GHTL-13 WHF-A

REPORT ON ARCHAEOLOGICAL EXCAVATIONS AT WOLSTY CASTLE 2013.

GRID REFERENCE: NY 1048 5059
NMR no 15 SW5
Monument no. 9669
OASIS ID: 270987
October 2016

Contact:
Grampus Heritage and Training Ltd,
Ashgill, Threapland, Wigton, Cumbria, CA7 2EL
+44 (0) 16973 21516
enquiries@grampusheritage.co.uk

CONTENTS

Page

ILLUSTRATIONS

PLATE **PAGE**

SUMMARY

The excavation was undertaken with members of the West Cumbria Archaeological Society and local volunteers under the supervision of Grampus Heritage and Training Ltd as part of the Solway Wetlands 'Hidden Heritage' Project. Work on site was preceded by a magnetometry survey (figure 2), and continued throughout July and August for eight weeks in 2013.

The topsoil was stripped by machine and an area of 90m² opened up (trenches 1, 2 and 3) initially outside the scheduled area targeting anomalies identified in the geophysical survey. This found an outer ditch on a different alignment to the visible earthwork, suggesting an earlier phase of fortification. Medieval pottery was found in the ditch and samples were taken. We then opened an area of 225m^2 within the scheduled area on the visible earthworks (Trench 4). This exposed several walls, mostly at foundation level, which were then cleaned by hand. The moat was dug by machine then investigated by hand on the north side. We uncovered the exterior walls to the north and south, establishing the limits of the interior of the castle and several interior walls representing a north and eastern range surrounding a cobbled courtyard. We also sectioned the moat and the edge of the platform establishing how they were constructed, and discovered the wooden remains of a possible bridge and entrance. Dendrochronology samples were taken of the timbers but it was not possible to establish a date.

ACKNOWLEDGEMENTS

Grampus Heritage and Training would like to thank the Heritage Lottery Funded Solway Wetlands Project for funding this research and the staff of the Solway Wetlands Project and Solway Coast AONB for their support throughout. We would like to express our gratitude to the Sharp family of Wolsty Hall Farm for granting permission for this survey and excavation to take place. The excavation would not have been possible without the commitment and enthusiasm of our team of volunteers from the West Cumbria Archaeological Society and local community and we would like to thank everybody who participated in the fieldwork. We are grateful to the children of Abbeytown Primary School for their contribution to the excavation and, in particular, for their excellent trowelling skills which uncovered a large portion of the central cobbled yard surface. We would finally like to thank Alan James for metal detecting throughout the excavation.

The fieldwork was led by Mark Graham from Grampus Heritage, working alongside freelance archaeologists Jan Walker and Trish Shaw and our archaeological apprentice Megan Ferguson.

1. INTRODUCTION.

1.1.1 Permission was obtained from the landowners Messrs Sharpe and the Department of Culture Media and Sport for Grampus Heritage and Training Ltd to undertake archaeological survey and excavation work at the scheduled monument of Wolsty Castle. This research was funded by the 'Hidden Heritage' community archaeology project, which is part of the Solway Coast AONB lottery funded Landscape Partnership Scheme. Both survey and excavation were led by Grampus Heritage and Training Ltd, working with assistance from members of the West Cumbria Archaeological Society and volunteers from the local community.

Plate 1: Magnetometry survey

1.1.2 The survey and excavation at Wolsty Castle follows previous research undertaken by Grampus Heritage and the West Cumbria Archaeological Society at St Mary's Abbey, Holme Cultram, Abbeytown. This fieldwork is the first archaeological intervention at the site of Wolsty Castle. Our aim was to firstly investigate the site through archaeological geophysics to search for evidence of associated defences beyond the clearly visible moated platform. The magnetometry survey revealed several archaeological anomalies to the north of the scheduled moated platform and within the scheduled area. Four trenches were then excavated to further understand these features.

1.1.3 The excavation was conducted in accordance with the aims of the Hidden Heritage project design and North West Archaeological Framework. The geographical situation of the site and its dramatic history with associations with the colourful scholar Michael Scot, and also as a stronghold for the treasure of the Abbey, made it an ideal focus for school visits (Plate 2) and the engagement of local people from the Silloth area.

Plate 2: Visit to site by children from Abbeytown Primary School

1.2. SITE LOCATION AND DESCRIPTION.

1.2.1 Wolsty Castle is situated 2 miles north of Mawbray and 7 miles due west of Holme Cultram Abbey. The remains of the castle consist of a substantial moated platform which is clearly visible. The moat is 20-30m wide and 1.5m deep and surrounds a platform area of around 950m^2. There are traces of robber trenches and foundations and two upstanding fragments of masonry, probably not in their original location, which show that the walls were over 2m thick. There are traces of an outer bank 5-10m wide and up to 0.40m high and a possible outlet channel for the moat on the south east side.

1.3. HISTORICAL BACKGROUND.

1.3.1 Holme Cultram Abbey was pillaged by the Scots led by Alexander II in 1216 and Robert Bruce 1322 and there were other raids in the first half 14th century. Wolsty consisted of a large house in 1327. In 1348 October 13th, the abbot of Holme Cultram Abbey applied to crenellate Wolsty and form a stronghold to protect monastic treasure and books against Scottish raids. The castle was put in the care of the Chambers family from the time of Edward III onwards; after 1495 Thomas Chambers was steward of "Wolstie" Castle. Thomas Chambers had 4 sons: Richard who took over the castle and the others who became abbots at Furness (Thomas) Peterborough (Lancelot) and Holme Cultram 1489-1519 (Robert.)

1.3.2 In 1537 at the time of the Dissolution the castle was presumably surrendered as part of the abbey possessions. It is listed as belonging to the Abbey in 1535.

1.3.3 In 1572 a return made by jury stated that Wolsty was in decay. The hall, chamber at the end of the hall, the evidence house, the kitchen, the peat house, byre and stable were ruinous. The estimated cost of repair was £104.10. 4d.

1.3.4 In 1580 the castle is again reported as in disrepair. Five years later Robert Chambers was granted 20 shillings a year for its upkeep.

1.3.5 In 1638 a survey again reported the castle was ruinous. Robert had, at his own cost, given £100 after his death towards the upkeep of the castle. His son, Thomas, in 1596 granted Wolsty to his brother, Richard Chambers first, then to his brother William, who died in 1629. Robert the son of William, spent around a further £100 in repairing it. In 1634 Robert, his wife, children and servants totalling nine people, were in bed when the roof of the bed chamber fell in, breaking down the floor

on which their beds stood. No one was hurt and Robert rebuilt the chamber. In 1649 the castle is again reported as ruinous. (Grainger and Collingwood. 1929)

1.3.6 In 1652, Thomas Fitch, Parliamentary Governor of Carlisle, ordered the destruction of the castle. Demolition men (their names are all listed in CWAAS 21) arrived; Mary Chambers attempted to stop them but they went ahead overseen by James Jackson, Bailiff of Holme Cultram Abbey who noted details in his diary. (in private possession; copy with WCAS archive and at Carlisle Archive Office.)

1.3.7 The following buildings were recorded as pulled down: The Hall, One tower at the end of the Hall, One great barn, One larder house, One long gallery, One chapel with chamber at the end. One chamber called Michael Scots Chamber, One chamber called Lords chamber, One house called the prison, One tower above said house, One long byre, One great stable. (Grainger. 1921)

1.3.8 The stones were carted away for a new house at Hayrigg for James Jackson's brother John. In 1663 more stone was taken to Carlisle.

1.3.9 By 1794 there was only a small part remaining, with a broad ditch around it.

1.3.10 A mile fortlet 13b, part of the extension of the Hadrian's Wall defenses down the west coast of Cumbria, was located to the south east of Wolsty Castle in 1880. Its position was confirmed by Bell-House in 1972.

2. METHODOLOGY.

2.1.1 A total area of 315m^2 was opened by machine. The area and all visible features were then cleaned and excavated by hand and recorded in accordance with IFA Guidance Notes and following best archaeological practice. A total of four trenches were opened up; trenches 1-3 to the north of the moat outside of the scheduled area and trench 4 orientated north-south across the earthwork.

3. RESULTS.

3.1 Trench 1. Trench 1 was oriented West-East and was 10m x 1m and excavated to depths of between 0.50-0.80m. A gravel spread (102) in the natural was recorded in the Northern edge of the trench which was approx. 1.5m x 05m. In the east end of the trench, a change was noted above the natural (101). This was a thin lens about 0.5m deep of a dark grey clay like deposit (105). A total of 3 pieces of Iron were found unstratified in relation to this trench.

3.2 Trench 2. Trench 2 (Figure 3) was orientated south southwest – north northeast and was 10m x 2m and excavated to a maximum of 1.40m. A ditch [107] running West – East was uncovered which had two fills (Plate 3). The primary fill (109) consisted of grey silty clay with dark sand and pebble inclusions. Two pieces of medieval pottery were recovered from (109) dated to 12th-13th century and 13th-14th century. The secondary (108) fill consisted of a friable sandy clay soil, grey brown in colour with pebble and sandstone inclusions.

Plate 3: East-facing section of ditch [107] in trench 2

3.3 Trench 3. Trench 3 was orientated north-south and was 12m x 10m and excavated to a depth of between 0.30m and 0.50m (Figure 3). Three fragments of Cistercian-ware were recovered from the topsoil (100) dating to 15th-16th century. Below the topsoil was a compact dark brown silty clay soil with pebbles, small cobble, medieval pottery and charcoal inclusions, which was found throughout the trench (106). Six sherds of medieval pottery were recovered from context (106), three dating from 12th-14th century and three dated 13th-14th century. Beneath this deposit, a cist was identified (Plate 5) [115]. It was orientated NNE/SSW and measured 2 metres long by 0.5 metres wide. The rectangular cut contained upright stones set on edge lining the sides and a stone base (116). The feature was filled with a dark grey brown soil with pebbles and small stone inclusions (117). The cist cut through a pad of yellow clay and stone (110). Deposit (110) covered an area of roughly 1.5m from the northeast end of the trench, widening out to 3.0m towards the southwest end. Six sherds of medieval pottery were recovered from context (110), all dated 12th-14th century.

Plate 4: View north of trench 3

3.3.1 A steep sided post hole [121] was recorded which was almost triangular in shape and filled with a fairly compacted dark brown sandy clay with sandstone and pebble inclusions (122).

3.3.2 A ditch running West-East was recorded which had fairly steep sides with a flattish base [123]. The primary fill comprised of a compact dark grey clay with pebble and small cobble inclusions (125). The secondary fill comprised of a fairly compact dark grey brown soil with pebble, gravel and sandstone fragment inclusions (124). No dating evidence was recovered from this ditch.

3.3.3 The trench was extended which revealed a cut for a ditch [129] in the most westerly end of the trench, which may be a continuation of [123]. This cut was not fully excavated. Three other cut features were recorded in this extension. [130] is a heavily truncated possible beam slot measuring 1.5m x 0.40m. The fill comprised of loosely compacted grey silty sandy clay with few pebble inclusions (131). Another heavily truncated beam slot was also recorded [132], cutting the fill (135) of a larger north/south orientated slot [134]. These may represent beam slots associated with timber buildings, though no dating evidence was recovered from any of these contexts.

3.3.4 A total of 15 medieval pot sherds were found in this trench (100), (106), (110).

3.3.5 The ditches [107] in trench 2 and [123] in trench 3 correlate well with the anomalies identified through the geophysical survey (Figure 10). These trenches were targeting geophysical anomalies interpreted as ditches to the north of the castle earthwork. The geophysical survey shows that they are on a different alignment to the moat and platform, suggesting that they may be from an earlier phase of fortification.

3.3.6 The license to crenellate Wolsty, granted in 1348 (Collingwood and Grainger, 1929), suggests a period of rebuilding and remodeling of the defences, the details of which are not known. The primary fill (109) of ditch [107] contained two sherds of pottery dated 12th-14th century, which would be consistent with an earlier phase of defensive ditches, perhaps made redundant following a remodeling of the moated platform and castle in the mid-14th century.

Plate 5: View northeast of cist in trench 3 [115], (116).

3.4 Trench 4. Trench 4 orientated north northeast-south southwest and was 40m long and between 2m-5m wide. It was machine and hand excavated to a maximum depth of 1.2m and was located north

south across the castle limits. A total of 43 medieval pot sherds were found in various contexts throughout this trench; 3 of these were unstratified.

3.4.1 There were 89 contexts recorded in this trench. Beneath the topsoil (100) at the north northesast end of the trench, the moat [199] was recorded. This had been filled with 10 contexts (184)- (193) mostly related to the natural infilling of the moat (Figure 7). No medieval pottery or artefacts were found in the moat. The moat was sampled for insect analysis (Appendix II).

Plate 6: View southeast of west facing moat section

3.4.2 The northern end of the platform banked steeply down (194) forming the southern side of the moat. The moat was banked up with debris material including large cobbles, clay and sand (195) which, when excavated, revealed oak timbers preserved in the waterlogged clay. (5001-5011) These are interpreted as the remains of a bridge structure spanning the moat. The timbers were well preserved, with cut marks still visible. (Plate 7)

Plate 7: View west of bridge timbers timbers (5002-4)

3.5 The bridge structure.

3.5.1 Planks placed horizontally ran east-west (5002) across the northern edge of the feature. More planking formed the eastern side. Thus the main timbers were set into a box like structure.

3.5.2 A square cut timber (5004) ran across the clay parallel with (5002). This measured 1.27m. x 285mm.x 350mm. This timber is neatly cut heartwood, and may be a reused wall plate. At the eastern end there is a mortice cut 7mm wide, with another at the western edge of the trench, also 7mm wide. The eastern mortice has a peg hole visible, to fasten the tenon which would have fitted into it.

3.5.3 Running north south across (5004) (saw marks are visible where it has had a piece cut out to fit over) and through (5002- the planking) is (5003). This is a timber toe piece; much more roughly hewn than (5004). It measures 1.27m x 285mm x 350mm - the same as (5004) It has a large mortice cut at the southern end 240mm in depth and measuring 190mm east -west and 210mm north - south. At the northern end, just beyond the planking (5002) is a second mortice cut 90mm x 140mm and 35mm deep. It was originally set in clay.

3.5.4 The timbers are interpreted as part of the eastern end of a bridge structure; the rest of the structure and the entrance presumably lies to the west immediately outside the excavation. The bridge appears to be similar to type IIIa according to Rigold's classification. (Med.Arch. 1975, p. 48-91) However, (5004) runs to both sides of (5003) Therefore it is suggested that the bridge is a simplified version of IIIb.

3.5.5 A substantial upright would have been tenoned into the mortice at the southern end of (5003), the toe piece. This would have supported a horizontal beam running north -south, the northern end fixed to a further upright tenoned into the mortice the northern side of the planking. This horizontal beam would have been braced by two braces, tenoned into the mortices at the east and west ends of (5004). The beam would have supported a plank walkway. Rigold suggests this construction is strong enough to operate a drawbridge. The timbers were packed in clay.

3.5.6 Other timbers (5011 - with two peg holes) may represent a fallen plank from the walkway. (5001) is probably a plank fallen from the box encasing the transverse beam (5002) for rigidity. (5005) and (5006) are timber braces possibly the original braces tenoned into (5004) (5005) measures 520mmx 60mm x62mm. (5006) measures 420mmx 70mm x 50mm. (5010) is a large post, shallowly set into the clay, packed with large stones for stability and forming additional support beam for the walkway. It has been sawn off at the height of the transverse beam ((5002). (Figure 6)

3.5.7 To the South of the moat, a layer of demolition rubble and roofing material (126) extended for 13 metres. This context included four pieces of pottery dating from 13th to 17th Century. Below (126) the northern wall of the castle (155) and its core (156) were discovered. The core (156) comprised of rough and smooth granite cobbles. These were edged with (155), comprising of a mixture of ovid and rectlinear granite cobbles. This wall appears to have been consolidated with context (140), a yellow clay which appears to have been used to level the platform area. (Plate 8)

Plate 8: View west of northern wall (155) and core (156)

3.5.8 An area of burning and heat affected clay was recorded 2.3m south of wall (155). This is interpreted as the position of a hearth (153), being located midway between wall (155) and wall (159) to the south. It is possible that the heat affect in the clay is the result of heat transfer through an upper slab or surface which has since been removed.

Plate 9: Hearth (153)

3.5.9 Foundations for wall (159) were found to the south of the hearth. This comprised of large granite cobbles with a buttress foundation on the south side. The trench was extended to follow the foundations, which carried on to the east before turning and carrying on to the South (204, 205). The wall (159) is parallel to the northern wall foundation (155) with the two being 5 metres apart. These 2 walls are likely to be the foundations for an east-west aligned northern range of buildings surrounding a cobbled courtyard with (159) the inner wall and (155) the outer wall. The north south aligned wall (204, 205) is the inner wall of an eastern range. The cobble layer (127) was seen to abut wall (204) suggesting a continuation of the cobbled yard surface up to the eastern range (Fig 9, Section 6).

Plate 10: Wall (204) and foundations (205) and (159) in the eastern extension

3.5.10 As this Eastern extension was opened, demolition layer (158) was uncovered into which a horse/pony had been buried. The grave cut [174] had been cut into both the demolition layer (158) and foundations (159). The horse skeleton and other bone from the site was assessed by Don O'Meara (Appendix 1). The assessment of the spine suggested the animal had been used to carry heavy loads and that "… this animal was exposed to intensive, repetitive strain over a relatively short life-span." The cutting of the pit [174] into demolition material and the wall foundation, along with evidence of use for carrying, suggest that this animal may have been used to transport blocks of stone during the demolition of the castle in the mid-17th century. (Plate 11)

Plate 11: Horse burial [174]

3.5.11 A pit [144] was excavated to the west of wall (159) which cut through the wall foundation and continued into the western section. This may be the end of a robber trench to remove the stone of (159) following the line of the wall to the west.

Plate 12: Pit [144] and fill (145)

3.5.12 To the South of wall (159), a cobbled surface (127) was found, covering an area of approx. 3 x 5m. Types of stone used were granite, riolite and fine sandstone. The cobbles used measured approx. between 0.15 and 0.25m. A musket ball was found on the cobbled surface (Small Find 2) measuring 17mm diameter. Fourteen pieces of Cistercian-ware were recovered from the cobble surface, dating from the 15th-16th century as well as two pieces of 17th-18th century slipware. A single layer of cobbles sits on a levelling layer (161) which is a very compact grey brown soil. The cobble surface has been partly robbed. At the south west extent of the remaining cobble surface we excavated a sondage. Below the levelling layer (161) we encountered context (162), a loose grey/brown matrix soil with inclusions of small pebbles and sandstone fragments. Below this layer was context (168) which consisted of crushed red sandstone fragments.

3.5.13 Visible in the cobbles (127) is a curved line of larger cobbles (179) which was incorporated in the cobbles (127). This curved line (179) may be a decorative feature, slightly echoing the curving corner of wall foundation (176). (Figure 5)

Plate 13: View SSW showing cobbles (127) with curved line of cobbles (179) and wall (157). The crushed red sandstone layer (168) is visible in the lower left

3.5.14 In the South end of the trench a short length of wall (157) survives as a course of dressed sandstone with a rubble and mortar core still in situ and siting on foundation layer (176). The wall foundation abuts the cobbled yard surface (127) and turns to the east, continuing into section. The southern extent of (157) meets an east-west aligned section of robbed wall (172). A possible entrance threshold was identified in wall (172), constructed of sandstone blocks and fragments along with a step, still in situ, on the South side of the wall. A short section of wall foundation abuts (172) to the south, where wall (157) meets (172) to the north. This is interpreted as a possible buttress, though the eastern side of this feature was not excavated (Plate 14).

Plate 14: View north of east-west wall (172) and north-south wall (157). A possible threshold entrance is visible on the south side of (172)

Plate 15: Aerial photo of site looking north. (courtesy of Messrs Sharpe)

4. CONCLUSIONS

4.1.1 Wolsty Castle was the stronghold to which the Abbot retreated with the treasures of Holme Cultram Abbey during the raids of the Scots. The demolition of the castle was comprehensive and organised but the remaining foundations and moat demonstrate that the place had formidable and substantial defences. The differing alignment of the outer ditches and pottery dating from 12th-14th century suggests that the defences may have been remodeled following the license to crenellate in the mid-14th century.

4.1.2 The horse burial is probably a haulage animal as it is associated with the demolition material and the snaffle bit found is consistent with this as riding animals are more commonly associated with curb bits. It is suggested that the animal collapsed and died, and rather than haul it away from the castle part of the deeper foundations of the castle were pulled out and the horse put in the hole and covered up.

4.1.3 Identifying the buildings listed as demolished in Jackson's diary is problematic. It is possible that they were listed in order; but the starting point and direction is unknown. The survey of the platform earthwork shows a broadening of the plateau with heavy robbing at the SW corner, which may be the position of a tower. The excavation has greatly added to our knowledge of the layout of the castle, with good evidence for a northern and eastern range surrounding a cobbled central courtyard. The buildings had substantial tightly packed foundations of granite and cobble with upper courses of dressed red sandstone.

4.1.4 A possible parallel can be seen at Askerton Castle, Gilsland which has a courtyard with buildings around, an entrance with the hall above and towers at each corner of the frontage. Wolsty Castle would have been an imposing and well defended building as befitted the Chambers family.

5. ARTEFACTS.

5.1.1 The pottery was largely green glazed on a grey body; dating to 13th – 17th century.

5.1.2 The granite foundations of the wall (159) containing the horse burial produced a bronze chape 12mm wide. A partially complete small snaffle bit came from the upper fill of the burial itself. The cobbles (127) produced a musket ball.

6. REPORT ON THE SMALL FINDS FROM WOLSTY CASTLE. Jan Walker.

6.1.1 There were few small finds from the area excavated, considering the castle was the treasure store for the Abbey. However, this perhaps reflects the poverty and condition of the building post Dissolution until the time it was demolished.

6.2 Pin. GHTL 13 WHF-A small find no.1 context (161) (consolidation layer for cobble courtyard)
6.2.1 This is the pointed end of a broken copper alloy pin length 29mms diameter; at break 2mm x 1mm. It tapers to a point.

6.3 Musket Ball. GHTL 13 WHF-A small find no.2 context (127.) (Cobble courtyard.)

6.3.1 This is made from lead and 17mm in diameter. A join is visible around the circumference implying it was made in two halves. It is spherical and dates to 1600-1800AD.

