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# Rievaulx Abbey, Helmsley, North Yorkshire: Archaeological Survey and Investigation of the Precinct

Trevor Pearson

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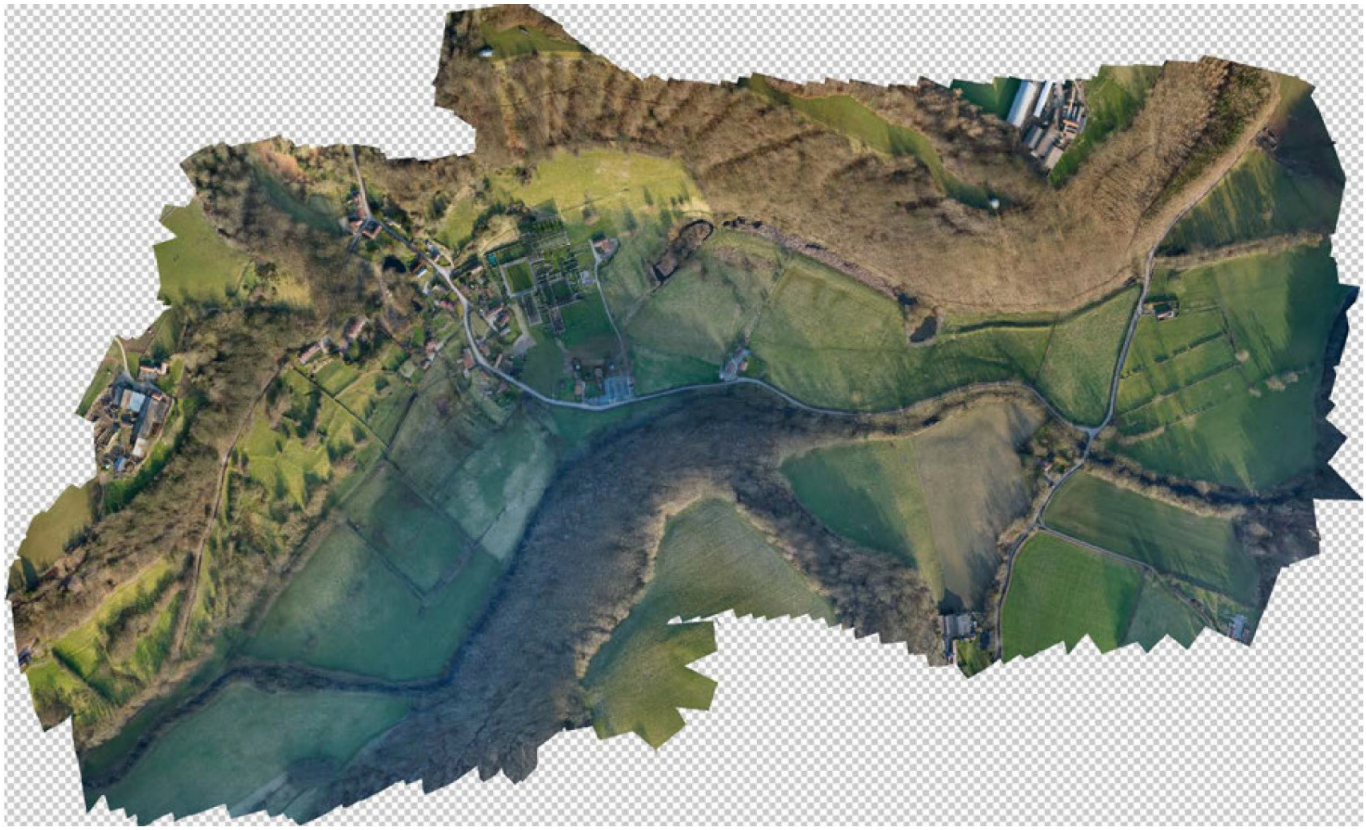

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# Rievaulx Abbey, Helmsley, North Yorkshire

## Archaeological Survey and Investigation of the Precinct

Trevor Pearson

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SUMMARY
This report is based upon the results of unpublished fieldwork at the medieval Cistercian abbey of Rievaulx in North Yorkshire undertaken in 2015 by Historic England, together with a limited amount of new survey work undertaken by the author in the spring of 2018. The abbey is situated in the valley of the river Rye, just north of Helmsley in North Yorkshire, at the centre of an extensive precinct encompassing a variety of earthwork remains from the monastic and later periods. This earthwork evidence is assessed to develop a new understanding of the development of the landscape during the period of the abbey's life, and the use of the site for iron manufacture in the later 16th and 17th centuries. The ruins became part of a landscape park in the later 18th century and in the 20th century the abbey became a much-visited historic monument in the care of the State.

CONTRIBUTORS
The report was written by Trevor Pearson, formerly of Historic England, who undertook the survey in 2018 with the assistance of Marcus Jecock and Rebecca Pullen from Historic England and volunteer Martin Bland. David Went instigated the 2018 project on behalf of Historic England and edited the report with Marcus Jecock. Former colleagues from English Heritage, Chris Dunn, Paul Barnwell and the late Ian Goodall discussed the site with the author while Nick Hannon, Jon Bedford and David Andrews from Historic England undertook the 2015 survey. The survey plan in this report is based on one prepared by Phillip Sinton in 2015.

ACKNOWLEDGEMENTS
The work would not have been possible without the kind permission of the land owner, Sir Richard Beckett. Thanks are due to everyone who helped with the 2015 and 2018 surveys and contributed ideas which appear in this report, and in particular to Nick Hannon for the excellent work he did processing and analysing the data from the 2015 survey.

ARCHIVE LOCATION
Historic England Archive Services, the Engine House, Firefly Avenue, Swindon, SN2 2EH

DATE OF SURVEY
Fieldwork took place in February and March 2018 and the report was completed in January 2019

CONTACT DETAILS

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Cover illustration: Orthophotographic mosaic created from drone-acquired imagery by Nick Hannon in 2015. North is to the left. © Historic England.

# 1. INTRODUCTION

Rievaulx Abbey was one of the most important medieval monasteries in the north of England. It was founded in 1132 in the valley of the river Rye, known as Ryedale, on land granted by Walter Espec, an important local landowner whose castle and estate centre lay at Helmsley, 3km further south down the valley. The abbey was the first Cistercian establishment in the north of England and it rapidly grew in importance during the 12th century following bequests of land in Ryedale and further afield, in particular within the North York Moors to the north and along the Vale of Pickering to the south and east. The abbey was dissolved in 1538 and for a century afterwards Rievaulx was an important iron manufacturing site. In the middle of the 18th century the owner of the site, Thomas Duncombe, constructed a terraced walk along the valley top overlooking the abbey from where the picturesque qualities of the ruins and the wider landscape could be enjoyed. Called Rievaulx Terrace, the viewpoint is now in the ownership of the National Trust. The abbey was brought into the care of the Ministry of Works in 1917 and is now managed by the English Heritage Trust. The wider area of the former monastic precinct was given protection as a scheduled ancient monument in 1915.

In 2015 a survey commissioned by Historic England used low-level aerial photography from an Unmanned Aerial Vehicle (UAV) to make a digital surface model and an earthwork plan of the precinct (Hannon 2015). Owing to the nature of the technique, the 2015 survey was unable to record areas obscured by tree cover and therefore it was decided to undertake ground-based survey in these areas in 2018 to fill in these gaps in an effort to develop a more complete understanding of the landscape surrounding the abbey. Accordingly, in February and March 2018, the author, along with members of the Historic Places Investigation team from the Historic England's York office undertook a 1:1000 scale earthwork survey of parts of the precinct, enough to support the analysis provided in this report.

Scholarly interest in the medieval landscape began with the publication of the abbey cartulary in 1889 by the Surtees Society (Atkinson 1889). That account and those that followed have tended to focus on the idea that monks constructed 'canals' to bring stone along the valley from quarries to the north and south for use in the construction of the abbey, and that they also diverted the course of the river Rye where it flows past the abbey. Neither of these ideas are supported by the landscape evidence.

It should be noted that previous accounts, largely concerned with the architectural history of the abbey, base their descriptions around a liturgical orientation which places the choir at the east end of the church. In reality, the restrictions imposed by the valley location caused the choir to be oriented to the SSE, and the entire claustral range is therefore similarly askew. This report uses cardinal compass points as the norm and clearly indicates when reference is made to the liturgical orientation.

## 2. TOPOGRAPHY AND GEOLOGY OF THE SITE

Rievaulx Abbey is situated in the valley of the river Rye about 3km north-west of the market town of Helmsley (Figure 1). The river Rye originates in the Cleveland Hills on the north edge of the North York Moors about 16km to the north of the abbey. From there it flows southwards along the steep-sided Ryedale valley and after passing the abbey enters the flat lands of the Vale of Pickering at Helmsley to eventually feed into the River Derwent, 5km north of the market town of Malton. The abbey stands at a slight bend on the east side of the valley on a terrace elevated above the flood plain. At this point the river Rye is about 200m distant from the conventual buildings on the opposite side of the valley, but along the length of Ryedale the river turns from one side of the valley to the other in a series of sharp bends. At Rievaulx the river is around 15m wide and flows in an incised channel about 2.5m below the level of the valley floor.

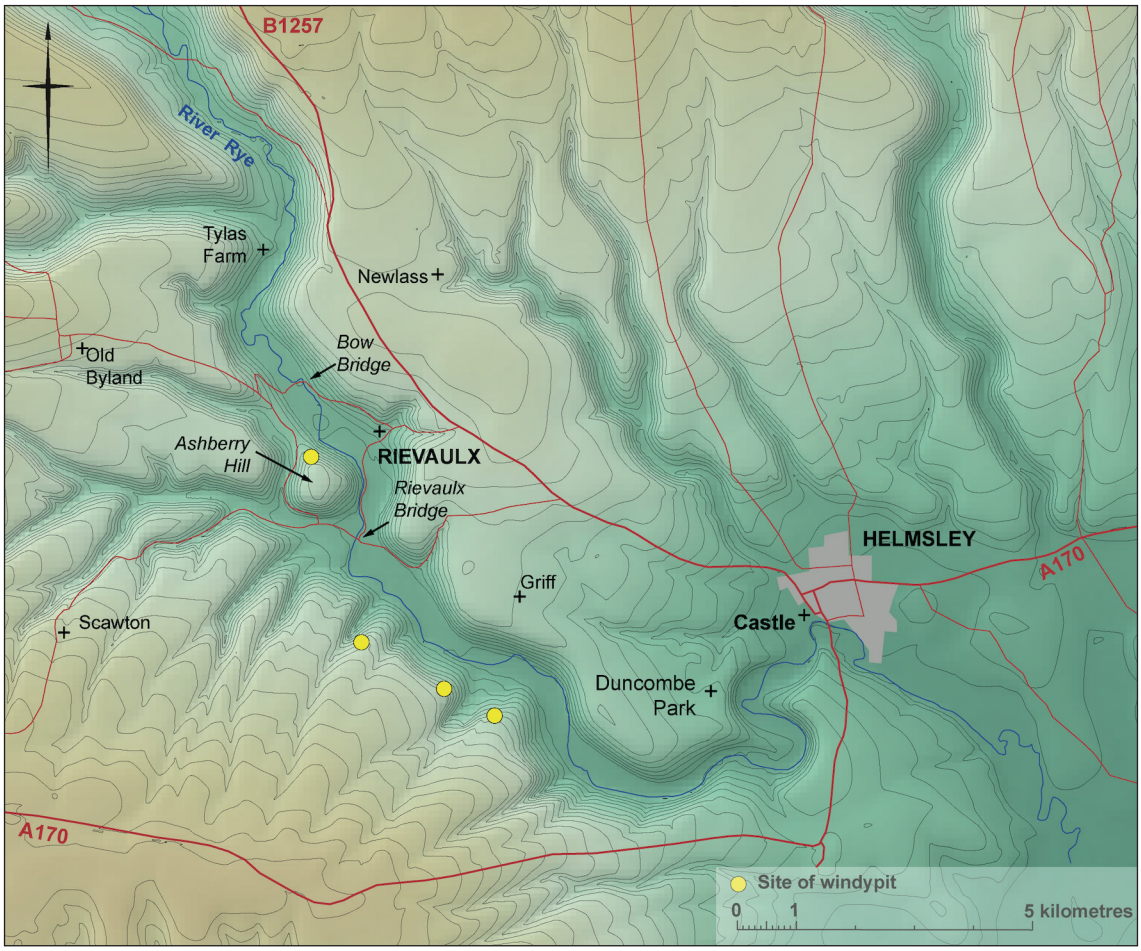


Fig 1. The location of Rievaulx and principal places mentioned in the text © Historic England.

