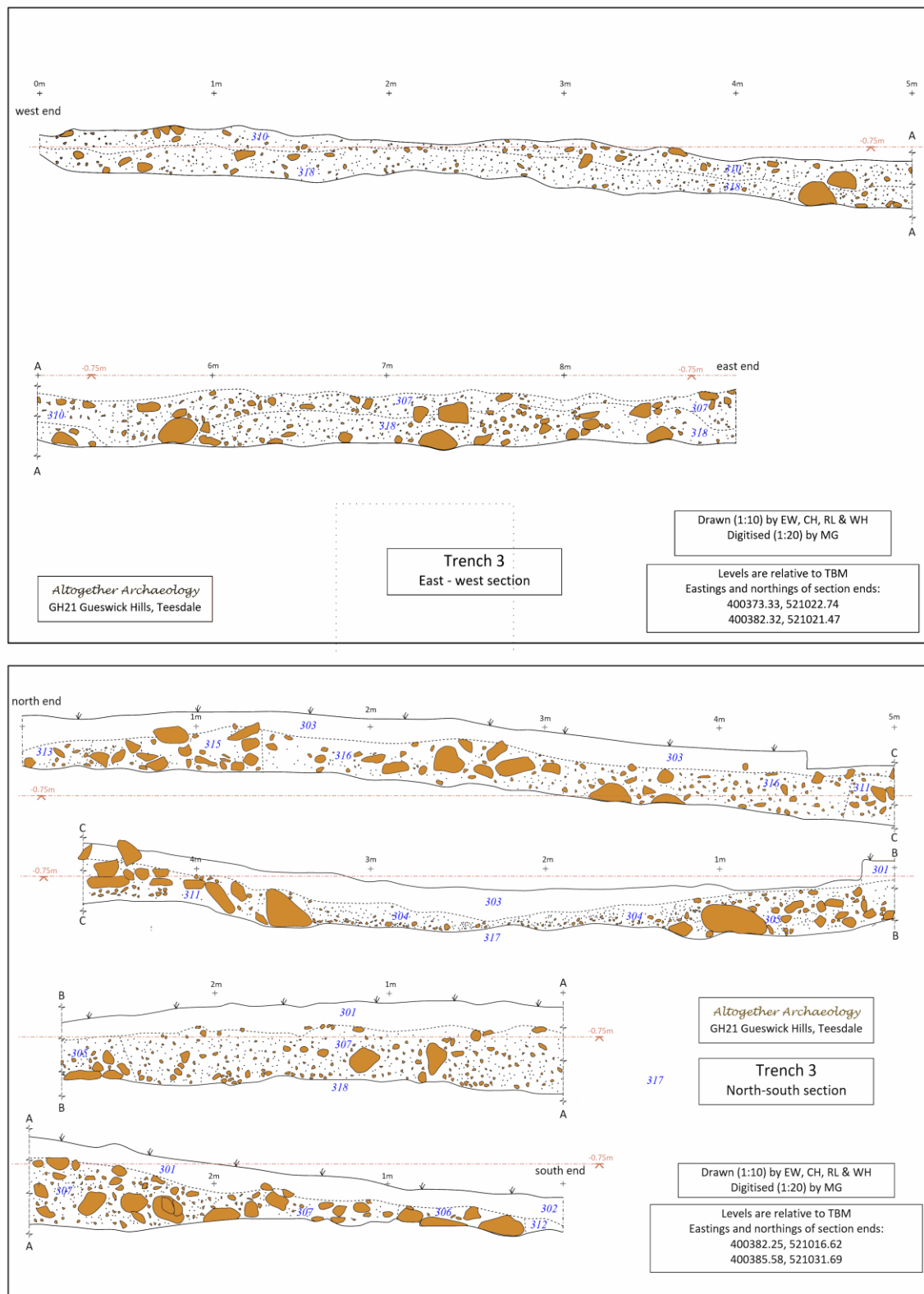




**Figure 29: Trench 3: plan of topsoil contexts.**



**Figure 30: Trench 3: plan of lower contexts, with levels marked.**



**Figure 31: Trench 3 N-S and E-W sections.**

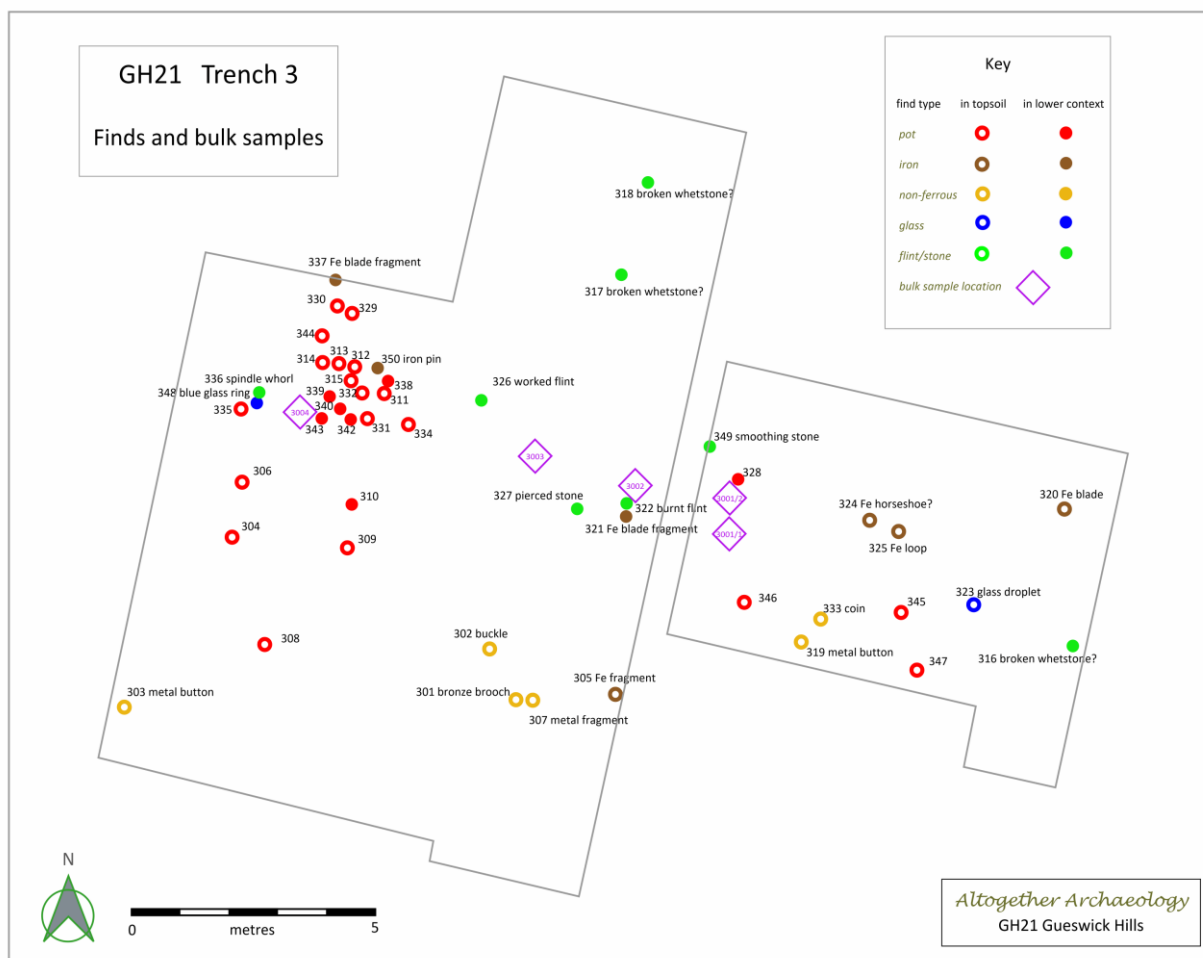
The position of these sections are shown on the trench plan (Figure 28).



## 4.2 Trench 3: finds

### *Distribution*

The distribution of finds in the trench was far from random. There was significant grouping of potsherds plus a spindle-whorl in the NW section suggesting domestic occupation. Metal objects were most common on the stony bank 307/310. The flat gravel surface 304 had very few finds: two flints, an iron blade fragment, a small pierced stone (probably natural) and a single pot-herd. At the east end of the trench there were several metallic finds, plus a glass droplet, suggesting industrial rather than domestic use. The northern part of the trench was devoid of finds, apart from a couple of possible broken whetstones.



**Figure 32: Distribution of finds in Trench 3.**



### ***Bronze brooch***

This was immediately under the turf, lying on the stony bank (find 301). It was complete, except that the pin and rivet had corroded away (the pin is usually of iron, the rest of the brooch of copper alloy). It has a flat annular form, 43mm in diameter. It is almost certainly early medieval, of a type in use between 475 AD and 575 AD.



**Figure 33: Annular bronze brooch after conservation. Photograph scale in mm.**

Drawing by Tony Metcalfe.

Geake (2018) notes that it is difficult to date early Anglo-Saxon brooches accurately, though there is no clear evidence for their use in graves before 475 AD. This brooch is of the commonest variety of annular brooch (Leeds type g), which seem to have gone out of use around 575AD. They range in diameter from 35mm to 65mm and decoration with grooves (as in this brooch) is common. Later annular brooches tend to be smaller, less than 42mm diameter, and/or thicker.

Most similar brooches have been found in graves further south in England. This example is unlikely to have been from a grave as it was found on a stony bank with no nearby grave-cuts. If it had been moved by ploughing from a cemetery site, then more damage to it would have been expected. More likely, it was accidentally dropped; Geake notes that annular brooches are difficult to use as the fabric layers have to be pushed through the centre-hole, the pin put through it, and then the fabric pulled back with the pin in place to secure it. Later types of brooches were easier to use.

Interestingly, a very similar brooch was found on the flagstone floor of a roundhouse on the northern flanks of the Cheviots at Crock Cleuch (Steer and Keeney 1947).

### *Bone assemblage*

Only a few small bones were recovered, these are described in the bone report for Trench 1.

### *Pottery*



**Figure 34: Left: Iron Age type sherd, find 308 from 301 (topsoil).  
Right: Handle-sherd, find 329 from context 320 (topsoil, NW sector of Trench 3).**

### *Spindle whorl*



**Figure 35: Spindle whorls, Left: Find 336 from 320 (topsoil, NW corner of Trench 3)  
Right: 2019 excavation find, from A204 (gravelly layer), at same scale.**

The spindle whorl found in 2021 was slightly larger but similar to the shale whorl found in the 2019 excavation, see illustration above. It is 41.5mm diameter, with 8.0mm diameter hole. Both whorls are decorated with incised concentric rings. The find spots were only about 4m apart: the 2021 whorl was in topsoil above gravelly surface 321 north of the stony bank, the 2019 whorl was in a similar gravelly layer a few metres further west, also north of the bank.

## Glass

A broken glass bead, find 319 from gravelly layer 321, is of an Iron Age design. It is 26.7mm diameter, with a 9.7mm diameter hole (though measurement cannot be precise as it is not a regular shape). The glass is dark blue, almost opaque, decorated with spirals of white glass. The spirals are on protuberances bulging from the bead's surface. This is a Guido Class 6 Oldbury type bead, several of which are illustrated in [finds.org.uk](https://finds.org.uk). Although late Iron Age, they may have remained in use into the RB period.