6.4 Coin. GHTL 13 WHF-A Small find no. 3 context (171.) (demolition layer.)

6.4.1 Copper alloy coin. 18mm. diameter. Indecipherable.

6.5 Snaffle Bit. GHTL 13 WHF-A small find no. 4 context (158.) (pit)

6.5.1 This was found in a pit filled with demolition material overlying a horse burial.
It is made of iron. Mouth width between rein attachments180mm. The bit is incomplete and consists of a two link mouth piece with slight curvature. (Type II Ward Perkins London Museum Medieval Catalogue.) The rein ends of the mouthpiece are simply curved round. Only one rein attachment survives; it is a single strip of iron square in section 5mm diameter bent into a rectangular shape 35mm x 28mm to which the reins were presumably attached. There is no sign of cheek pieces or additional bars to protect the animal's lips. It is fairly corroded. The LMMC suggests that the archaeological context of most snaffle bit finds means they were associated with haulage rather than riding, which fits with the context at Wolsty. It can probably be dated to the late 13th early 14th century, though it is of such a basic design it could easily be a later local product.

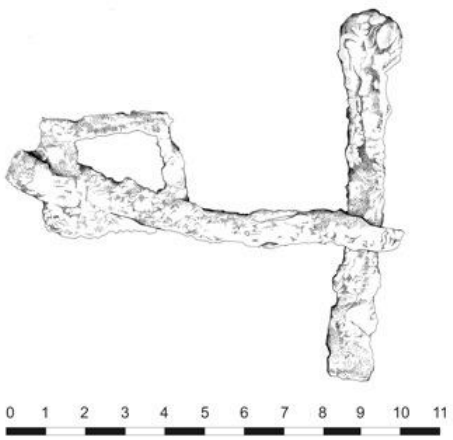


Illustration 1: Snaffle bit Small Find 4

6.6 Belt chape. GHTL 13 WHF-A small find no.5 context (159.) (in large granite cobbles; possible foundations for buttress)

6.6.1 This was made of copper alloy, possibly silvered. The shank of the pin which is possibly iron, is missing. It has a direct parallel to Plate LXXV no. 8 LMMC. strap end 13mm long x12mm wide; width of buckle 16mm x 10mm long. 15th century.

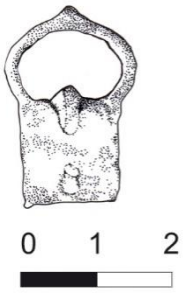


Illustration 2: Belt Chape Small find 5

6.7 Belt chape? GHTL 13 WHF-A Trench 4 unstratified.

6.7.1 This is a copper alloy trapezoidal flat object, 31mm at top, 20mm at bottom with a broken off hole 4mm in the narrow end which may have held a tassle. It is 1mm thick. It probably dates to the 14th century.

6.8 Clay pipe bowl and part of stem. GHTL 13 WHF-A Trench 4 context (100) (topsoil)

6.8.1 Probably late 17th century; no maker's marks on flat heel, bulbous bowl milled below rim. No join visible. Similar to one found at Holme Cultram Abbey (CWAAS Research Paper 4 Fig 43 no. 3) and probably from east of the Pennines. Bowl 3cms to stem; 18mm. at top. Bore diameter 3mm. Fragment of stem: 2cms. long: bore 3mms. Plain.

6.9 Miscellaneous objects.

6.9.1 Iron.

6.9.2 Nails.

6.9.3 The excavations produced 90 nail heads and fragments of 72 shanks from trench 4. Trenches 1,2 and 3 produced 6 shanks and 3 nail heads. Most were broken and heavily corroded and concreted. They were all hand made. The shanks ranged in length from 150-450mm in length with one 9cms long, and were rectangular in section and tapered at one end. The nail heads where present were both rectangular and round and ranged from 150 to 350mm in diameter.
Trench 4 produced 6 bolts from the upper levels.
6.9.4 There was no particular concentration of nails, though Trench 4 (127) -the cobbled yard- produced 11 square headed and three round headed and 22 fragments of shanks. Layer (161), beneath the cobbles, produced 11 round headed nails and 12 fragments of shanks.

6.10 Other iron.

6.10.1 Trench 4
(109) strip 32mm x 5mm and .5mm thick.

(127) 1 possible rivet and 3 heavily corroded flat fragments of iron. 1 square fragment.
(161) corner point of possible buckle.
(169) rectangular fragment of iron possibly part of a buckle as it has a hinge for a shank 3mmx 350mm square.
U/S
1 square plate 75mmx75mm with lip 5mm deep and 5mm thick.
1 fragment of a file end 75mm long, file 24mm wide and 50mm long.
1 possible chisel heavily corroded 120mm long x 45mm wide and with a flat head 50mm square.
1 chisel flat head 20mm x 80mm tapering to 30mm.
1 lynch pin curved and tapering, 150mm long.

6.11 Lead.

6.11.1 Trench 2

U/S
3 flat fragments.

6.11.2 Trench 4
U/S
12 scraps lead.
64 small lumps melted lead.
2 strips, one with the impression of a corner.
5 pieces of window came. 1 possible seal and tag 10mm diameter and 5mm tag.
1 fragment with possible decoration one side. 18mm square.
1 fragment with possible decoration one side 13mm x 10mm and 1mm thick.
1 tubular shaped tapered fragment 55mm long and 13mm diameter.

(127) 1 strip possibly window came 38mm long x 3mm wide x1mm thick.
6 lumps melted lead.
3 partially circular fragments with edges bent inwards; possible seals.
1 melted lump.
(137) folded sheet of lead 45mm x 25mm.
(140) 1 large fragment melted lead, 6 smaller pieces.
(161) 1 curvilinear strip possibly window came. 3 small lumps
(164) strip of possible window came 45mm long x 25mm wide, beveled both sides.
(167) 1 melted lump.
(171) 2 fragments of sheet lead 30mm x 20mm and 27mm x 12mm.

6.12 Musket / pistol balls. (all lead)

6.12.1 Trench 2
U/S conical lead ball diameter top 10mm base 15mm: with hole in top diameter 2mm and 5mm depression in base.

6.12.2 Trench 4
U/S 1 musket/pistol ball diameter 13mm with small drip of lead at top5mm diameter.
1 musket/pistol ball 14mm diameter.
(127) 1 musket ball diameter 20mm
1 pistol ball diameter 10mm.

6.13 Coins.

6.13.1 Trench 2
U/S c 1/3 of possibly silver coin; indecipherable. diameter estimated 18mm.

6.13.2 Trench 4
U/S probably copper alloy; some decoration one side; indecipherable. 14mm diameter.

6.14 Copper alloy.

6.14.1 Trench 2
U/S
flat sheet 44mm long x 10mm wide.

6.14.2 Trench 4
(109) strip 32mm x 5mm x .5mm thick.

(127) probably machine made modern; 50mm long x 13mm at one end and 25mm at other end; top edge slightly curved, bottom edge straight. 3mm thick.

6.15. Clay pipe.

6.15.1 Trench 4
U/S 1 fragment stem, bore 3mm, 30mm long diameter 9mm.
(171) 1 fragment stem, bore 3mm, 20mm long diameter 9mm.

6.16 Flint.

6.16.1 Trench 2
(109) brown/white fragment of flint, worked debitage.

6.16.2 Trench 4
(126) triangular fragment brown flint debitage 10mm x 13mm.

6.17 Coal.

6.17.1 Trench 3
(100) 1 fragment coal.
(106) 1 fragment coal.

6.17.2 Trench 4

U/S 1 fragment coal.
(110) fragment charcoal.
(121) 6 fragments coal.
(127) 2 fragments coal.
(140) lump of clinker.
(156) 1 fragment coal.
(161) 9 fragments coal.
(162) 1 fragment coal.
(173) 3 fragments coal, 11fragments burnt stone.
(203) 5 fragments coal.
(217) 2 fragments coal.

6.18 Building material.

6.18.1 Trench 2

U/S 7 fragments of unglazed tile, probably roofing tile.
1 fragment red brick.
(109) 1 fragment of red sandstone with X engraved on it -possible masons mark.
1 squared fragment of possible whetstone.

6.18.2 Trench 3

(100) 1 piece fired daub.
(106) 1 fragment brick

3 fragments brick/tile.
1 small fragment green grey slate.

6.18.3 Trench 4

U/S 1 fragment roofing tile, unglazed, curved with cross hatching engraved on it and possible grain impressions.
4 fragments roofing tile.
(120) 1 fragment brick.
(126) 1 fragment roofing tile with modern drainage pipe and tile and mortar.
(143) 1 fragment red sandstone with groove.
(156) 1 fragment mortar from wall core.
(158) 2 fragments unglazed tile probable roofing tile.
(159) 1 fragment daub with possible indentations from wattle.
7 fragments brick.
2 fragments red sandstone with mortar attached.
(161) 5 fragments roofing tile.
(162) 1 fragment burnt stone.
(165) 1 fragment brick/tile.
(168) 1 fragment squared red sandstone.
(171) 1 fragment oval shaped red sandstone possibly window column with traces of mortar.
2 fragments mortar.
(173) 1 fragment mortar.
(178) 3 fragments plain unglazed roofing tile.
(212) 1 fragment roofing tile with lump of mortar.

Bibliography.

Clark, J. 2004 *'The Medieval Horse and its Equipment'* Woodbridge.
Hare, J.N. 1985 '*Battle Abbey; The Eastern Range and the Excavations of 1978-80'* (HBMC for England.

Medieval Catalogue London Museum (1954) HMSO London.

Walker, J., and Graham, M. 2013 '*St. Mary's Abbey Holme Cultram Abbeytown, Cumbria.'* CWAAS Cumbria Research Paper no.4

7. POTTERY ASSESSMENT by Wardell Armstrong Archaeology Ltd.

7.1.1 The medieval ceramics were initially sorted by fabric group based on the existing fabric series created for Holme Cultram (Greenlane 2011). The pottery was then quantified and weighed, and vessel fragments were noted, e.g. bases, rims, handles etc. Sherds were also examined for any decoration or residues which may be present.

7.1.2 The medieval pottery was assessed and recorded using guidelines published by the Medieval Pottery Research Group (MRPG 2001) and Orton *et al* (1993). In addition to the Holme Cultram pottery series, fabric descriptions from other local sites were also considered.

7.1.3 A total of 84 sherds of pottery were recovered from WHF-A, weighing 806g, of which only ten sherds were unstratified. The medieval pottery comprised 44% Lightly gritted/ Sandy and fine wares, with the remainder Partially Reduced grey ware and Late Medieval Reduced Grey ware. Fourteen sherds of Cistercian ware were also recovered from context **(127)**.

Site Code	Context	Trench	Fabric type	Qty	Wgt (g)	Date	Base	Rim	Body	Shoulder	Handle	Glaze?	Decor?	Notes
WHF-A	100	3	Cistercian?	3	17	15th - 16th			3			3		Glaze on inner edge - misfire?
WHF-A	100	4	Reduced 3	2	18	14th - 17th		1		1		2		
WHF-A	106	3	PRGW	3	25	13th - 14th		1	3			3		
WHF-A	106	3	Sandy 6	3	12	12th - 14th			3			3		Flaking brown glaze
WHF-A	108	2	Sandy 2	1	4	12th - 14th	1							
WHF-A	108	2	Sandy 6	3	8	12th - 14th		1	2					
WHF-A	108	2	Transfer Printed ware	1	1	19th - 20th			1			1		
WHF-A	108		Cisterian?	1	1	15th - 16th						1		From Sample 2
WHF-A	109	2	PRGW	1	5	13th - 14th			1			1		Carlisle buff gritty ware?
WHF-A	109	2	Sandy 6	1	2	12th - 14th			1					
WHF-A	110	3	Sandy 2	3	5	12th - 14th			3			2		
WHF-A	110	3	Sandy 6	3	14	12th - 14th		1						
WHF-A	114	4	Sandy 8?	1	2	12th - 14th			1			1		
WHF-A	120	4	PRGW	1	3	13th - 14th	1					1		
WHF-A	126	4	PRGW	2	12	13th - 14th			2			2		
WHF-A	126	4	Reduced 1	1	11	14th - 17th			1			1		
WHF-A	126	4	Sandy 6?	1	2	12th - 14th	1					1		Clear/ buff glaze
WHF-A	127	4	Cistercian?	14	209	15th - 16th	5	1	8			14		Glaze on inner break indicate misfire
WHF-A	127	4	Slipware	2	3	17th- 18th			1			2		Conjoining sherds
WHF-A	142	4	PRGW	1	23	13th - 14th	1					1		Splashy base
WHF-A	142	4	Sandy 6?	4	19	12th - 14th			3					
WHF-A	158	4	Reduced 1	2	14	14th - 17th			2			2	1	Scored parallel lines
WHF-A	158	4	Reduced 2	1	8	14th - 17th			1			1		
WHF-A	159	4	Reduced 2	1	5	14th - 17th			1			1		
WHF-A	161	4	PRGW	2	63	13th - 14th			1		1	2		
WHF-A	161	4	Reduced 3	1	12	14th - 17th			1	1		2		Very dull brown glaze
WHF-A	161	4	Sandy 6	1	1	12th - 14th								
WHF-A	162	4	Slipware	1	3	17th - 18th				1		1		Cross context join with (127)
WHF-A	165	4	Reduced 2	1	5	14th - 17th			1			1		
WHF-A	171	4	Reduced 3	1	3	14th - 17th			1			1		
WHF-A	171	4	Sandy 2	1	6	12th - 14th			1			1		
WHF-A	173	4	Reduced 2	1	6	14th - 17th			1			1		Very shiny glaze on either face. Very hard
WHF-A	178	4	PRGW	2	25	13th - 14th		2				2		2 different vessels
WHF-A	178	4	Reduced 1	3	60	14th - 17th			2	1		3		Patchy glaze above hard outer slip
WHF-A	178	4	Reduced 3	1	18	14th - 17th				1		1		Patchy glaze above hard outer slip
WHF-A	178	4	Sandy 2	4	97	12th - 14th		1	2	1		4		Outer ridges on body
WHF-A	195		Reduced	1	7	14th - 17th			1			1		
WHF-A	212	4	Reduced 1	1	11	14th - 17th			1			1		
WHF-A	U/S	2	PRGW	3	29	13th - 14th			1		2			Conjoining sherds of handle
WHF-A	U/S	2	Reduced	1	17	14th - 17th			1			1		
WHF-A	U/S	2	Reduced 3	2	8	14th - 17th			2			2		
WHF-A	U/S	4	Earthemware	1	3	17th - 18th			1			1		
WHF-A	U/S	4	PRGW	1	7	13th - 14th			1			1		Base of handle
WHF-A	U/S	4	Sandy 6	1	5	12th - 14th	1							
WHF-A	U/S	4	Stoneware	1	4	17th - 18th			1					
Total				**87**	**813**									

8. BIBLIOGRAPHY

Calendar of patent rolls Ed III 1348-50 p 1941

Hutchinson, W. 1794. *The History of the County of Cumberland*. vol II. Carlisle. p340

Camden Magna Britannia, ed London 1607 p636, Dictionary of National Biography.

Curwen, J. F. 1913. *The Castles and Fortified Towers of Cumberland, Westmorland and Lancashire North of the Sands together with a brief Historical Account of Border Warfare.* CWAAS Extra Series.

Graham, M. 2013. Report on Geophysical Survey at Wolsty Castle 2013. Unpublished Report.

Graham, T. H. B. 1911. *Extinct Cumberland Castles (Part III)*. Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society (2nd Series). Vol.11. pp 235-240

Grainger, F. 1902. *The Holme Cultram Chapels*. Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society (2nd Series). Vol. 2. pp 335-347

Grainger, F. 1921. *James Jackson's Diary, 1650 to 1683*. Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society (2nd Series). Vol. 21. pp 96-129.

Grainger, F and Collingwood, W. G. 1929. *Register and Records of Holme Cultram*. Cumberland and Westmorland Antiquarian and Archaeological Society. T Wilson and Son. Kendal.

Holme St. Cuthbert History group. 2004. Plain People, Bygone times on the Cumbrian Solway Plain. Workington. P 104-5

Medieval Catalogue London Museum (1984) HMSO London

Oblique aerial ref no NMR NY 1050/10 GBJ 01 Jan 1975

Oblique aerial ref no NY 1050/10GBJ13486/21 01 Jan 1975

Perriam, D and Robinson, J. 1998. *The medieval fortified buildings of Cumbria an illustrated gazetteer and research guide*. CWAAE extra series vol 29 p 28

Rigold, S. E. 1975. *Structural Aspects of Medieval Timber Bridges*. Medieval Archaeology. Vol 19. pp. 48-91

Walker, J and Graham, M. 2013. *St. Mary's Abbey Holme Cultram*. CWAAS Archaeological Research Reports no.4

APPENDIX I

ZOOARCHAEOLOGICAL Report

ZOOARCHAEOLOGICAL REPORT: Wolsty Castle, Cumbria

CLIENT: Grampus Heritage

AUTHOR: Don O'Meara, donomeara@gmail.com

INTRODUCTION AND PURPOSE

The purpose of this report is to outline the main observations of the bone excavated during the 2013 West Cumbria Archaeology Society excavations at Wolsty Castle, North Cumbria

The aim of the report is to produce an assessment which conforms to the standard set out by Historic England (formerly English Heritage) for the assessment of the remains of animal bones from archaeological sites (English Heritage 2014). The report contains a more detailed analysis of a horse burial encountered at the site. This horse burial consists of the bulk of the analysis within this report.

BACKGROUND

Site: The material examined here (summarized in Table 1 and Table 2) was recovered during the 2013 excavation. It includes material from a medieval ditch, and from rubble/demolition layers from the site of the former medieval tower.

Recovery Methods for the bone: All bone was hand collected.

EXAMINATION METHODS

Assessment methods: all of the material was examined over the course of two days. The assemblage is clearly divided between the animal bone fragments recovered in various contexts during the excavation (referred to here as the general assemblage), and the horse burial.

In terms of the general animal bone the material was examined visually with morphometric measurements taken when possible. Only three such measurement were taken however, due to the generally fragmentary nature of the bone and its overall moderate-poor levels of preservation.

The horse burial was visually examined, and a number of morphometric measurements taken to estimate stature, and pathology.

In the tables which accompany this report details have been entered on the species of animal present, whether the bone was from the left or the right (L/R), the amount of the bone which was preserved. For the horse this is on a scale of 1-10, with 10 being extremely well preserved. For the general assemblage this is recorded as P-10-D, with a capital P denoting a fused proximal end, and a small p an unfused proximal. Likewise a small or capital D for an unfused or fused distal end. The bone is divided into 10 divisions from proximal to distal end; therefore P-5 would denote a fused longbone with 50% of the bone from the proximal to the midshaft being present, 5-d would denote 50% of the lost half of an unfused bone being present.

Phasing/Dating: At the moment most of the material is believed to date to the 14th-16th century, with the exception of the 17th century horse burial.

Assemblage Characterisation: The general animal bone was characterised by its display of a range of taphonomic indicators. These includes moderate-heavy surface flaking on some bones, root-etching, abrasion, canid gnawing, and various butchery marks. The colour range of the bone (light yellow-brown to dark brown), and the inconsistent range of preservation suggests that this material may have come from various sources, or be material from various periods. This is testament to the generally disturbed nature of the deposits in which the material was recovered. This should be borne in mind when considering the dating of other features across the site.

The horse burial, on the other hand, showed a limited range of taphonomic markers. This is likely to be due mainly to the burial occurring as a single event, the stable/secure nature of the deposit in which the horse was buried, the lack of later disturbance of this deposit in the time between burial and excavation. Some evidence of light root etching was noted on some of the long bones.

Analysis: The general assemblage is summaries in Table 1. Bone from 22 contexts was recovered, but with generally small volumes of bone from each context. Ths species represented include cattle (20 identified bones), sheep (8 identified bones), as well as a possible canid bone (a metacarpal), 6 possible cat bones, two horse bones and a Galliform type (e.g. chicken) tibio-tarsus; the cat, horse and bird bone all coming from context **(165)**. A gracile tibia was also recovered, which is suggested as a possible red deer bone, but this fragment could not be confidently identified due to its fragmented nature.

This assemblage forms part of an Associated Bone Group as defined by Grant (1984). In this case this consists of the first type of group; i.e. animal remains which were deposited in an articulated state (Morris 2011, 12). As such, the examination of these remains does not consist of a typical zooarchaeological report (which would consist of numerous disarticulated remains) and is more akin to the examination of a single human inhumation where the bones are examined as part of a greater whole.

The purpose of this assessment report is to quantify the recovered bones, take suitable osteometric measurements in the manner suggested by von den Dreisch (1976), to identify evidence for the age at death of the animal (as per Levine 1982 and Silver 1969), and to identify possible pathological evidence on the bones (Baker and Brothwell 1980; Bartosiewicz 2013).

Horse Burial: The animal had evidently been buried as a complete animal, with no post mortem disturbance of the bones to suggest it was exposed to the open air for any notable period. The presence of bones such as the hyoid in the throat, and bones such as the coccyx demonstrate that the carcase was intact when deposited. Furthermore, the absence of gnawing on any of the bones further demonstrates that not only was the carcase deposited in the hole shortly after death, but that it was subsequently buried rapidly, presenting scavenging from animals such as foxes, rats or dogs which would all leave diagnostic traces through gnawing.

Identification was undertaken using reference material, standard texts (Hillson 1996; Schmid 1972), as well as reference material. Measurements follow the conventions set out by von Driesch (1976), while analysis was undertaken with reference to the work of Cluny-Johnson.

Species: The skeleton was examined to determine whether the animal was indeed a horse, or whether it could have been a donkey or mule. This was mainly examined via the teeth, however Peter's characteristics of the distal radius and scapula were also used (1988). The only partial penetration of the buccal fold, asymmetrical metastylid and metaconid folds of the enamel, and a notch between the metastylid and metaconid which verged more on the U-shaped than V-shaped suggested that the animal represented can be classified as a horse.