The abbey's precinct boundary, which separated the monks from the secular world, encompassed an area of around 37ha (92 acres) extending westwards to the Rye and eastwards part way up the valley side above the abbey church, stretching for over 500m in both directions along the length of the valley. The village of Rievaulx consists of around 25 properties on the east side of the valley to the north of the church and is almost wholly contained within the former monastic precinct. This settlement developed after the Dissolution of the abbey and contains some properties perhaps dating back to the 16th and 17th centuries (Emerick 2003, 124).

Both sides of the valley rise to a height of about 80m AOD above the valley floor. The west side, facing the abbey, is mostly wooded and at the bend in the valley forms an isolated hill called Ashberry Hill, which is possibly the 'Mons Escherberch' mentioned in 12th century in the Rievaulx Cartulary. The valley floor and the lower slopes on the east side of the valley are mostly pasture fields, but the upper slopes are wooded. Terrace Bank Wood, to the south of the abbey, covers the entire eastern side of the valley. Close by the abbey, to the north, the main valley slope is cut by a deep side-valley which extends for about 600m eastwards. The road down the side-valley is called Rievaulx Bank. It connects the main road running north out of Helmsley (B1257) with Rievaulx village where it forms the main street. There is a concentration of at least seven springs within the side-valley which contributed fresh water to the abbey. The spring line appears to occur along the junction between the Lower Calcareous Grit that forms the upper slopes of the valley and the underlying softer Oxford Clay. Below the Oxford Clay lie rocks of the Osgodby Formation which form the valley floor as far as a point about 500m south of the abbey church. Here the Weaverthorpe Fault crosses the valley from east to west creating a downthrow to the south, beyond which the Oxford Clay forms the valley floor (JBA Consulting 2015, 8).

Of particular geological interest in this part of Ryedale are a group of natural horizontal and vertical fissures on the west side of the valley called the Windypits. These are named after a natural phenomenon which results in the passage of cold and warm air, the latter exiting the vents in cold weather and occasionally forming clouds of vapour on the hillside (McDonnell 1963, 17). They are thought to be formed by bedrock fracturing at the junction between the Oxford Clay and the overlying Lower Calcareous Grit. The most northerly example is on the side of Ashberry Hill, opposite Rievaulx. Here, two separate openings are situated on gently sloping ground about 3m below the crest overlooking the abbey (Dale and Thomas 2016, 11).

Hand auguring and investigation of the river bank has established that the valley floor is covered by a red-brown silty clay alluvium, up to 5m thick, which supports a stoneless fine loamy and clayey soils of the Enborne Association (JBA Consulting 2015, 7). These soils are characteristic of seasonal floodplains and are best suited to permanent grassland with stock rearing when the flood risk is low. Most of the valley floor from the Rye up to the west side of the abbey's claustral range falls within Risk Zone 3, which is defined by the Environment Agency as having a 1 in 100 (or greater) annual probability of river flooding. Indeed, a recent study has identified Rievaulx Abbey among eleven sites in the care of English Heritage which are most

at risk of flooding (Pearson 2013, 127). The site's vulnerability was demonstrated as recently as 2005 when the abbey's visitor centre and its immediate surroundings were inundated, but the problem is one of long standing. In 1754 both Rievaulx Bridge immediately to the south of the abbey precinct and Bow Bridge immediately to the north were reportedly swept away when the Rye flooded (McDonnell 1963, 74-6) and one can only presume that flooding must have posed a threat to the abbey and its precinct since its very foundation.

The abbey ruins are in the guardianship of Historic England (Estate number: N0521) and are protected as a listed building (List entry number: 1175724), while the much wider area of the former monastic precinct is protected as a Scheduled Ancient Monument (List entry number: 1012065) (Figure 2). The ownership of this area is shared between several private individuals and the National Trust who acquired the Rievaulx Terrace in 1972. This landholding extends across the wooded slope of Terrace Bank Wood to the valley floor to encompass the south-east part of the monastic precinct.

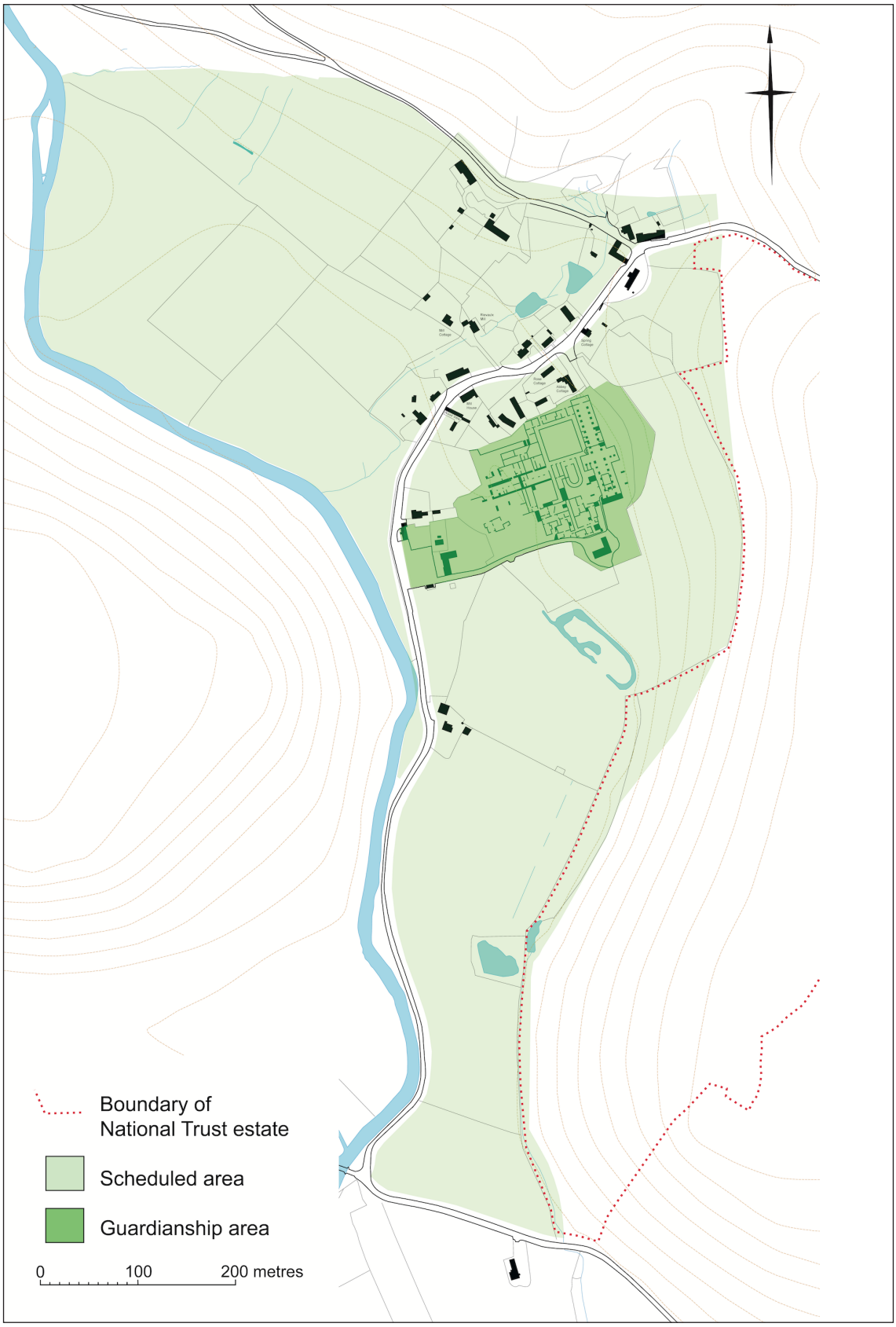


Fig 2. Map of the scheduled and guardianship areas and the National Trust boundary. © Historic England.

# 3. THE DOCUMENTED HISTORY OF THE SITE

## 3.1 The pre-monastic period

There is no mention of Rievaulx in the Domesday Survey or any earlier written source for the simple fact that the name was the creation of the Cistercian monks who founded the abbey. The name simply means Rye Valley - the 'vaux' element derived from the contemporary French term for valley (Smith 1928, 73), a conscious copying perhaps of the name of Rievaulx's mother house in France - Clairvaux. However, the absence from the Survey does not mean people were not already living and farming in the locality. The Domesday Survey does record a settlement with a church and priest at Helmsley - then called Elmeslac - divided between three manors and forming part of the administrative district or 'wapentake' of Maneshou which included the future site of Rievaulx. The name 'Maneshou' is thought to derive from 'Man's Mound' and refer to an unknown hill or similar feature that was the meeting place of the wapentake. The name of the wapentake later changed to Ryedale (Smith 1928, 42). The discovery of part of an Anglo-Scandinavian hogback tomb at the parish church in 1888 supports the evidence of the Domesday Survey for the existence of a pre-conquest church at Helmsley (Lang 1991, 142-3). The Survey also records a farmstead at Griff, a name which later became that of one of the granges of Rievaulx Abbey and where extensive earthworks still survive on the hilltop above the east side of the Rye valley around a mile to the south-east of the abbey. A survey of the site in 2002 by English Heritage was not able to establish conclusively that the grange is on the same site as the Domesday farm (Hunt and Stone 2003, 31) but nevertheless it is evidence that settlement and presumably agriculture occurred on the hill tops in close proximity to the future site of the abbey in the 11th century.

## 3.2 The founding of the monastery

Rievaulx was the first abbey founded by the Cistercian Order in the north of England. The monks who all came from the mother abbey of Clairvaux in north-east France took possession of the site in 1131 and the formal foundation of the abbey was recorded as 5 March 1132. The events leading up to the foundation are recounted by William of Newburgh's history written in the late 12th century (Stevenson 1996, 419) and in biography of Abbot Aelred of Rievaulx written around 1167 by the abbey's infirmarer Walter Daniel (Powicke 1950, 12-13). The foundation is also discussed and analysed in several recent studies (Burton 1999, 99-101; Fergusson *et al* 1999, 37-8).

At the time of the Domesday Survey the site of the future abbey formed part of the lands of the Count of Mortain, but the Mortain manors were surrendered to the Crown following Count William's participation in a failed uprising against Henry I in 1106. The king later bestowed Mortain's forfeited Yorkshire estates, those centred on Kirkham in the East Riding and on Helmsley in the North Riding, on Walter Espec. Espec was one of the king's principal supporters in the north of England and with an estate at Wark in Northumberland on the Scottish Border, played a key role in dealings between the English and Scottish thrones, including a leading part in the victory of English forces over the Scots at the Battle of the Standard, near

Northallerton, in 1138. Espec originally favoured the Augustinian Order, granting them land for a priory on his estates at Kirkham in the East Riding around 1122. His grant of around 1,000 acres to allow the Cistercians to found Rievaulx Abbey near Helmsley occurred nearly a decade later (Atkinson 1889, 16-21). The site was on the western edge of the Ryedale wapentake, the river Rye here marking the boundary with Birdforth Wapentake to the west (Smith 1928, 179). William of Newburgh describes the site of the abbey at its foundation as 'a horrid and wild desert' (Stevenson 1996, 419) - alternatively translated as, 'a place of terror and solitary waste' (Burton 1999, 101). Around 30 years after the foundation, Walter Daniel likened the location to an earthly paradise extolling both the peace and quiet of the wooded valley and the sounds created by the copious springs cascading down the valley side (Powicke 1950, 12-13).It is thought that around 12 monks and 20 lay brothers were initially accommodated in temporary wooden buildings as work progressed over several decades on the construction of Rievaulx's stone buildings (Fergusson 1999, 45). A recent study has identified seven or eight different quarries where stone may have come from. Of these the nearest are Penny Piece Quarry just beyond the north boundary of the precinct and an unnamed quarry on the hillside above the church which, in a later phase, destroyed part of the east side of the precinct boundary (Senior 1999).