**Figure 36: Left: The IA/RB bead (find 319).  
Right: For comparison, bead from North Yorkshire, finds.org.uk ID: SWYOR-EBF2F4.**

Foulds (2014, p420) discusses this type of bead as follows:

*“Guido pointed to continental parallels for this bead type, as similar examples have been found in Europe. In general, she suggested a date from about 150 BC until the Roman conquest. From the distribution map, she suggested that they were imported into two primary areas: southeast England and in the Bristol Channel where the beads then spread out through Britain. Some examples have been found as far north as Kilmany in Fife and one was found on the Isle of Coll in western Scotland. However, she did not speculate on the significance of these northern specimens.”*



A large droplet of glass waste, about 12mm x 9mm, was found in context 319 (the grouping of large stones at the east end of the trench). this suggests re-working of glass (possibly Roman) on the site



**Figure 37: The glass droplet (find 323), scale in mm.**

## 5 DISCUSSION

Further excavation is planned, so fuller discussion will follow later. Points of interest are:

### *Coal.*

The palaeoenvironmental report mentions that coal was found in all four of the bulk samples analysed, two from the fill (dated to the late Iron Age) of the large ditch in Trench 1, two from the gravelly surfaces in Trench 3. Coal was clearly in use prehistorically on this site. Coal use is well-attested in Roman Britain, but information about coal in the Iron Age is sparse. However, Coggins (1984, p80) states that his excavations (with Ken Fairless) showed that coal was used as domestic fuel in the native settlement at Forcegarth North and South (in Upper Teesdale) during the Roman period. He notes that the source was at least 3km from the settlement, implying that firewood may have been a limited resource. Interestingly, he also mentions that their excavations at the nearby, later, site at Simy Folds (occupied in the early medieval period) produced no evidence of coal use.

Where did the coal come from? The bedrock geology of the area is Carboniferous; although lower in the Carboniferous sequence than the Coal Measures closer to the coast, it still contains thin coal seams. The first edition Ordnance Survey map (mid 19<sup>th</sup> century) shows small coal mines higher up Baldersdale, mostly adits dug into outcropping seams in the side of stream valleys. The coal would have been exposed by erosion. Examples are at NY930177 (by Hunder Beck) and NY924181 (Birk Hill); both only 8km from the Gueswick site. The online map of English coal mines (NMRS 2018) shows several closer coal workings e.g. at NY991196 (Corn Park) less than 2km away.

Even closer, at NY99211998 (only 1.5km SW of the site), are coal workings shown on the 18<sup>th</sup> century Estate Map of Doe Park (Figure 2 in Green 2020). These workings are on the north bank of the River Balder, beside a footbridge. They are described on the map:

*“..a Place where the present tenant Thos Raine used to get coals, the seam of which is above the level of the River balder. These coals burn & light well.”*

Thus, there is extensive evidence that coal was available nearby, and from easily mined seams outcropping at the surface on the side of the deep stream and river valleys. Erosion after heavy rain would have repeatedly exposed these seams, so they were an obvious resource.

### *Palisaded settlements*

Palisaded upland settlements are typical of Northumberland and the Scottish Borders. They have generally been ascribed dates in the 150 years either side of 300 BC. Some developed into classic hillforts with earth ramparts defended by ditches. The hypothetical “Hownan sequence” is the progression: from palisaded settlement, to simple hillfort, to multi-ditched hillfort, to undefended settlement (Piggott 1950), although this may be an over-simple view (Oswald, Ainsworth & Pearson 2006, Frodsham 2004). It seems that many Northumberland palisaded settlements by 300 BC had become hillforts, though a few were abandoned or moved. The need to fell two hectares or more of mature woodland to build one palisade (plus more to maintain it) may have been a factor in the change to earthen defences as timber became a scarcer resource (Frodsham 2004, p40).



A good example is Wether Hill, which developed from a Bronze Age burial cairn, to undefended Bronze Age settlement, to palisaded settlement, to hillfort, to unenclosed RB settlement (see plans in Oswald, Ainsworth and Pearson 2006 p40). One settlement that didn't become a hillfort is High Knowes, where two palisade rings are visible, over one of which are RB roundhouses.



**Figure 38: High Knowes. *Left: photograph by Andy Curtis. Right: Aerial view (Bing).***

There is a major selection effect in that hillforts are very obvious in the landscape whereas palisaded settlements are far less so, and may be essentially invisible (as at Gueswick). So, the proportion of them that developed into hill-forts is difficult to establish, as many that didn't evolve in this way may remain undiscovered. Similarly, the proportion of hillforts that developed from palisaded settlements can only be found by excavation of a broad selection of hillforts. Mapping of the distribution of palisades (including those detected on aerial photographs) shows that they are concentrated in the Till Valley and neighbouring Cheviots, where they are almost as common as hillforts, but are rare elsewhere (Oswald, Ainsworth and Pearson 2006, p63) compared to hillforts. Hence there may be local factors involved.

Hunter et al (2022) excavated the Bleakmoor Hill palisaded settlement in Northumberland (NY96010886), a complex multi-period site including a Bronze Age ring-cairn, cord-rig running over earlier prehistoric field boundaries, roundhouse sites, and medieval ridge and furrow. It lies at an altitude of 330m. Hazel charcoal in the palisade ditch dated it to the 5<sup>th</sup> century BC. Some oak charcoal was also found, presumably from the palisade timbers themselves (possibly charred before construction). The round-house ring-grooves gave similar dates, so were roughly contemporary with the palisade.

They comment that although a variety of palisaded sites have been excavated, this was mostly several decades ago. Radiocarbon dates for them are few in number, often have wide error ranges, and in many cases are of unidentified species so there may be an "old wood" effect on the dates. This effect is likely to be particularly big if the charcoal was from large timbers of e.g. oak used to build the palisade itself. Overall, their 5<sup>th</sup> century BC date is rather earlier than many given for palisaded settlements in the uplands, but later than those for lowland sites. Hunter et al note that the adverse climatic conditions at the start of the Iron Age may have limited settlement to low sites, with Bleakmoor Hill being established as the uplands were re-occupied.

Both hillforts and palisaded upland settlements are almost absent from the North Pennines, despite the huge concentration further north. This is despite the good evidence of Iron Age occupation, with IA/RB settlements and field systems in all the major valleys (Frodsham 2017, 2019). Only two possible upland palisades have been suggested:

**Briar Dykes** (NY948199), about 6km up Baldersdale from the Gueswick Hills. This is a sub-rectangular enclosure about 80m across. Excavation by Fairless and Coggins (Fairless 1989 p190) found a shallow ditch with a slot in the bottom appropriate for a palisade. There is no published radiocarbon date for



this site (Frodsham 2019).

**Harter Fell** (NY936238) on the south side of Teesdale has a large (180m x 80m) oval enclosure around two knolls, consisting of a shallow ditch and low inner bank. However, this has never been excavated, so its nature is uncertain; it may even be a post-medieval enclosure.

The Gueswick Hills site is clearly different from “classic” upland palisaded settlements in Northumberland and the Borders. It is rectilinear, rather than oval, and it has been dated to later in the Iron Age. When it was built, there was clearly no local tradition of building earthen hillforts, so the decision to use a palisade is not surprising. However, it does mean that there must have been timber available locally in large quantities, suggesting a more wooded landscape than in the Cheviots. There is a lack of evidence for settlement in the North Pennines in the earliest part of the Iron Age (Frodsham 2019), and little evidence for the middle Iron Age (apart from a hearth at Simy Folds dated to 420 cal BC +/-100y). This apparent absence of settlement may simply be due to the small number of excavations carried out, but if it is genuine, and settlement only became extensive in the North Pennines in the late IA and RB eras, then this might explain the greater availability of timber.

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## 8 APPENDIX 1: CONTEXT TABLE

This is the context table for both 2021 trenches. In Trench 1, the equivalent context numbers of the 2019 trench are shown in brackets after the 2021 context number.

The details given of charcoal and bulk samples are brief summaries, see Appendix 8 for full details of the laboratory analysis. Small finds are described in more detail in the Finds Table and text.

NB plant species: *maloideae* is e.g. hawthorn, *prunus* is e.g. blackthorn, *salicaceae* is e.g. willow.

Context #	Type	Trench	Is above	Is below	Adjoins	Description
(01)	Topsoil	1	1000			Includes backfill from 2019 trench.
1000 (02)	Deposit (Surface)	1	1001	topsoil		Layer of rounded cobbles 10cm-25cm size, in a mid/dark brown fine sandy/silt matrix. Depth 10cm-15cm. Over whole trench. Probably deposited as single layer.
1001 (05)	Deposit (Soil)	1	1002 1004 1005 1009 1015	1000		Layer of fine silty/sandy loam, depth 20cm-34cm. Below cobble layer 1000, across whole trench, overlying surfaces of flagstones and cobbles (1002 etc). Contains coal and pot-sherds.  Small find: 101 (iron object)
1002 (06)	Deposit (Surface)	1	1007	1001 1005		Laid surface of stone flags. At N end of trench. There is a similar surface at S end of trench, 1004. Neither over the large ditch cut, 1014.  Small finds: 102, 103 (pot-sherds)
1003 (07)	Deposit	1	1008 1011	1005		Intermittent layer of rounded small/medium cobbles. Typical dimension 10-25cm. In dark brown/black sandy clay matrix. About 2m N-S width. Overlies flat slabs 1008 & 1011, which are above the large ditch cut, 1014. Possibly, these cobbles have been deposited to level the ground when the flats slabs have slumped into the waterlogged ditch (see section drawing). Contains charcoal fragments.  Small find: 105 (pot-sherd)  Charcoal sample: C19
1004	Deposit (Surface)	1	1006	1001		Laid surface of stone slabs and cobbles, similar to 1002 (and at same level approximately) but at S end of trench. Light brown matrix between slabs.  Small find: 106 (stone lid/stopper)
1005 (11)	Deposit	1	1002 1003 1008	1001		Small patch of finer soil, dark fawn/brown sandy silt with v small rounded pebbles/grits, beneath soil 1001 and above 1002, 1003 & 1008. May have been deposited in slight depression produced by slumping of the ditch fill and overlaying surface.  Charcoal sample: C04

Context #	Type	Trench	Is above	Is below	Adjoins	Description
1006	Deposit	1	1009	1004		Thin deposit of mid-brown friable silty loam under (and sealed by) slab surface 1004. Is over subsoil 1009. Contains small rounded sandstone fragments.  Small find: 107 (pot-sherd)  Charcoal samples: C06, C07 (hazel, birch), C09
1007 (12)	Deposit	1	1009	1002		Thin deposit of mid/golden brown friable sandy silt under and sealed by slab surface 1002. Is over subsoil 1009. Contains small angular & rounded stones, maximum 10cm.  Small finds: 108 (pot-sherd) & 109 (Crambeck ware pot-sherds)  Charcoal sample: C12 (birch)
1008	Deposit (Surface)	1	1010	1005 1003	1011	Small area of slabs, between slabbed surfaces 1002 & 1011. Probably part of surface 1011. Lies over ditch-fill 1010. Cobbles 1003 overlie the southern half of this surface.
1009 (10)	Natural (Subsoil)	1	-	1001 1006 1007 cut by 1014 1015		The natural subsoil in the trench. Glacial till: sandy clay with small stones, mainly friable sandstone. Had occasional charcoal in upper part, so may have been disturbed/redeposited.  Charcoal samples: C01, C18
1010	Deposit	1	1012	1008 1011		Upper fill of large ditch (cut 1014). Over fill 1012. Dark brown/black silty loam. Some flecks charcoal.  Small finds: 111 (pot-sherd: black burnished ware) & 112 (animal bone)  Charcoal samples: C11 (maloideae, birch) and C16  Bulk sample: 2 (charcoal, coal, cinder, heather charcoal, hazel nutshells, spelt wheat, heath grass)  Bone sample (GH21-1010-B1) sent for radiocarbon (SUERC). Dated to 65 cal AD.
1011 (08)	Deposit (Surface)	1	1010	1003	1008	Surface of slabs and round stones, a continuation of slabs 1002, over the fill of large ditch (cut 1014).
1012	Deposit	1	1013	1010		Middle fill of large ditch (cut 1014). Under fill 1010 and over fill 1013. Dark brown sandy silt. Some very small gravel and some rounded cobble inclusions. Very damp. Contains some butchered animal bones.  Small finds 113, 114, 115, 116, 117 (all animal bones), 118 (iron object), 119 (pot-sherd)  Charcoal samples: C02 (birch), C17 (maloideae), C24  Bulk sample: 3 (charcoal, coal, cinder, heather & hazel charcoal, hazel nutshells, barley, spelt wheat, heath grass, dock, sedge, redshank)