Height: Based on the measurements of the greatest length of the humerus, radius and a metacarpal the withers height of the animal is estimated at between 1408mm-1549mm, or 13.8-15 hands. This would place the animal on the boundary between being classed as a pony and a horse (13.9 hands). However, this should be considered in the contest of the wide difference between the heights as calculated from these three bones. With a GL of 304mm from the humerus the withers height would be calcaulted as 1408.7mm. From the radius GL of 353mm this would work out as a withers height of 1451.2mm. However, based on the GL of 242mm from a metacarpal this would work out as 1549.5mm. The average of these three measurements would give a withers height of 1469.8mm, or 14.2 hands, just tall enough to be classified as a horse.

Sex: The presence of fully erupted canines on the maxillary dentition suggests this was a male horse.

Butchery: Of note during the assessment was the presence of butchery cutmarks around the distal end of the left humerus. This may be attributable to the removal of the hide before the burial of the animal. However, the absence of other cutmarks on the skeleton might suggest other alternatives. The removal of the hide would ideally involve no contact between the knife and the bone, therefore a small number of cuts is consistent with removal of the hide. However, it is also possible that the knife marks represent an attempt to make the carcase easier to move. In this case by cutting the ligaments in order to fold the leg under the body before rolling in into the hole where it was buried.

Pathology: The skeleton is notable for having a number of pathological conditions. The most basic of these is bit-wear on the second lower pre-molars, and on the upper second premolars. This is more pronounced on the upper teeth than on the lower, confirming that the animal wore a bit for an extended period. Possible crib-biting evidence on the incisors was also noted. This fine wear on the teeth has been attributed to a repetitive, comforting habit which confined horse indulge in, however, the exact cause may be attributable to a number of factors which at unclear (Bartosiewicz 2013, 136).

More notable pathologies were identified on the vertebra. This included first, a spongy mass of growth on the dorsal aspect of the atlas bone. Secondly, on cervicals 1-3 the neural spines have a flattened appearance; becoming T-shaped, or horizontal, approximately half way up the neural spine. This condition is not present on any of the other vertebra. Thoracic vertebra 12-18 showed further pathological growth amongst the neural spines, but not between the vertebral centrums. Furthermore lumbar vertebra 1-2 showed the early stages of growth, but had not yet fused. This might be seen as significant as it might suggest vertical pressure from a rider, or a load, rather than the horizontal pressure from the pulling of a plough. Ossification of this nature has been well attested in archaeozoological literature (Baker and Brothwell 1980; Bartosiewicz 2013), but the number of vertebra directly involved here might be considered atypical for medieval England. Severe cases have been reported from early medieval sites on Continental Europe (Bartosiewicz and Bartosiewicz 2002). It is unclear whether this case is attributable to riding or the use of the animal as a pack-horse. The lack of corresponding severe pathology on the limb bones suggests that rather than merely old age, this animal was exposed to

intensive, repetitive strain over a relatively short life-span. It might be suggested that a working life on the soft boggy Solway topography may have put a strain on the animal which might be atypical in other regions.

Conclusions: The general remains are of little interpretative value for the site economy during the medieval period as they appear to come from a mixture of sources, disturbed over time. They do reveal issues relating to the formation of the site however, which may be pertinent for the general interpretation of the archaeology layers, and their stratigraphic integrity.

However, the horse skeleton is of particular interest due to its almost complete nature and the unusual spinal pathologies. More recently animal burials, or ABG's (Associated bone groups), have received more attention than previously given, particularly in medieval contexts (Morris 2011, 119).

Baker, J. R. and Brothwell, D. 1980. Animal diseases in archaeology. London, Academic Press.

Bartosiewicz, L. 2013. *Shuffling Nags and Lame Ducks*. Oxbow Books, Oxford.

Bartosiewicz, L. and Bartosiewicz, G. 2002. "Bamboo Spine" in a Migration Period Horse from Hungary. *Journal of Archaeological Science* **29**, 819–830.

Johnstone, C.J. n.d. A biometric Study of Equids in the Roman World. Unpublished PhD. Thesis Submitted to Department of Archaeology, University of York (2004).

English Heritage. 2014. *Animal Bones and Archaeology: Guidelines for Best Practice*. English heritage, Swindon.

Morris, J. 2011. *Investigating Animal Burials: Ritual, Mundane and Beyond*. Oxford, British Archaeological Report British Series 535.

Schmid, E. 1972. *Atlas of Animal Bones*. Amsterdam, London, New York. Elsevier.

Silver, I. A. (1963) The ageing of domestic animals. In: Brothwell, D. Higgs, E. S. and Clark G. (eds.) *Science in Archaeology*. London, Thames and Hudson. 283-302.

Von Driesch, A. 1976. *A Guide to the Measurement of Animal Bones from Archaeological Sites*. Peabody Museum, Harvard.

Element	L/R	Present	Notes
Cranium	-	6	Though much of the skull was present it was in an extremely fragmentary state.
Mandible	L	7	22a-101.8; 22b-78.4; 22c-61.1; 37-39.0; 36-36.8; 34-94.2,
Mandible	R		
Atlas	-	9	Some of the wings of the bone were broken off. A spongy mass on the dorsal-caudal aspect of the bone was noted
Axis	-	9	Very well preserved
Cervicals	-	9	All in very good condition, 1-3 flattened neural spines, 4-5 well preserved
Thoracic	-	9	1-11 well preserved, 12-18 fused along the neural spines
Lumber	-	9	1 is fused to the adjacent thoracic vertebra, some growth between 1-2 but not fused
Saccrum	-	9	Well preserved
Scapula	L	5	GLP: 104.8; SLC: 67.2; BG: 47.7; LG: 60.26. The blade is broken, but the preservation is excellent
Scapula	R	7	GLP: 101.9; SLC: 67.0; BG: 48.6; LG: 60.86. The blade is broken, but the preservation is excellent
Humerus	L	10	GL: 304; Bd: 83.5; Bp: 101. Cutmarks around the distal half of the bone on all sides
Humerus	R	8	Though much of the right was present the bone was itself fragmentary
Rad-Ulna	R	9	Radius: GL: 353; Bp: 87.3; Bd: 80.2; SD: 41.4; The ulna head was broken off
Rad-Ulna	L	8	Though much of the left was present the bone was itself fragmentary
M-carpal	L	10	GL: 242; Bp: 54.9; Bd: 54.3; SD: 33.9
Innominate	-	7	The pelvis was in a generally poor state of preservation, being highly fragmentary
Femur	L	8	Highly fragmented
Femur	R	8	Highly fragmented

Table 1: Horse remains measurements recorded as part of the assessment

Context	Species	Element	L/R	Present	Notes
100	Cattle	Tooth			Loose molar, heavily in wear
106		Frags			Fragments of burnt bone
109		Frags			Fragments of burnt bone
126	Cattle	Ulna	L	p-8	Lightly abraded, with gnawing around proximal head
126	Unid	Tooth			Unidentified tooth, possible badger?
126		Frags			c10 fragments of burnt and unburnt bone
138		Frags			Frags including cattle and pig rib midshafts, large and medium long bones frags, bird tibia midshaft, plus misc. small fragments
139		Femur		1	Fragments of large mammal femur. Very poor preservation
139	Sheep	Radius		1	Mid-shaft fragment of distal end of radius
140	Cattle	Scapula	L	1	Fragment of scapular blade
143	Horse	Prox-phalange		P-3	Fragment of proximal phalange, Bp:50.2
143	Cattle	M-podial		P-1	Fragment of very abraded metapodial
159		Rib			Midshaft fragment of large mammal rib
161	Cattle	M-carpal	L	3-D	Bd: 48.8
161	Cattle	Inter-phalange		P-9-D	
161	Cattle	Calcaneous	L	p-7	Abraded, with an unfused head
161	Frags				Fragments, including 9 large mammal midshaft framgnets, a cattle unfused vertebral centrum, plus c.10 smaller unid fragments
162	Sheep	Innominate	L	3	Fragment around acetabulum, possible cutmarks around acetabulum
162	Cattle	Prox-phalange		P-9-D	Possible gnawing on the proximal end.
162	Sheep	Radius	R	4-d	
162	Cattle	Radius		1-d	
162		Ribs			2 fragments of rib midshaft
165	Cattle	Radius	R	P-4	Irregular distal break, Bp: 70.3
165	Cattle	Humerus	L	3-D	Cranial aspect of distal condyle chopped through, gnawing around lateral epicondyle

165	Sheep	Humerus	L	6-D	Very poor preservation, heavily abraded
165	Cattle	Innominate	L	1	Acetabulum fragment with puncture marks from gnawing
165	Unid				Fragment of large mammal long bone
168	Sheep	Humerus	L	4	Distal mid-shaft fragment, probable butchery chop through the distal end
168	Cattle	Tarsal	L	10	Central tarsal
169	Cattle	Scapula	L	1	Fragment of scapular blade, deep chop marks on medial side, at scapular neck
169	Sheep	Calcaneous	L	8	Very abraded example
169	Cattle	Vertebra	-	2	Fragment of wing of thoracic vertebra
169		Frags			fragment of Large mammal long bone
171	Cattle	Humerus	R	6	Proximal and distal ends have been extensively gnawed
171	Cattle	Tibia	R	1-D	
171	Cattle	Talus	R	7	Moderately abraded
171	Sheep	Talus	R	10	Excellent preservation, showing very different appearance to other bones from this context.
171	Felis				6 possible cat bones; metapodial, femur, radius.
171		Frags			2 large mammal rib midshaft fragments, 1 ossified cartilage
173	Unid	Ribs			7 large mammal rib midshaft fragments
173		Innominate			Fragment of large mammal illiac crest
173	Unid				Fragment of medium mammal longbone, mandible ramus, and vertebra
174					Large mammal seismoid bone
174	Unid				2 large mammal bone fragments
178	Cattle	Hyoid		7	
178		Carpal		10	Cattle/Horse carpal
198	Deer?	Tibia		3	Midshaft fragment of large mammal tibia, its gracile nature might suggest deer, vivianite on surface
198		Tooth		7	Loose P3
208		Ribs			1 large mammal rib, 1 medium mammal rib fragment, 1 large mammal midshaft fragment

217		Frags			4 fragments of medium-large mammal bone
218	Galli-form	Tibio-T		P-4	
U/S	Horse	M-podial		0-D	Fragment of distal metapodial
U/S	Canid	M-carpal		P-10-D	Possibly a fox metacarpal
U/S	Cattle	Tooth		8	Loose molar
U/S	Sheep	Tooth		10	
U/S		Rib			Medium mammal midshaft fragment
	Unid				large mammal rib midshaft fragment, 4 long bone fragments

Table 2: The general animal assemblage

APPENDIX II

Environmental analysis of Insect remains from samples at Wolsty Castle, Cumbria (2013)
Report by Lynda Howard 05/07/2016

Introduction
One environmental sample from the moat at Wolsty castle extracted during excavations in the summer of 2013 and weighing 3.0kg was analysed for insect remains. The material was taken from the top of a peat layer containing abundant wood fragments, just below a demolition layer. Beetle elytra were clearly visible in the sample.

Methodology
The sample was disaggregated in warm water and processed by paraffin floatation (Coope 1986) sieving at 90μm. The resulting floats were stored in 70% IMS and insect fossils sorted by low power binocular microscopy. Beetle fragments were stored in IMS and taken to Birmingham University where they were compared with modern examples in the Goring Collection under the supervision of Dr David Smith. Beetle nomenclature follows that of Duff (2012).
Due to the large amount of material which contained a considerable volume of insects, it was necessary to identify a smaller but representative sample.

Results
The sample consisted of black peaty material with abundant wood fragments. No lithic fragments were recorded.

Insect remains
A total of 40 beetle taxa were identified from a total of 101 individuals and one caddis fly larva. These numbers represent less than 25% of the total from the sample due to the necessary subsampling.
Other unidentified taxa included chironomid larvae and orabitid mites (decomposers)

Discussion and environmental interpretation
The beetle assemblage consists of a mainly environmental background and very few synanthropic (human associated) taxa. Fourteen taxa (35%) are considered aquatic, none of which are associated with flowing water (*Helophorus grandis, Helophorus minutus, Ochthebius sp., Agabus bipustulatus, Agabus affinis, Hydraena britteni, Hydraena sp., Hydrochus brevis, Colymbetes fuscus, Hydrobius fuscipes, Ilybius ater, Haliplus sp., Dryops sp.,* and *Hydroporus sp.*). The most abundant taxon present was Hydraena which with 22 individuals, representing 22% of the total sample total of 101, was by far the most abundant taxon. Therefore, aquatic taxa accounted for around 40% by total abundance. Two are known to be acidophilous (*H. britteni* and *Ilybius ater)*. Several taxa are associated with marginal wet environments such as *Cercyon analis* and *Lesteva longelytrata,* together with *Chrysomela aenea* which specifically prefers alder carr.
Several taxa are associated with foul organic conditions, often dung including *Cercyon analis* and *Cryptopleurum minutum*. *Aphodius sphaecelatus/prodromus* and *Aphodius contaminatus* are dung beetles associated with all types of herbivore dung (10% total taxa). Other taxa associated with open grazed land with either dung or decaying vegetable matter are *Anotylus rugosus, Philonthus sp., Gyrohypnus angustatus, Tachinus signatus, Trypocopris pyrenaeus, and Onthophilus striatus* (15% total taxa).
There are also several taxa associated with sandy, disturbed arable ground (*Phyllotreta* sp., and the weevils *Ceutorhynchus* sp., *Sitona lepidus* and *Coelositona cambricus* (10% total taxa)). *Aphodius contaminatus* is also noted to prefer sandy soils.

From other environmental indicators it is possible to detect the presence of plant taxa such as stinging nettles from *Brachypterus urticae*. A couple of taxa indicate woodland (*Crepidodera aurea* and *Chrysomela aenea*).
The large variety of taxa from different environments would indicate a fairly healthy and unpolluted ecosystem.
There is one synanthropic species present but represented by only on specimen. *Sitophilus granarius* is a pest of stored grain. There were also two individuals of *Anobium punctatum* (woodworm) present but these can be found in any source of decaying wood and do not necessarily indicate a structural infestation.
The caddis larva – *Athripsodes aterrimus* inhabits stagnant to slow flowing water and prefers a muddy to sandy substrate.
Environmental information on Coleoptera from BUGS database (Buckland and Buckland, 2006), available to download online.

Conclusions

The sample from the moat represents mainly local aquatic species from the standing water present with smaller inputs from the surrounding disturbed arable pasture on mainly sandy soil. There is little evidence of local habitation which may have ceased by the time of the filling of the moat.

References

Buckland PI and Buckland PC, 2006. Bugs Coleopteran Ecology package Software [Component versions: Bugs CEP: Release 7.43; Bugsdata: Release 7.09; Bugs MCR: Release 2.0; Bustats: Release 1.2] [Downloaded/CDROM:Oct 2016].
Coope GR, 1986 Coleoptera analysis. In: B.E. BERGLUND, ed, *Handbook of Holocene Palaeoecology and Paleohydrology.* Chichester: John Wiley and Sons: 703-713.
Duff AG, 2012 Checklist of beetles of the British Isles, 2nd edition. Pemberley books, UK.

Table 1 Insect taxa present in sample from Wolsty castle moat

Taxon by family	MNI	L elytra	R elytra	Pronotum	Head
Haliplidae					
Haliplus sp.	1	1	1		
Helophoridae					
Helophorus grandis	2	2	1	1	
Helophorus cf. minutus	1			1	
Hydrochidae					
Hydrochus brevis	3	3	2		
Hydrophilidae					
Hydrobius fuscipes	1			1	
Coelostoma orbiculare	1	1	1	1	
Cercyon analis	9	8	9	1	
Megasternum obscurum	1				
Histeridae					
Onthophilus striatus	1				
Hydraenidae					
Hydraena britteni	1			1	
Hydraena sp.	22	18	23		
Ochthebius sp.	2	1	2		
Dytiscidae					
Agabus affinis	3	3	2	2	
Agabus bipustulatus	1				
Colymbetes fuscus	1	Bits			
Hydroporus sp.	1				
Ilybius ater	1	1			
Agabus/Ilybius sp.	1				
Staphilinidae					
Lesteva longoelytrata	2	1	2	1	
Tachinus signatus	4	4	3		
Tachyporus sp.	1	1			
Anotylus rugosus	4		1	4	
Stenus sp.	2	2	2		
Philonthus sp.	1	1			
Gyrohypnus angustatus	1	1	1		
Xantholinus sp	1			1	
Geotrupidae					
Geotrupes pyrenaeus	1			1	
Scarabaeidae					
Aphodius sphaecelatus/prodromus	5	1	1	1	5
Aphodius contaminatus	1	1	1		1
Phylopertha horticola	1				1
Dryopidae					
Dryops sp.	1			1	

Ptinidae					
Anobium punctatum	2	2	1		
Kateretidae					
Brachypterus urticae	3	1	3		
Chrysomelidae					
Phyllotreta sp.	2	2			
Chaetocnema concinna	2	2	1		
Chrysomela aenea	1				
Crepidodera aurea	1		1		
Dryophthoridae					
Sitophilus granarius	1			1	1
Curculionidae					
Ceutorhynchus sp.	8	8	7		
Coelositona ?cambricus	1				1
Sitona lepidus	2				2
Trichoptera					
Athripsodes aterrimus	1				

APPENDIX III

ENVIRONMENTAL REPORT *by* ***Patricia Shaw***

Introduction

Patricia Shaw was commissioned by Mark Graham, on behalf of Grampus Heritage and Training Ltd (GHTL), to undertake an assessment of the plant remains recovered from samples at the site of Wolsty Castle, Wolsty Hall Farm, Wigton. This work is in addition to the community geophysical survey and archaeological evaluation report on the environs of the site carried out by GHTL, following the successful bid for tender to Allerdale Borough Council (2013). The evaluation produced a wealth of archaeological remains and associated biological samples.

This report on the environmental remains, covers works as outlined in the project design 'Sule Wath' Landscape Partnership Scheme Heritage Steering Group (Graham & Walker 2011), with regard to the analysis of the soil samples recovered from Wolsty Castle in 2013. The works have been carried out according to English Heritage guidelines (EH; Jones 2011), and as set out in the Institute for Archaeologists (IfA) guidelines (IfA 2001a & b; 2008).

The main objective of the field evaluation was to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record these wherever present. All trenches were excavated down to the top of the natural substrate. Additional to this, and covered by this report, objectives were:

- to recover palaeoenvironmental material where it survived, especially that useful for dating purposes
- to analyse the plant macrofossils in terms of methodology, sampling strategy and species encountered in order to understand the site and the landscape formation processes.

As part of the requirements of the project design all aspects relating to the biological samples from the site were adhered to in the work. The work was also consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), English Heritage (Jones 2011), and generally accepted best practice procedures (Brown 2007; DoE 1987, 1990a-c; EH 1991, 1995, 2004, 2006, 2011, 2014; IfA 1992, 2001a & b, 2008; Jones 2011; Murphy & Witshire 1994; Shaw 2008). The work sought to add to the knowledge of the Resource and Research Agendas for the medieval period (Newman, C. 2006a; Newman & Newman 2007); possibly also adding to the early medieval period Resource and Research agendas (Newman 2006b; Newman & Brennand 2007 respectively), and the Research Framework for the North West Region (Chitty & Brennand 2007).

Revealing archaeological remains in each of the trenches excavated, the evaluation succeeded in amplifying the knowledge of the site of Wolsty Castle; particularly Trench 4 where major structural remains were encountered. The majority of the surviving features and the two extant stone remnants date to the medieval period, although tight dating is difficult as there were few artefacts recovered.

The moated site of Wolsty Castle can be found in the field to the rear of Wolsty Hall Farm, in the civil parish of Holme Law. This small hamlet is south of Silloth-on-Solway and west of Abbey Town. The castle appears in the Historic Environment Record as number 1013508 in the Sites and Monuments Record. This listing occurs since on the moated platform can be seen the remains of a structure, thought to be a fortified dwelling or castle from around the period 1250-1350. It was said to be historically linked to Holme Cultram Abbey at Abbeytown.

However, moated sites built throughout the medieval period, are widely scattered throughout England and exhibit a high level of diversity in their forms and sizes. They form a significant class of medieval monument and are important for the understanding of the distribution of wealth and status in the countryside. Many examples provide conditions favourable to the survival of organic remains, particularly within the moat. Despite major stone robbing, the moated site of Wolsty Castle survives reasonably well and remains unencumbered by modern development. It is a rare example in Cumbria of a moated castle constructed for the purpose of protecting a nearby abbey, in this case Holme Cultram. The site was revealed to contain buried remains of the medieval castle, which is known from documentary sources, to have been occupied from the early 14th to the mid-17th centuries.

What appear to be the remnants of a moated castle or fortified house were recovered during the excavation. This was the first known thorough investigation of the site. Phases of occupation were difficult to determine as artefacts were few and building seemed to be mainly carried out in one phase. The intense community involvement with this project enabled the environmental samples to be used as part of a training programme for the removal and documentation of biological samples in the field. The importance of meticulous recording and archiving was learned by the volunteers. This report then fulfilled some of the criteria of the initial project as part of the Solway Wetlands Landscape Partnership Scheme, to add to the knowledge of the landscape heritage surrounding the peat bogs of the Solway Plain Area of Outstanding Natural Beauty (AONB), as well as the aims of Grampus Heritage and Training Limited.

The methodology below follows English Heritage guidelines (Jones 2011) and Shaw (2008) with reference made to Pearsall (2000) for the processing and assessment of soil samples retrieved from archaeological sites. The area of excavation at Wolsty Castle provided conditions of various degrees in that some of the contexts were moist and some were dry. Preservation of the organic remains was then expected to be variable. Analysis of all the recovered material is skewed due to factors such as none recovery of pertinent material, degradation of originally deposited material, degradation of material during processing, and differences between the preservation of the phases of occupation.

Post-excavation study of the plant macrofossils and other environmental material was addressed in this report as follows:

- to establish the types of plants encountered and state their habitats;
- to analyse them statistically if appropriate to determine trends and patterns;
- to recover plant and other material, especially that useful for dating purposes

METHODOLOGY

Of the contexts excavated some 16 were considered worth sampling due to their organically rich content. All 14 of the whole earth samples were selected for processing as their potential was high, due to their rich organic content. This lead to their full analysis as the material was seen to be richly organic in some samples during processing. This will help provide further information as to the depositional processes involved in their formation. The methodology employed required that the whole earth samples (soil matrices) be broken down and split into their various different components. This was achieved by a combination of water washing and flotation.