The sequence of building has been reconstructed by architectural analysis of the standing remains. This has shown that the nave of the present church and the main claustral ranges were constructed by about 1165 during the abbacy of Aelred (1147-67). The confined nature of the terrace on which the church was constructed meant that it could not be aligned liturgically from east to west but was laid out with a south-east to north-west axis with the claustral ranges aligned to match. Less is known about the development of the precinct. The description of Aelred's entry into the Rievaulx community in 1134 when he was met at the gatehouse by 'the prior, the guest master, and the keeper of the gate and a great company of the brethren' (Powicke 1950, 15) implies the precinct boundary with its formal entry point was already established within two years of the abbey's foundation.

The expansion in the size of the abbey was a consequence of its success in attracting donations of land to add to the initial endowment from Walter Espec. By the 1180s it had acquired widespread estates across the western half of the North York Moors, in Ryedale and on the north of the Vale of Pickering, supported by a network of granges with the abbey at the economic centre. Facilities must have developed within the precinct to match the expansion in the landholdings and economic activities, with buildings added to store and process agricultural produce and to work the iron ore brought in from mining operations on the abbey's estates to the north in Bilsdale and further afield in the West Riding (McDonnell 1963, 116). However, the absence of any named barns or animal houses (apart from a swine house) within the precinct at the time of the Dissolution led Coppack to speculate that these were to be found at the nearby home granges of Griff and Newlass, rather than within the precinct itself (Coppack 1999, 186).

For a period of about five years starting in 1142 the Cistercians shared the valley with a house of Savigniac monks who had settled on land granted by Roger de Mowbray higher up the valley, probably at the site that is now Tylas Farm on the west side of the Rye about 1.5km to the north (Burton 2004, 337). The site was part of the manor of Byland on the Moor, later to be known as Old Byland (Burton 1999, 112). The proximity of the two houses created problems and the Savigniacs were re-settled to another site at Stocking near Oldstead, 7km to the south, in 1147, the same year in which their order was merged with the Cistercians. The former Savigniac community moved to their final site, the present Byland Abbey, in 1177. While still in Ryedale they had granted the monks of Rievaulx permission to:

> 'make a dyke through our land at the foot of the hill 'Escheberch' in the manner they know to be needful and may have for their use the land which on their side they enclose by the same dyke as peaceably and freely as we until yesterday have held the same' (Atkinson 1889, Document 244, 180-81).

This charter has been taken both as evidence for the construction of a 'canal' to bring building stone to the abbey from quarries to the north (Rye 1900, 71) and for the wholesale movement of the river Rye from the east to the west side of the valley (Russell 1914, 502). The move of the Savigniacs out of Ryedale also appears to have helped Rievaulx acquire more land down the valley to the south from Hugh de Malebisse (Atkinson 1889, Document 74, 43-4 and no. 75, 44-5) and Richard de Malebisse (Atkinson 1889, Document 300, 211-12 and Document 304, 213-4).

After the 12th century little is recorded about the history of the abbey. A gothic style choir of seven bays was added to the east of the nave probably in the 1220s making it the longest Cistercian church in the country. The new building work was partly in response to Rievaulx's growing importance as a cult centre for William, the first abbot of Rievaulx, whose shrine was in the north-east corner of the cloister, and for Abbot Aelred, whose body was moved from the cloister to a shrine in the new choir (Fergusson *et al* 1999, 163-4). However, the prosperity of the abbey declined in the 13th and 14th centuries to the extent that by the 1370s there were only 15 monks and three lay brothers resident and the abbey had started to relinquish direct control of its granges by leasing them to tenants (Fergusson *et al* 2016, 39). The last major change to the claustral buildings occurred around the end of the 15th century when Abbot John Burton converted the former single-storey infirmary block into a commodious two-storey residence for himself and his immediate retinue (Fergusson 1999, 132-5). The building had a hall on the first floor with private chambers for the abbot that included a large oriel window giving views down the valley to the south. The abbot's house was retained as a dwelling for a short while after the abbey's suppression but was evidently rejected as a country residence by the new owner of Rievaulx, the Earl of Rutland, and was soon dismantled (Fergusson 1999, 135 & Coppack 1999, 181-2).

## 3.3 Post-monastic history

Having acquired the abbey and its estates from the Crown in 1538 the Earl of Rutland quickly stripped the church and claustral buildings of their fittings and turned to demolishing the structures in order to recover the roofing material and the stonework for resale. By the 1540s the eastern arm of the church and the refectory were still standing, although much of the rest of the site had been reduced to low walls or rubble mounds. A remarkable series of documents survive from the period of the Earl of Rutland's acquisition which list the buildings and the individual plots of ground within the precinct, and together give a good impression of the landscape at the time. These documents comprise (1) the grant of the abbey lands by the Crown dated to 1538 (2) an inventory compiled in 1539 for the Earl of Rutland (3) a slightly later survey that survives only as a modern copy that came to light in 1984 (4) a rental that is broadly the same date as the survey and finally (5) the Ministers' Accounts which is based on a valuation of the abbey undertaken in 1538 (Fergusson 1999, 226-237).

While many of the buildings and closes listed in and around the claustral nucleus have left no visible trace, but other plots noted in the 1530s can be related to existing landscape features, allowing Coppack (1986; 1999) to attempt a reconstruction of the precinct as it stood in the 1530s,  Many of the monastic buildings within the precinct were let to private tenants, marking the start of the transition from monastery to village. An individual named Lambert Semer who had tenanted the abbey's iron forge prior to the dissolution continued to work the forge under the Earl of Rutland. The importance of the site for iron production seems to have increased during the following decades and culminated in the construction at Rievaulx of what is believed to have been the first blast furnace in the north of England in 1577 (Fergusson 1999, 187-8). The furnace is thought to have stood to the north of the former abbey refectory in a part of the village now called Furnace Hill, where mounds of iron slag have been observed (McDonnell 1972, 29). Geophysical survey and a trial excavation within the refectory building itself failed to confirm that the building itself was used as a charcoal store (Wheeler and McDonnell 2011). There is good archaeological evidence for a forge located to the south of the former monastic precinct at Forge Farm (McDonnell 1972, 28) the siting of which may also be connected with the construction of a long, narrow mill pond down the east side of the valley. This former pond (or 'canal' as it was first called by Atkinson) is still an important landscape feature and for part of its length supports an important wetland habitat (JBA Consulting 2015, 5).

Manufacture of iron at Rievaulx appears to have ended in the 1640s (Fergusson 1999, 188) and in 1695 the estate was sold to Charles Duncombe, a London banker and goldsmith. During the next century the Duncombe family turned the valley into one of the key elements of a landscape park associated with the house they had built in 1713 on the west side of Helmsley and named Duncombe House. The original house burnt down in 1879 but the landscape park with its near 1km-long terrace cut into the crest of the hill on the east side of the valley above Rievaulx still survives, as does a second terrace, Duncombe Terrace, nearer to the house. Rievaulx Terrace, as the former terrace became known, is believed to have been created by Thomas

Duncombe II soon after 1749 on his return from the Grand Tour, during which he probably acquired 'a heightened sensitivity to the arts' (Green 2016, 19). Tuscan and Ionic style temples were constructed at either end of the terrace and sight lines may have been cut through the wooded slope below the terrace to open up views of the abbey ruins and the Ryedale below, although whether the latter were original features of the terrace's design is disputed (Green 2016, 36-7).

Rievaulx Terrace was approached by a carriage drive of about 5km across the fields from Duncombe House. Visiting in 1768, the agricultural writer Arthur Young described the view from Rievaulx Terrace, remarking on the quality of the view and noting in particular the grass enclosures 'scattered with trees' and a village of 'straggling houses'. His may be the first voice to note the importance of the wider valley as part of the view of the abbey ruins from the Terrace (Young 1771, 83-86).

While visitors to the Rievaulx Terrace may have appreciated the aesthetic qualities of the ruined abbey and the surrounding landscape it should not obscure the fact that this was also a working agricultural landscape supporting the villagers of Rievaulx. Two important early 19th-century estate maps survive from this period among the estate papers of the Duncombe family in the archive collection curated by the North Yorkshire County Record Office (Hornby 1806; Tukes and Ayer 1822). Both maps show the landscape of roads, fields and houses along with the abbey ruins to a fair degree of accuracy. The oldest houses appear to have begun as small cottages for labourers, since they lack evidence for byres or ancillary buildings that indicate small holdings (Barnwell *et al* 2005). A farm house (Abbey Farm) with a yard and outbuildings had developed to the south-west of the abbey church by this date. Its origins have not been documented but it appears as a complex of buildings on Hornby's map of 1806 (Figure 3) and lasted until the 1950s when the tenancy expired. Most of the buildings were then demolished in order to open up the ruins (Emerick 2003, 130) although one was retained and adapted to become the site museum.

The abbey became increasingly popular with visitors during the 19th century, especially after the railway came to Helmsley in 1871. This, and increasing scholarly interest in the architecture of the standing remains, beginning with the unpublished surveys of John Chessell Buckler in the early 1800s, focused attention on the need to conserve what was left (Fergusson 1999, 190-1). At the start of the 20th century strong appeals were made to the then owner, William Duncombe, 1st Earl of Feversham, from both the Society for the Protection of Ancient Buildings and the Society of Antiquaries of London, to make repairs and to clear the site of vegetation and livestock (Emerick 2003, 123-151). In 1915 the 1st Earl was succeeded by his grandson Charles Duncombe, but he was killed in action on the Western Front in the following year, leaving the title and estate to a minor. This was the catalyst for the transfer of the abbey into the Guardianship of the Commissioners of Works in 1917, and over the next five years more of the site was added (Emerick 2003, 128).

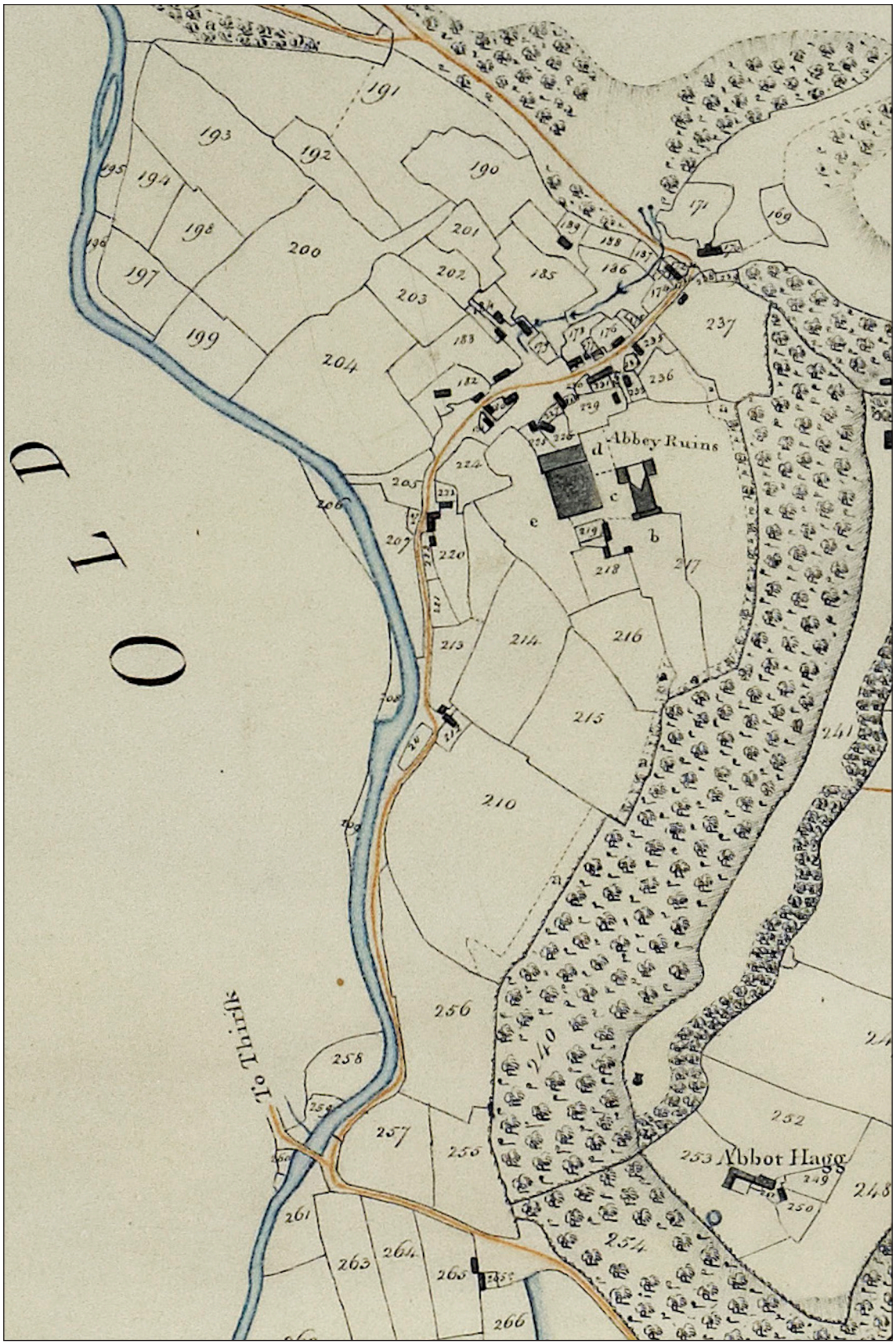


Fig 3. Part of Hornby's 1806 map of the township of Rievaulx, from the original held in the North Yorkshire County Record Office (ZEWM20A4). Copyright reserved.