Context #	Type	Trench	Is above	Is below	Adjoins	Description
1013	Deposit	1	is fill of cut 1014	1012		<p>Lower fill of large ditch (cut 1014). Under fill 1012. Medium-large rounded stones in a yellow brown sandy silt with small gravel fragments and many butchered animal bones. At edge of ditch, the stone is tightly packed, but in centre the stones are loose with many voids: possibly these stones were packing for a palisade which has decomposed or been removed, leaving the voids. Some animal bone fragments.</p> <p>Small finds: 120 (beehive quern rough-out)</p> <p>Charcoal sample: C14 (hazel), C21</p> <p>Bone assemblage: see bone report.  One (GH21-1013-B1) sent from middle of layer for radiocarbon (Belfast). Dated to 7 cal AD.  One (GH21-1014-B1) sent from bottom of this layer for radiocarbon (SUERC). Dated to 20 cal BC.</p>
1014	Cut (Ditch)	1	cuts 1009	1013		<p>The cut of large ditch. Fills of this ditch are: 1013, 1012, and 1010. See section drawing. Ditch is about 3m wide at top, lip indistinct. Upper sides are at a shallow angle, but lower down steepen to form a slot. Cut is about 1.3m deep.</p>
1015 (09)	Deposit	1	1009	1001		<p>Patch of rounded pebbles 2cm – 5cm diameter. Between slabbed surfaces 1004 and 1011. Single layer of pebbles over an area of 2m x 1m, to the south of the large ditch. overlies subsoil 1009. Was exposed and largely removed in 2019 excavation but a small remnant remained where the western half of the 2019 trench had not been excavated to this depth. (see photographs)</p>
301	Topsoil	3	307 310	-	302 303 320	<p>Topsoil on stony bank 307/310. See plan.</p> <p>Small finds: 301 (annular brooch), 302 (metal buckle), 305 (iron object), 307 (non-ferrous fragment) 304, 306, 308, 309 (pot-sherds)</p>
302	Topsoil	3	306 309 312	-	301	<p>Topsoil to S of stony bank 307/310. See plan.</p> <p>Small find: 303 (metal button)</p> <p>Charcoal sample: C22</p>
303	Topsoil	3	304 305 311 313 315 316 319 321 322	-	301 314 320	<p>Topsoil to N of stony bank 307/310. See plan.</p> <p>Small finds: 311, 312, 313, 314, 315, 345, 346, 347 (pot-sherds), 319 (metal button), 320, 324, 325 (iron objects), 333 (post-medieval coin)</p>



Context #	Type	Trench	Is above	Is below	Adjoins	Description
304	Deposit	3	305 311 317	303		<p>Almost level surface (slightly lower in its centre) between areas of large stone: 305 to the south, 311 to the north. Boat shaped, 7.5m (E-W) x 2m (N-S). Compacted. Rounded gravel up to 1cm, in an orange/brown sandy matrix. Some larger stones up to 4cm, two larger 30cm stones in centre. Context becomes more gravelly, less sandy, in its lower parts. Maximum depth 15cm, average 7cm: see N-S section drawing.</p> <p>Small finds: 321 (iron blade fragment), 322 (burnt flint flake), 326 (worked flint), 327 (stone ring: natural?), 328 (pot-sherd),</p> <p>Charcoal samples: C03 (hazel), C08, C10, C13, C15 (prunus)</p> <p>Bulk samples: 3001, 3002, 3003 3002: birch, elm &amp; salicaceae charcoal, coal, calcined bone, no charred plant remains</p>
305	Deposit	3	318	303 304 314 320 321		<p>Band approx 1m wide of larger stones forming the northern boundary of low stony bank 307/310. Runs E-W. Stones irregular rounded sandstone 10cm to 40cm, some smaller. Approximately 1m wide at base, 50cm at apex, 50cm high. Loosely in a mid-brown matrix, similar to topsoil. Stones not placed carefully and would not effectively revet the bank. Seen clearly in cross-section in N-S section. Lays on the natural till 318. A couple of stones may be set 1 or 2cm into the natural, not more. No finds or dateable material. No samples taken.</p>
306	Deposit	3	318	302		<p>Band, approx 80cm wide and 30m high, of larger stones forming the southern boundary of low stony bank 307/310. Runs E-W. Stones irregular rounded sandstone 10cm to 30cm. Loosely in a mid-brown matrix, similar to topsoil. Stones not placed carefully and would not effectively revet the bank. Seen clearly in cross-section in N-S section. Lays on the natural till 318.</p> <p>A possible stone setting, 309, was investigated, part of 306, but excavation failed to show it was more than a group of stones</p>
307	Deposit	3	318	301 314		<p>A low broad linear bank of rounded stones, the eastern extension of bank 310, 5m wide (N-S); together they extend the whole width E-W of the trench. At the eastern edge of the trench there is some indications that the bank has a rounded eastern end. 307 and 310 are one continuous bank, with a slight reduction in the height of the bank at the transition; this was initially interpreted as an entrance, but there are no features to support this interpretation.</p> <p>Stones are rounded, mostly 2cm to 10cm: very few larger stones in the upper parts, more lower down (up to 15cm diameter). Closely packed, though not very compacted. No rut marks. Profile of bank is rounded (see section drawing): 70cm high at centre, 20cm high at S edge (bordered by larger stones 306), 30cm high at northern edge (bordered by larger stones 305). Matrix between stones is yellow/brown sandy loam.</p> <p>Charcoal sample: C05 (maloideae, birch)</p>
308						Not used