The process of floatation, by passing the sample through a floatation tank (see Figure 1 below), separates the matrix of the soil into the lighter mainly organic fraction and the heavier mineral content of mainly sands, silts, clays and stones. The two resultant sub-samples are the flot and the retent or residue respectively. The fine soil matrix washes through the mesh and settles in the bottom of the tank. The flot consists of the material that floats on water as the light or floating fraction. This produces mainly organic and charred remains. The heavy, retent fraction consists of the denser material

that usually sinks, including any waterlogged material. The method relies purely on the variation in density of the recovered material to separate it from the soil matrix, allowing for the recovery of eco-facts and artefacts from the whole earth sample. The recovered remains can then be assessed for content. A table with details of the samples taken can be seen as Appendix 3. Volunteers took part in floatation of the samples seen below.

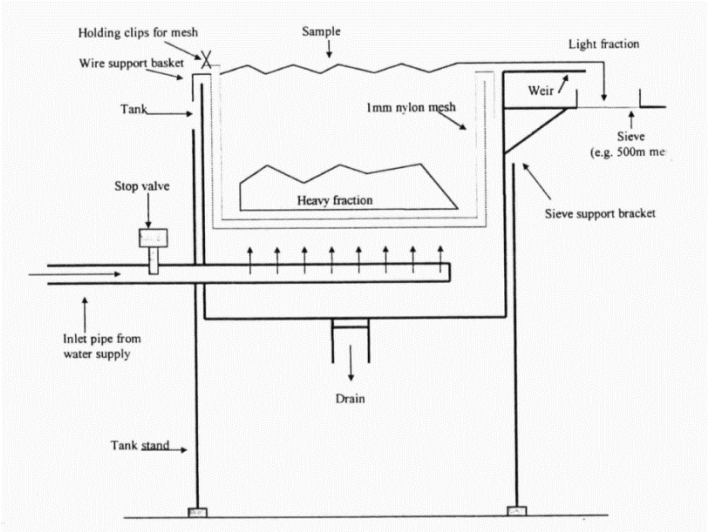


Figure 1: Schematic drawing of a 'Siraf' Style Floatation Tank. © P. Shaw

The retent, like the residue from wet sieving, will contain any larger items of bone or artefacts. The flot or floating fraction will generally contain organic material such as plant matter, fine bones, cloth, leather, and insect remains. A rapid scan at this stage allowed further recommendations to be made as to the potential for further study by entomologists, faunal specialists or palaeobotanists with a view to retrieving vital economic information from the samples. Favourable preservation conditions can lead to the retrieval of organic remains that may produce a valuable suite of information in respect of the depositional environment of the material, which may include anthropogenic activity, seasonality and climate, and elements of the economy.

The more of the sample that can be processed the better the interpretation of the results from it. The entire recovered matrix was processed in most cases as retention of a sub sample for parasite analysis was deemed unnecessary due to the lack of waterlogged material in relation to human or animal faecal waste. Both the retent and the flot residues will be examined and a full report of the results produced by myself.

RESULTS AND PRELIMINARY ASSESSMENT

The samples recovered were from fills of pits and some were deposited contexts. One was recovered as a 'spot' sample and was the skeleton of a horse or pony that will be dealt with separately in the bone report to analyse it for age, sex, dimensions and whether it had been used for traction or riding. The retents from all the samples contained stones and gravel to some degree. There were also small amounts of other material present as charcoal, coal, mortar, cinders, pottery, glass, lead, iron, nails, bone, and burnt bone. One seed but no nutshells were found in any of the retents. Initial assessment of the flots was expected to produce organic material such as bone fragments, fish bone, burnt bone, charred grain, seeds, roots, twiglets and moss, with possible fibres and insect remains. Inorganic remains may be recovered as mortar, plaster, coal, charcoal, nails, iron pan, and cinders. A list of environmental samples taken can be seen in Appendix VI.

Full analysis and recording was carried out to assess the interactions that occurred which led to the recovery of these matrices and their associated ecofacts and artefacts. Many of the retents have already been examined by volunteers, keen to recover and learn to identify finds. The flots were examined under a microscope, to record seeds present and the background matrix associated with them, to determine the types of environment from which they came. This was achieved using reference material such as *Oxford dictionary of ecology* (Allaby 1994), *Atlas of Seeds and Small Fruits of North-west-European Plant Species, with Morphological Descriptions* (Anderberg 1994; Bergrenn 1969, 1981), *A Modern Herbal* (Grieve 1977) and *Seed Identification Handbook: Agriculture, Horticulture and Weeds* (Jones *et al* 2004) for interpretation. Nomenclature follows Stace (1997).

Examination of some of the material delivered evidence of charred grains in greater numbers than expected on the site; evidence of medicinal plants as well as evidence for fuel consumption on the site. The potential for the material recovered and processed was very high.

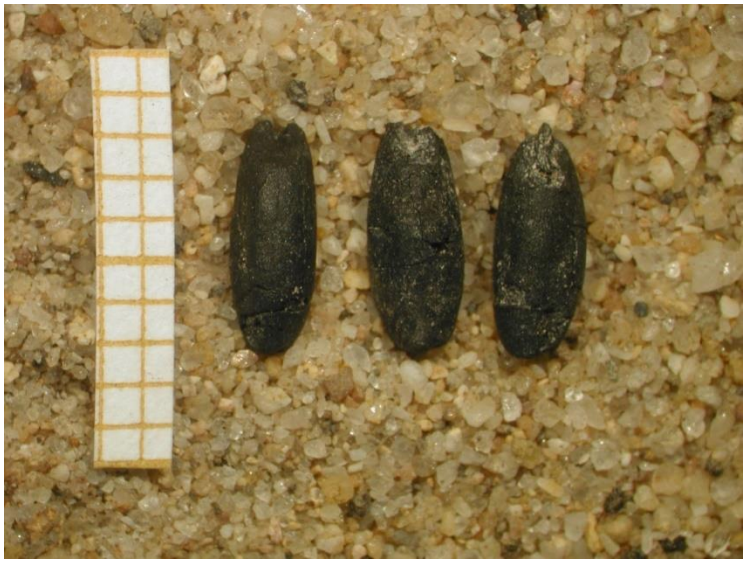


Plate 1: An example of charred grain such as that recovered from the soil samples. The grain from Wolsty is reduced in size by comparison of standard cereal size.

Analysis of biological samples

Samples appear below in Sample number order. They are described relating to the table (Appendix VI) as 0 = absent, 1 = present, 2 = frequent and 3 = abundant. Charred grain appears in the table as actual counts. The substance of the retent or retained portion of the soil matrix is discussed first, as this is the background material from which the organic remains came. This was used to determine the type of environment present at the time of deposition of the soil matrix. This is followed by the interpretation of the organic remains for each sample.

TRENCH 2 - SAMPLES FROM CONTEXTS (109) AND (108).

Both these samples came from Trench 2 and were associated as being from the same ditch. The cut was [107]; context (109) being the primary fill and (108) the secondary fill. Excavation of Trench 3 revealed the same ditch, given cut number [123] with various fills discussed below. (See Trench plans 2 and 3, Figure 3).

Context (109) Trench 2.

Context (109) was the primary fill of a ditch in Trench 2. Associated with context (108) below, the secondary fill, the cut was [107]. The ditch can be seen to carry on and was further excavated in Trench 3. This fairly compacted dark grey silty clay had 30% inclusions of pebbles. Medieval pottery and a metal object were recovered from it during excavation. It extended throughout the excavated portion of the ditch.

The retent contained fragments of degraded wood, some resembling small stakes or pegs. Several small fragments of charcoal were present and a few of burnt bone. Medieval pottery and a metal object were hand recovered during excavation. A stone from the species *Prunus* was present, which was larger than 1cm. Damsons in the Medieval Period were selectively cultivated to become the more domesticated and sweeter tasting plums, of which this may be an example. A small amount of grass roots were present in the retent.

Present in the flot were grass roots, fibrous plant material, worm cases, spheres (1mm diameter) resembling glass, burnt bone, and beetle fragments. Only one small fragment of charcoal occurred in this flot matrix. No other charred matter was present. Seeds present were as *Chenopodium album* and *Bonus Henricus* plants of wide niches, nettles *Urtica urens* of cultivated and wasteland, and *U. dioica* of woodlands and hedgerows, *Leonarus cardiaca* L. (motherwort), a plant of wide niches, *Stellaria media* (common chickweed) a plant of waste ground, *Rubus* species (brambles) of hedges, scrub, woods and heathland, *Sambucus* species (elder) common small trees or shrubs of hedges and woodland, *Rumex* (dock) and *Polygonum* species having types that occupy many different habitats, and *Cirsium vulgare* (common thistle), a weed of fields, meadows, wasteland and pastures.

Other species present were *Polygonum aviculare* and *Lapathifolium*, both of wide spread niches and open ground, as well as *Ranunculus repens* (creeping buttercup) a species of wet meadows, pastures, woods and dune slacks that can grow on clay, or *bulbosus* (bulbous buttercup) a species of dunes, grassy slopes or calcareous sub-strata. Both can be used as a famine food, although all plant parts are toxic in their raw state and must be cooked before eating! *Chenopodium* species present are known to have been used as subsistence foods in the Medieval period. Also present were *Potentilla* species as *recta* (rough fruited cinquefoil) and *verna* (spring or spotted cinquefoil), both of waste and grassy places.

The residue of this flot, containing a large proportion of decayed plant matter, has an odour of decay and cess! The composition of the matrix as mainly uncharred and degraded plant material probably originates from the period when the ditch was still open. Leaf litter and other plant matter would have become deposited in it. The smell of cess indicates that human waste was deposited there as well.

Context (108) Trench 2.
Context (108) in Trench 2 was the secondary fill of ditch cut [107], above (109), the primary fill. This fairly compact grey brown sandy clay soil had inclusions of pebbles and fragments and pieces of sandstone. Context (108) extends throughout the excavated portion of the ditch. Bone and burnt bone fragments were present in the retent, as well as fragments of coal and charcoal. Grass roots and iron pan had formed around some root systems; the cylindrical material could be seen in the retent.

In the flot grass roots were abundant; charcoal was frequent; spores, worm cases, glass like spheres (1mm), burnt bone, beetle parts, and fibrous plant parts were present. Seeds of *Urtica dioica* (common nettle) were present, as were *Stellaria media* (common chickweed) a plant of waste ground, *Cirsium vulgare* (common thistle), a weed of fields, meadows, wasteland and pastures, and *Eleocharis palustris* the common spike-rush, an inhabitant of ponds, marshes, ditches and riversides.

Charred grain numbers were high. Oats had a count of 40; indeterminate grain, where identifying features were lost during the charring process, had a count of 20. Most of the grains were whole but a few were fragmentary. The charred grain measured smaller than normal size, even accounting for the charring. The frequent occurrence of charcoal probably indicates fire or grain drying waste deposited in the ditch.

TRENCH 3 - SAMPLES FROM CONTEXTS (112), (110), (122), (124) and (125).
Context (112) was from the fill of a truncated posthole, cut number [111]. Context (110) was a pad of yellow clay above the ditch cut [123] that was seen in Trench 2 as cut [107]. Context (122) was the primary fill of a large posthole that lay below the brown soil (106). Contexts (124) and (125) are respectively the secondary and primary fills of the ditch cut [123].

Context (112), Trench 3.
Context (112) was removed from the fill of a truncated post hole in Trench 3. The cut was context [111]. This loosely compacted soil had inclusions of sand and dark grey brown clay with some small gravel. Context (106) above it had inclusions from the medieval period and a matrix of brown soil. The retent contained a degraded handmade iron nail and fragments of other degraded iron, probably from nails. Small pebbles and gravel were also present.

The flot contained abundant grass roots with fibrous plant material probably of grass stems, worm cases, fungal spores and flecks of charcoal were present. Charred plant remains occurred as five indeterminate grains that are bulbous in shape and therefore not oats which are long and slender. No visible identifying features were noted; their ovoid shape resembled barley, rye or wheat. Their general size was unusually small though.

Context (110), Trench 3.
Context (110) was a pad of yellow clay that spread across Trench 3 and lay below context (106). A small fragment of burnt bone and a few of charcoal were recovered from the retent.

The flot contained abundant grass roots with charcoal, fibrous plant material, and worm cases present. A charred oat and an indeterminate charred grain of rye, wheat or barley were noted. Seeds presented as *Stellaria media* (common chickweed) a plant of waste ground, *Euphorbia* species (spurge) that tolerate drought and inhabit a wide range of niches, a large and diverse genus of flowering plants, and *Prunus* species as sloe, bullace, damsons, cherries and plums. Due to the size of the stone it is either a bullace or cherry.

Context (122) Trench 3.
Inclusions of artefacts of Medieval date were recovered from context (106) in Trench 3. Below this a large posthole cut [121] had the primary fill (122), a fairly compact dark brown sandy clay soil, with inclusions of sandstone and pebbles. The retent contained fragments of burnt bone, charcoal, coal, sandstone fragments and brick or tile fragments and a small amount of grass roots were present.

Charred grain, again small in size, showed counts of oats 15 and indeterminate grain counts were 5, their lack of identifying features and bulbous shape again signifying wheat, rye or barley. Grass roots occurred in abundance in the flot matrix and charcoal was frequent. Fibrous plant parts and worm cases were present. Seeds present were *Chenopodium album*, a plant of wide niches, *Stellaria media* (common chickweed) a plant of waste ground, *Rubus* species (brambles) of hedges, scrub, woods and heathland, *Sambucus* species (elder) common small trees or shrubs of hedges and woodland, Poa species, *Polygonum* species that have types inhabiting many different niches. A stone from the species *Prunus* was present, which was larger than 1cm. Damsons in the Medieval Period were begun to

be selectively cultivated to develop into the more domesticated and sweeter tasting plums, of which this may be an example. This matrix seems to be that of fire waste that may have been spread on the fields to enhance them.

Context (124) Trench 3.
The secondary upper fill of ditch cut [123] in Trench 3 was context (124) that lay above the primary fill (125), discussed below. The cut was seen in Trench 2 as [107]. This fairly compact dark grey brown soil had inclusions of pebbles and gravel with some sandstone fragments. Grass roots and sandstone fragments were present in the retent, as well as fragments of burnt bone, charcoal and sandstone. Again iron pan had formed around some root systems leaving the cylindrical deposit in the retent.

In the flot matrix grass roots were abundant; spores, metallic and glass like spheres, worm cases, charcoal, and fibrous plant matter were present. Charred grain occurred as 2 indeterminate and 3 oats that were again all smaller than normal. Seeds present occurred as *Chenopodium album* and *Bonus Henricus* plants of wide niches, *Stellaria media* (common chickweed) a plant of waste ground, *Poa* of the wide niche grass family, *Rumex* (dock) species that have types that occupy many different habitats, and *Chrysanthemum segetum* the corn marigold, a casual weed of arable fields. This matrix has no defining species, indicating natural deposition of the species although seeds were fossilised to some degree. The sandstone fragments could have been from the period when the castle was dismantled.

Context (125).
This sample was recovered as the primary fill of ditch [123] in Trench 3. The moist, compact, dark grey clay matrix with inclusions of pebbles and small cobbles was the primary fill at the bottom of a ditch beneath secondary fill (124) and in cut [123]. The retent was mainly stones ranging from medium sized gravel to small cobbles. Of the flotted matrix, almost half was stone and gravel and was discarded after recording. Metallic fragments removed from the retent with a magnet were abundant. Iron pan, burnt bone and sandstone fragments were present.

In the flot matrix charcoal was abundant; grass roots were frequent; spores, fibrous plant matter and worm cases were present. A total count of 8 charred oats were noted in the flot matrix and this was the only cereal present. *Urtica dioica* (common nettle) was frequent, whilst *Urtica urens* (small nettle) was present. Other seeds present were *Leonarus cardiaca* L. (motherwort), *Rubus* species (brambles) of hedges, scrub, woods and heathland, *Sambucus ebulus* (dwarf elder) common small trees or shrubs of hedges and woodland. A sedge of Carex type and a soft-grass of *Holcus* (either *mollis* or *lanuca*) were probably modern intruders as they show no signs of fossilisation or charring. The above charred matrix may indicate fire waste and use of different fuels at various times that were then deposited in different sections of the ditch.

TRENCH 4 – SAMPLES FROM CONTEXTS (145), (152), (169), (188), (173), (198) AND (195).
Context (145) was the fill of pit [144] that lay at the western end of the structural wall base (158). Context (152) was associated with the hearth (153) near the curtain wall, and is within shallow cut [151]. Context (169) was the secondary fill of the moat seen in the North West facing section that was excavated to determine the build-up of deposits at this point. Context (188) lies below context (169) discussed above, in the same section of the moat.

Context (173) seen in Figure 5 was a shallow deposit lying to the south of the most southerly structural wall base, and continued into the section at the southern extent of the trench. Many different deposits were formed here; some of demolition and others, such as this one, richer in organic matter. Contexts (198) and (195) were in another section of the moat, towards the north east, and are associated with the timbers of the bridge structure that were partially excavated.

Context (145) Trench 4
Context (145) lay in the cut [144] of a pit that appeared to have been lined with stones as seen in Figure 8: Section 3. This loose friable dark grey brown silty sand pit fill had occasional lenses of darker grey silt within it, as well as stones and rubble. Medieval pottery and some bone were found at the top of this pit fill. The pit seen in Figure 5 was of unknown purpose at the west end of the structural wall base towards the north end of Trench 4, partly in the west section edge. In the retent Medieval pottery was frequent. Coke and burnt bone were present.

The flot contained abundant fibrous plant matter as root and leaf fragments or mould and small twigs; clinker, beetle parts and moss were also present. Seeds were poorly represented and there was only one partial charred oat with no other charred grain. The ruderal common chickweed *Stellaria media* was frequent; *Chenopodium* species were present, as were common nettle *Urtica dioica* of woodlands and hedgerows, *Rubus* species (brambles) of hedges, scrub, woods and heathland, *Rumex* (dock) and *Polygonum* species that have types occupying many different habitats, and moss fragments. Present were seeds of *Senecio aquaticus* (Hill) or marsh ragwort that grows by streams, marshes and damp meadows.

There is little to define the habitat that resulted in this suite of seeds except that the leaf mould and abundant fibrous plant matter may indicate, with the presence of the marsh ragwort and the rubble that the pit remained open to accumulate such matter, sometimes with standing water in it. There is a possibility that this pit was used purposely for keeping a store of water for domestic or other use.

Context (152).
The hearth (153) seen in Figure 5 lies close to the wall of the castle on the south side of it as context (156). Within shallow cut [151], the deposit or fill (152) was sealed by the yellow clay (140), and was associated with the hearth being adjacent to it. The yellow clay extended to the curtain wall and to the structural wall base (159) to the south of it. This loosely compacted black matrix of what appeared to be soot, had a few inclusions of burnt bone, burnt clay, charcoal, seeds and pebbles.

Burnt peat and burnt clay were frequent in the retent. Sandstone fragments, burnt bone and bone were present. Charcoal was frequent in the flot, as was peat, with its matrix of associated plant parts. Grass roots, spores, a small amount of green moss and unburnt fish bone were present. Charred oats were the only grain noted with a count of 6 that were again unusually small. *Polygonum maculosa* (Redshank) was present, as was *Chenopodium album* (fat hen) that was charred, *Stellaria media* (common chickweed) a plant of waste ground, and *Polygonum* species that colonise many different habitats.

The frequency of the charcoal and peat promotes the association of this context and feature with the hearth. It may be possible that this area was also used to smoke food as the fish bone was uncharred. Hearths and ovens often had secondary uses. The nature of the feature as a small oblong area of only 25cm deep could also indicate the draw out for the hearth where the soot and debris were cleaned out. The shape may be the result of it being dug out every now and again to remove the build-up of debris and soot, possibly to put on the fields as fertiliser. The frequency of burnt peat and burnt clay in the retent associated with the hearth could indicate industrial action, though due to the truncated nature of the archaeology any evidence may have been removed during the systematic demolition of the castle.

Context (169) Trench 4.

This fairly compact richly organic grey black matrix lay above clay (188) and was abutted by context (200). The secondary fill of the moat to the north of the curtain wall, context (169) begins to the west of a wooden peg embedded between contexts (188) and (192) seen in Figure 7 and abuts the wooden peg at the east end. At the west end of the cut into the moat the context continues to run above context (188) in cut [199], where it then runs up the slope of [199], then meeting the natural where (188) stops. No cuts were seen at the west end of this section of the moat. It appears the moat was dug out at times as several recuts can be seen in the south-south-east end.

The matrix is rich in organic matter, possibly from cess and kitchen waste, and has occasional inclusions of pebbles. Inclusions in the retent were poor, with charcoal, coal and burnt bone present. The flot matrix contained abundant wood fragments; there were frequent inclusions of fibrous plant matter. Charcoal, coal, worm cases, beetle parts, bark, desiccated peat like material and bran were all present.

Common nettle *Urtica dioica* occurred frequently. Seeds of pond weed were frequent, as the flat stalked species, *Potmogeton friesii*. It occurs in ponds and canals, similar types of habitat to a water filled moat. *Apium inundatum*, the lesser marshwort of still, shallow water or bare mud nearby was present, as were *Schoenus nigricans*, black bog-rush, and *Chaerophyllum temulum*, rough chervil. Two wooden pegs were recovered from the flot matrix.

Lesser marshwort has seen a serious decline in numbers since the 1960's with the destruction of shallow water bodies by drainage, causing eutrophication. This plant was seen regularly in permanent shallow waters such as streams, canals, and backwaters. It was also common in sites subject to periodic desiccation, such as the edges of lakes, pools, reservoirs, dune-slacks, moats and ditches. Most of the sites it inhabits are base-poor. The compressed layered matrix seen in this context was typical of the build-up of organic material over time at the base of a moat.

The desiccated peat like material and bran are both indicative of large amounts of fibrous plant matter being deposited in the moat. It cannot be said with any degree of certainty whether the moat was permanently water filled. The matrix was made up of wood fragments and fibrous plant matter that dropped into the moat. There was a high content of desiccated peat material and bran, an indicator that cess had been deposited in the moat. The flot also smelled of cess. Seed remains recovered were species of ponds, still shallow water or the mud beside it, canals and ditches. Pertinent to say that the moat, for at least part of the year, was filled with water, even if it were still, shallow water in parts. Evidence exists that the moat was also re-dug from the cut lines to the south-south-east end, suggesting it was kept clear of organic build up to some extent, possibly to allow for a greater depth of water.