The Office of Works began a programme of restoration in 1919 under the direction of Sir Charles Peers which saw the removal of the thick deposits of rubble from in and around the church, cloisters and adjacent areas down to the first intact medieval surface, so as to recover the plan of the abbey and open the ruins up for display (Figure 4). The work continued until the mid-1930s. Spoil was dumped in the fields immediately adjacent to the south and west of the ruins to a depth of over 1m, masking any earthwork survival in these areas (Fergusson 1999, 200). The demolition of Abbey Farm was followed by excavations in the late 1950s and early 1960s by the Ministry of Works to reveal the monastic infirmary and associated buildings (Hurst 1958, 193 & Hurst 1961, 314-5). Other minor excavations have taken place since then in and around the abbey, by various commercial archaeological units, mostly in advance of the laying of buried services and small construction projects, but these have not revealed much information that is new. Since 1983 the Abbey has been in the care of English Heritage (now the English Heritage Trust). A new visitor centre opened in July 2016 reflecting the fact that Rievaulx Abbey is one of that organisation's most-visited sites in the north of England.

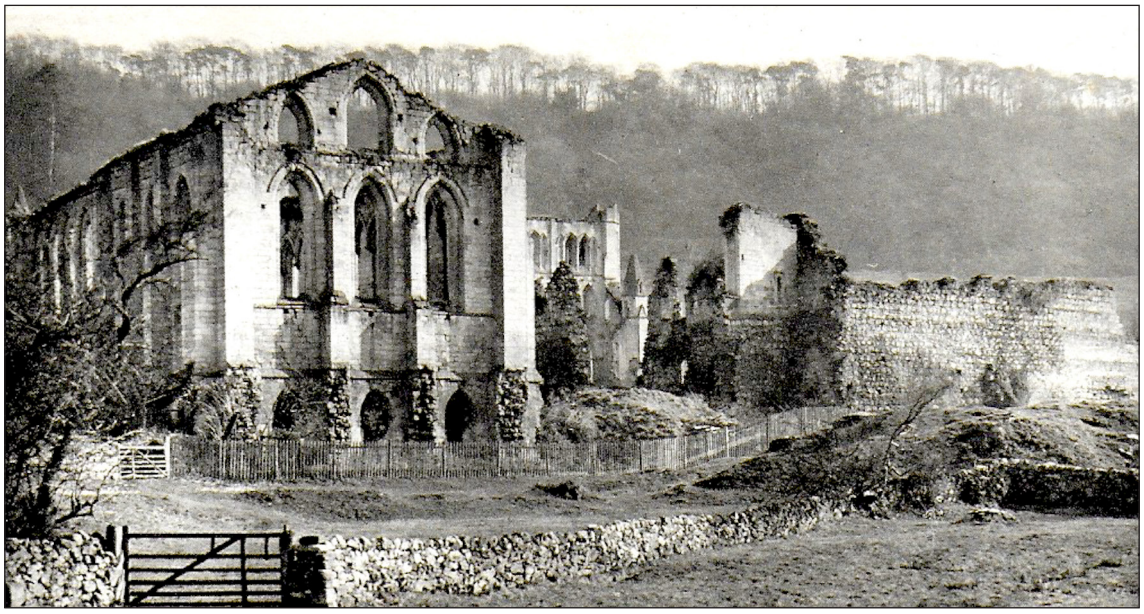

Fig 4. The refectory area viewed from the west before clearance in the 1920s; source author's collection.

## 4. HISTORY OF LANDSCAPE RESEARCH

Antiquarian research in Rievaulx began in the early 19th century with accounts of the standing remains by authors such as Thomas Whitaker, whose publication 'A Series of Views of the Abbeys and Castles in Yorkshire' appeared in 1820, and William Richardson who published 'The Monastic Ruins of Yorkshire' in 1844. Predating these are the unpublished records by John Chessell Buckler who visited the ruins several times between 1809 and 1811 and has been described as 'the first and most original scholar-antiquary of the architecture of Rievaulx' (Fergusson 1999, 191).

While these early accounts marked the start of the process of understanding the architecture of the standing remains, the development of the landscape of which they formed part was largely ignored until the publication of the Rievaulx Cartulary by J C Atkinson and the Surtees Society in 1889. The Cartulary is a 12th-century document with 13th-century additions that details the extent of the abbey's landholdings together with other matters. It is the earliest surviving Cistercian cartulary in England (Jamroziak 2005, 21), and is now held in the collections of the British Library (BL Cotton MS Julius Di). In her recent study of the cartulary Jamroziak pointed out that Atkinson inserted documents from other sources not in the original and altered the order in which the documents appear in bringing the volume to publication (Jamroziak 2005, 7). Nevertheless, Atkinson's introduction to the volume can be credited as the earliest investigation of the monastic landscape. Atkinson collaborated with Henry Rye who, as the clerk of works and surveyor to the Duncombe Park estate, knew the landscape intimately. Together they developed the idea that the monks had used 'canals' to move stone up and down the valley for use in construction. Atkinson identified a channel on the north side of the precinct below the east side of the valley and named it the 'First Canal', speculating that it was used to bring stone south to the abbey from Penny Piece Quarry, situated very close to the 'canal's' head (Atkinson 1889, lxx-lxxi). Furthermore, he noted what he took to be the remains of a dam 'just above a small island lying in the bed of the stream' where water could be directed from the Rye into this 'canal'.

Atkinson named another channel on the east side of the valley to the south of the abbey as the 'Second Canal'. He records that Henry Rye had developed a theory that the monks had dammed the river a good distance further south down the valley at a place recorded in the cartulary as 'Hangendebridge' to back water up to fill the 'Second Canal' in order to bring stone to the abbey from quarries in that area. Atkinson published an interpretative plan which not only showed the river, his two suggested dams and the alignments of his two 'canals' but also the line of the monastic precinct boundary - the first time this had been defined on a map (Figure 5). Atkinson mapped a third dam crossing the fields between the south-west corner of the abbey and the river Rye (labelled 'Dam' on Figure 5) but it is not clear from his account what the purpose of this was supposed to be, and there is no other evidence to support its existence. Following his collaboration with Atkinson, Rye published his own account of the 'canals' and their use for transporting building stones (Rye 1900). He tied the development of the 'canal' system to several documents contained in the published version of the cartulary. He also published his own far more detailed plan

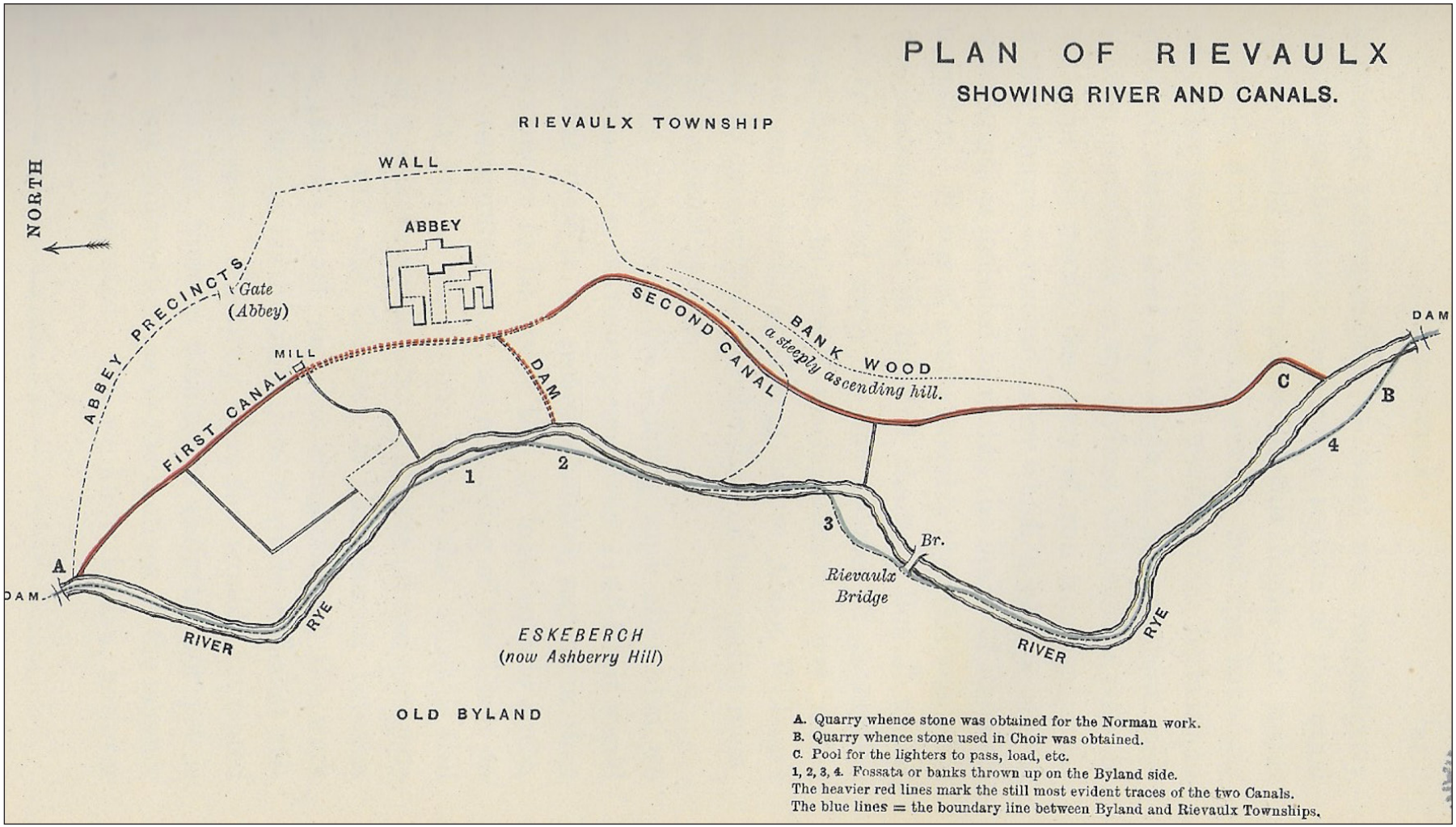


Fig 5. Atkinson's 1889 map of the precinct of Rievaulx Abbey (Atkinson 1889, facing page lxxii).

of the 'canal' system than that previously offered by Atkinson. It seems to be based on the 1893 Ordnance Survey map with colouring added by Rye to pick out the supposed 'canal' system (Figure 6).

Just over a decade later a third interpretation of the documentary evidence and its relevance to the supposed 'canals' was offered by Ada Russell in her account of Rievaulx village and abbey prepared as part of the first Victoria County History volume on the North Riding (Russell 1914). Russell approached the landscape from a historian's perspective and reinterpreted the documents on which Atkinson and Rye had based their 'canal' theories. She suggested that the monks had dug 'fossata' (ditches) in several stages in order to move the river Rye from its natural course along the east side of the valley to where it is now on the west, and that the 'canals' identified by Atkinson and Rye utilised the former natural course of the river (Russell 1914, 502 note 20). The new interpretation is accompanied by a map (Figure 7) which identifies a series of 'deflections' in the course of the river and attempts to correlate these with the locations named in the cartulary (Russell 1914, 495).