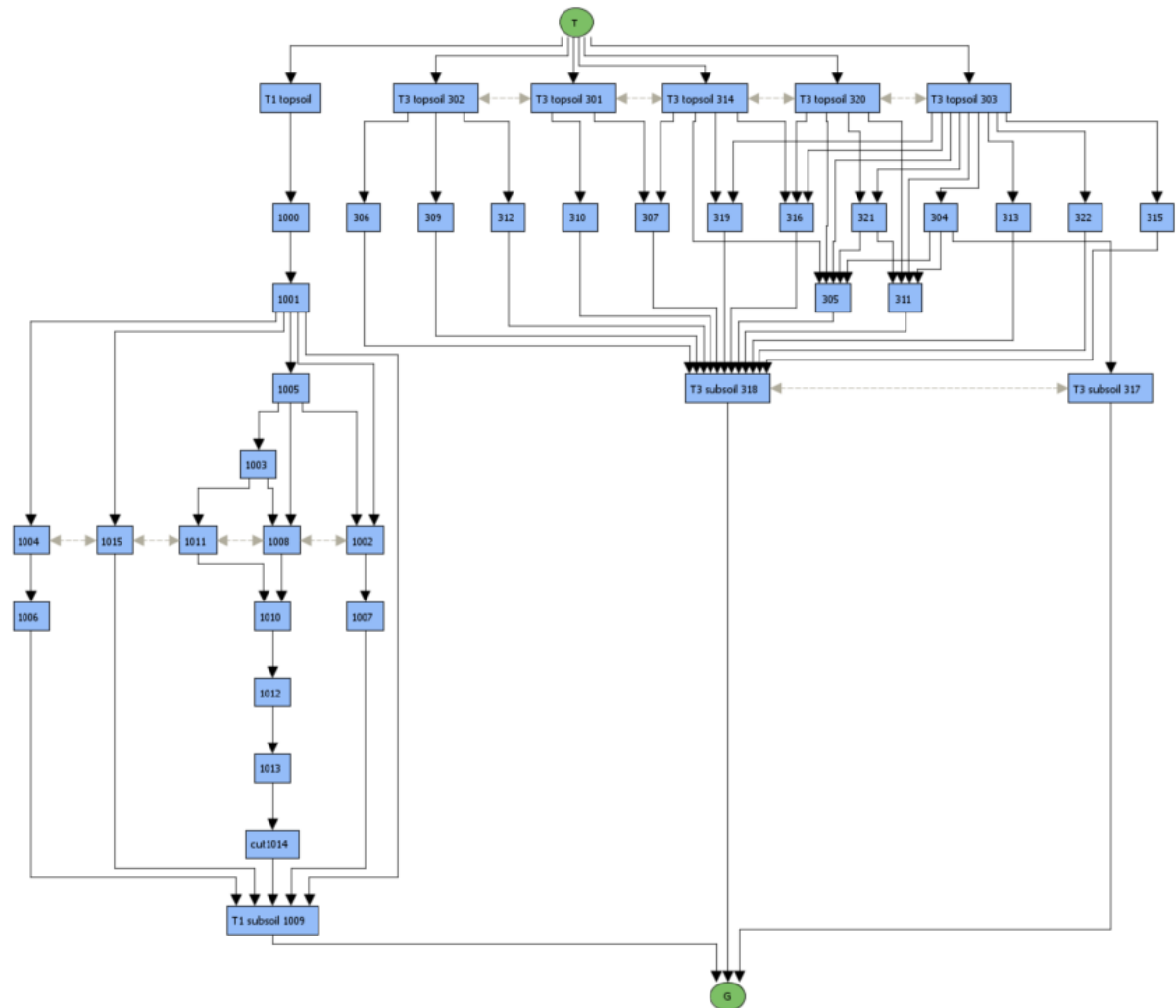


Context #	Type	Trench	Is above	Is below	Adjoins	Description
309	Deposit	3	318	302		Group of about eight rounded stones, each about 15cm diameter, on line of band of stones 306. Sectioned to see if was a stone setting in a posthole, but no evidence of this found. Probably, just part of 306.
310	Deposit	3	318	301		Low bank of stones, the west end of which is 310 and the east end 307. the two ends have a slightly lower section between them which was initially interpreted as an entrance, but no evidence found for this on excavation. See 307 for composition.  Small finds: 310 (pot-sherd)
311	Deposit	3	318	303 304 320 321		Band, approx 1.5m wide running E-W, of larger stones on north side of gravelly surface 304. Stones irregular, some rounded, 10cm to 30cm diameter. Mostly sandstone, a few limestone. Matrix is yellow-brown sandy silt loam. Stones pile loosely to maximum 45cm high, revetting the deposits to the north (uphill). Base stones are angular, lying flat on the subsoil. A more substantial deposit of stones than the bands of stones 305, 306 and 315.  Small finds: 338 (pot-sherd), 349 (smoothing stone), 350 (iron pin)
312	Deposit	3	318	302		Deposit at south edge of trench, over subsoil and under topsoil. 1m wide (N-S), extending the width of the trench E-W, 8cm deep. Not clearly differentiated from subsoil/topsoil, may be a transition zone between them. Mid brown silty loam, with gravel 1cm to 2cm. Occasional larger stones to 15cm.
313	Deposit	3	318	303		Deposit at north edge of trench, over subsoil and under topsoil. 1.5m wide at west end, narrowing to east, extending the width of the trench, 10cm deep. Not clearly differentiated from subsoil/topsoil, may be a transition zone between them. Mid brown silty loam, with gravel 1cm to 2cm. Very stony, mostly 1cm-2cm, some rounded stones up to 15cm diam.
314	Topsoil	3	305 307 316 319	-	303	Topsoil to at east end of trench (originally opened as separate trench 3A then merged with main trench). See plan.  Small find: 316 (broken whetstone?)
315	Deposit	3	318	303		Irregular band of rounded stones (most sandstone, a few limestone), running E-W across trench. 1.2m wide (N-S) at east end, narrowing to 0.8m at the west end. Stones 10cm-30cm, some smaller. Jumbled in a mid-brown silty loam matrix (similar to 313). Layer 25cm deep, smaller stones in lower part, resting on subsoil. No evidence in plan or section that it is a wall of placed stones. More large stones, but otherwise similar to the deposits to north (313) and south (316).  Small find: 318 (broken whetstone?)
316	Deposit	3	318	303 314 320		Broad band of stony deposit, 3.5m wide (N-S), running across trench. Not clearly differentiated from contexts to north (315) and south (311), except that it has fewer large stones over 15cm diam. Has many smaller rounded, 2cm – 15cm stones (plus smaller gravel) in a mid-brown sandy silt loam matrix. Not compacted. resting on subsoil.  Small find: 317 (broken whetstone?)

Context #	Type	Trench	Is above	Is below	Adjoins	Description
317	Natural (Subsoil)	3		304	318	The natural subsoil under 304. Equivalent to 318 in rest of trench.
318	Natural (Subsoil)	3		305 306 307 309 310 311 312 313 315 316 319 322	317	The natural subsoil in the trench. Glacial till: mid grey-brown firm sandy clay with small stones, mainly friable sandstone.
319	Deposit	3	318	303 314		A grouping of larger irregular rounded stones (up to 50cm) in the eastern part of the trench, a continuation eastwards of stony bands 305 and 311, but containing larger stones. Also, many stones 10cm-30cm in a mid-brown sandy silt loam. Does not extend to the edge of the trench, terminating 20cm short. No obvious structure, just a spread of large stones.  Small finds: 323 (large glass droplet)
320	Topsoil	3	305 311 316 321	-	303	Topsoil in NW corner of trench. See plan.  Small finds: 329, 330, 331, 332, 334, 335, 344 (pot-sherds), 336 (stone spindle whorl), 337 (iron blade)
321	Deposit	3	305 311	303 320		Gravelly layer, similar composition to 304. Forming a small level patch to the west of 304, separated from it by large stones 322. Ill-defined including its extent. Appears to fill depression between stony bands 305 and 311. About 0.5m (N-S) by 1.5m (E-W), elliptical. Max depth 10cm.  Small finds: 339, 340, 341, 342, 343 (pot-sherds), 348 (latte IA blue glass ring)  Bulk sample: 3004 (birch oak, elder, maloideae and prunus charcoal, coal, hazel nutshells, cleavers, calcined bone.
322	Deposit	3	318	303		Ill-defined grouping of large stones between gravelly deposits 304 and 321. 1.5m x 1.5m. Merges to N with stony band 311 and to the south with stony band 305. Stones rounded, up to 40cm diam.



## 9 APPENDIX 2: HARRIS MATRIX FOR BOTH TRENCHES



## 10 APPENDIX 3: SMALL FINDS TABLES

The finds are shown in a separate table for each of the two trenches. Finds are cross-referenced in the context table. Pottery identification by Tony Metcalfe. Tees Valley Ware is an ill-defined category, due to lack of comparison sites; it is based on the fabric of the pot and, although originally used for medieval pottery, may also include earlier wares. See bone report for details of bones. Prefix eastings with 4003 and northings with 5210 to give OS co-ordinates.

### Trench 1

Date Aug 2021	Find #	Context #	E'ings m	N'ings m	Elev m	Made of	Finder	Description
6	101	1001	54.91	07.10	217.98	Fe	Kay	bodger? 15cm long
8	102	1002	55.63	06.19	218.00	pot	Bob	high quartz sherd 8cmx1cm broken in 2 Tees Valley Ware
8	103	1002				pot	Anne	1 sherd 5.5x3.5cm Tees Valley Ware
10	104	spoil- heap				Cu alloy	Audrey	corroded coin (Marcus Aurelius) Roman 2 <sup>nd</sup> century AD. <i>see discussion in text</i>
13	105	1003	54.30	09.48	217.53	pot	Anne	early sherd under slab
13	106	1004	53.42	06.23	218.05	stone	Michael	stopper/lid <i>see photo in text</i>
13	107	1006	54.07	05.36	217.89	pot	Michael	Tees Valley Ware
14	108	1007	54.49	12.71	218.14	pot	Bev	Tees Valley Ware?
14	109	1007	52.91	12.05	218.16	pot	Brian	rim. (of 36cm diam vessel). Crambeck ware, late R-B. <i>see photo in text</i>
	110	1010						Iron Age (or earlier) pot
	111	1010	53.82	10.34	217.87	pot	Jane	lattice decorated Black Burnished sherd. Late 1 <sup>st</sup> /early 2 <sup>nd</sup> cent AD <i>see photo in text</i>
	112	1010	54.05	07.87	217.69	tooth	Brian	large animal
	113	1012	53.78	09.13	218.34	bone	Bob	animal
	114	1012	53.41	18.00	218.38	bone	Bob	animal
	115	1012	54.39	09.33	218.35	bone	Sue	animal
	116	1012	53.78	09.28	218.31	bone	Sue	animal
	117	1012	53.98	09.89	218.29	bone	Sue	animal
	118	1012	53.63	10.09	218.41	Fe	Sue	iron object
	119	1012	52.44	09.94	217.35	pot	Pete	Tees Valley Ware
	120	1013				stone	Rob	rough-out quern <i>see discussion in text</i>
	121	1012				pot		group of crumbly sherds: Iron Age <i>see photo in text</i>



### Trench 3

Date Aug 2021	Find #	Context #	E'ings m	N'ings m	Elev m	Made of	Finder	Description
2	301	301	81.06	20.49	217.46	Cu alloy	EW	annular brooch, under turf, lying on stones 307 <i>see discussion in text</i>
3	302	301	80.50	21.50	217.49	Fe /	SG	metal buckle
3	303	302	73.12	20.35	217.32	metal	PW	metal button
3	304	301	75.34	23.65	217.74	pot	GF	early sherd. Iron Age?
4	305	301	83.61	20.47	219.77	Fe	PG	curved iron object
4	306	301	75.54	24.67	217.65	pot	JR	12cm rim-sherd, Tees Valley Ware
5	307	301	81.39	20.54	217.45	non-ferr metal	KS	small metal fragment ?rim
10	308	301	76.03	21.54	217.46	pot	MA	early coarse sherd
10	309	301	77.65	23.50	217.59	pot	Bob A	?medieval sherd
12	310	310	77.76	24.44	217.48	pot	Barbara	early unglazed sherd
12	311	303	78.42	26.59	217.46	pot	Alan N	unglazed white/red/black sherd
12	312	303	77.78	27.01	217.50	pot	Alan N	unglazed white/red/black sherd. Tees Valley Ware
12	313	303	77.54	27.29	217.50	pot	Alan N	unglazed white/red/black sherd. Tees Valley Ware
12	314	303	77.22	27.29	217.50	pot	Alan N	unglazed dark thin sherd
12	315	303	77.67	26.85	217.47	pot	Robert C	pale red unglazed rim
13	316	314	92.29	21.47	217.25	stone	Chris B	broken whetstone? fine- grain sandstone
13	317	316	83.12	28.99	217.73	stone	P G	broken whetstone?
13	318	315	83.51	30.84	217.90	stone	Deb	broken whetstone?
14	319	303	86.72	21.58	217.34	metal	Karen	metal button
14	320	303	92.02	24.14	217.24	Fe	Ron	?blade
15	321	304	83.22	24.20	217.15	Fe	Clare	?blade fragment
15	322	304	83.23	24.37	217.16	flint	-	burnt flake
16	323	319	90.22	22.32	217.21	glass	Karen	large droplet of glass. ?reworked Roman <i>see photo in text</i>
16	324	303	88.13	24.02	217.35	Fe	Margaret A	curved flat object ?horseshoe segment
16	325	303	88.67	23.92	217.45	Fe	Margaret A	iron loop
17	326	304	80.32	26.36	217.35	flint	Kay	worked flint
17	327	304	82.22	24.25	217.17	stone	Ron	small stone with hole in. Probably natural.
17	328	304	85.42	24.81	217.06	pot	Brian/Jan et	coarse ?prehistoric. Found at bottom of context.
18	329	320	77.76	28.21	217.52	pot	Stephen	handle sherd <i>see photo in text</i>
18	330	320	77.49	28.30	217.55	pot	Stephen	thick large sherd, Tees Valley Ware
18	331	320	78.03	26.10	217.40	pot	Alan N	early sherd, ?Iron Age
18	332	320	77.95	26.56	217.39	pot	Kay	early sherd, ? Iron Age
19	333	303	87.11	22.07	217.18	Cu alloy	David	?post-medieval penny
19	334	320	78.88	25.91	217.42	pot	Sue	sherd (same pot as find 335?)



Date Aug 2021	Find #	Context #	E'ings m	N'ings m	Elev m	Made of	Finder	Description
19	335	320	75.61	26.25	217.50	pot	Ron	sherd (same pot as find 334?)
19	336	320	75.94	26.55	217.48	stone	Ron	shale spindle whorl, diam: 41.5mm (external), 8.0mm (hole) <i>see photo in text</i>
19	337	320	77.42	28.80	217.61	Fe	Stephen	blade
19	338	311	78.46	26.82	217.42	pot	Audrey	thin sherd
19	339	321	77.31	26.34	217.36	pot	Margaret	tiny sherd, similar to finds 334/335
19	340	321	77.57	26.29	217.40	pot	Margaret	tiny sherd, similar to finds 334/335
20	341	321	77.66	26.13	217.40	pot	Kay	sherd, similar to finds 334/335
20	342	321	77.76	26.07	217.40	pot	Margaret	tiny sherd, similar to finds 334/335
20	343	321	77.26	26.14	217.40	pot	Margaret	handle-sherd, Tees Valley Ware
20	344	320	77.22	27.70	217.48	pot	Stephen G	rim-sherd
20	345	303	88.68	22.14	217.13	pot	David	rim-sherd, RB?
20	346	303	85.55	22.32	217.17	pot	Janet	early sherd
20	347	303	88.98	21.07	217.23	pot	Brian	early sherd
21	348	321	75.81	26.38	217.68	glass	Barbara	large late Iron Age blue glass bead Oldbury (Guido Class 6) <i>see discussion in text</i>
21	349	311	84.80	25.47	217.61	stone	PG	smoothing stone?
21	350	311	78.25	26.93	217.55	Fe	Anne	iron pin





## 11 APPENDIX 4: CHARCOAL AND BULK SAMPLES TABLES

**Charcoal samples** These are cross-referenced in the context table.

See Appendix 8 for lab identification with details of microscopic findings.