Context (188) Trench 4.
The primary fill of the moat in this area, context (188) lay below (169) discussed above, and above the natural matrix (101). A compacted grey clay with orangey inclusions, and medium sized pebbles contained a richly organic matrix of wood fragments, old roots and other organic matter, with a slight odour of cess. It appeared to be the interface of the natural and the base of the moat, forming a clay lining. Context (192) that abutted it at the eastern end had been cut through at some point to allow for the deposition of (188). This is further evidence that the moat was re-dug at intervals.

Small twigs and wood fragments were abundant in the retent, indicating the matrix of the wood was waterlogged; otherwise it would have floated during processing. Small stones and gravel were also present. No charred material was present in this flot but it was rich in organic matter and smells of cess. It contains some uncharred wood fragments, the largest of which is 3x2x0.5cm. Bran and moss were abundant in this sample.

Present in the flot were seeds of *Urtica dioica* (common nettle), *Stellaria media* and *Potentilla* species as *recta* (rough fruited cinquefoil) and *verna* (spring or spotted cinquefoil), both of waste and grassy places. These are probably modern intruders as they were not fossilised or waterlogged. Larva cases of an insect such as caddis fly, were present of small size between 0.2-1.0cm. Ephippia that house the dormant eggs of Daphnia were present indicating the incidence of water rather than just mud or wet ground. Seeds of a type of pond weed were frequent as *Potamogeton pectinatus* or fennel pondweed, that grows over gravel, sand, eutrophic or slightly brackish water.

The conclusion of this suite of organics is that this matrix was formed largely of moss and bran. Moss was frequently used for wiping in latrines and bran was part of the faecal matter as it was present in bread and other baked goods at the time the castle would have been occupied. The presence of the pondweed and Daphnia eggs infer the moat contained a good amount of water at least part of the year, especially with the species of water plants encountered. Both these species can however lie dormant if the water source dries up.

Context (173) Trench 4.
Seen in Figure 5 this shallow deposit (173), to the south and close to the southern structural wall (172) in Trench 4, was a black layer associated with rubble layer (171). This fairly compact blackened matrix had inclusions of ash, charcoal, bone, soot, sandstone fragments, wood fragments, roots and other organics with an odour of cess. The deposit was only partially excavated in an area at the south end of Trench 4. Coke and coal were abundant in the retent; sandstone fragments were frequent; mortar, bone and grass roots were present. It is likely this is a demolition layer, possibly from burning material during the organised demolition of the castle, as it is historically noted that other structures in the area were built from stone originating from the castle.

Apart from small snail shells and a few small mammal bones most of the flot matrix was charred. The snails would have occurred as part of the post deposition process. Burnt bone presented, as did charred wood fragments. Uncharred material was present only as magnetic metal spheres, coal fragments, a few seeds of *Sambucus ebulus* (dwarf elder) a common small tree or shrub of hedges and woodland, (that may be a modern intruder as it grows on the site now), and a few small mammal bones, probably mouse, almost certainly a post depositional visitor. The main bulk of the flot was an abundance of what seemed to be coke as the substance had floated over the trap during the floatation process defining it as light enough to float on water.

Context (198) Trench 4.
Seen in Figure 8, Section 4 contexts (198) and (195) (discussed below) were associated with the timbers from a bridge structure across the moat. To the north east, in the moat, context (198) was packed around these timbers that had once formed part of a bridge structure. Context [194] shaped the cut for context (198) in the moat, with a sandy lens (222) lying partially beneath it. The context contained wood, pottery and burnt or calcined bone. The grey clay seems to have been put down or around as a setting or packing for the wooden timbers. Small pockets of sand ran through it in lenses. Wood fragments and iron pan were abundant in the retent.

Wood fragments, fibrous plant matter and degraded plant parts were abundant in the flot matrix. Burnt bone and bran were present, as were some beetle parts. Slight traces of Vivianite, a mineral consisting of a phosphate of iron that occurs as a secondary mineral in ore deposits was present. It is colourless when fresh but becomes blue or green with oxidization by exposing to air, and hence it was easy to detect after exposure to air.

Charred grain counts of 4 oats were noted in the flot that were again unusually small. Fossilised seeds of *Sambucus ebulus* (dwarf elder), common small trees or shrubs of hedges and woodland were present, as was *Dipsacus sativus* or Fuller's teasel. *Polygonum lapathifolia* (pale persicaria), a seed of wide spread niches and open ground, as well as *Ranunculus repens* (creeping buttercup), a species of wet meadows, pastures, woods and dune slacks that can grow on clay, or *bulbosus* (bulbous buttercup) a species of dunes, grassy slopes or calcareous sub-strata were present, with *Chenopodium album* and *Bonus Henricus* plants of wide niches. *Stellaria media* (common chickweed) a plant of waste ground, *Spergula arvensis*, the arable weed corn spurrey, *Rumex acetosa* (common sorrel) from a wide range of grassy places, *R. acetosella* (sheep's sorrel) of heathy, open ground and *R. aquaticus* (red dock), an aquatic perennial herb growing on silty and gravelly lake shores, beside ditches and streams, in marshes, wet fields and woodland clearings were also present.

Urtica dioica (common nettle) and *Urtica urens* (small nettle) were present, as well as *Polygonum persicaria*, Redshank that grows on waste, cultivated and open ground and the common knotgrass, *Polygonum aviculare*. Modern *Poa* grass species presented as intruders. Other seeds present were *Ranunculus ficaria*, the lesser celandine, of damp meadows, woods, hedgebanks and streams, *Viola palustris* or Marsh Violet of bogs, fens, marshes, wet heaths and woods, *Potentilla neumanniana* the spring cinquefoil of dry grassland and rocky slopes, *Vaccinium myrtillus* the bilberry a native of moors, heaths and woods, *Scirpus* species (club-rushes), *Carex* (sedge species), the Six Stemmed waterwort *Elatine hexandra* of ponds and wet mud, and *Galeopsis speciosa*, the large-flowered hemp nettle of arable land often with peaty soil with root crops, and waste places.

Context (195) Trench 4.
Deposit (195) lies above the timbers of the collapsed bridge structure, and the fill associated with it, context (198) discussed above. It lies beneath the topsoil and spreads across the excavated area, partially in cut [194], to the limit of the excavation. It lies above and around the timber structure, possibly acting as packing. The timbers appear to lie in it. A firm, weakly cemented yellow/grey clay it has inclusions of some rubble, wood fragments and occasional lenses of sand. It lies beneath the topsoil and above the clay layer (198), Sample <15> seen in Figure 8.

In the retent iron pan and wood were abundant; burnt bone was frequent and shell was present. Wood, seen as fragments from planks, sees the largest piece at 20x5cm cut like a triangular wooden peg. Wood fragments and moss were abundant in the flot. The flot residue had an odour of cess. Fibrous plant matter was frequent. Worm cases, bran, charcoal, feather, and spores were present.

Charred oats occur but only total 6 that are again very small. A charred grain of *Hordeum vulgare* presented, and one other charred grain of small size but bulbous in shape, indicating wheat, rye or barley, although species was indeterminate due to a lack of identifying features.

Chenopodium album (fat hen) of waste and cultivated ground and *bonus henricus* (Good-King-Henry) of roadsides, pastures and by farm buildings were present, as were the ruderal common chickweed *Stellaria media*, a hemp nettle of *Galeopsis* species, cinquefoil *Potentilla*, *Spergula arvensis* the arable weed corn spurrey, and club rush species *Scirpus*. *Polygonum lapathifolia* (pale persicaria), a seed of wide spread niches and open ground, *Dipsacus sativus* or Fuller's teasel a native of marginal habitats and rough ground, as well as *Polygonum persicaria*, Redshank that grows on waste, cultivated and open ground and the common knotgrass, *Polygonum aviculare* were present

Present were *Urtica dioica* (common nettle), *Rubus* species (brambles) of hedges, scrub, woods and heathland, *Potentilla* sp. of grassland, roadsides and wasteland, and seeds of *Sambucus ebulus* (dwarf elder) common small trees or shrubs of hedges and woodland. *Rumex* as *obtusifolius* the blond leaved

dock or *palustris* the marsh dock as well as other *Rumex* species were also present. *Brassica oleracea* the cabbage, were present, a native of sea cliffs, and *Heracleum sphondylium* the hogweed, a native of rough ground, grassy places, roadsides and banks.

The Eight Stemmed waterwort *Elatine hexandra* a native of ponds and small lakes was present, *Eleocharis palustris* the common spike-rush an inhabitant of ponds, marshes, ditches and riversides, *Scirpus lacustris* the bulrush of shallow pond margins, rivers and lakes, as well as *Honckenya peploides* the sea sandwort, common around coasts on bare maritime sand and sandy shingle. These species are indicators of water or waterlogged and marshy areas, appropriate as this was the moat.

DISCUSSION

In general there were very few true organic matrices to be sampled, apart from those in the moat. Sandstone pieces and fragments in various contexts indicate the organised demolition phase of the castle that occurred around 1652.

As discussed, in several contexts above charred grain occurred in some of the samples. The only grain that could be firmly identified were the oats due to their distinctive shape. One grain of barley was also determined that still had some identifying features present. The other grain however were classed as indeterminate due to the fact that the process of charring had blown or exploded them to varying degrees to the point that none of them were identifiable, apart from the fact that they were either rye, barley or wheat due to their bulbous shape. The other interesting point was that all the grains were small in comparison to material from other archaeological sites viewed by the author. An explanation for the oats could have been that they were black oats (*Avena strigosa*) but this does not explain the small size of the other species. In general then all the grain was of small size, possibly due to lack of nutrients in the soil, brackish water present and generally poor soil conditions. Further research needs to be carried out in this area, to determine whether there was any regional variation in grain sizes of material recovered from archaeological sites, and whether the results varied for sites from different eras.

The same ditch was excavated in Trench 2 and Trench 3 and can be seen in Figure 3. Contexts (109) and (125), from trenches 2 and 3 respectively, had seed of *Leonarus cardiaca* L. or motherwort present. This herb of the mint family has medicinal qualities and was formerly grown for the purpose. It is now thinly scattered over the British Isles and is becoming scarcer.

Motherwort is especially valuable in the treatment of female weaknesses and disorders, allaying nervous irritability, inducing quiet and passivity of the whole nervous system. Seen as a remedy for heart palpitations, it has a strengthening effect, especially on a weak heart. The sedative and antispasmodic effects stimulate relaxation rather than drowsiness. It acts as an anti-spasmodic used to relieve spasm of involuntary muscle, particularly the uterus and is said to prevent uterine infection, as well as to prevent pregnancy and regulate menstruation. (Grieve 1977). Further research into recordings of this medicinal herb recovered from archaeological sites needs to be done to determine whether it was grown in the area for use as a medicine. Other seeds seen in the fills of this ditch varied somewhat but all contained examples of charred grain. Nothing else unusual was detected.

Context (188) had an abundance of bran and moss in this primary moat fill seen in Figure 7. The smell of cess and the abundance of moss recovered from the sample indicates deposits of faecal material and the use of moss for wiping. This area of the moat is known to have been recut as the deposits can be seen in different cuts towards the south east end of the section.

In context (173) the main bulk of the flot was an abundance of what seemed to be coke as the substance had floated over the trap during the floatation process, defining it as light enough to float on water. Historic sources (Wertime 1961) mention the use of coke as far back as the fourth century AD. A patent was granted to Thomas Proctor and William Peterson in 1589 for making iron and steel and melting lead with 'earth-coal, sea-coal, turf, and peat'. The patent contains a particular reference to the preparation of coal by 'cooking'. In 1590 a patent was granted to the Dean of York to 'purify pit-coal and free it from its offensive smell', presumably resulting in the production of coke. The full analysis and study of this material would determine its type. It may be possible as well to study more historical documents for information on the manufacture of coke, should it prove to be this substance. The amount recovered from this context certainly indicates use other than a domestic fire.

In Context (198) there was a large amount of iron pan and iron based material that was removed from the retent with a magnet. Vivianite, a mineral comprising of a phosphate of iron that occurs as a secondary mineral in ore deposits was present. It is colourless when fresh but becomes blue or green with oxidization by exposing to air, and is hence easy to detect after exposure to air. The iron content in the ground water could possibly have come from the iron nails used in the bridge, although iron working was also known to have been carried out at the nearby Friar's Garth in the Medieval period, an indicator that the raw material was close enough to use in manufacture and again needs to be researched.

Contexts (195) and (198) were clay matrices. Plant and other remains recovered from the samples taken prove though that it was not sterile clay. Organic matter and seeds were frequent to abundant throughout, with some pottery present. It is probable that the clay was turbated, either in preparation for depositing around the timbers for the bridge or when older structures were removed and replaced. At this point it would be possible for the inclusions to become a part of the clay matrices.

Degraded plant parts and the smell of cess indicate faecal waste was being deposited in the moat in this section. The phosphates from the cess and the iron rich background of the surrounding matrix would then have all the constituents for the formation of Vivianite present. Further research work needs to be carried out in this area.

Seen in the associated contexts, as the primary and secondary fill of the moat, contexts (198) and (195) respectively, Fullers' teasel was introduced as a cultivar, although the specific period is unknown. From textile-historical sources though, we know though that its use in the raising of the pile or nap on wool cloth was well established in the Middle Ages, more latterly known as the Medieval Period. (Ryder 1994). The wool trade was developed and introduced by the monks, and is known to have been an industry carried out at the nearby Holme Cultram Abbey. Links between the abbey and the castle were strong, although research needs to be carried out in what vane. Research is also needed into the plant associations and what was grown in the area. A study could be carried out to core some of the area to determine the background makeup of the plants in the Medieval period.

ARCHAEOLOGICAL POTENTIAL AND FURTHER WORK

With the aid of our team of volunteers we have been allowed, during this phase of the project, to accumulate information that adds to the research priorities and methods of the North West Regional Framework (Newman & Newman 2007). The more knowledge we gain from this, and the other sites associated with the castle such as Holme Cultram Abbey, the more the research priorities and potential methods of implementation and delivery will be tested for future archaeological research in the area.

The four trenches excavated all produced artefacts from the Medieval Period, defining them from that era. The archaeology within them showed a moat that had been re-dug over time, when other structural changes had been made, as with the bridge. The area of burning, context (152) seen in Trench 4 and associated with the hearth is particularly interesting in that it may define an industrial area. Systematic excavation of sections of the moat would enable us to detect changes in deposition matrixes, particularly in identifying whether any industrial activity could be detected.

Our aims of engaging the public, on whatever level they feel comfortable with, have been a success! We now have a strong core of volunteers who can use their newly acquired or improved key skills in making the project successful. Their willingness to undertake tasks has led to an uplifting atmosphere in all aspects of excavation and post-excavation work. They were keen to learn more about the history and archaeology of the project. The aim of a further season of excavation at the castle would be to extend and define the structural limits of the castle and determine any phasing that may be present. Further open area excavation would lead to a better understanding of the castle, as well as defining the depth of knowledge it took to engineer the castle itself and other bridge structures that may have existed, by local craftsmen.

Bibliography

Allaby, M. 1994. *Oxford dictionary of ecology*. Oxford: Oxford University Press.

Allerdale Borough Council (ABC). 2013. Invitation to Tender for Hidden Heritage Archaeology Services. Unpublished Report from Allerdale Borough Council, Allerdale House, Workington, Cumbria, CA14 3YJ.

Anderberg, A-L. 1994. *Atlas of Seeds and Small Fruits of Northwest-European Plant Species, with Morphological Descriptions*. Part 4: *Resedaceae-Umbelliferae*. Stockholm: Swedish Museum of Natural History.

Bayley, J., D. Dungworth, & S. Paynter. 2001. Archaeometallurgy: Centre for Archaeology Guidelines. English Heritage.

Berggren, G. 1969. *Atlas of Seeds and Small Fruits of Northwest-European Plant Species, with Morphological Descriptions,* Part 2: *Cyperaceae*. Stockholm: Swedish Museum of Natural History.

Berggren, G. 1981. *Atlas of Seeds and Small Fruits of Northwest-European Plant Species, with Morphological Descriptions,* Part 3: *Salicaceae-Crucifera*. Stockholm: Swedish Museum of Natural History.

Brennand, M., G. Chitty & M. Nevell (Eds). 2006. *The Archaeology of North West England: an Archaeological Research Framework for North West England* Volume 1 Resource Assessment. Manchester: Association for Local Government Archaeological Officers and English Heritage with the Council for British Archaeology North West. *Archaeology North West* Volume 8 (Issue 18, for 2006).

Brennand, M., G. Chitty & M. Nevell (Eds). 2007. *Archaeology in North West England: an Archaeological Research Framework for North West England* Volume 2 Research Agenda and Strategy. Manchester: Association for Local Government Archaeological Officers North West and English Heritage with the Council for British Archaeology North West. *Archaeology North West* Volume 9 (Issue 19, for 2007).

Brown, D. H. 2007. *Archaeological Archives: A Guide to Best Practice in Creation, Compilation, Transfer and Curation*. Reading: IfA &Archaeological Archives Forum.

Chitty, G. & M. Brennand. 2007. An Archaeological Research Framework for the North West Region: Research Agenda Introduction. *In* Brennand *et al*: 7-30.

Department of the Environment (DoE). 1987. *Historic buildings and conservation areas - policy and procedures*. Circular 8/87. London: Department of the Environment.

Department of the Environment. 1990a. *Planning Policy Guidance Note 15: Planning and the Historic Environment*. London: Department of the Environment.

Department of the Environment. 1990b. *Planning Policy Guidance Note 16: Archaeology and Planning*. London: Department of the Environment.

Department of the Environment. 1990c. *The Planning (Listed Buildings and Conservation Areas) Act*. London: Department of the Environment.

English Heritage. 1991. *Management of Archaeological Projects (MAP 2)* 2nd Edition. London: English Heritage.

English Heritage. 1995. A Strategy for the Care and Investigation of Finds. London: English Heritage Ancient Monuments Laboratory.

English Heritage. 2004. *Dendrochronology - Guidelines on producing and interpreting dendrochronological dates*. London: English Heritage.

English Heritage. 2006. *Management of Research Projects in the Historic Environment*. London: English Heritage.

English Heritage. 2011. *Environmental Archaeology: A Guide to the Theory and Practice of Methods, From Sampling and Recovery to Post-Excavation*. 2nd Edition. London: English Heritage.

English Heritage. 2014. *Animal Bones and Archaeology: Guidelines for Best Practice.* Swindon: English Heritage.

Graham, M. & J. Walker. 2011. Sule Wath – Archaeology Project Design: 'Sule Wath' Landscape Partnership Scheme Heritage Steering Group. Unpublished Report from Grampus Heritage & Training Limited, Cumbria.

Grainger, F. & W. G. Collingwood (Eds.). 1929. *The Register and Records of Holm Cultram*. Cumberland and Westmorland Antiquarian and Archaeological Society. Record Series, Volume VII. Kendal: T. Wilson & Son.

Grieve, M. 1977. *A Modern Herbal*. England: Penguin Books Limited.

Institute for Archaeologists. 1992. *Guidelines for Finds Work*. Reading: Institute for Archaeologists.

Institute for Archaeologists. 2001a. *Standards and Guidance for Archaeological Field Excavation*. Reading: Institute for Archaeologists.

Institute for Archaeologists. 2001b. *Standards and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials*. Reading: Institute for Archaeologists.

Institute for Archaeologists. 2008. *Standards and Guidance for Archaeological Field Evaluation*. Reading: Institute for Archaeologists.

Jones, M. D. 2011. Environmental Archaeology: *A Guide to the Theory and Practice of Methods, fromSampling and Recovery to Post-excavation (second edition)*. English Heritage Publishing: Self-Print Version.

Jones, S., J. Taylor & F. Ash. 2004. *Seed Identification Handbook: Agriculture, Horticulture and Weeds*. Cambridge: NIAB.

Murphy, P. L. & P. E. J. Wiltshire. 1994. *A Guide to Sampling Archaeological Deposits for Environmental Analysis*. Privately Printed.

Newman, C. 2006a. The Mediaeval Period Resource Assessment in the North West. *In* Brennand, M. *et al*: 115-144.

Newman, R. 2006b. The Early Mediaeval Period Resource Assessment. *In* Brennand, M. *et al*: 91-114.

Newman, C. & R. Newman. 2007. The Mediaeval Period Research Agenda. *In* Brennand, M. *et al*: 95-114.

Newman, R. & M. Brennand. 2007. The Early Mediaeval Period Research Agenda. *In* Brennand, M. *et al*: 73-94.

Pearsall, D. M. 2000. *Palaeoethnobotany: A Handbook of Procedures* 2nd Edition. San Diego, California: Academic Press.

Ryder, M. L. 1994. Fascinating Fullonum. *Circaea: The Journal of the Association for Environmental Archaeology* **11**: 23-31.

Shaw, P. 2008. Method Statement: Sampling Strategies and Environmental Sampling Protocol for Archaeological Sites Excavated by North Pennines Archaeology Limited. Unpublished Report from North Pennines Archaeology Limited, Cumbria.

Stace, C. 1997. *New Flora of the British Isles*. 2nd Edition, Cambridge: Cambridge University Press.