Russell's account also gives useful descriptions of several structures which no longer survive or have been greatly reduced. These include the ruins of a conduit building which, although not labelled on her map, is probably to be correlated with a 'well house' shown on the first edition Ordnance Survey 6-inch map within the group of seven springs north-west of the junction of the main village street and the road leading to Bow Bridge (Ordnance Survey 1856). Russell also relates that St Mary's Church, built in 1906, replaced a ruined medieval chapel which was 'a roofless and much-ruined oblong building, with a Tudor east window of three uncusped lights and late diagonal buttresses at the west end, with a 13th-century doorway between' (Russell 1914, 496).

The idea that the monks moved the river Rye in several stages from one side of the valley to the other over a distance of 2km from Bow Bridge in the north to a point far to the south of Rievaulx Bridge has been enormously influential in many later accounts of how the Rievaulx landscape developed. For example, it is repeated in modern editions of the English Heritage guidebook, including the most recent issue published in 2016 (Fergusson *et al* 2016, 30), and is also described and illustrated in the recent authoritative architectural and historical account of the abbey (Fergusson 1999, 38-9). Indeed, the idea that the monks moved the river has been accepted as fact in more general accounts of medieval monastic landscapes (e.g. Aston 2000, 90-2; Waites 2007, 218). However, as is discussed below (Section 5.5), there is no landscape evidence to support this idea.

Other variants on the theory are known. For example, John Weatherill has suggested that the river originally flowed in a wide bend from the west side of the valley eastwards towards the abbey, citing evidence of surface features visible nearly 40 years previous to his writing, some of which were later buried under spoil from the clearance of the ruins. He also points to the existence of a second eastwards bend in the Rye south of the abbey. This is partly correct as there is a remnant course, or palaeochannel, in this area, left after the river changed direction naturally long before the founding of the abbey (Weatherill 1954, 351-2).

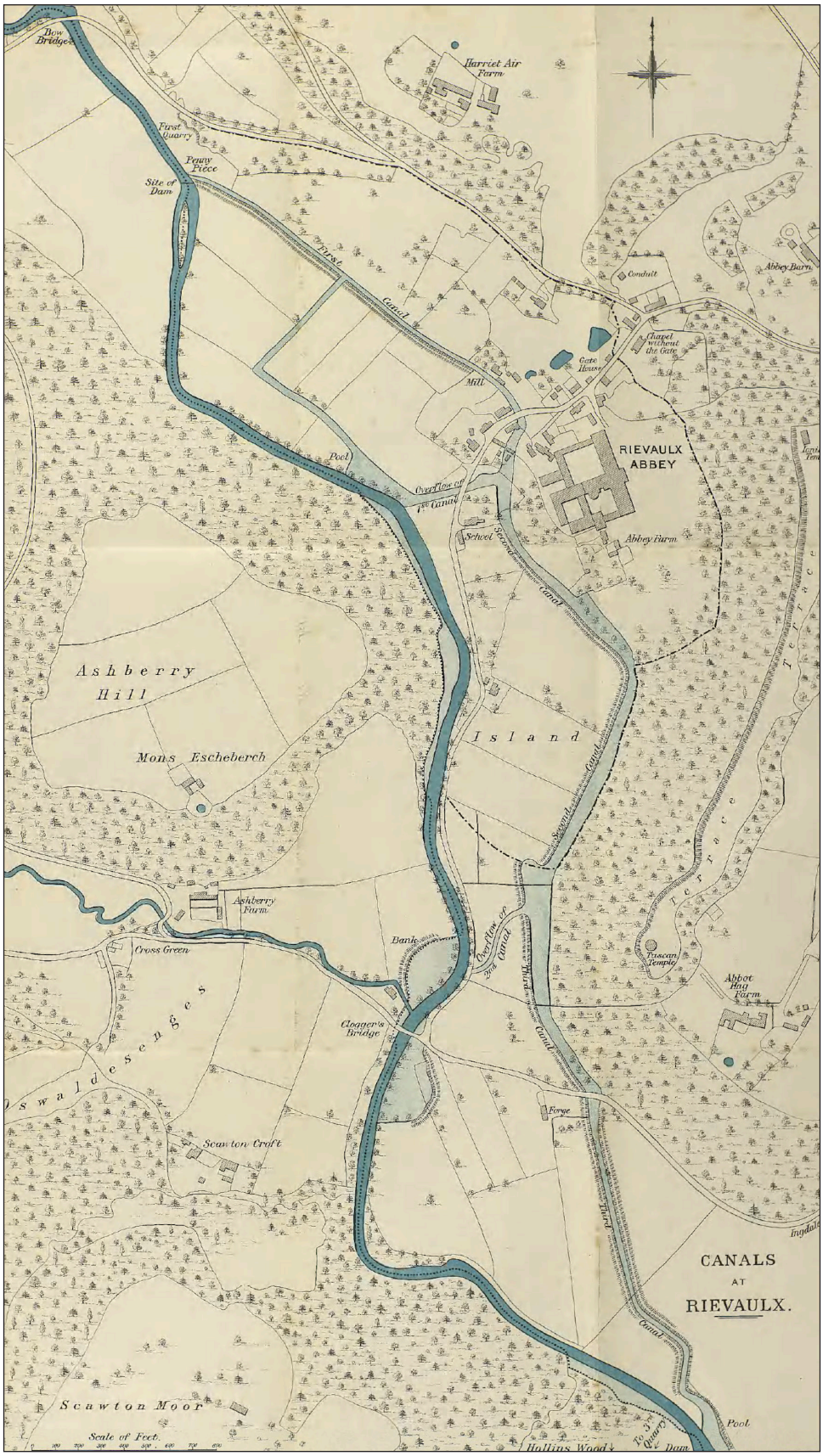


Fig 6. Rye's 1900 map of Rievaulx (Rye 1900, facing page 76).

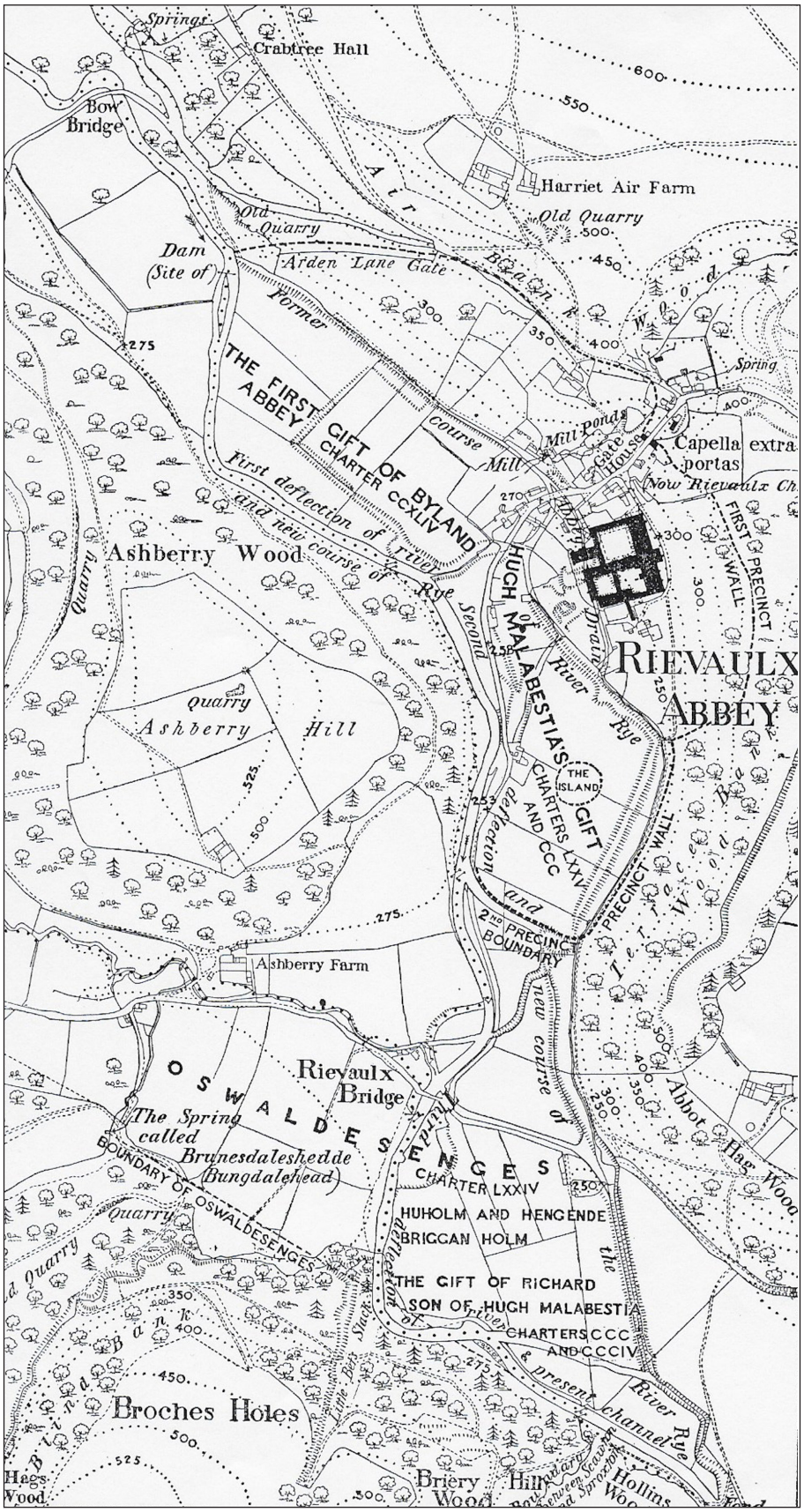


Fig 7. Map of Rievaulx accompanying Russell's 1914 account of Rievaulx Abbey (Russell 1914, 495).

The first detailed research into the archaeological evidence for the iron industry at Rievaulx was undertaken by J.G. McDonnell in 1971 as part of a wider survey of the evidence from the upper Ryedale covering the period 1150 to 1650 (McDonnell 1972). McDonnell put forward evidence for three possible forges at Rievaulx: the first at Forge Farm beyond the south side of the monastic precinct, which he dates to after the Dissolution; a second at Rye House on the south-west side of the precinct near the river and the third near the presumed site of the blast furnace on Furnace Hill near the abbey (McDonnell 1972, 28-9; 42). The paper marked the beginning of an on-going research project by McDonnell into the iron industry of Ryedale, latterly facilitated through the University of Bradford but as yet not fully reported. Research has included geophysical survey and limited excavation at several locations in order to provide more detail on the various activities associated with monastic and later iron production, though McDonnell has stated that so far, the work has failed to resolve one of its key objectives, namely to discover the remains of the post-Dissolution blast furnace (Wheeler and McDonnell 2011, 101-3).

In the early 1980s, the former Royal Commission on the Historical Monuments of England (RCHME) initiated a survey project in Ryedale (Bowden 2015, 4) which was to include an earthwork survey of Rievaulx Abbey. This survey was never completed and consequently the first detailed landscape survey of the whole precinct is that undertaken by Caroline Atkins in 1996. The survey seems not to have had an accompanying report. Atkins' plan was used in the 1999 Rievaulx monograph, although without any accompanying detailed description or interpretation of the earthworks (Coppack 1999, 176). Although the scale of the published survey was too small to show the level of subtle detail recorded by the present survey, it is the first detailed representation of the earthworks within the precinct and the first to show the varying condition of the precinct boundary, differentiating where it survives as a bank and where there is still evidence for a wall. This is particularly valuable along the bank of the river where the boundary is susceptible to erosion. Atkins' survey was used as the basis for several illustrations in the 1999 publication; to show the supposed changes in the course of the river (Coppack 1999, Figure 2); the alignment of the precinct boundary (Coppack 1999, Figure 149) and to illustrate the likely location of buildings and closes mentioned in the Dissolution documents (Coppack 1999, Figure 151).

Also, in 1996, a geophysical survey of the cloister revealed the outline of a rectangular aisleless building in the north-east corner, on the same alignment as the later church, with smaller related structures to the east and south. The aisleless building was interpreted as the first stone church constructed on the site probably within a few years of the founding of the abbey (Fergusson 1999, 47). The survey also detected areas of fill to the south of the cloister showing where the ground had been made up to form an artificial terrace.