NB plant species: *maloideae* is e.g. hawthorn, *prunus* is e.g. blackthorn, *salicaceae* is e.g. willow

Context #	Trench #	Bag #	No. of bits	Biggest bit cubic mm	Notes	Lab species ident
1003	1	C19	3	12x5x2=120		
1005	1	C04	1	6x3x2=36		
1006	1	C06	12	12x8x6=576		
1006	1	C07	22	15x8x5=600		C07a hazel C07b birch
1006	1	C09	3	10x6x3=180		
1007	1	C12	1	15x12x6=1080		C12a birch
1009	1	C01	10	7x7x2=98		
1009	1	C18	3	8x7x3=168		
1010	1	C11	3	8x4x3=96		C11a maloideae C11b birch
1010	1	C16	5	6x6x2=72	upper ditch-fill 16 <sup>th</sup> Aug	
1010 ?	1	C20	2	20x18x12=4320	no label, in 1010 tray	
1012	1	C02	1	20x15x10=3000		C02a birch
1012	1	C17	1	15x12x5=900		C17a maloideae
1012	1	C24	6	8x2x1.5=24		
1013	1	C14	3	6x5x2=60	in ditch bottom, 21 Aug	C14a hazel
1013	1	C21	3	10x3x2=60	"on low boundary of ditch"	
?	1	C23	1	11x5x3=165	"on top of ditch-fill" photo (trowel marker)	
302	3	C22	3	8x5x2=80	topsoil context	
304	3	C03	5	15x15x3=675	20 <sup>th</sup> Aug	C03a prunus
304	3	C08	1	8x5x2=80	well in context	
304	3	C10	1	7x3x3=63		
304	3	C13	13	12x10x4=480	17 <sup>th</sup> Aug	
304	3	C15	3	8x7x5=280	at base of context 304	C15a prunus
307	3	C05	6	15x10x6=900	sealed – well in context	C05a maloideae C05b birch



**Bulk samples.** These are cross-referenced in the context table.

See Appendix 8 for details of the lab analysis.

Prefix eastings with 4003 and northings with 5210 to give OS co-ordinates.

Context #	Trench #	Sample #	No. of bags	Weight kg	E'ings m	N'ings m	Elev m	Notes
1006	1	1	1	0.26				"1012 within 1006"
1010	1	2	1	2.1				From drawn E-side section: upper ditch-fill <a href="#">Sent to labs</a>
1012	1	3	1	3.3				From drawn E-side section: lower ditch-fill, above stones <a href="#">Sent to labs</a>
304	3	3001 bag1	1	7	85.83	26.06	217.54	E end (just to E of baulk) of gravel deposit with scanty finds
304	3	3001 bag2	1	5.6	85.41	24.93	217.45	E end (just to E of baulk) of gravel deposit with scanty finds
304	3	3002	1	6	83.44	26.13	217.80	Middle of gravel deposit with scanty finds <a href="#">Sent to labs</a>
304	3	3003	1	5.7	81.32	26.78	217.75	W end of gravel deposit with scanty finds
321		3004	1	6	76.30	26.24	217.43	Gravel deposit with many potsherds ?RB <a href="#">Sent to labs</a>

## 12 APPENDIX 5: DRAWN SECTIONS TABLE

Date	Plan/section number	Trench #	Scale	Levels done?	Drawn by	Description
19 Aug	1	3	1:10	y	EW, CH, PW, RY	4 sheets: North-south section across whole trench. East side of 1m wide slot, running along the west side of baulk
20 Aug	2	3	1:10	y	EW, CH, RL, WH	2 sheets: East-west section across trench from western edge to north-south slot. Straight line along apex of stony bank (not parallel to trench-edge). North side of a 1m-wide slot
22 Aug	3	1	1:10	y	EW, CH, RL, WH	3 sheets (north end, ditch, south end): North-south section: the east side of the trench. There is a 0.5m step in the section (to south of ditch)

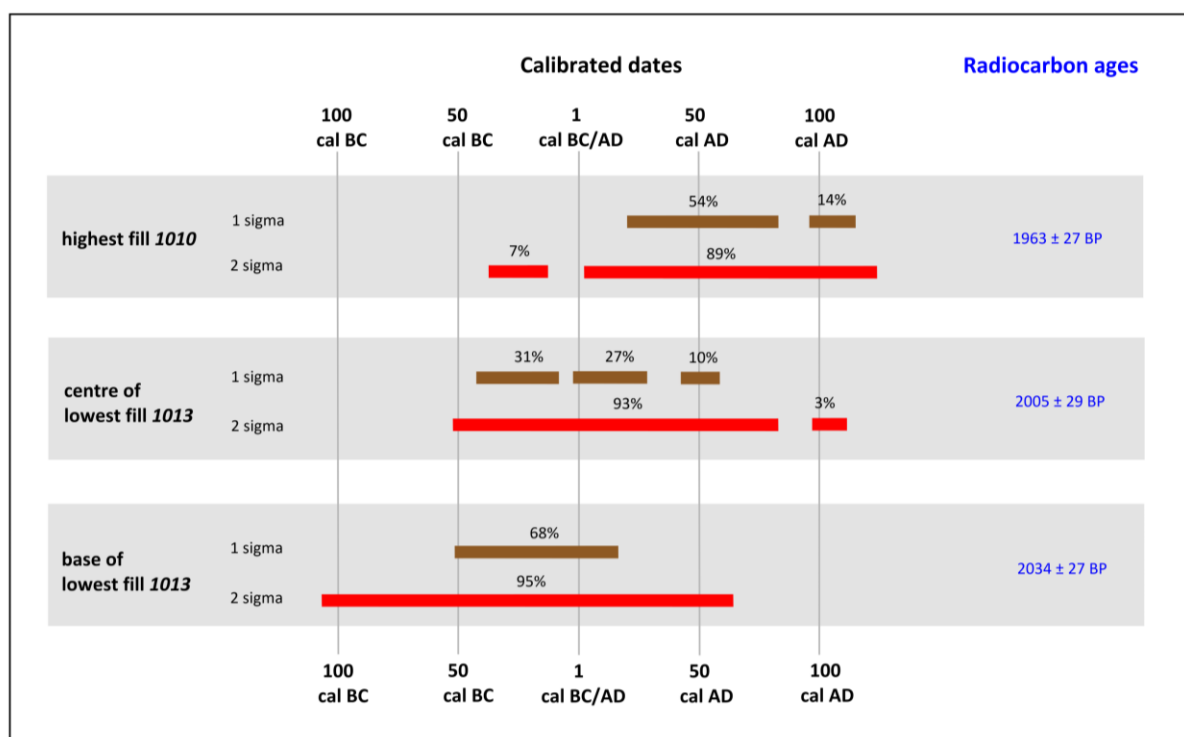


### 13 APPENDIX 6: RADIOCARBON DATES

Three radiocarbon dates were obtained from fills of the ditch (in upper fill 1010, central in the lowest fill 1013, and at the base of the lowest fill 1013). They are from two different laboratories, but in both cases the IntCal20 calibration curve is used, so the results are comparable.

The dates are summarised in the following table and diagram. The radiocarbon certificates and graphs of probability are shown in following pages.

Sample number	GH21/1010/B1	GH21/1013/B1	GH21/1014/B1
Type	horse tooth	horse femur	Sheep rib
Laboratory number	SUERC - 105518	UBA - 47201	SUERC - 105517
Context	1010	1013 (centre)	1013 base)
C/N ratio	3.3	3.2	3.3
Radiocarbon Age	1963 ± 27 BP	2005 ± 29 BP	2034 ± 27 BP
Calibrated dates (1σ)	21calAD–83calAD (54%) 96calAD–115calAD (15%)	42calBC–8calBC (31%) 2calAD–28calAD (27%) 44calAD–58calAD (10%)	51calBC–17calAD (68%)
Calibrated dates (2σ)	37calBC–13calBC (7%) 3calAD–134calAD (89%)	51calBC–82calAD (93%) 97calAD–111calAD (3%)	106calBC–64calAD (95%)



Approx median calibrated date (rounded to 10y)	60calAD	10calAD	20calBC
--	---------	---------	---------





The probable date ranges are shown in brown for the 1 sigma (68.3%) level of certainty, and in red for the 2 sigma (95.4%) level of certainty.



**Sample GH21/1010/B1 horse tooth from upper fill of ditch, context 1010**



Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK  
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229996 www.glasgow.ac.uk/suerc



**RADIOCARBON DATING CERTIFICATE**  
23 August 2022

<b>Laboratory Code</b>	SUERC-105518 (GU61205)		
<b>Submitter</b>	Maryne Baylet Archaeological Research Services Ltd Angel House Portland Square Bakewell Derbyshire DE45 1HB		
<b>Site Reference</b>	Gueswick Hills 2021 Trench 1		
<b>Context Reference</b>	Uppermost context of fill of the probable palisade trench		
<b>Sample Reference</b>	GH21/1010/B1		
<b>Material</b>	Tooth : Horse		
$\delta^{13}\text{C}$ relative to VPDB	-22.6 ‰	$\delta^{34}\text{S}$ relative to VCDT	10.9 ‰
$\delta^{15}\text{N}$ relative to air	5.3 ‰	C/S ratio (Molar)	666
C/N ratio (Molar)	3.3	N/S ratio (Molar)	202
<b>Radiocarbon Age BP</b>	1963 $\pm$ 27		

**N.B.** The above  $^{14}\text{C}$  age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Laboratory and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon* 58(1) pp.9-23.

For any queries relating to this certificate, the laboratory can be contacted at [suerc-cl4lab@glasgow.ac.uk](mailto:suerc-cl4lab@glasgow.ac.uk).