Wertime, T. A. 1961. *The Coming of the Age of Steel*. Leiden: E. J. Brill

APPENDIX IV

FINDS TABLE

GHTL 13 WHF - A																					
TRENCH NUMBER	**CON-TEXT**	**MED POT**	**POST MED POT**	**GLASS**	**FLINT**	**CLAY PIPE STEMS**	**CBM**	**Fe**	**Pb**	**SLAG**	**WOOD**	**CuALLOY FRAGS**	**WORKED STONE**	**COIN**	**MUSKET BALL**	**SHELL**	**OYSTER SHELL**	**BONE**	**BURNT STONE**	**COAL**	**HAEMATITE**
1	U/S							3													
2	108	5	1					1										4			
2	109	2			1			4	1		2		1					6			
2	U/S	6					8	26		3			1	1	1			1			
3	100		3	2			1													7	
3	106	6					6	3										10		1	
3	110	6																			
3	120							6													
4	114	1																			
4	100	2					1	2										3			
4	120	1					1														
4	126	4			1		4	2										17			
4	127		16					42	1	11		1			2	2		7		1	
4	138						1	2								8		41			
4	139																	11			
4	140							5		7								1		1	
4	142	6						1													
4	143						1											5			
4	147								1												

4	156						1														
4	158	3					2	1										39			
4	159	1					10	5									1	4			
4	161	7					5	31		4							4	35		13	
4	162		1				1	3										13		1	
4	163							2										9			
4	164							1	1									11			
4	165	1					1											7			
4	167							1										6			
4	168						1	1										4			
4	169							1										4			
4	171	2				1	3	4	2							2	3	27		6	
4	173	2					1										4	18	3		
4	174																	18			
4	178	10					3	4										4			
4	181																	6			
4	183							1										75			
4	198																	2			
4	203									1							1	1			1
4	208															1		4			
4	212	1					2	10										26			
4	217																1	4		1	
4	218																	6			
4	Below 110		1																		
4	U/S	3	2			1	8	143	24	70		2	1	1	2			23		1	

APPENDIX V CONTEXT INDEX

WHF-A GHTL 13

CONTEXT NO	TRENCH	TYPE	BRIEF DESCRIPTION	ABOVE	BELOW
100	ALL	TOPSOIL			
101	ALL	NATURAL			
102	1	DEPOSIT	GRAVEL PATCH	101	100
103	1	CUT	CUT FOR (104)	101	104
104	1	FILL	FILL OF [103]	103	100
105	1	DEPOSIT	THIN LENSE OF BROWN/BLACK DARK MATRIX	101	100
106	3	DEPOSIT	BROWN SOIL MEDIEVAL INCLUSIONS	SEVERAL	100
107	2	CUT	CUT FOR DITCH	101	108/9
108	2	FILL	SECONDRY FILL OF [107]	101/9	100
109	2	FILL	PRIMARY FILL OF [107]	107	108
110	3	DEPOSIT	YELLOW CLAY		106
111	3	CUT	POSTHOLE	101	112
112	3	FILL	FILL OF [111] POSTHOLE	101	111? 106
113	3	CUT	PIT SOUTH OF TRENCH	101	114
114	3	FILL	FILL OF [113] SOUTH OF TRENCH	113	106
115	3	CUT	GRAVE CUT		116
116	3	DEPOSIT	STONES FOR GRAVE (FEATURE 1)	115	117
117	3	FILL	FILL OF GRAVE ONTO (101)(RED GRAVEL)	116	106
118	3	CUT	CUT FOR DITCH IN NORTH CORNER	101	119
119	3	FILL	FILL OF [118]	118	106
120	3	DEPOSIT	LAYER BELOW 110, 2 MED FLOOR TILE	137	110
121	3	CUT	CUT FOR POSTHOLE IN NORTH WEST END	101	122

122	3	FILL	FILL OF POSTHOLE [121]	121	106
123	3	CUT	CUT FOR DITCH = IN TRENCH 2?	101	125
124	3	FILL	FILL OF DITCH = (108) IN TRENCH 2?	125	106
125	3	FILL	PRIMARY FILL OF [123] = (109) TRENCH 2	123	124
126	4	DEPOSIT	RUBBLE/FLAT SANDSTONE/ROOF MATERIAL		100
127	4	DEPOSIT	COBBLES	161	100
128	3	CUT	CUT INTO (110)	101	110
129	3	DEPOSIT		101	106
130	3	CUT	CUT FOR GREY SLOT	101	131
131	3	FILL	FILL FOR GREY SLOT	131	106
132	3	CUT	CUT FOR GREY SLOT	135	133
133	3	FILL	FILL FOR GREY SLOT	132	106
134	3	CUT	CUT FOR (135)	101	135
135	3	FILL	FILL OF[134]	134	106
136	?		?		
137	?		?		
138	4	DEPOSIT	RUBBLE OUTSIDE WALL		100
139	4	DEPOSIT	RUBBLE ABOVE CLAY		
140	4	DEPOSIT	YELLOW CLAY JUST IN WALL	139 163	
141	3	CUT	CUT FOR (142)	101	142
142	3	FILL	FILL FOR [141] LARGE COBBLE & PEBBLES	141	110
143	4	DEPOSIT	UPPER FILL OF MOAT RICH ORGANIC		
144	4	CUT	POSS PIT FEATURE		145 150
145	4	FILL	FILL OF [144]	144 150	100
146	4	CUT	CUT OF (147)		147
147	4	FILL	FILL OF [146]	146	140

148					
149	4	DEPOSIT	SANDSTONE RUBBLE		100
150	4	DEPOSIT	STONE LINING IN PIT [144]	144	145
151	4	CUT	CUT FOR OTHER BURNT FEATURE	175	152
152	4	FILL	FILL OF [151]	151	140
153	4	DEPOSIT	HEARTH- BURNT LAYER	139	126
154	4	DEPOSIT	OUTSIDE WALL- CLAY RETAING LAYER?		170
155	4	DEPOSIT	GRANITE COBBLES OF CURTAIN WALL		170
156	4	STRUCTURE	COBBLES WALL CORE		127
157	4	STRUCTURE	SHORT WALL- COURSE & CORE	176	164
158	4	DEPOSIT	DEMOLITION LAYER TOP OF ROBBER TRENCH	159	100
159	4	DEPOSIT	GRANITE FOUNDATION LAYER	160	158
160	4	CUT	CUT FOR FOUNDATION LAYER (159)		159
161	4		UNDER COBBLES (127) IN SONDAGE	140 168	127
162	4		SLOT NEXT TO COBBLES ON SSE SIDE TOWARDS NNE END	168	161
163	4	DEPOSIT	LAYER UNDERNEATH (140) BETWEEN (127) & (158)		140 162
164	4	DEPOSIT	RUBBLE DEPOSIT SSE END OF TRENCH	101	100
165	4	DISTURB-ANCE	ROBBED OUT PORTION OF (157) POSS RETURN?		100
166	4	DEPOSIT	BURNT SPLODGES NEXT TO HEARTH	140	100
167	4	DEPOSIT	BURNT CLAY LAYER IN SECTION (140)	140	100
168	4	DEPOSIT	RED BELOW (161) BELOW (162)		162
169	4	DEPOSIT	MOAT FILL TOP	188 192 199	
170	4	DEPOSIT	YELLOW CLAY = (140)?	154	100
171	4	DEPOSIT	RUBBLE LAYER BEHIND WALL (172)		100

172	4	STRUCTURE	WALL RUNNING 90DEGREES TO (157)		171 100
173	4	DEPOSIT	ABUTTING BLACK LAYER (172)		171
174	4	CUT	MODERN CUT (HORSE BURIAL?) CUT INTO (158) (159)		183
175	4	DEPOSIT	BURNT CLAY BASE OF (151)	101	151
176	4	STRUCTURE	WALL FOUNDATION OF (157)		157
177	4	DEPOSIT	COBBLES IN EXTENSION	178	100
178	4		BELOW COBBLES (177)	204	177
179	4	STRUCTURE	CURVED LINE OF LARGE GRANITE COBBLES	204	100
180	4	CUT	CUT FOR PIT IN EXTENSION	159	181
181	4	FILL	FILL OF [180]	180	
182	4		BELOW ROBBER TRENCH		157 165
183	4	FILL	PIT FILL [174]	174	158
184	4	DEPOSIT	MOAT FILL	169	187
185	4	DEPOSIT	MOAT FILL	186 187	100
186	4	DEPOSIT	MOAT FILL		100 185
187	4	DEPOSIT	MOAT FILL	169 184	186
188	4	DEPOSIT	MOAT FILL	101	169
189	4	DEPOSIT	MOAT FILL	169 190 200	186 187
190	4	DEPOSIT	MOAT FILL	191 169	185 186 189
191	4	DEPOSIT	MOAT FILL	169 192	100 185 190
192	4	DEPOSIT	MOAT FILL	199	196 200
193	4	DEPOSIT	MOAT FILL	199	138
194	4	CUT	CUT FOR PIT OUTSIDE CURTAIN WALL		195 196

195	4	FILL	YELLOW CLAY FILL OF [194]	198	100
196	4	DEPOSIT	RUBBLE TIP ON 195	195	100
197	4	DEPOSIT	RED SANDSTONE FRAGS RUBBLE OF 179	140	100
198	4	DEPOSIT	GREY CLAY FILL IN [194]	222	195
199	4	CUT	CUT FOR MOAT	101	169 188 192
200	4	DEPOSIT	IN SITU WOODEN POST	192	189
201	4	CUT	CUT FOR WOODEN POST (200)	101	200
202	4	?	WOODEN PEG- REMOVED?		188
203	4	STRUCTURE	WALL CORE ADJACENT TO [180]		158 178
204	4	STRUCTURE	WALL EAST OF EXTENSION	205	178
205	4	STRUCTURE	FOUNDATION FOR (204)		204
206	4	DEPOSIT	GREY ABOVE LARGE GRANITE COBBLES	159	
207	4		BENEATH (140) EAST SIDE OF EASTERN EXT		140 205
208	4	DEPOSIT	RED DEPOSIT WEST SIDE WALL EAST EXT & EAST CORNER ABUTTING FOUNDATION COB-BLES	211	210
209	4	DEPOSIT	ORANGE CLAY 0.02M SOUTH SECTION OF WEST SIDE	210	168
210	4	DEPOSIT	GREY CLAY 0.08M	208	209
211	4	DEPOSIT	COBBLES SOUTH SECTION OF WALL WEST SIDE	101	208
212	4		ABUTTING (205)		197
213	4	DEPOSIT	FOUNDATIONS FOR (214)	140	214
214	4	DEPOSIT	WALL ABOVE (213) FOUNDATION	213	215 100
215	4	DEPOSIT	SMALL STONE AND CRUSHED SANDSTONE	214 220	100
216	4	DEPOSIT	CARVED SANDSTONE AT SSW END POSS ENTRANCE	213	214
217	4	DEPOSIT	BLACK ASH LAYER	140	218
218	4	DEPOSIT	RUBBLE & LARGE STONE SSW CORNER SSW OF EXT	140 217	100

219	4	DEPOSIT	RUBBLE & LARGE STONE SSE CORNER OF EXT		100
220	4	DEPOSIT	ALL IN SLOT LARGISH STONES		100
221	4	DEPOSIT	BENEATH COBBLES, ABUTTING (176)		168
222	4	DEPOSIT	SANDY LAYER		198
223	4	DEPOSIT	NATURAL? SEPOSIT IN SECTION BENEATH COBBLES ANOTHER CONTEXT?		140
5001	4	TIMBER	PLANK PANELLING	5002	
5002	4	TIMBER	TRANSVERSE BEAM	5003	5001
5003	4	TIMBER	TIMBER TOE PIECE	5004	5002
5004	4	TIMBER	SUPPORTING BEAM		5003
5005	4	TIMBER	TIMBER BRACE 1	5004	5002
5006	4	TIMBER	TIMBER BRACE 2	5004	
5007	4	TIMBER	UPRIGHT PLANK WITH HOLE		
5008	4	TIMBER	UPRIGHT PLANK/STAKE (NORTHERN)		
5009	4	TIMBER	UPRIGHT PLANK/STAKE (SOUTHERN)		
5010	4	TIMBER	POST SAWN OFF		
5011	4	TIMBER	PLANK		

APPENDIX VI ENVIRONMENTAL ANALYSIS OF SAMPLES TAKEN FROM WOLSTY CASTLE DURING EXCAVATION SITE CODE GHTL13 WHF-A

Context	108	109	110	112	122	124	125	145	152	169	173	188	195	198
Residue contents (relative abundance)														
Bone/teeth	-	-	-	-	-	-	-	-	1	-	1	-	-	-
Bone - burnt	-	-	1	-	1	1	1	1	1	1	-	-	2	1
Burnt clay	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Charcoal	1	1	1	-	1	1	-	-	-	1	-	-	-	-
Coal	1	1	-	-	1	-	-	-	-	1	3	-	-	-
Coke	-	-	-	-	-	-	-	1	2	-	3	-	-	1
Iron nail	-	-	-	1		-	-	-	-	-	-	-	-	-
Iron pan deposited around roots	1	-	-	-	-	1	1	-	-	-	-	-	3	3
Metal working fragments	-	-	-	1	-	-	3	-	-	-	-	-	-	-
Pottery	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Prunus stones	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Roots from grass etc.	1	-	-	-	1	1	-	-	-	-	1	-	-	-
Sandstone fragments	1	-	-	-	1	1	1	-	1	-	2	-	-	-
Wood fragments	1	-	-	-	-	-	-	-	-	-	-	3	3	3
Flot matrix (relative abundance)														
Bark and wood (waterlogged)	-	-	-	-	-	-	-	-	-	3	-	-	3	3
Bone (unburnt)	-	-	-	-	-	-	1	-	1	-	1	-	-	-
Bone (calcined)	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Charcoal	2	1	1	1	2	-	3	1	2	1	1	-	1	-
Coal	-	-	-	-	-	-	-	-	-	1	1	-	-	-
Clinker or coke	-	-	-	-	-	-	-	-	-	-	3	-	-	-
Feather (?chicken)	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Cereal stalks/fibrous plant parts	-	2	-	3	-	3	1	3	-	2	-	-	1	3
Larvae/insects	-	-	-	-	-	-	-	1	-	1	-	-	-	1
Leaf mould	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Metal spheres	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Moss	-	-	-	-	-	-	1	1	1	-	-	-	3	-

Peat fragments	-	-	-	-	-	-	2	-	2	1	-	-	-	-
Degraded plant matter	-	-	-	-	-	-	-	-	-	3	-	-	-	3
Roots modern (grass and other)	3	1	3	-	3	-	2	1	1	-	-	-	-	-
Sclerotia	-	-	-	-	-	-	-	-	1	-	-	-	1	-
Uncharred small twigs/ wood fragments	-	-	-	-	-	-	-	1	-	3	-	-	3	3
Worm cases	-	1	1	-	-	-	1	-	1	1	-	-	1	-
Charred plant remains (total counts)														
(c) *Avena* sp. L. (Oats)	40	-	1	-	15	3	8	1	6	-	-	-	6	4
(c) *Hordeum vulgare* L.	-	-	-	-	-	-	-	-	-	-	-	-	1	-
(c) Cerealia indeterminate	20	-	1	3	5	2	-	-	1	-	-	-	1	-
(c) Cereal bran	-	-	-	-	-	-	-	-	-	1	1	-	1	1
Other plant remains (relative abundance)														
(a) *Chrysanthemum segetum* L. (corn marigold)	-	-	-	-	-	1	-	-	-	-	-	-	-	-
(a) *Spergula arvensis* L. (corn spurrey)	-	-	-	-	-	-	-	-	-	-	-	-	1	1
(g) *Holcus* sp. (soft grasses)	-	-	-	-	-	-	1	-	-	-	-	-	-	-
(r) *Stellaria media* L. (common chickweed)	1	1	1	-	-	-	-	-	1	-	-	-	1	1
(t) *Rubus* sp. (brambles)	-	1	-	-	1	-	1	1	-	1	-	-	1	-
(t) *Sambucus* sp. (elder)	-	1	-	-	1	-	1	-	-	1	1	-	1	1
(t) *Prunus* sp. (cherries)	-	1	1	-	-	-	-	-	-	-	-	-	-	-
(w) *Apium inundatum* L. (lesser marshwort)	-	-	-	-	-	-	-	-	-	1	-	-	-	-
(w) Cyperaceae (sedges and rushes)	1	-	-	-	-	-	-	-	-	1	-	-	1	1
(w) *Elatine* sp. L. (waterwort)	-	-	-	-	-	-	-	-	-	-	-	-	1	1
(w) *Eleocharis palustris* L. (com spike-rush)	-	-	-	-	-	-	-	-	-	-	-	-	1	-
(w) *Honckenya peploides* L. (sea sandwort)	-	-	-	-	-	-	-	-	-	-	-	-	1	-
(w) *Persicaria* sp. L. (Pale persicaria)	-	-	-	-	1	-	-	-	-	-	-	-	1	1
(w) *Potamogeton* sp. L. (Pondweed)	-	-	-	-	-	-	-	-	-	2	-	-	-	-
(w) *Ranunculus* sp. L. (Buttercups)	-	1	-	-	-	-	-	-	-	-	-	-	-	1
(w) S*cirpus* sp. L. (common club-rush)	-	-	-	-	-	-	-	-	-	-	-	-	1	1
(w) *Senecio aquaticus* Hill (marsh ragwort)	-	-	-	-	-	-	-	1	-	-	-	-	-	-
(w) *Vaccinium uliginosum* L.	-	-	-	-	-	-	-	-	-	-	-	-	-	1
(w) *Viola palustris* L.	-	-	-	-	-	-	-	-	-	-	-	-	-	1
(x) *Brassica* L. (Cabbage family)	-	-	-	-	-	-	-	-	-	-	-	-	1	-
(x) *Chenopodium* sp. L. (Goosefoot)	-	1	-	-	1	-	1	-	1	-	-	-	1	1

(x) *Cirsium* sp. Miller (Thistles)	1	1	-	-	-	-	-	-	-	-	-	-	-	-
(x) *Dipsacus sativus* L. (Fuller's teasel)	-	-	-	-	-	-	-	-	-	-	-	-	1	1
(x) *Euphorbia* sp. L. (Spurges)	-	-	1	-	-	-	-	-	-	-	-	-	-	-
(x) *Galeopsis* sp. L. (Hemp nettle)	-	-	-	-	-	-	-	-	-	-	-	-	1	-
(x) *Heracleum sphondylium* L. (hogweed)	-	-	-	-	-	-	-	-	-	-	-	-	1	-
(x) *Leonarus cardiaca* L. (motherwort)	-	1	-	-	-	-	1	-	-	-	-	-	-	-
(x) Poaceae (Grasses)	-	1	-	-	1	-	-	-	-	-	-	-	-	1
(x) *Polygonum* sp. (Knotgrass family)	-	1	-	-	-	-	1	1	1	-	-	-	1	1
(x) *Potentilla* sp. L. (cinquefoils)	-	1	-	-	-	-	-	-	-	-	1	-	1	1
(x) *Rumex* sp. L. (Dock)	-	1	-	-	-	-	-	1	-	-	-	-	1	1
(x) *Urtica* sp. L. (nettle)	1	1	-	-	-	-	2	-	-	2	1	-	1	1
Unidentified seeds	-	-	-	-	-	-	-	1	-	-	-	-	-	-

Key: a: arable weed; c: cultivar; g: grassland; r: ruderal; t: trees/shrubs; w: wetland; x: wide niche Relative abundance is based on a scale from absent -, 1 (present), 2 (frequent), 3 (abundant). Cereals are total numbers of grain counted

APPENDIX VII: FIGURES

0 1 2 3 4 Kilometers

GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
'Hidden Heritage'
Community Archaeology Project

Geophysical Survey and
Excavation at Wolsty Castle
June/July 2013

October 2016

Grid Ref: NY 1049 , 5060

Scale: 1:40,000 at A4

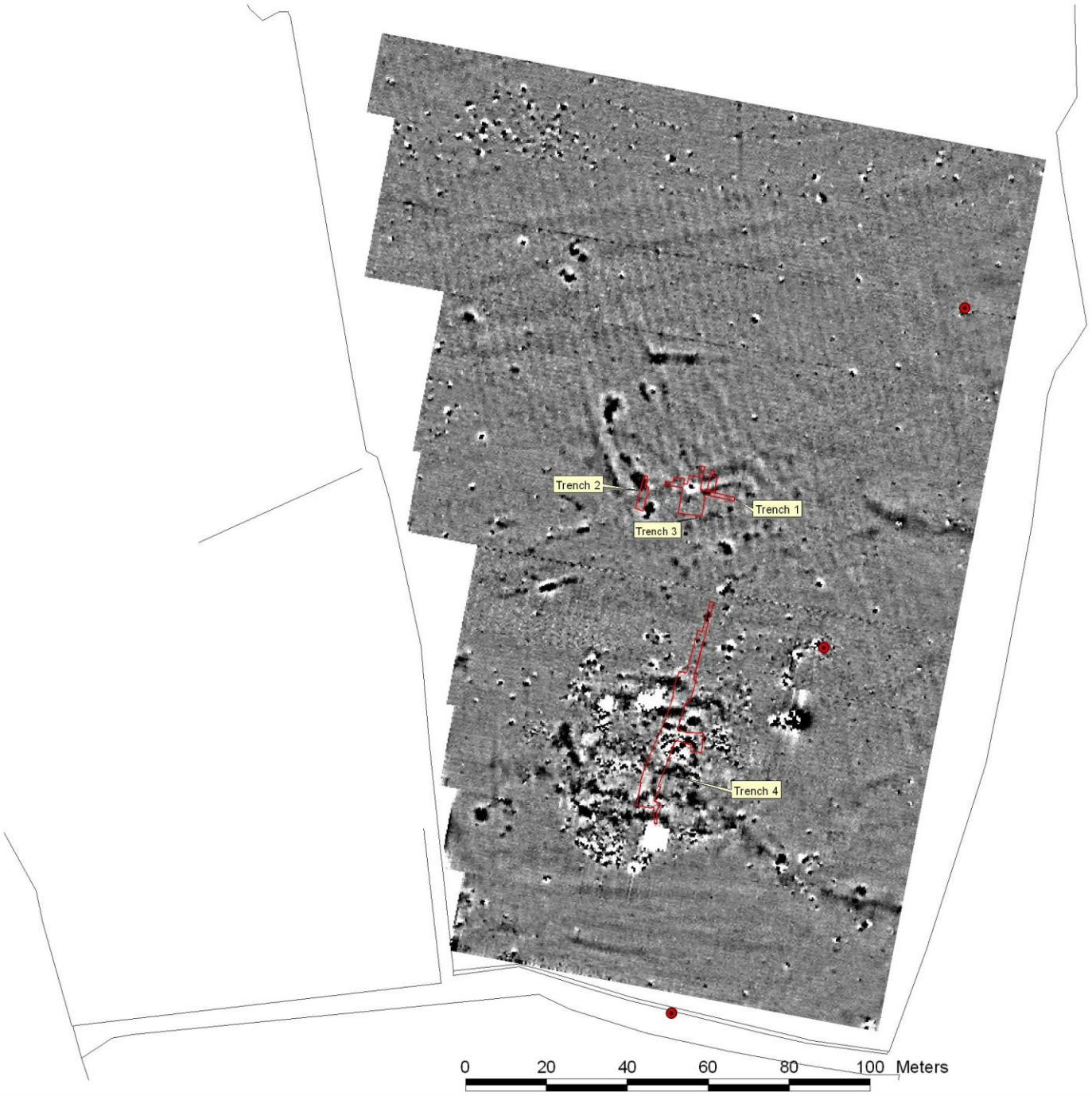
Drawn by: MG

N

KEY

Fieldwork Location

Figure 1: Location Plot



GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
'Hidden Heritage'
Community Archaeology Project

Geophysical Survey and
Excavation at Wolsty Castle
June/July 2013

October 2016

Grid Ref: NY 1049 , 5060

Scale: 1:1500 at A4

Drawn by: MG

N

KEY

Electricity Pole

Trench Location

Survey Parameters

Instrument: Geoscan FM256
Dual System
Resolution: 0.1nT
Traverse interval: 0.5m
Readings taken: every 0.25m
in traverse direction.
Zig Zag
Log zero drift function used.
Grid size: 20mX20m cells
Data downloaded and processed
using Geoplot 3.