In 2000 English Heritage commissioned a conservation plan for Rievaulx. This was critical of the way that English Heritage presented the site to its visitors without including a landscape narrative (Caroe and Partners 2000, 59-60). It pointed out that the interpretation omitted large parts of the story including the presence of the precinct boundary, the relationship of the village to the abbey, the history of water

management (especially after the Dissolution) and the location and importance of the ironworks. These perceived shortcomings were addressed to an extent in 2005 when English Heritage published a leaflet on the Rievaulx landscape as part of a project in partnership with the Authorities for both the North York Moors National Park and the Howardian Hills Area of Outstanding Natural Beauty (AONB). The leaflet presented the results of a walkover survey of the village and precinct undertaken by an English Heritage field team to Level One standard (Barnwell *et al* 2005). As a Level One survey (Jamieson 2016, 33-4), no detailed recording of the earthworks was undertaken, and no written report produced other than the leaflet. The survey identified and interpreted several features not previously recognised, including former fishponds to the north of the abbey and, on the road side opposite the nave, a possible 18th- or 19th-century prospect mound from which to view the ruins. The study also firmly discounted the theory that the monks had moved the river from the east side of the valley.

A fresh perspective on the landscape came from the work of Archaeological Research Services who were commissioned by English Heritage in 2010 to undertake the North York Moors Aerial Survey Mapping project. This covered part of the Rye valley including the area around the abbey. The summary report includes a brief description and a map (Figure 8) of features recorded from aerial photographs at Rievaulx (Knight *et al* 2011, 36 and Figure 17). A more detailed description of the features mapped by the project is provided in Historic England's on-line archive (Pastscape entries 57047, 1529859, 1529861 and 1529884). Both the summary report and the Pastscape entries draw attention to various features on the valley floor north and south of the abbey and raised the possibility that those to the south which seemingly consist of a north-south aligned rectilinear enclosure defined by ditches and banks with internal coaxial boundaries, may be part of a medieval garden. However, this conclusion is at best speculative and is not supported by the present investigation which interprets many of these features as modern drainage.

In 2015 the National Trust commissioned Southern Green Landscape Architects to prepare a Conservation Management Plan for their Rievaulx Estate. This encompassed the mid-18th-century Rievaulx Terrace and extended westwards down the hillside to include part of the monastic precinct and part of the north section of Atkinson's supposed 'Second Canal'. The published plan incorporates separate studies of different aspects of the landscape including, of particular relevance, a report on an Historic Landscape Survey by Addyman Archaeology (2016) and a 'Hydrological Conceptualisation' of the ponds and supposed 'canal system' to the south of the abbey by JBA Consulting (2015). The historic landscape survey combined a very comprehensive assessment of surviving archaeological features with evidence from historic maps, aerial photography and lidar mapping. The survey presented the evidence in the form of gazetteer with photographs and with map locations determined using a hand-held GPS device. The report repeats (without challenging) the old idea that the river naturally ran along the east side of the valley (Addyman Archaeology 2016, 52). The study by JBA Consulting mainly focussed on the steps necessary to protect the wetland associated with the 'canal'.


Fig 8. Features at Rievaulx recorded from aerial photography (Knight et al 2011, Figure 17). © Historic England.

Also, in 2015 a major step forward was undertaken in understanding the precinct landscape with the creation of a digital surface model of this part of the valley using low level aerial photography obtained from a UAV by Nick Hannon while on a placement with Historic England. The surface model contains a detailed representation of the ground surface which can be manipulated to bring out details such as very broad shallow depressions that are difficult to recognise and map on the ground (Figure 9). The results were used in conjunction with an existing digital elevation model of the ground surface from the Environment Agency lidar data to create an unpublished analysis of the landscape (Hannon 2015). The report contains a comprehensive description of the main landscape features and makes new observations such as that the curving south side of the precinct boundary is aligned along the edge of a palaeochannel. However, some assertions, such as the identification of an area of formal post-medieval gardens in the valley floor to the north of the abbey is, after further examination, not supported by the earthwork evidence, as discussed below.

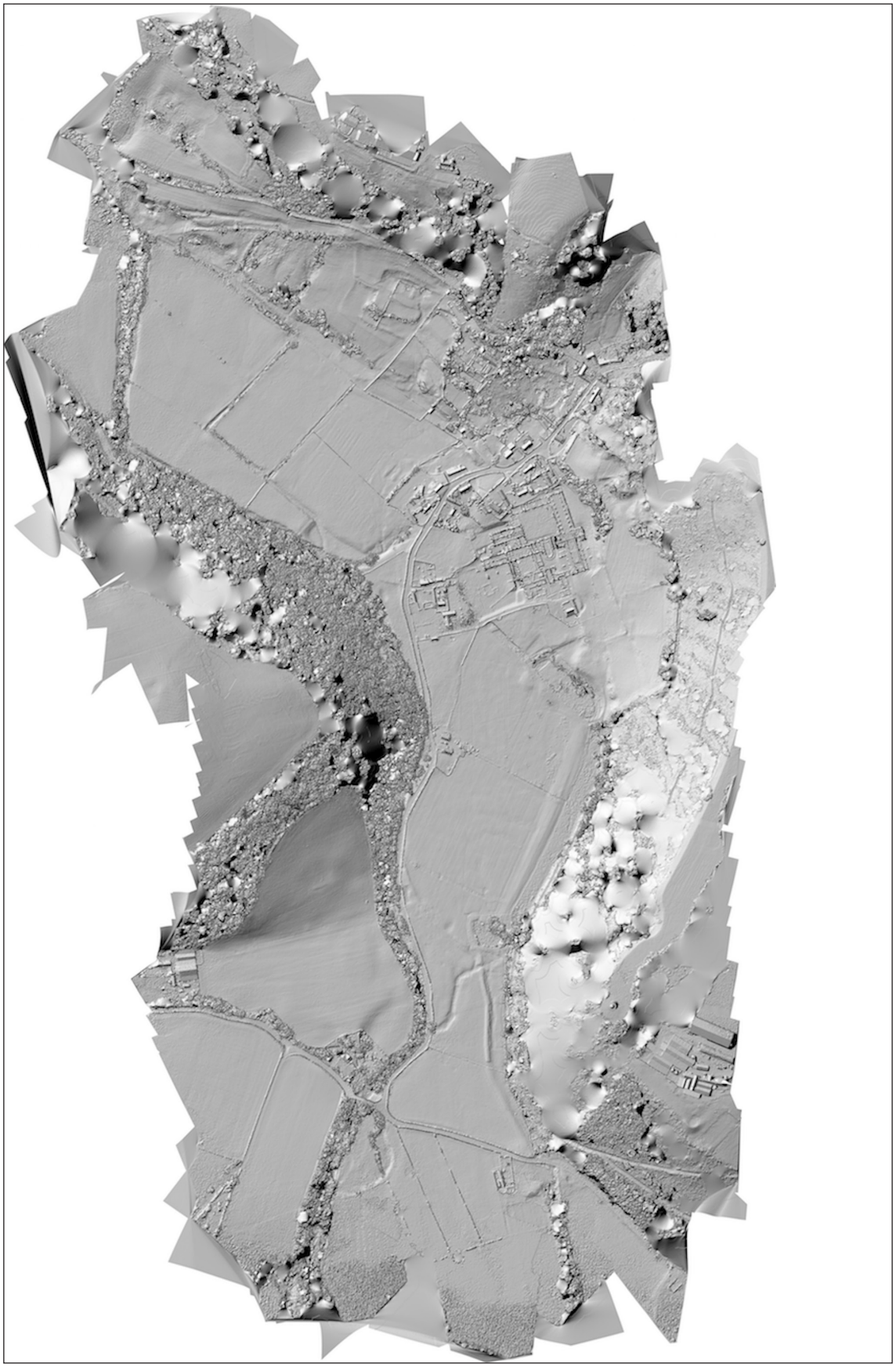

Fig 9. The Digital Surface Model (DSM) created in 2015 by Nick Hannon. © Historic England.

# 5. DESCRIPTION AND INTERPRETATION OF THE LANDSCAPE

The plan resulting from the 2015 and 2018 surveys of the Rievaulx landscape is presented as Figure 40. The main findings are described and interpreted in chronological order below, supported by a range of written and cartographic sources. Extracts from the survey plan are used to illustrate aspects of the interpretation.

## 5.1 Pre-monastic features

Walter Espec's first foundation at Kirkham was already an established settlement with a church when the priory was founded around 1122. While there is the suspicion among scholars that 'few monasteries were established on entirely new sites' (Coppack *et al* 1995, 134), as yet no evidence for a pre-monastic settlement or church at Rievaulx has come to light. More generally though, it is entirely reasonable that the natural advantages of a sheltered location, a group of springs on the hillside providing fresh water and the side-valley creating a natural route from the east to the valley floor could well have attracted settlement to this part of Ryedale before the foundation of the abbey.

## 5.2 The site of the church and claustral buildings

As has long been recognised, the Cistercians chose to construct the church in an elevated position on the east side of the valley, no doubt from the practical need to keep the building, and the rest of the abbey, as safe as possible from flooding. The abbey church is situated on a natural terrace at the foot of the slope that can be traced for around 150m to the south of the church and for over 500m to the north as far as Penny Piece Quarry. This feature probably defines a change in geology where the softer and more gently sloping Oxford Clay gives way to the underlying harder sandstone of the Osgodby Formation (sometimes referred to as Kellaways Rock) forming a distinct step in the bottom of the valley side (British Geological Survey 1882). The church is thus elevated some 8m above the flood plain and additional space was gained on the east by cutting back into the hillside. The excavated stone could have been used in construction, although Senior does not discuss this possibility in his study of the building materials (Senior 1999). The rest of the claustral buildings occupy artificial platforms added to the west of the terrace.

## 5.3 The Precinct boundary

The precinct marked the division between the secular and the religious world even though the abbey owned the land immediately beyond its boundary as part of the original bequest by Walter Espec. For the most part, the course of the precinct wall can be traced on the ground or from historic mapping, covering a total length of about 2.7km and enclosing an area of around 37ha (92 acres) (Figure 10). The precinct had a maximum width of 360m stretching from the Rye in the west to part way up the valley side on the east, and an overall length of 1.1km along the valley with the church and claustral buildings at the centre. Part of the precinct on the east side of the valley enters the National Trust estate and was not mapped as part of the present survey, although it has been recorded recently as part of a National Trust

conservation plan (Addyman Archaeology 2016). From the surviving remains the precinct boundary appears to have consisted on all sides of a faced stone wall with a rubble core around 1m wide, though the wall has been heavily robbed around most of the circuit and now at best only survives as a stony bank. On the east side of the precinct there is also evidence in several places for a ditch or roadway running outside the wall.

### West side

The west side of the precinct followed the east bank of the river Rye. Despite having the Rye as a natural boundary and being overshadowed by the mass of the valley side and Ashberry Hill beyond, this side was nonetheless walled. This is evidenced by an earthwork bank encapsulating visible masonry faces and several short sections of low, upstanding wall surviving in the river bank north and west of the abbey (Figure 11). These were not mapped as part of the present survey as they are clearly shown on Atkins' 1996 plan (Coppack 1999, 176 Figure 148). The longest stretch consists of a line of large, squared stones set around 1-2m back from the river edge, with tumbled stones scattered across the river bank and falling into the water. Further south, where no stones survive, the course of the boundary is nevertheless still traceable as a distinct ledge set back from the edge of the river.

### North and North-east side

At the point where the river Rye meets the east side of the valley in front of Penny Piece Quarry the boundary wall turns east to ascend the hillside and form the north and north-east sides of the precinct (Figure 12). On the hillside it survives as a prominent stony bank with sections of wall face and rubble core visible and a ditch on the uphill side. This ditch now acts as a drain for water emanating from a spring above, although it may also have been used as a route, one of several adjacent hollow ways on this part of the slope (see Section 5.6). After some 230m, as the precinct boundary comes closer to the road to Bow Bridge (Arden Lane), it becomes less distinct as a surface feature and seems to have followed the upslope edge of a slight natural terrace in the hillside. There are several patches of stone rubble here but few signs of any definite monastic walling, probably because the boundary has been thoroughly robbed to create the walled post-monastic closes below. Beyond this section the line of the boundary continues through private properties for over 200m as far as the village street. There was no opportunity to investigate this section in detail, but the boundary is visible across a short section of rough ground about 14m downslope from Arden Lane where the overgrown bank is flanked by a ditch on the uphill side. It was not surveyed and does not appear on the 2015 surface model as it was obscured by vegetation cover but does appear on the 1996 survey plan. The lack of clear signs of the precinct boundary as it nears the village street is regrettable as it bears upon the likely position of the outer gatehouse, as discussed below (Section 5.4).