Conventional age and calibration age ranges calculated by : *C. Dunbar*

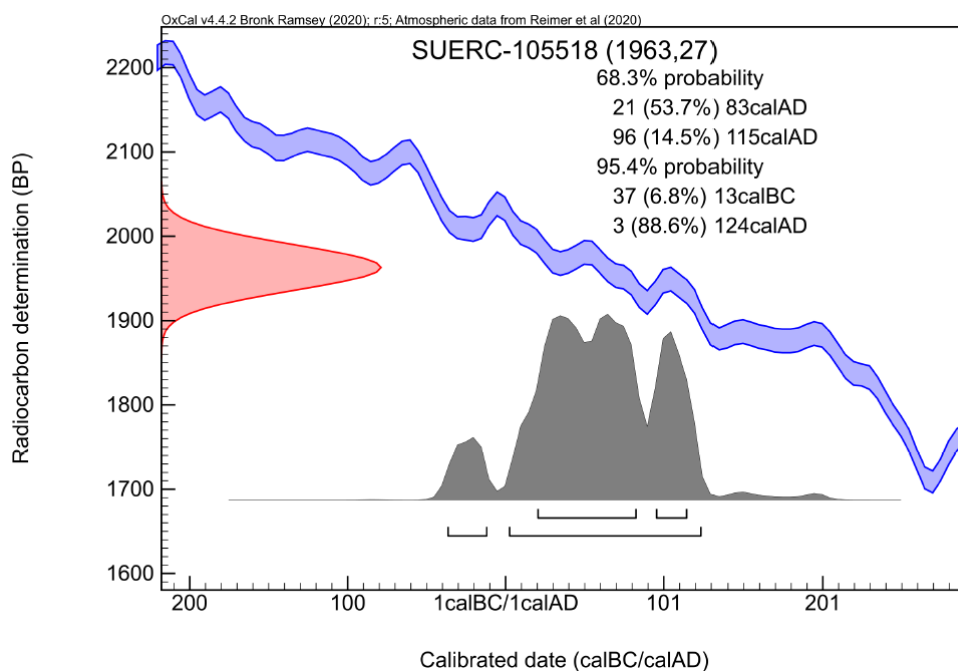
Checked and signed off by : *B. Topping*



The University of Glasgow, charity number SC004401



The University of Edinburgh is a charitable body, registered in Scotland, with registration number SC000336



# Sample GH21/1013/B1 horse femur from fill of ditch, centre of context 1013

Martin Green  
Altogether Archaeology



<sup>14</sup>CHRONO Centre  
Queens University Belfast  
42 Fitzwilliam Street  
Belfast BT9 6AX  
Northern Ireland

## Radiocarbon Date Certificate

Laboratory Identification: UBA-47201  
Date of Measurement: 2022-04-04  
Site: Gueswick Hills  
Sample ID: GH21/1013/B1  
Material Dated: bone, antler or tooth root  
Pretreatment: Collagen  
mg Graphite: 0.981  
Submitted by: Martin Green

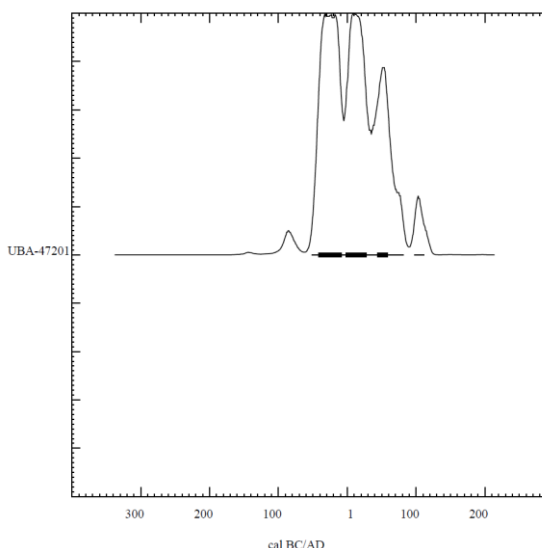
Conventional <sup>14</sup>C  
Age: 2005±29 BP  
Fraction  
corrected δ<sup>13</sup>C

UBNo	Sample ID	δ <sup>13</sup> C	δ <sup>15</sup> N	C:N ratio	Pretreatment	Yield
47201	GH21/1013/B1	-22.7	5.0	3.20	Collagen	3.60

C:N values are one indication of the degree of preservation of bone protein ("collagen") and/or contamination by soil organic substances. The recommended values for C:N atomic values reported here are between 2.9-3.5. (1,2).

1. van Klinken, G.J., Journal of Archaeological Science, 1999, 26(6), p. 687-695.
2. Ramsey, C.B., et al., Radiocarbon, 2004, 46(1), p. 155-163.

Posterior Probability Distributions



## RADIOCARBON CALIBRATION PROGRAM\*

CALIB REV8.2

Copyright 1986-2020 M Stuiver and PJ Reimer

\*To be used in conjunction with:

Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230.

UBA-47201

47201

Radiocarbon Age BP 2005 +/- 29

Calibration data set: intcal20.14c

% area enclosed cal AD age ranges

		# Reimer et al. 2020 relative area under probability distribution
68.3 (1 sigma)	cal BC 42- 8	0.458
	2- cal AD 28	0.391
	cal AD 44- 58	0.152
95.4 (2 sigma)	cal BC 51- cal AD 82	0.971
	cal AD 97- 111	0.029

Median Probability: 7

## References for calibration datasets:

Reimer P, Austin WEN, Bard E, Bayliss A, Blackwell PG, Bronk Ramsey C, Butzin M, Edwards RL, Friedrich M, Grootes PM, Guilderson TP, Hajdas I, Heaton TJ, Hogg A, Kromer B, Manning SW, Muscheler R, Palmer JG, Pearson C, van der Plicht J, Reim Richards DA, Scott EM, Southon JR, Turney CSM, Wacker L, Adolphi F, BÄXntgen U, Fahrni S, Fogtmann-Schulz A, Friedrich R, KÄhler P, Kudsk S, Miyake F, Olsen J, Sakamoto M, Sookdeo A, Talamo S. 2020.  
The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0-55 cal kB Radiocarbon 62. doi: 10.1017/RDC.2020.41.

## Comments:

\* This standard deviation (error) includes a lab error multiplier.  
\*\* 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)  
\*\* 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)  
where ^2 = quantity squared.  
[ ] = calibrated range impinges on end of calibration data set  
0\* represents a "negative" age BP  
1955\* or 1960\* denote influence of nuclear testing C-14

NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.



**Sample GH21/1014/B1 rib from fill of ditch, base of context 1013**



**RADIOCARBON DATING CERTIFICATE**  
23 August 2022

<b>Laboratory Code</b>	SUERC-105517 (GU61204)		
<b>Submitter</b>	Maryne Baylet Archaeological Research Services Ltd Angel House Portland Square Bakewell Derbyshire DE45 1HB		
<b>Site Reference</b>	Gueswick Hills 2021 Trench 1		
<b>Context Reference</b>	Fill of the slot-like bottom of a large ditch		
<b>Sample Reference</b>	GH21/1014/B1		
<b>Material</b>	Animal Bone : Sheep rib		
<b><math>\delta^{13}\text{C}</math> relative to VPDB</b>	-22.8 ‰	<b><math>\delta^{34}\text{S}</math> relative to VCDT</b>	12.4 ‰
<b><math>\delta^{15}\text{N}</math> relative to air</b>	5.8 ‰	<b>C/S ratio (Molar)</b>	571
<b>C/N ratio (Molar)</b>	3.3	<b>N/S ratio (Molar)</b>	173
<b>Radiocarbon Age BP</b>	2034 $\pm$ 27		

**N.B.** The above  $^{14}\text{C}$  age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Laboratory and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon* 58(1) pp 9-23.

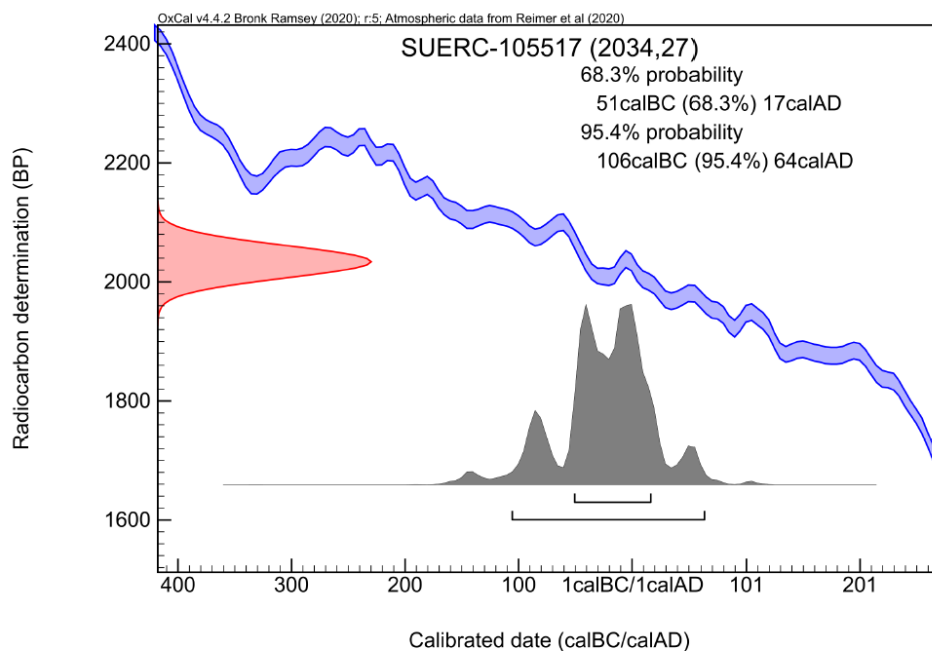
For any queries relating to this certificate, the laboratory can be contacted at [suerc-cl4lab@glasgow.ac.uk](mailto:suerc-cl4lab@glasgow.ac.uk).

Conventional age and calibration age ranges calculated by: *C Dunbar*

Checked and signed off by: *B. Topping*



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The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.\*

The above date ranges have been calibrated using the IntCal20 atmospheric calibration curve†

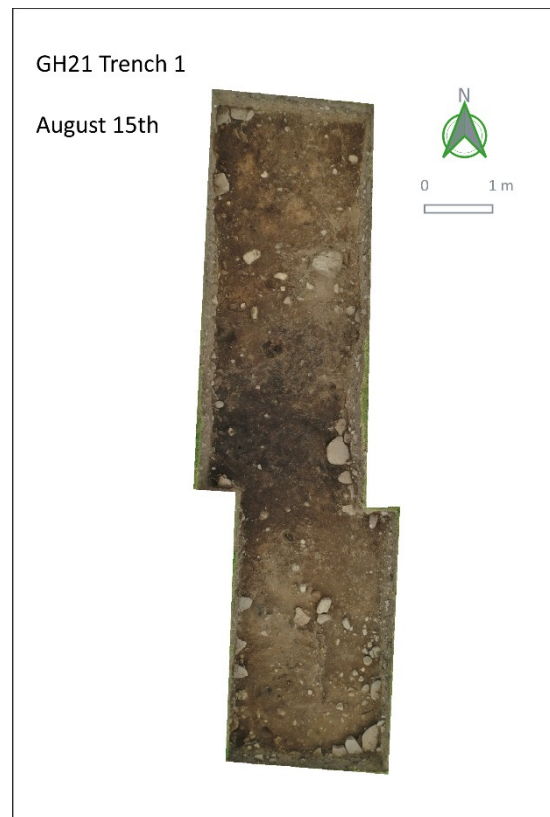
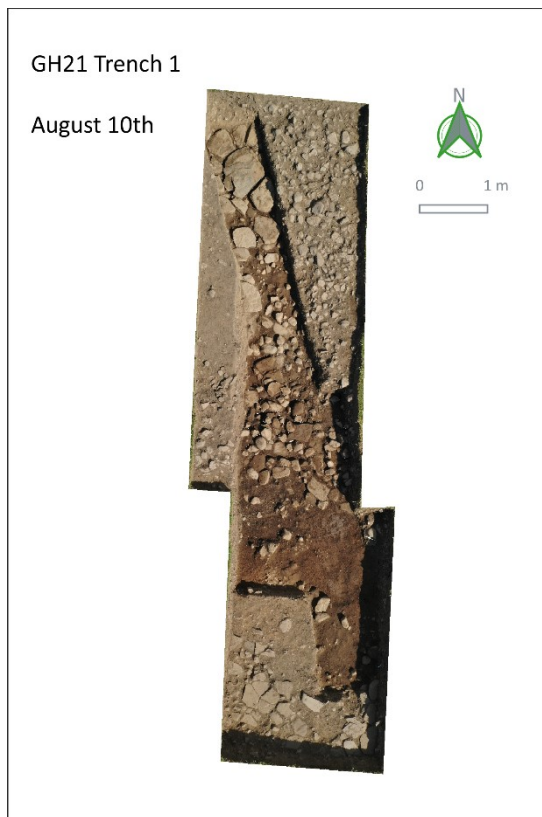
Please contact the laboratory if you wish to discuss this further.