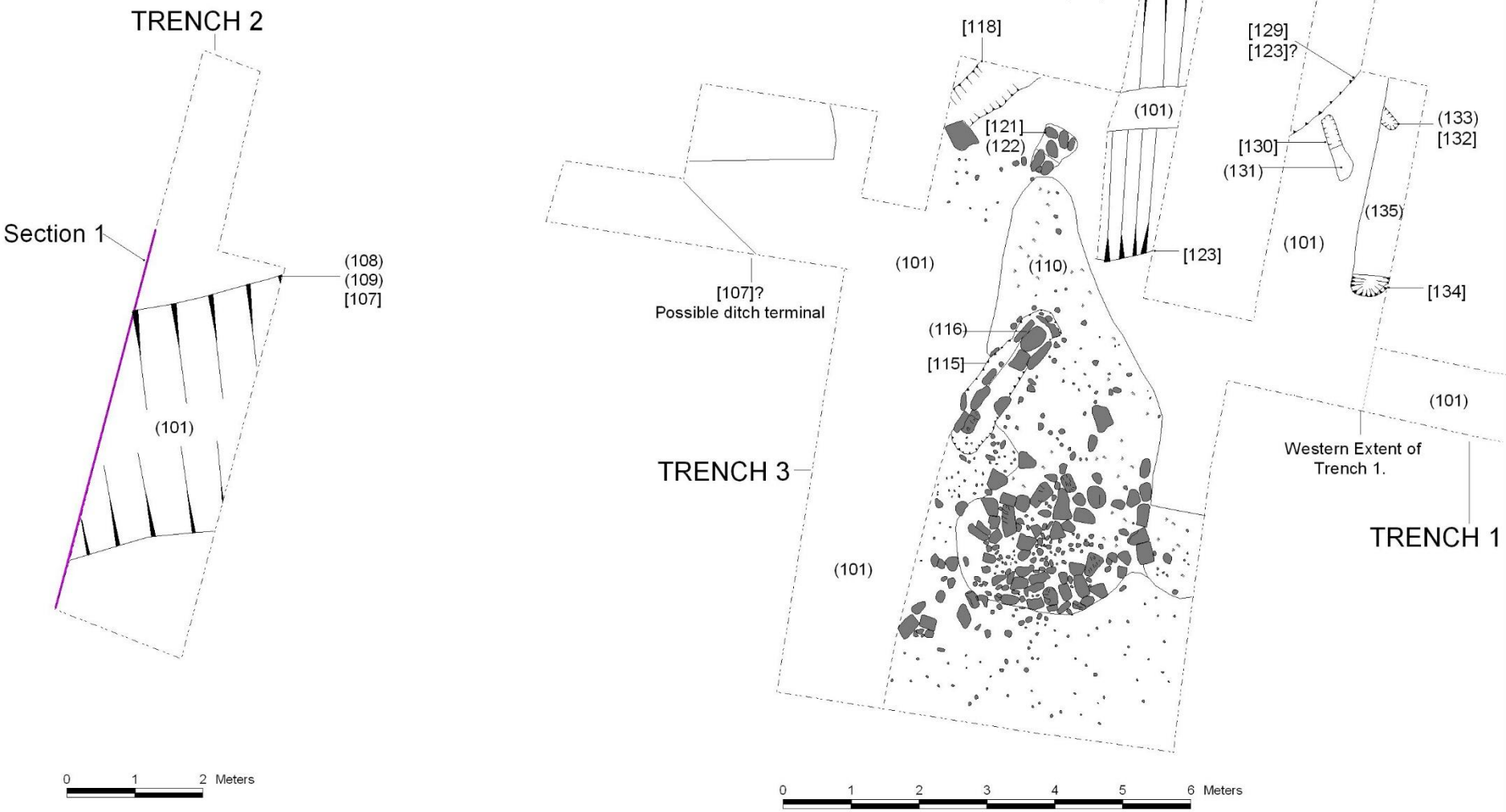
Plot Parameters

+5nT

Positive Greyscale Plot
Absolute + - 5nT
Zero mean grid applied
Zero mean traverse applied
Despiked

-5nT

Figure 2: Gradiometer Survey
Results and Trench Locations.



GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
Hidden Heritage
Community Archaeology Project

Grampus Heritage and Training Limited
2013 Wolsty Castle Excavations
Wolsty Hall Farm, Cumbria

NGR NY 1048,5059

Scale 1:90 at A4

Drawn By: MG

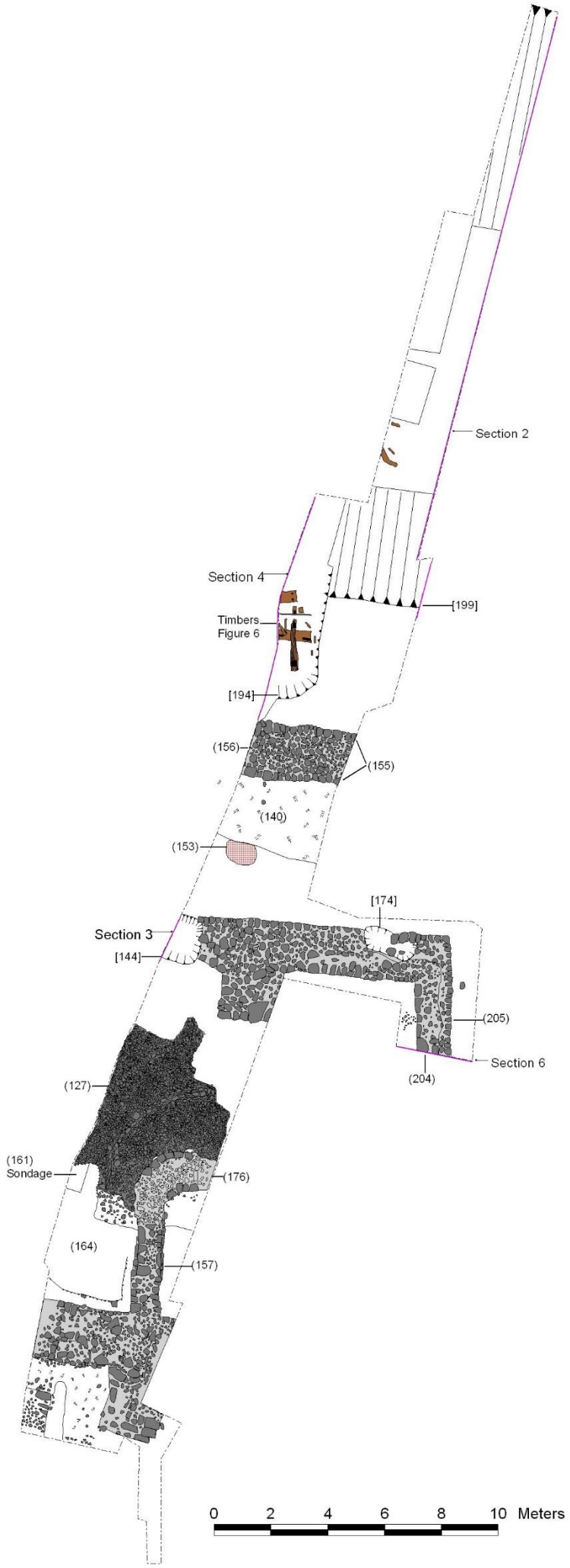
Date: October 2016

N

Key

- Stone
- (125) Context Number
- Excavation Extent
- Drawn Section

Figure 3: Plan of Trenches 1, 2 and 3.



GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
'Hidden Heritage'
Community Archaeology Project

Geophysical Survey and Excavation at Wolsty Castle June/July 2013

October 2016

NGR NY 1048,5059

Scale: 1:200 at A4

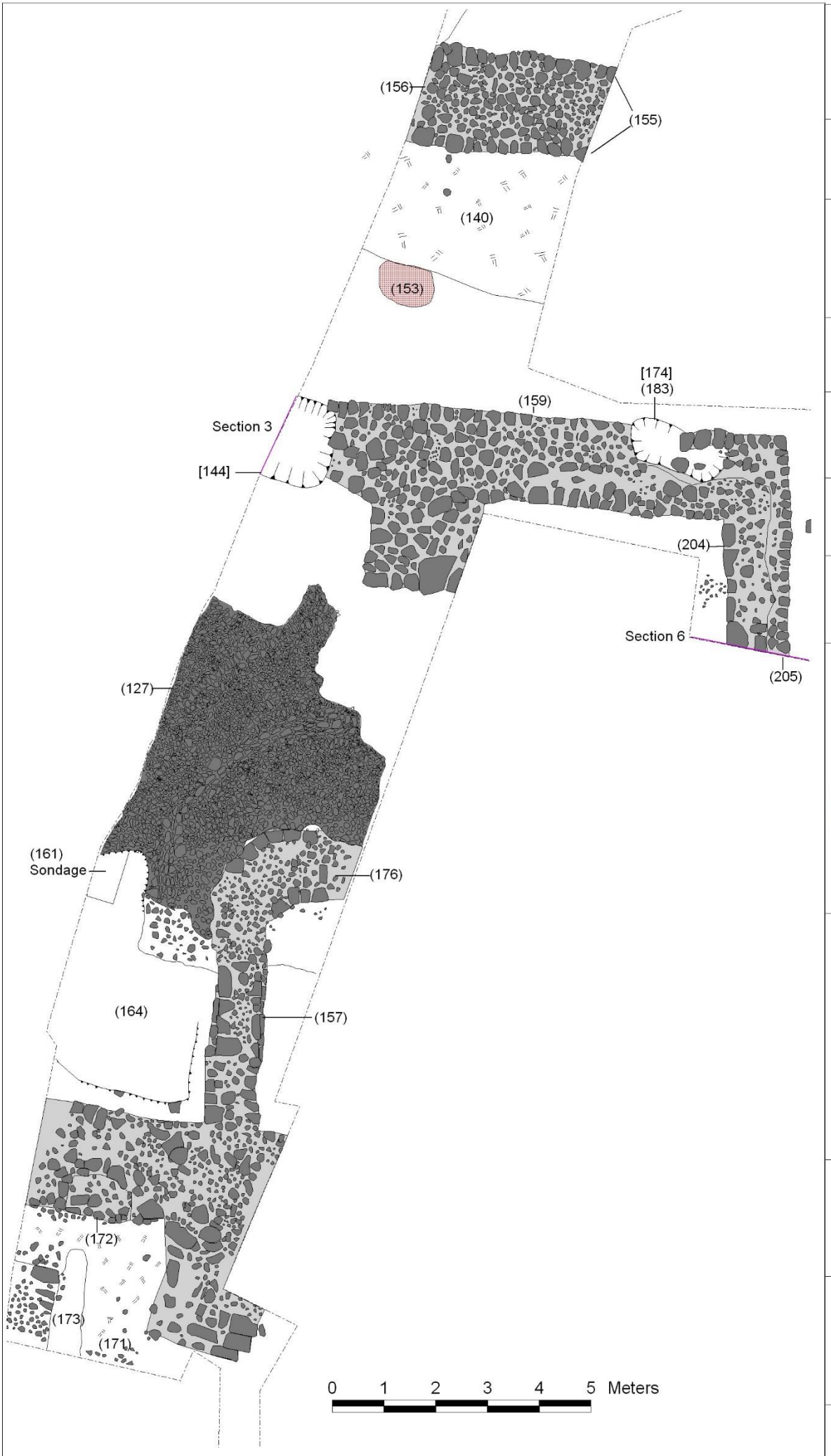
Drawn by: MG

Key

- Extent of Excavation
- Stone
- Walls
- Hearth
- Timber
- Section Drawn
- (140) Context Number

N

Figure 4: Plan of Trench 4.



GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
'Hidden Heritage'
Community Archaeology Project

Geophysical Survey and Excavation at Wolsty Castle June/July 2013

October 2016

NGR NY 1048,5059

Drawn by: MG

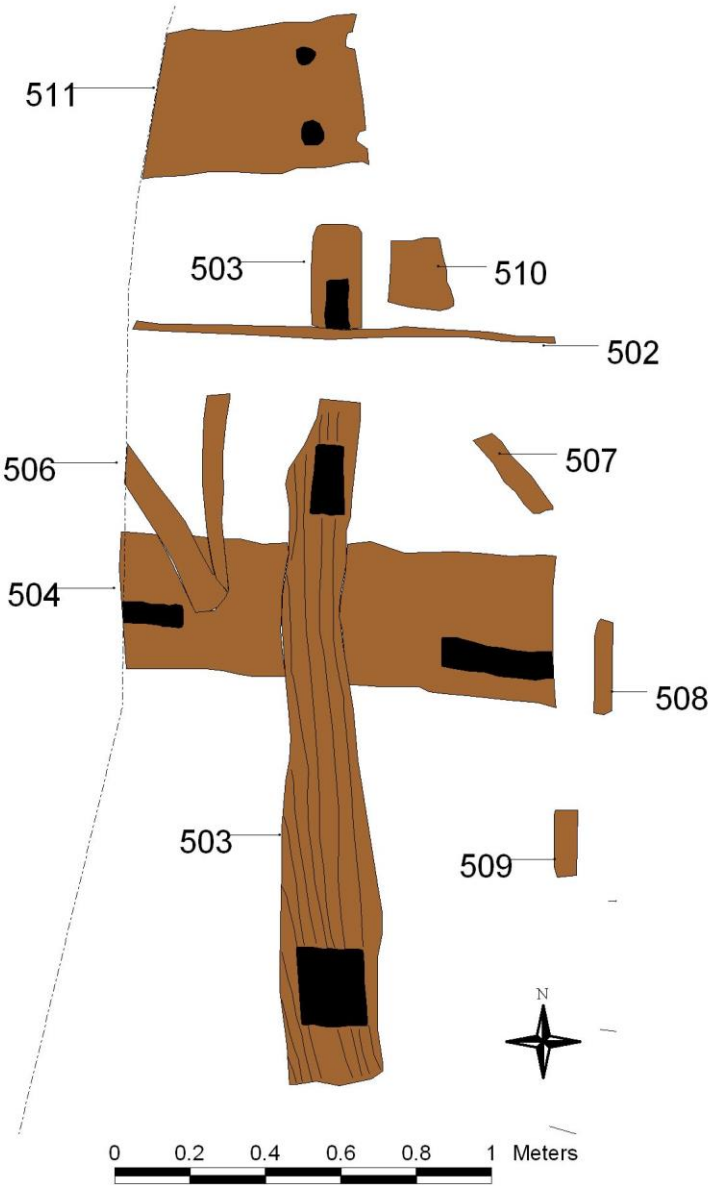
Scale 1:100 at A4

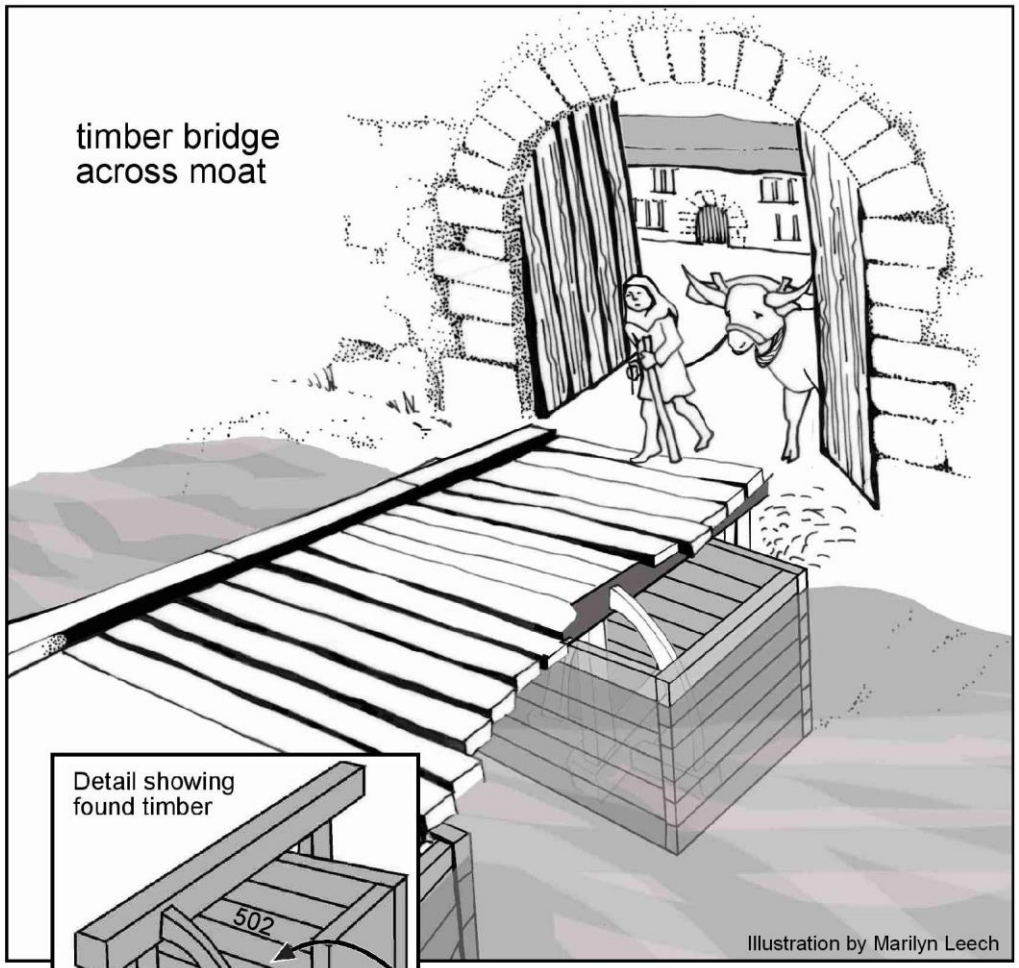
Key

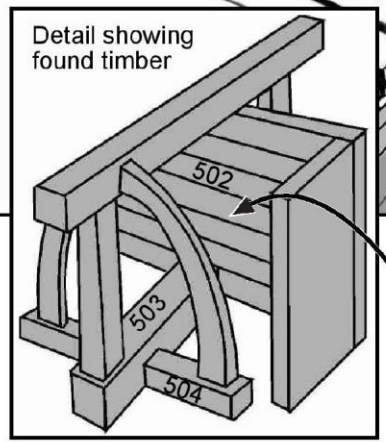
- Extent of Excavation
- Stone
- Walls
- Hearth
- Section Drawn
- (127) Context Number

N

Figure 5: Detail of Trench 4 Plan. South End.







supporting timber box in-filled with rubble

GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
Hidden Heritage
Community Archaeology Project

Grampus Heritage and Training Limited
2013 Wolsty Castle Excavations
Wolsty Hall Farm, Cumbria

NGR NY 1048,5059

Drawn By: MG

Date: October 2016

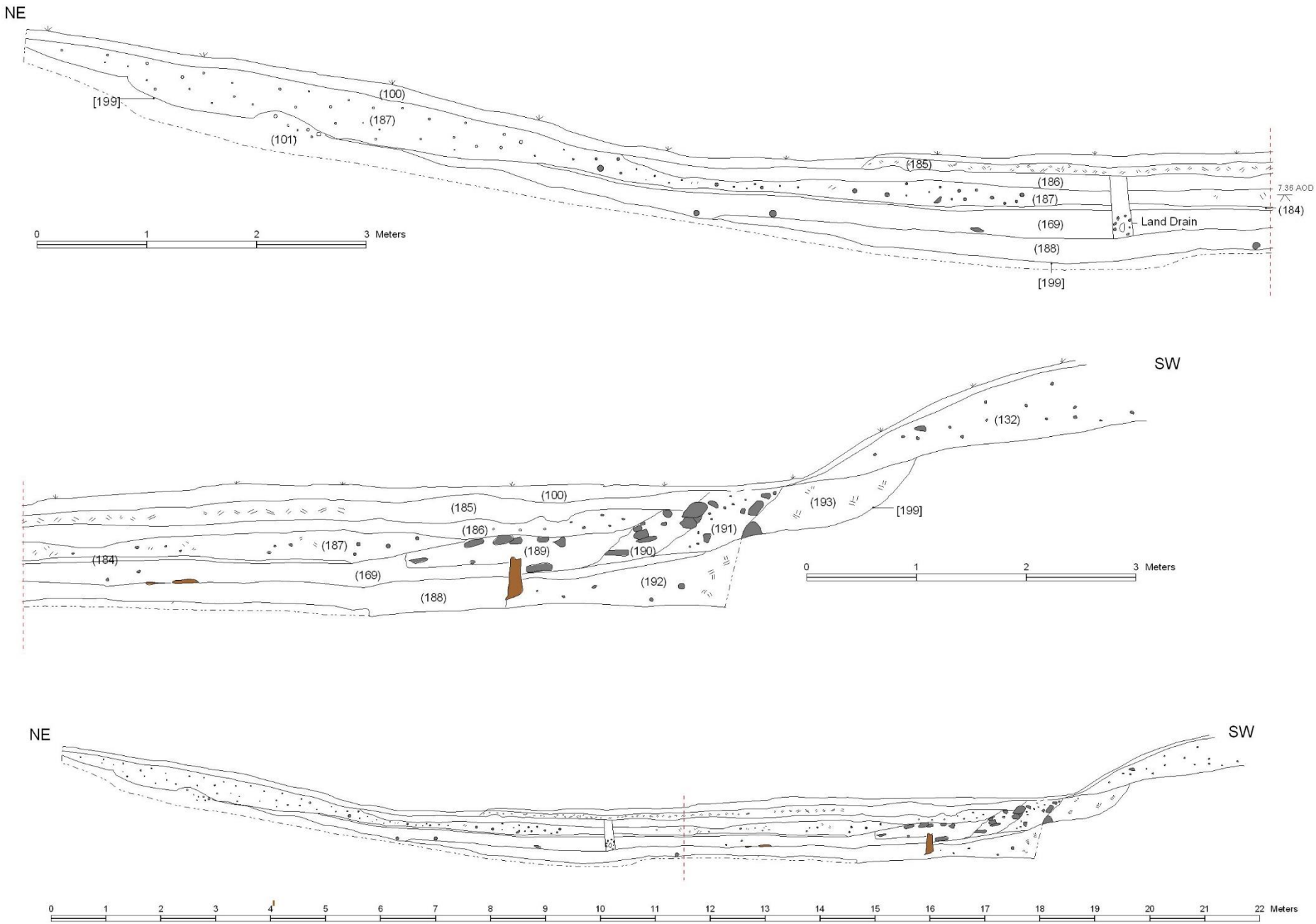
Scale of Timber Plot (left)
1:20 at A4

Key

Timber

502 Context Number

Figure 6: Detail Plan of Timbers in Trench 4 and Interpretive Illustration of Structure.