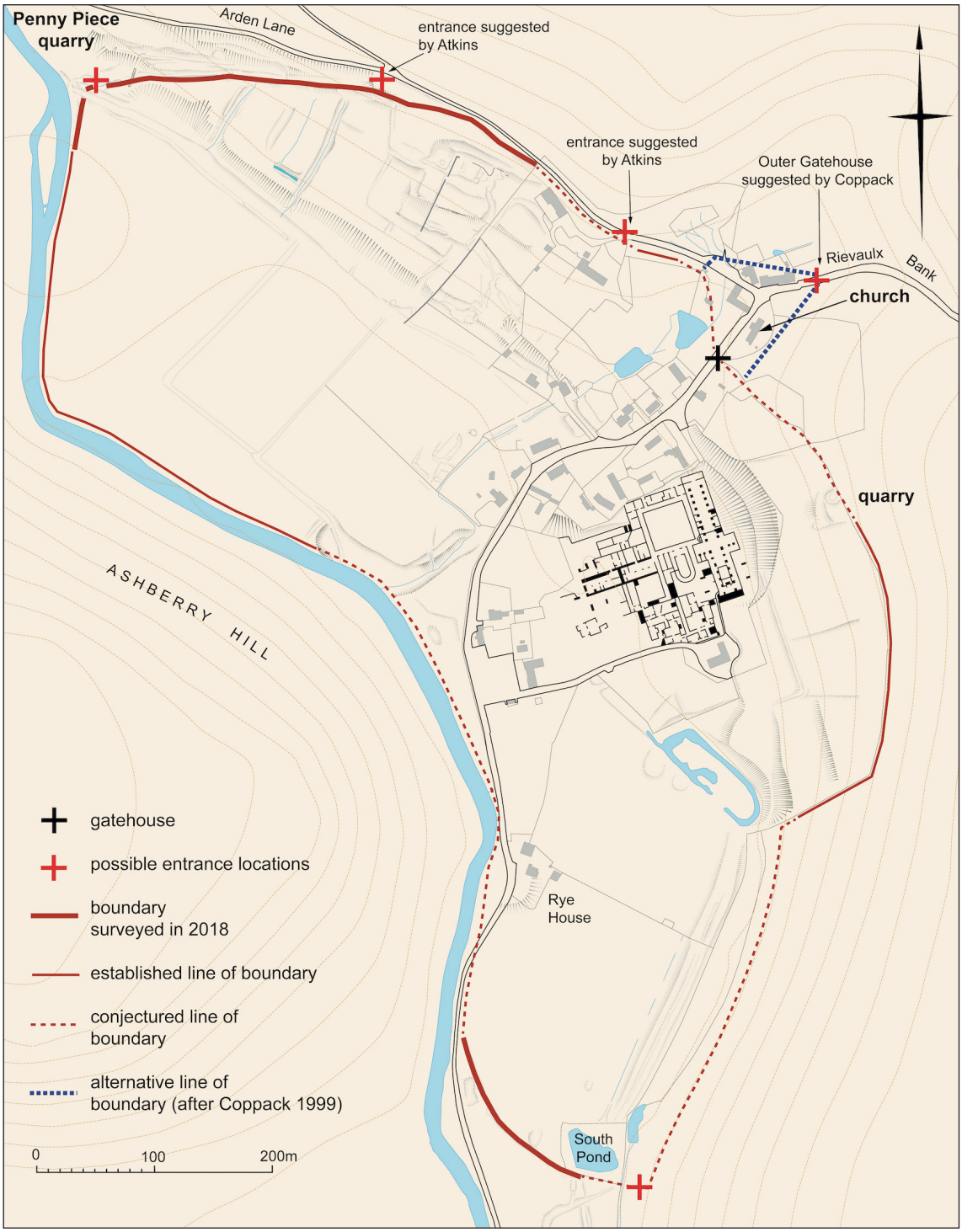


Fig 10. Plan of the precinct boundary and related features. Drawn by Trevor Pearson. © Historic England.

Fig 11. The river Rye to the north of the abbey showing remains of the precinct boundary wall on the east bank, February 2018. © Historic England.

Fig 12. Surveying along the wall defining the north-east side of the precinct, March 2018. © Historic England.

### East side

To the south of the village street there is no visible evidence for the course of the precinct boundary over a distance of around 130m, although it probably ran in the direction of an isolated quarry on the hillside (Figure 10). Beyond the quarry the boundary follows the contour and is well preserved, consisting of a prominent stony bank occupying the front edge of a ledge cut into the steep hillside (Figure 13). Part of the boundary falls within the National Trust estate and here Addyman Archaeology (2016, 51, Feature 60) speculated from the size of the earthwork that the sections of the wall might still survive to a height of around 1.5m, preserved within the make-up of the rubble bank. After following the contour of the slope for about 260m the wall turns sharply downhill ending just before the bottom of the slope (ibid, 51). From here to the point where it visibly turns west and crosses the valley floor there is a gap of about 320m where there is no definite evidence of its course, though is most likely to have followed along, or close to, the bottom of the slope. On this conjectured alignment, and still within the National Trust estate, there is a length of drystone walling 12m long and standing to a height of 2m forming a revetment along the edge of a modern track. Addyman Archaeology considered this to be a recent feature, while acknowledging it may be on the line of the precinct boundary (ibid Site 29; 51).

### South side

The south end of the precinct is defined by a low curving bank with occasional stones, including one concentrated stony area clearly indicating that this section was also walled. The bank is 160m long, emerging in the east from the edge of a pond bay (the South Pond - see Section 5.5 below) and ending in the west on the edge of the modern road north of Rievaulx Bridge, about 250m south of Rye House. At this point the road is lower than the field and it is possible that the drop in height marks the line of the precinct boundary for a short distance before it met the east bank of the river. For part of its length, the precinct boundary appears to follow the edge of a shallow natural depression which is visible on the digital surface model (Hannon 2015, 17-18) and which is also hinted at on Atkins' 1996 earthwork plan (Coppack 1999, 176 Figure 148). The depression is about 15m wide and 0.5m deep and bends in a broad arc eastwards to within about 60m of the present course of the Rye (Figure 14). It appears to be a palaeochannel, an ancient redundant river channel, which was utilised by the monks as a ready-made ditch to front the precinct wall, functioning like the artificial ditch found along other sections of the precinct boundary.

Fig 13. The bank defining the south-east side of the precinct, March 2018. © Historic England.

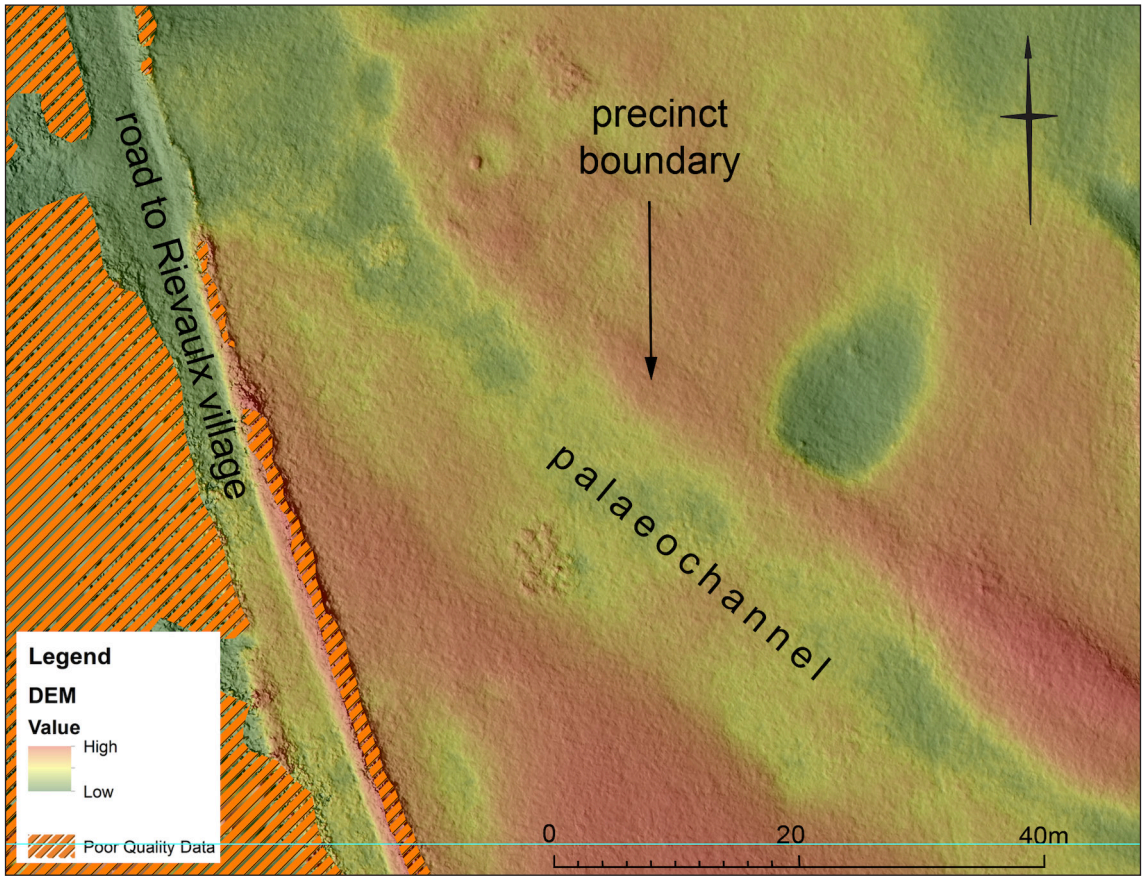


Fig 14. Elevation model of the south side of the precinct showing its relationship to a possible palaeochannel (after Hannon 2105, Figure 21). © Historic England.

## 5.4 Routes and Entrances

### Routes

The abbey was close to two important regional routes which led north and west from Helmsley. The route west, believed to be the medieval 'Sperragate' referred to in the Rievaulx Cartulary (McDonnell 1963, 70), descended into the Rye valley south to the south, between the abbey and its grange at Griff. It then crossed the river at Rievaulx Bridge (Figure 10). The discovery of a possible medieval bridge timber in the river bed could point to an earlier wooden construction predating the present 18th-century structure (Tyers 2008). From here the route headed out of Ryedale through the village of Scawton to what is now termed Sutton Bank and beyond in order to link with the major north-south routes passing through the Vale of York. The route north from Helmsley (now the B1257) followed the high ground above the east side of the Rye Valley into Bilsdale which provided a natural north-south passage through the North York Moors (McDonnell 1963, 71).

Closer to the abbey, it has already been mentioned that the modern road called Rievaulx Bank that branches from the B1257 to pass down the side-valley was the main approach to the abbey in the Middle Ages. This is seemingly the same route as that taken by the future Abbot Ailred when he joined the abbey in 1134, passing 'along the edge of the hill overlooking the valley, where a road led down the hill to the gate of the monastery' (Powicke 1950, 15). Branching northward from this route, probably just outside the monastic precinct, the road now called Arden Lane leads down to the Rye crossing at Bow Bridge. This route was evidently in use from an early date to judge from the number of previous alignments which remain visible as hollow ways along the valley side between the modern road and the precinct boundary. The hollow way nearest to the precinct boundary probably began as a ditch on the outside of the wall, as seen elsewhere on the east side of the valley (Figure 15 hollow way 1) and became deeper and wider though subsequent use as a convenient route to the valley bottom. It is now quite boggy in places as it also carries a small flow of water from a spring. At the west end the hollow way is crossed by the stone footings of an old field boundary which must post-date its use. A second hollow way immediately above has created a distinct step in the profile of the hillside with a steep edge on the uphill side (Figure 15 hollow way 2). A short section of a third, intermediate hollow way must be the relic of a time when the route above was angled slightly further down the slope (Figure 15 hollow way 3). A steep scarp cuts across the line of both this short hollow way (3) and the one immediately above (2) destroying evidence of where these routes met the valley floor. This destruction may be to do with the working of Penny Piece Quarry which is immediately adjacent to the north, although as there are no exposed rock faces the sudden drop here could also be due to natural erosion. The hollow ways evidently skirt around the precinct and by inference must be contemporary with its use and maintenance. They probably replaced each other in turn as the route to Bow Bridge moved progressively uphill toward its present course as Arden Lane. The final move may have been around 1754 when the present Bow Bridge was built.