## 14 APPENDIX 7: VERTICAL DRONE PHOTOGRAPHS OF TRENCHES

For an enlarged Aug 14<sup>th</sup> view, see next page





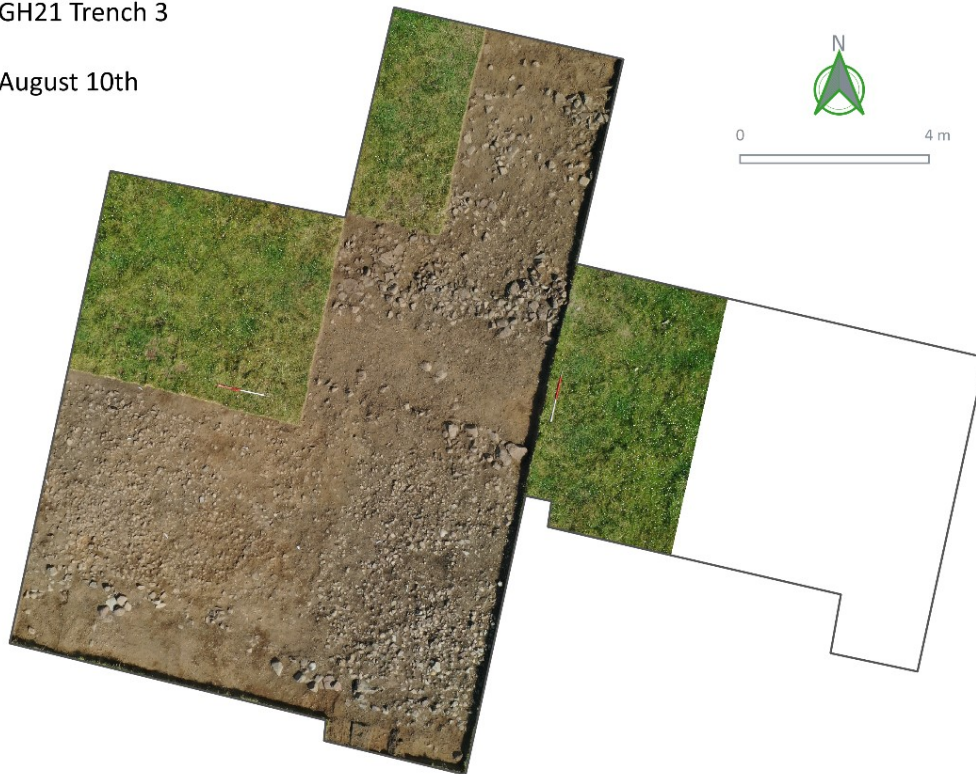


**Trench 1 on Aug 14<sup>th</sup> before removal of paving & cobbles over ditch**



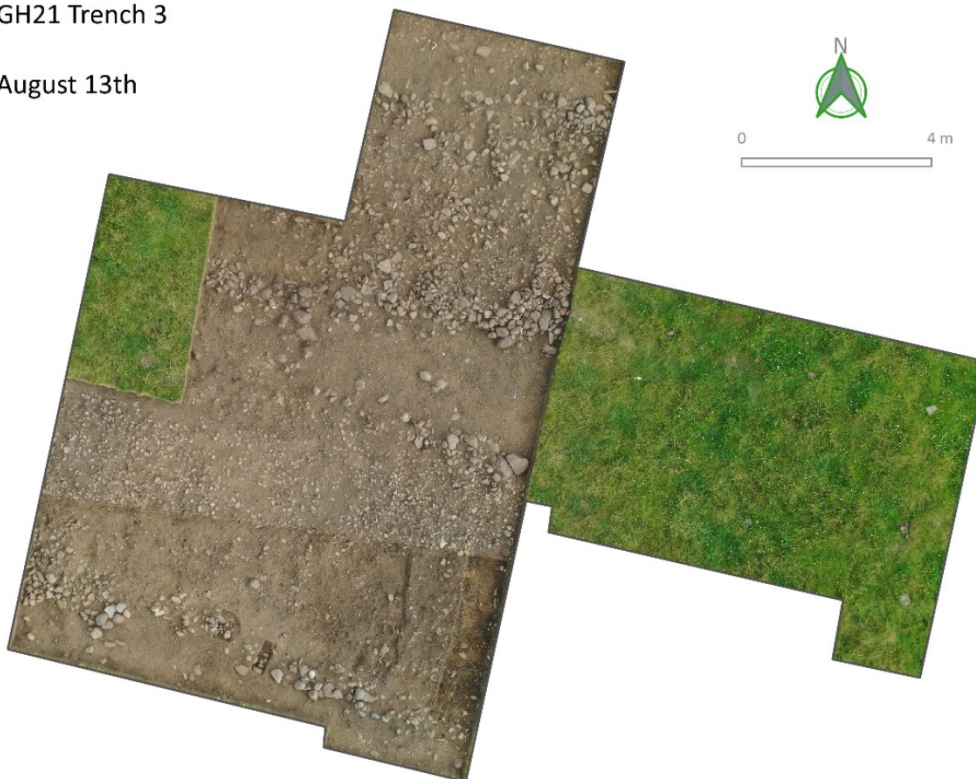
GH21 Trench 3

August 10th



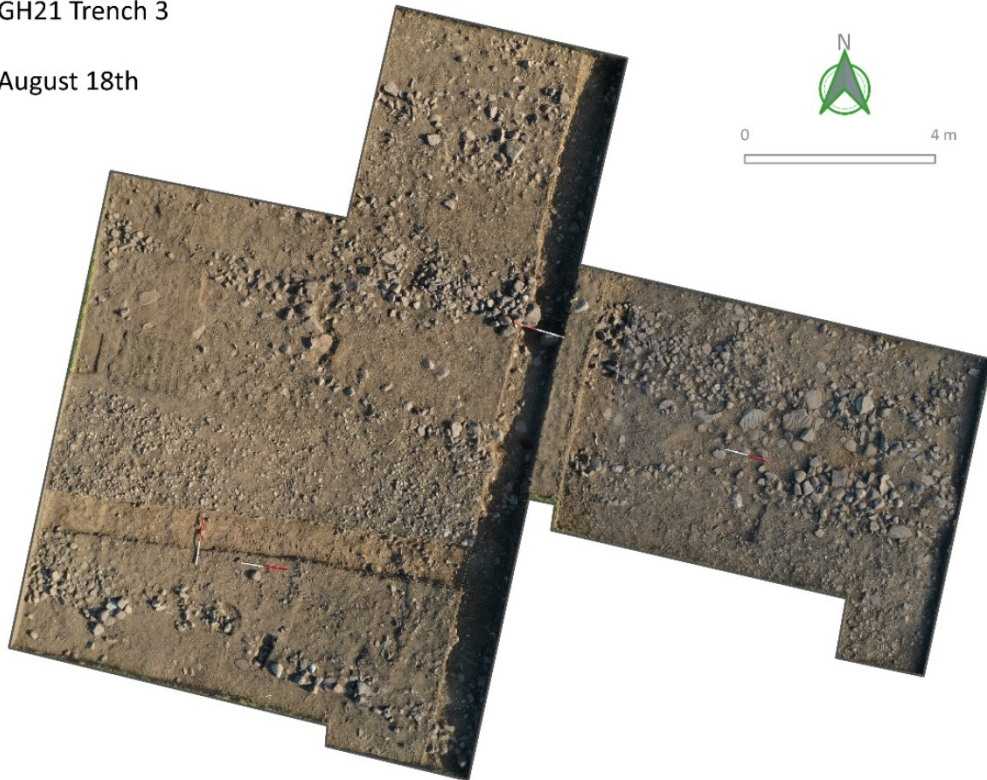
GH21 Trench 3

August 13th



GH21 Trench 3

August 18th



GH21 Trench 3

August 20th





## 15 APPENDIX 8: PALAEOENVIRONMENTAL REPORT (DURHAM UNIVERSITY)

This is the unedited Archaeological Services Durham University report on the bulk samples and charcoal (Report 5725, April 2022).

Note that 1.2 is incorrect: excavations were conducted by AA under supervision of Rob Young.

### 1. Summary

#### The project

1.1 This report presents a palaeoenvironmental assessment of four bulk samples and 12 hand-recovered charcoal samples, taken during archaeological excavations at Gueswick Hills, Teesdale, County Durham.

1.2 The excavations were commissioned by Altogether Archaeology and conducted by Archaeological Services Durham University.

#### Results

1.3 Palaeoenvironmental evidence from ditch fills [1010] and [1012] is consistent with a late prehistoric or Roman date, particularly the use of spelt wheat and the probable charred remnants of heathland turves. There are no diagnostic plant remains in the gravel surfaces. Every deposit has material suitable for radiocarbon dating.

#### Recommendations

1.4 No further analysis is required.

1.5 The flots should be retained as part of the physical archive of the site. The residues were discarded following examination.

1.6 The following plant remains are suitable for radiocarbon dating and are ranked by their likelihood to provide a reliable date:

#### GH21 – material from the bulk samples

[321] <3004> ditch – Hazel nutshell (charred)

[1010] <2> upper ditch fill – Spelt wheat grain (charred)

[1010] <2> upper ditch fill – Hazel nutshell (charred)

[1012] <3> middle ditch fill – Spelt wheat grain (charred)

[1012] <3> middle ditch fill – Heather charcoal (date use of turves)

[1012] <3> middle ditch fill – Hazel nutshell (charred)

[321] <3004> ditch – Elder charcoal (\* an anthropogenic indicator)

[304] <3002> gravel surface – Elm charcoal

#### GH21 - charcoal samples

[1006] <C07a> deposit under flagstone – Hazel charcoal

[1010] <C11a> upper fill of ditch – Maloideae charcoal

[1006] <C07b> deposit under flagstone – Birch charcoal

[1007] <C12a> deposit under flagstone – Birch charcoal

[1012] <C02a> middle fill of ditch – Birch charcoal



[1012] <C17a> middle fill of ditch – Maloideae charcoal

[304] <C15a> gravel surface – *Prunus* sp. charcoal

[304] <C03a> gravel surface – Hazel charcoal

[1013] <C14a> lowest fill of ditch – Hazel charcoal

[307] <C05b> low stony bank – Birch charcoal

[307] <C05a> low stony bank – Maloideae charcoal

[1010] <C11b> upper fill of ditch – Birch charcoal

## **2. Project background**

### **Location and background**

2.1 Excavations were conducted by Altogether Archaeology at Gueswick Hills in Teesdale. This report presents a palaeoenvironmental assessment of four bulk samples comprising the upper [1010] and middle [1012] fills of a probable Iron Age palisade ditch, and two gravel surface deposits [304] and [321] probably of Romano-British origin. The charcoal samples are from ditch fills [1006], [1007], [1010], [1012] and [1013], gravel surface [304] and stony bank [307].

### **Objective**

2.2 The objective of the scheme of works was to assess the palaeoenvironmental potential of the samples, establish the presence of suitable radiocarbon dating material, and provide the client with appropriate recommendations.

### **Dates**

2.3 The samples were received by Archaeological Services on 10th January 2022. Assessment and report preparation was conducted between 24th March and 24th April 2022.

### **Personnel**

2.4 Assessment and report preparation was conducted by Lorne Elliott. Sample processing was by Abi Milsom.

### **Archive**

2.5 The site code is GH21, for Gueswick Hills 2021. The flots, charcoal and charred plant remains are currently held in the Palaeoenvironmental Laboratory at Archaeological Services Durham University.