Section 2: North West Facing Section Across Moat.

GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
Hidden Heritage
Community Archaeology Project

Grampus Heritage and Training Limited
2013 Wolsty Castle Excavations
Wolsty Hall Farm, Cumbria

NGR NY 1048,5059

Drawn By: MG

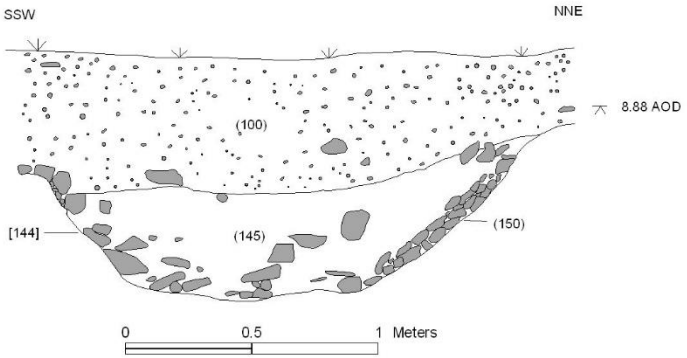
Date: August 2016

Scale at A4:
Split section (top) 1:50
Full section (bottom) 1:100

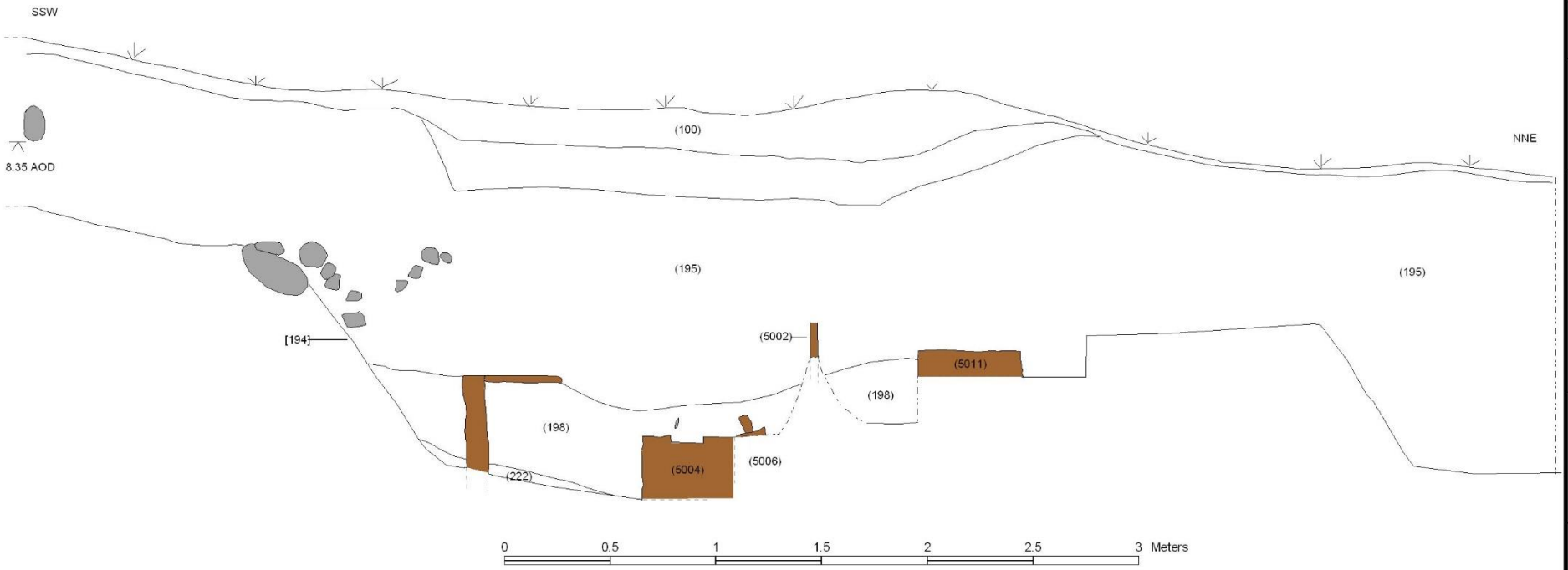
Key

- Elevation AOD
- Wood
- Stone
- Surface
- (195) Context Number
- Excavation Extent

Figure 7: Section 2. Moat.



Section 3: South-east facing section of pit [144].



Section 4: South-east facing section trench 4 above bridge timbers.

GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
Hidden Heritage
Community Archaeology Project

Grampus Heritage and Training Limited
2013 Wolsty Castle Excavations
Wolsty Hall Farm, Cumbria

NGR NY 1048,5059

Drawn By: MG

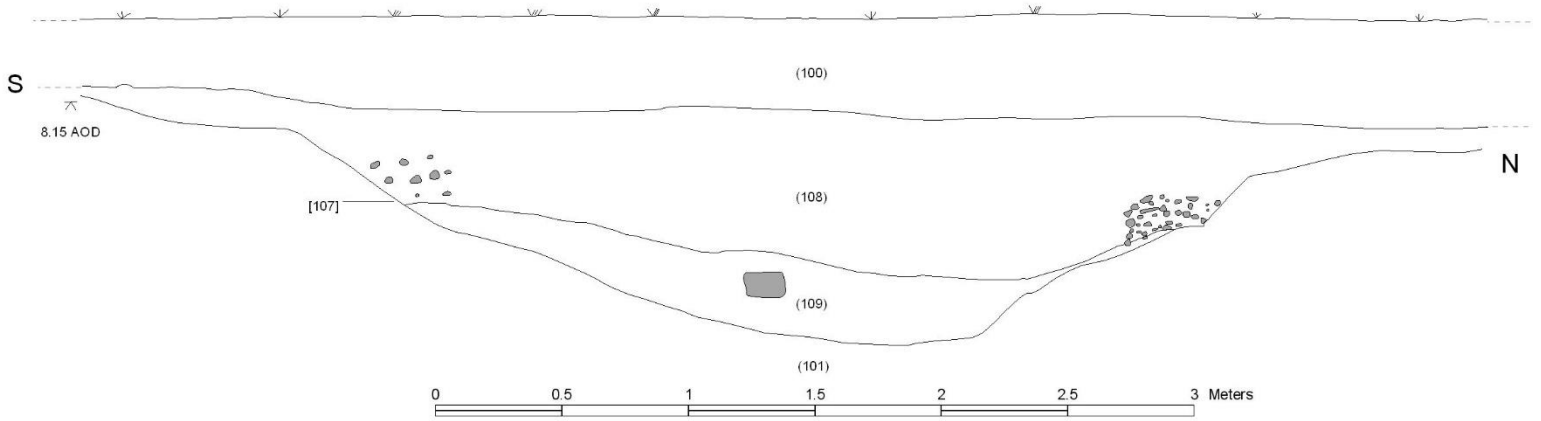
Date: August 2016

Scale: 1:30 at A4

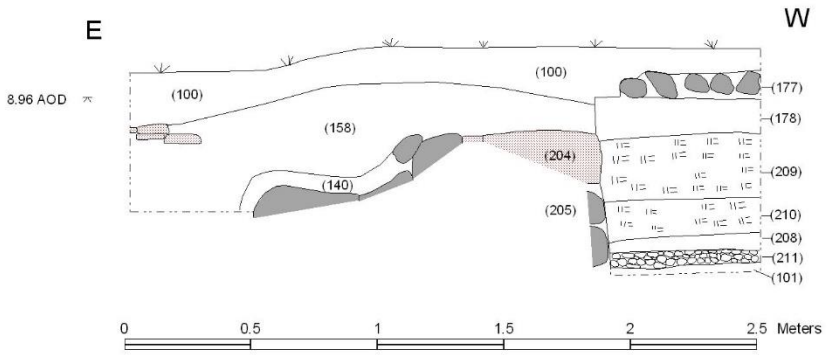
Key

- Elevation AOD
- Wood
- Stone
- Surface
- (195) Context Number
- Excavation Extent

Figure 8: Sections 3 and 4. Trench 4.



Section 5: East Facing Section of Ditch [107] in trench 2.



Section 6: North Facing Section Across Wall (204) and (205). Trench 4.

GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
Hidden Heritage
Community Archaeology Project

Grampus Heritage and Training Limited
2013 Wolsty Castle Excavations
Wolsty Hall Farm, Cumbria

NGR NY 1048,5059

Drawn By: MG

Date: October 2016

Key

Elevation AOD

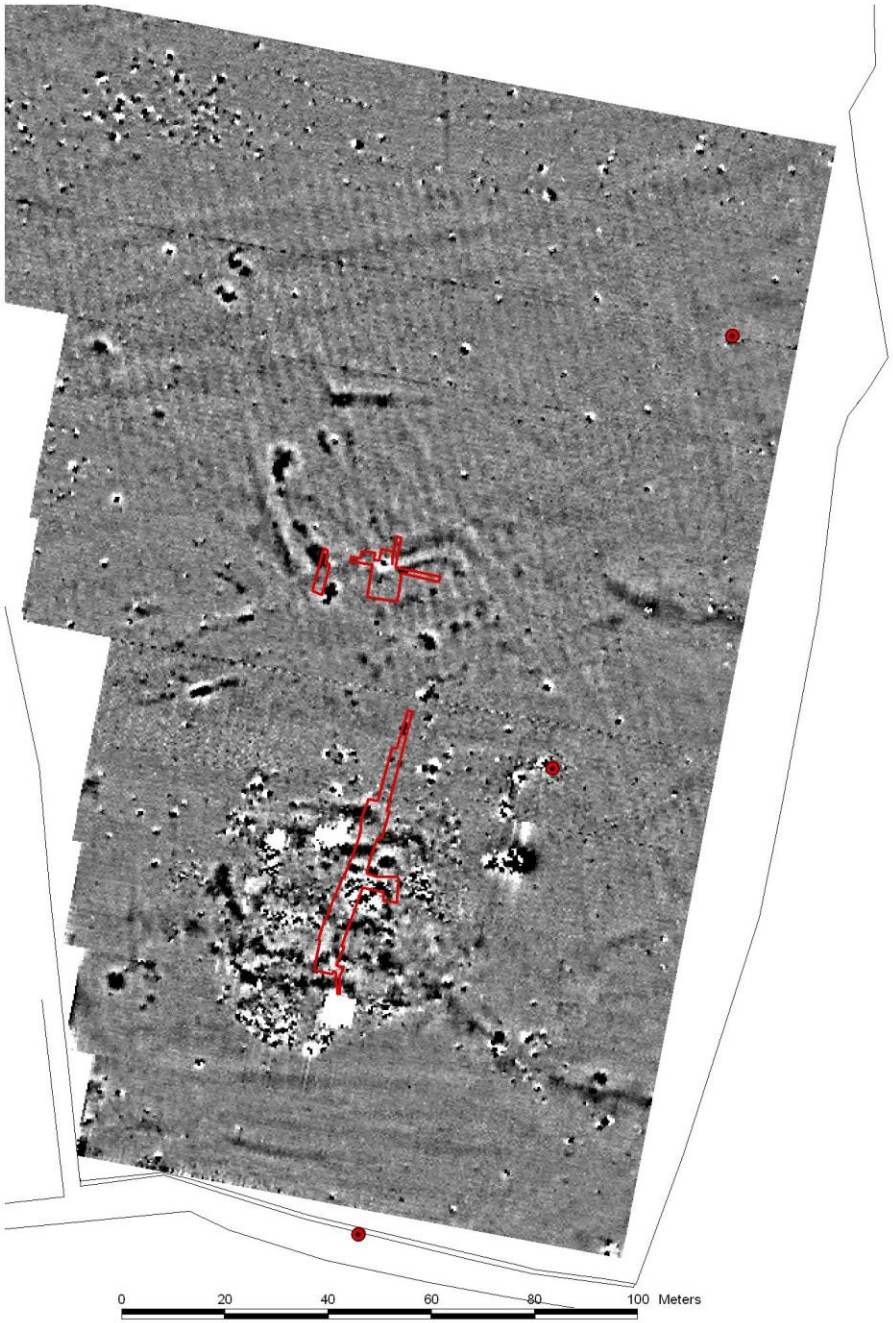
Stone

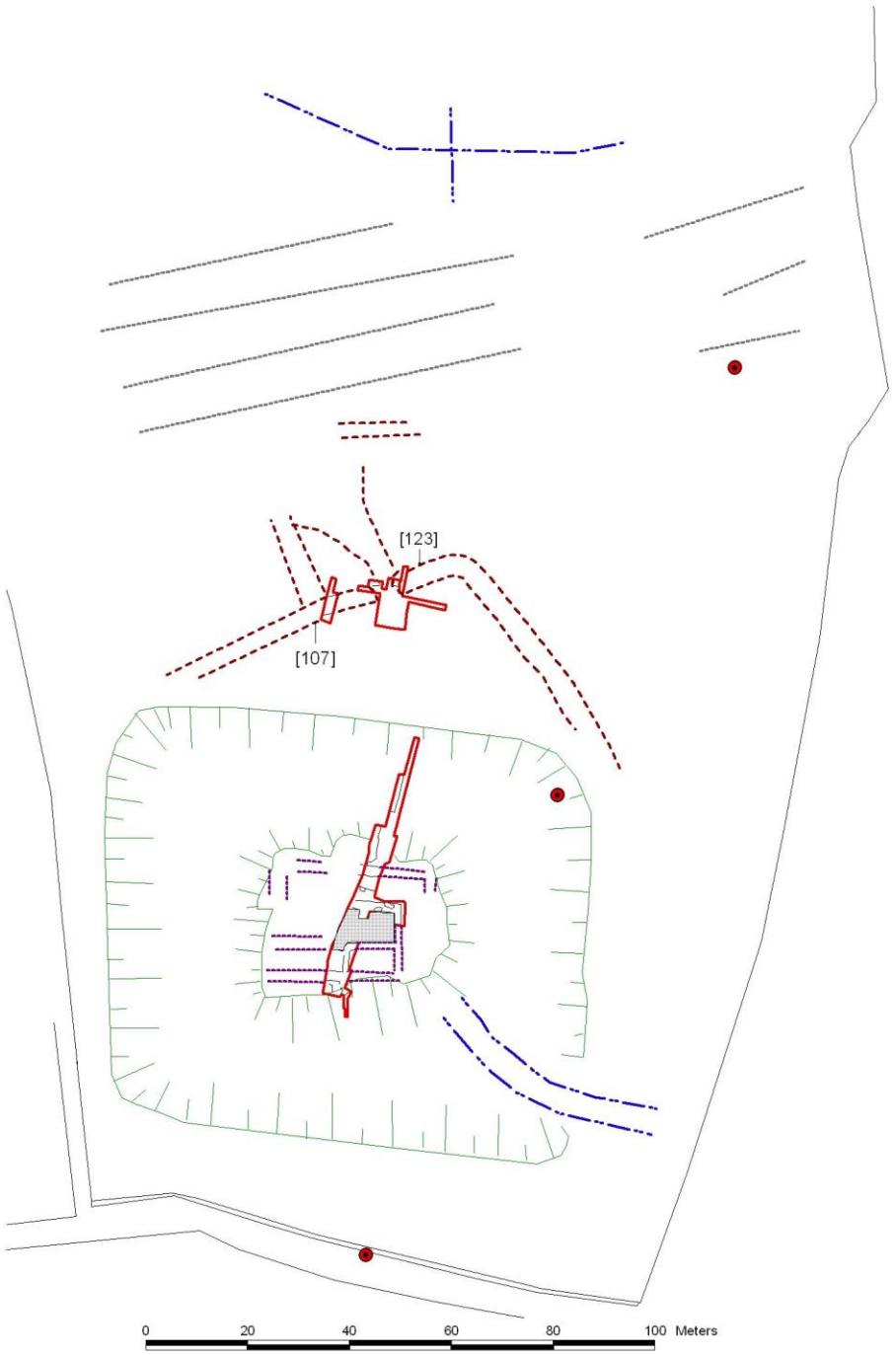
Surface

(195) Context Number

Sandstone

Figure 9: Sections 5 and 6.





GRAMPUS
HERITAGE & TRAINING LIMITED

Solway Wetlands
'Hidden Heritage'
Community Archaeology Project

Geophysical Survey and
Excavation at Wolsty Castle
June/July 2013

October 2016

Grid Ref: NY 1049 , 5060

Scale: 1:1,500 at A4

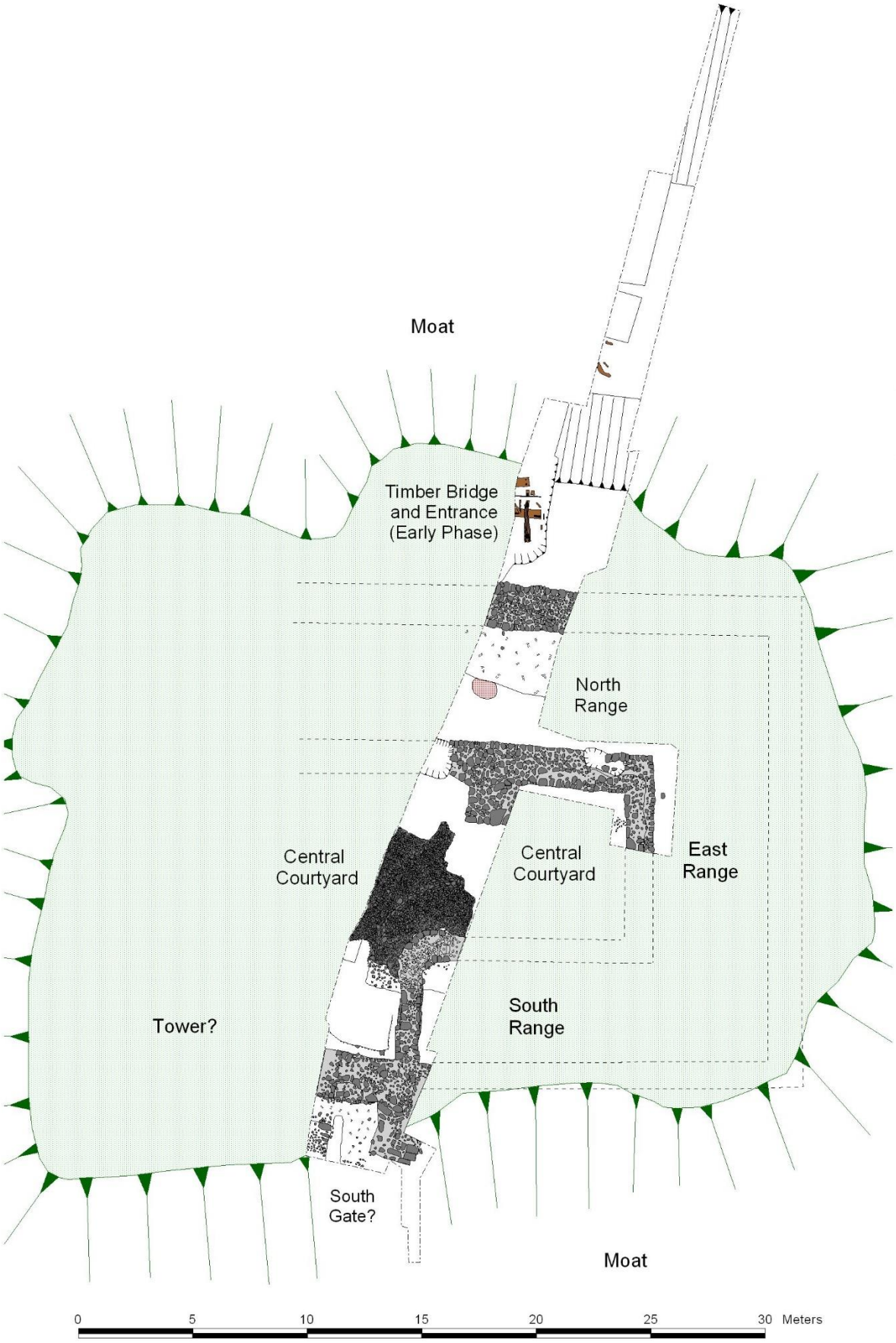
Drawn by: MG

N

Key

- Electricity Pole
- Modern Drain
- Geology
- Outer Ditch
- Excavated Area
- Earthwork
- Wall
- Cobbled Yard

Firgure 10: Geophysical
Survey. Interpretive Plot



GRAMPUS HERITAGE & TRAINING LIMITED

Solway Wetlands 'Hidden Heritage' Community Archaeology Project

Geophysical Survey and Excavation at Wolsty Castle June/July 2013

October 2016

NGR NY 1048,5059

Drawn by: MG

Scale: 1:250 at A4

Key

- Extent of Excavation
- Stone
- Walls
- Hearth
- Timber
- Wall Line (Projected)
- Moated Platform (Surveyed)

N

Figure 11: Trench 4 Interpretation and Platform Earthwork.