## **3. Methods**

3.1 The bulk samples were manually floated and sieved through a 500µm mesh. The residues were examined for shells, fruitstones, nutshells, charcoal, small bones, pottery, flint, glass and industrial residues, and were scanned using a magnet for ferrous fragments. The flots were examined at up to x60 magnification for charred and waterlogged botanical remains using a Leica MZ7.5 stereomicroscope. Identifications were aided by comparison with modern reference material held in the Palaeoenvironmental Laboratory at Archaeological Services Durham University, and by reference to relevant literature (Cappers *et al.* 2006; Jacomet 2006). Habitat classification follows Preston *et al.* (2002). Plant nomenclature follows Stace (2010).



3.2 Selected charcoal fragments were identified, in order to provide material suitable for radiocarbon dating and to determine the nature and condition of the assemblages. The transverse, radial and tangential sections were examined at up to x500 magnification using a Leica DMLM microscope. Identifications were assisted by the descriptions of Schweingruber (1990), Gale & Cutler (2000) and Hather (2000), and modern reference material held in the Palaeoenvironmental Laboratory at Archaeological Services Durham University.

3.3 The works were undertaken in accordance with the palaeoenvironmental research aims and objectives outlined in the regional archaeological research framework and resource agendas (Petts & Gerrard 2006; Hall & Huntley 2007; Huntley 2010).

## 4. Results

4.1 The bulk samples produced relatively small flots. Ditch fills [1010] and [1012] have a similar composition, though the latter deposit has double the amount of material. There are roughly equal amounts of charcoal, coal and cinder, with most of the charcoal being heather (*Calluna vulgaris*) in fairly good condition. Charred plant remains are few in number but similar in character, comprising spelt wheat (grains and chaff), barley (grain), hazel nutshells and weed remains typical of grassland and ruderal habitats such as heath-grass, redshank, sedges and docks.

4.2 Deposits [304] and [321] produced larger flots but are almost entirely made up of modern roots. There are a few small pieces of charcoal comprising a range of species such as birch, Salicaceae (cf. willow), Maloideae (cf. hawthorn), elm and elder, though charred plant macrofossils are rare, with just a couple of hazel nutshells and a cleavers seed in [321]. Detailed palaeoenvironmental results and a provisional date for each context are presented in Appendix 1.

4.3 The hand-recovered charcoal samples mainly comprise birch, hazel and Maloideae. Full descriptions are presented in Appendix 2.

4.4 Material for radiocarbon dating is listed in the recommendations section.

## 5. Discussion

5.1 The flot contents of ditch fills [1010] and [1012] are consistent with an Iron Age or Romano-British date, particularly with the presence of charred spelt wheat remains, as this was the principal wheat crop for these periods (Hall & Huntley; Greig 1991). Furthermore, the charred remains of heather twigs, grass rhizomes and propagules of grassland and ruderal plants are all listed as characterising the remnants of burnt turves in the archaeological record (Hall 2003), which is another characteristic of late prehistoric and Roman sites within the region.

5.2 The gravel surfaces [304] and [321] have nothing diagnostic, just a few charred remains representing background activity or settlement 'noise'.

## 6. Recommendations

6.1 No further analysis is required.

6.2 The flots should be retained as part of the physical archive of the site. The residues were discarded following examination.

6.3 The following plant remains are suitable for radiocarbon dating and are ranked by their likelihood to provide a reliable date:

### **GH21 – material from the bulk samples**

[321] <3004> ditch – Hazel nutshell (charred)

[1010] <2> upper ditch fill – Spelt wheat grain (charred)

[1010] <2> upper ditch fill – Hazel nutshell (charred)



- [1012] <3> middle ditch fill – Spelt wheat grain (charred)
- [1012] <3> middle ditch fill – Heather charcoal (date use of turves)
- [1012] <3> middle ditch fill – Hazel nutshell (charred)
- [321] <3004> ditch – Elder charcoal (\* an anthropogenic indicator)
- [304] <3002> gravel surface – Elm charcoal

#### **GH21 - charcoal samples**

- [1006] <C07a> deposit under flagstone – Hazel charcoal
- [1010] <C11a> upper fill of ditch – Maloideae charcoal
- [1006] <C07b> deposit under flagstone – Birch charcoal
- [1007] <C12a> deposit under flagstone – Birch charcoal
- [1012] <C02a> middle fill of ditch – Birch charcoal
- [1012] <C17a> middle fill of ditch – Maloideae charcoal
- [304] <C15a> gravel surface – *Prunus* sp. charcoal
- [304] <C03a> gravel surface – Hazel charcoal
- [1013] <C14a> lowest fill of ditch – Hazel charcoal
- [307] <C05b> low stony bank – Birch charcoal
- [307] <C05a> low stony bank – Maloideae charcoal
- [1010] <C11b> upper fill of ditch – Birch charcoal

### **7. Sources for palaeoenvironmental report**

Cappers, R T J, Bekker, R M, & Jans, J E A, 2006 *Digital Seed Atlas of the Netherlands*. Groningen

Gale, R, & Cutler, D, 2000 *Plants in archaeology; identification manual of vegetative plant materials used in Europe and the southern Mediterranean to c.1500*. Otley

Greig, J R A, 1991 The British Isles, in W Van Zeist, K Wasylikowa & K-E Behre (eds) *Progress in Old World Palaeoethnobotany*. Rotterdam

Hall, A, 2003 *Recognition and characterisation of turves in archaeological occupation deposits by means of macrofossil plant remains*. Centre for Archaeology Report 16/2003. English Heritage

Hall, A R, & Huntley, J P, 2007 *A review of the evidence for macrofossil plant remains from archaeological deposits in northern England*. Research Department Report Series no. 87. London

Hather, J G, 2000 *The identification of the Northern European Woods: a guide for archaeologists and conservators*. London

Huntley, J P, 2010 *A review of wood and charcoal recovered from archaeological excavations in Northern England*. Research Department Report Series no. 68. London

Jacomet, S, 2006 *Identification of cereal remains from archaeological sites*. Basel





Petts, D, & Gerrard, C, 2006 *Shared Visions: The North-East Regional Research Framework for the Historic environment*. Durham

Preston, C D, Pearman, D A, & Dines, T D, 2002 *New Atlas of the British and Irish Flora*. Oxford

Schweingruber, F H, 1990 *Microscopic wood anatomy*. Birmensdorf

Stace, C, 2010 *New Flora of the British Isles*. Cambridge

### Palaeoenvironmental data (bulk samples)

Context	Sample	Feature	Volume processed (l)	Flot volume (ml)	C14 available	Rank	Notes
1010	2	ditch - upper fill	2	15	Y	**	Small flot with traces of charcoal, coal, cinder, modern roots and a few charred plant macrofossils. The charcoal is heather in fair condition. Charred plant remains similarly in fair condition comprise hazel nutshells (2), a spelt wheat grain and chaff (2 glume bases) and heath-grass caryopses (2). <b>IA/RB</b>
1012	3	ditch - middle fill	3	30	Y	**	The flot matrix is like [1010] but double the size and with twice as much evidence. There is roughly equal amounts of fragmented (mainly <4mm) charcoal, coal and cinder, and a small assemblage of charred plant macrofossils. The charcoal is mainly heather with some hazel in quite good condition. (The heather examined has 4 growth rings and a small pith). Charred plant remains comprise several small hazel nutshells, a few poorly preserved cereal remains of barley (grain), and spelt wheat (grain and chaff) and a few propagules of heath-grass, brome, docks, sedges and redshank. (Finds: traces of calcined bone, animal tooth, magnetic semi-vitrified fuel waste). <b>IA/RB</b>
304	3002	gravel surface	5	100	?	*	The flot has mainly modern roots and a few small pieces of charcoal and coal (all <5mm). There are no charred plant macrofossils. The charcoal is birch, elm and Salicaceae (cf. willow) in fair condition. (Finds: trace of calcined bone). <b>Nothing diagnostic</b>
321	3004	gravel surface	5	100	Y	*	The flot has mainly modern roots, a few small fragments of charcoal and coal (all <5mm) and sparse charred plant macrofossils. The charcoal is in reasonable condition and includes several species: birch, oak, elder, Maloideae (cf. hawthorn) and <i>Prunus</i> sp. (wild plum or blackthorn). Charred plant remains are a couple of small hazel nutshells and a cleavers seed (a ruderal weed). (Finds: trace of calcined bone). <b>Nothing diagnostic</b>

[Rank: \*: low; \*\*: medium; \*\*\*: high; \*\*\*\*: very high potential to provide further palaeoenvironmental information. ? = material may be unsuitable for AMS dating due to small size]



## Palaeoenvironmental data (charcoal samples)

Context	Sample	Feature	Feature	weight (mg)	Description
1006	C07a	deposit under flagstone	Hazel charcoal	97mg	Branchwood in good condition with only a few mineral inclusions – tangentially fractured fragment with strong growth ring curvature and 6 short growth rings.
1006	C07b	deposit under flagstone	Birch charcoal	135mg	Large branchwood in good condition with only a few mineral inclusions – radially fractured fragment with moderate growth ring curvature and 4 growth rings.
1007	C12a	deposit under flagstone	Birch charcoal	321mg	Large branchwood in good condition with only a few mineral inclusions – tangentially fractured fragment with moderate growth ring curvature and 7 growth rings.
1010	C11a	upper fill of ditch	Maloideae charcoal	50mg	Branchwood in relatively good condition with only a few mineral inclusions – curled growth with strong growth ring curvature and more than 4 growth rings – This Maloideae fragment is cf. hawthorn.
1010	C11b	upper fill of ditch	Birch charcoal	18mg	Branchwood in reasonable condition with some mineral inclusions – radially fractured fragment with strong growth ring curvature and 3 average growth rings.
1012	C02a	middle fill of ditch	Birch charcoal	528mg	Large branchwood in relatively good condition with some mineral inclusions – large fragment (>10mm) with moderate growth ring curvature and more than 4 wide growth rings.
1012	C17a	middle fill of ditch	Maloideae charcoal	403mg	Large branchwood in relatively good condition with some mineral inclusions – large fragment (>10mm) radially fractured with moderate growth ring curvature and more than 10 growth rings. (cf. hawthorn).
1013	C14a	lowest fill of ditch	Hazel charcoal	24mg	Branchwood charcoal in relatively good condition with some mineral inclusions – tangentially fractured fragment with strong growth ring curvature and 4 average growth rings.
304	C03a	gravel surface	Hazel charcoal	148mg	Small calibre stemwood in relatively good condition with few mineral inclusions – radially fractured fragment with moderate growth ring curvature and variable ring growth comprising over 13 growth rings.
304	C15a	gravel surface	<i>Prunus</i> sp. charcoal	105mg	Small branchwood charcoal in relatively good condition with few mineral inclusions and some radial cracking – quarter section of roundwood with strong growth ring curvature and 4 growth rings. (cf. blackthorn).
307	C05a	low stony bank	Maloideae charcoal	302mg	Large branchwood/stemwood in average condition has patches of mould (bagged damp) – large fragment with moderate growth ring curvature, low vitrification, and radial cracking. Over 10 rings (cf. hawthorn).
307	C05b	low stony bank	Birch charcoal	201mg	Large branchwood/stemwood in fair condition with some mineral inclusions – large fragment with moderate growth ring curvature and 5 wide growth rings. Low vitrification and a crunchy texture like (C05a).