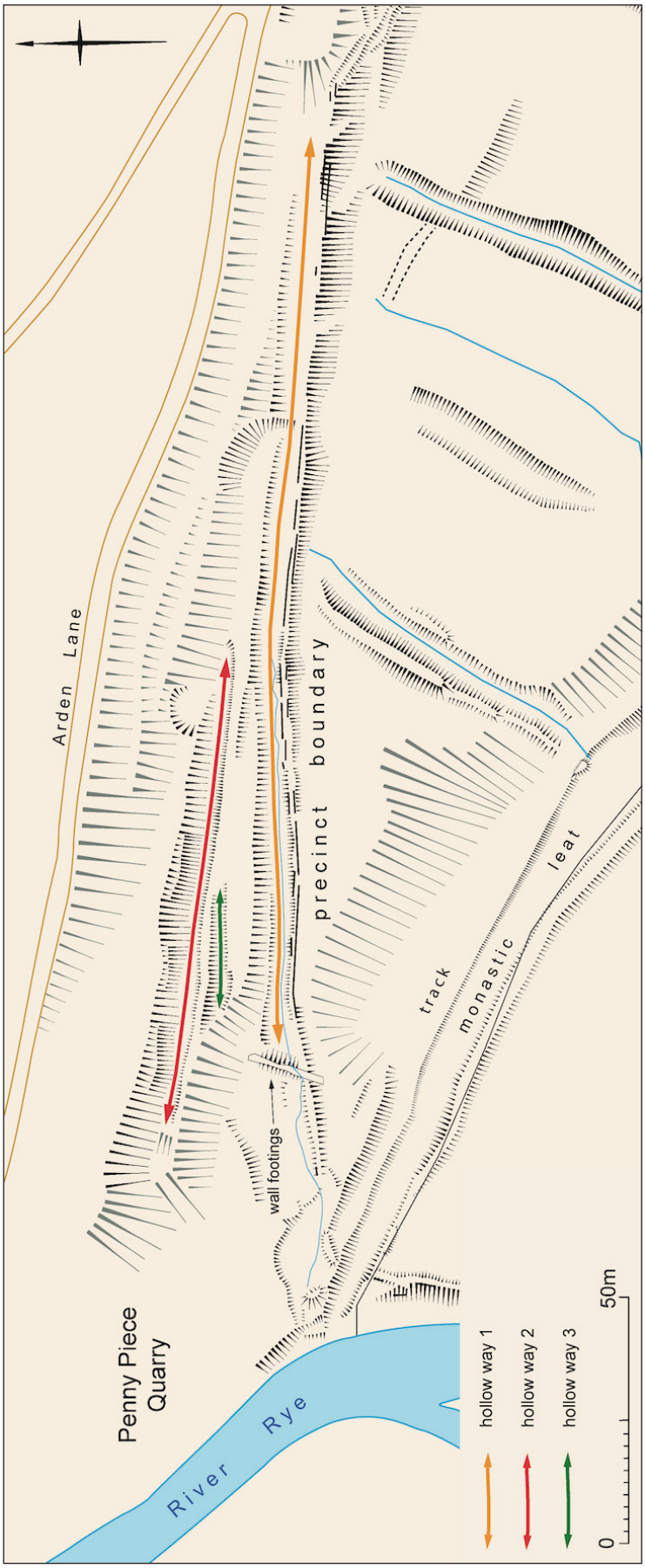


Fig 15. Extract from the 2018 survey plan (Figure 40, this report) showing the hollow ways between the precinct and the road to Bow Bridge. © Historic England.

## The Gatehouse

The probable site of the abbey's outer gatehouse is just down the hill from St Mary's Church, below the point where Arden Lane branches northward from the village street. The visible remains (Figure 16) comprise a low wall on the west side of the road along with the base of the central gate pier. There is also a masonry arch on the east side of the road (Coppack 1986, 129). Russell noted two arches and the buried remains of a large rectangular building to the north of the gate in 1914, but neither the second arch nor the building survive as visible features (Russell 1914, 496). Coppack also noted surface evidence for what he suggested was a guard room to the west of the gatehouse, but that area was not investigated by the present survey and is obscured by trees on the 2015 digital surface model. The location is close to the projected line of the precinct boundary and is therefore a strong candidate for having been the outer gate into the abbey. St Mary's Church located just beyond the site of the gate, could have begun as the monastic gate chapel where the monks allowed lay people to worship without having to pass into the abbey precinct (Burton 1994, 146).

An alternative interpretation of the evidence has been put forward by Coppack who identifies this site as the *inner* gatehouse, where access was granted from the precinct to the inner court containing the buildings most directly connected with the religious life of the abbey. Coppack places the outer gatehouse at a point about 120m higher up Rievaulx Bank (Figure 10) noting traces of the building in the roadside ditches, though nothing is visible today (Coppack 1986, 129; 1999, 184). In 1986 Coppack identified a wall immediately to the south of this site as a surviving section of the precinct boundary. This, however, is a free-standing drystone wall possibly associated with a nearby quarry (Addyman Archaeology 2016, Site 31) and very different in form to the stone rubble bank and outer ditch that marks the precinct boundary further along the hillside to the south.

A complication arising from Coppacks' suggested position for the outer gatehouse is that it brings the junction with the route to Bow Bridge (now Arden Lane) within the precinct, whereas the hollow ways lower down the slope clearly indicate that the earlier route there lay outside the boundary. In other words, if we accept Coppack's proposition, anyone using the route to the crossing at Bow Bridge would have had to pass through the precinct for a short distance. Since this goes against the purpose of the precinct boundary, which was to keep the monastic community isolated from the secular world, it would seem an unlikely arrangement. On balance, the outer gatehouse into the monastic precinct is more likely to have stood where there are still traces of a gate structure near St Mary's Church. However, this leaves unresolved the interpretation of the foundations noted by Coppack at the latter site, as well as the question concerning the location of the inner gatehouse.

Fig 16. The length of walling on the west side of the village street believed to preserve part of the fabric of the abbey gatehouse. © Historic England.

## Other Entrances

There is no firm evidence for other entrances at Rievaulx, but it is inconceivable that the precinct had but one. Other, probably less grand, entrances would have been needed to enable the monks to bring in produce and livestock from the surrounding countryside and their many granges. An entrance on the south side of the precinct is likely in order to reach the abbey's home grange at Griff and the important route west from Helmsley ('Sperragate') crossing the Rye at Rievaulx Bridge. Looked at practically the best location for this would have been at the foot of the slope on the east side of the valley in the direction of Griff grange. However, the precinct boundary does not survive in this area so the precise location of such a gate must remain speculative. The modern road to Rievaulx on the west side of the valley is unlikely to have developed until after the Dissolution when the village needed a route south to Rievaulx Bridge that avoided the area of the ruined abbey.

A second likely location for an entrance is at the north end of the precinct where the boundary turns away from the river Rye to ascend the east side of the valley. An entrance here would have given access to Penny Piece Quarry just beyond the precinct and to the northern granges such as at Newlass and Laskill. There is a 9m-wide gap in the boundary at the extreme north end of the precinct before it starts to climb the hillside. A modern track crosses the boundary at this point and may have created the gap, but it is possible, perhaps likely, that this break is original and marks the site of the north entrance.

The published version of Atkins' survey plan shows two entrances along the north-east section of the precinct boundary below Arden Lane (Coppack 1999, 177 Figure 149). One is near the uphill end of the hollow ways where the ground naturally levels off to form a platform (Figure 10), but there is no visible sign of an entrance structure at this point, nor of any routes heading downhill into the precinct. The second location is about 250m closer to the abbey where the line of precinct boundary is within the grounds of a modern house. This location was not investigated as part of the present survey.

## 5.5 Water Management

### The water supply to the abbey

The abbey evidently drew water from two main sources. One source was a group of springs in the side valley to the north of the abbey church, which the monks controlled and distributed via at least two conduit houses and a system of pipes and channels, now largely lost. This source provided the monks with water for cooking, brewing, drinking and liturgical use. The second source was river water, taken from the Rye at a point just to the north of the precinct and conveyed to the abbey via a leat, a broad, shallow channel, following the east side of the valley. Atkinson identified this channel as the 'First Canal' constructed to bring stone to the abbey from Penny Piece Quarry (Atkinson 1889, lxx-lxxi). The feature has also been interpreted as the original course of the river Rye (Russell 1914, 495), but the leat's scale and artificial nature does not support either of these notions. The course of the leat is clear for about 470m running south from the river but as it approaches the claustral range it has been lost. It may have originally carried straight on to form the outlet from the latrines (the reredorter drain) or turned to pass around the west side of the claustral area where there is good evidence for a monastic watercourse, including a long section of low wall that may indicate that some sections took the form of a stone-lined channel.

### The supply from springs

The springs are situated between 200m and 270m north of the abbey church (Figure 17) and are clearly marked on historic Ordnance Survey mapping (Ordnance Survey 1856). A building in this area, described as a ruined cottage in 1914, was thought to have begun as a conduit house. It was then 'a narrow stone building .... roofless, without any architectural features' but with at one end 'the remains of a carefully built stone settling-tank' (Rye 1900, map facing page 76; Russell 1914, 496). The building stood below the main concentration of springs (Figure 18) and presumably gathered the water from these and possibly a pair of more distant springs around 100m to the east. The area was not investigated as part of the present survey to see if any remains of the conduit house survives. However, the site is around 20m above the level of the abbey and so would have provided a strong flow of water downhill. Today the springs feed a series of ponds on the valley side immediately below, having been redirected to serve the 18th-century water mill (now a private residence called Rievaulx Mill) and possibly the 16th-century blast furnace (see Section 5.7 below).

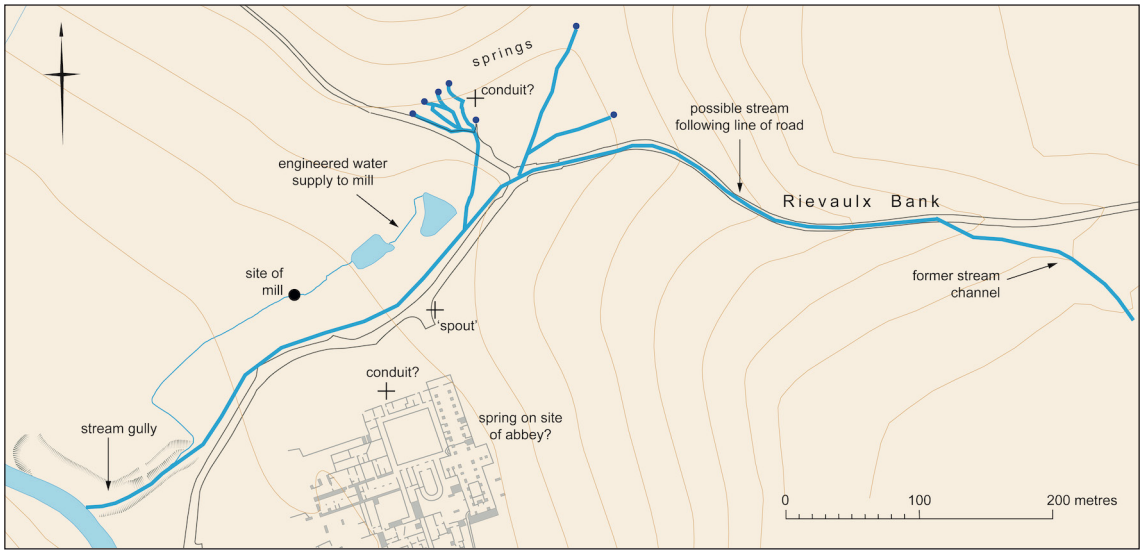


Fig 17. Natural drainage pattern and springs to the north of the abbey and the later supply to the 18th-century mill. © Historic England.

Fig 18. A photograph from the turn of the 20th century looking north across the road to the village with what may be the conduit house on the extreme right of the image; source author's collection.

There was probably also a second source of water much higher up the side-valley in the form of a stream following the approximate line of the modern road down to the village (Rievaulx Bank). Although there are no obvious springs to indicate the start of this suggested stream, there is a distinct broad, channel about 150m long and up to 3-4m deep with a 'U'-shaped profile towards the head of the side-valley (Figure 19). This feature falls within the National Trust estate and was noted by Addyman Archaeology in their archaeological survey. It was interpreted by them as a possible hollow way (Addyman Archaeology 2016, 51 site 67) but a defunct stream channel seems more likely given the depth and profile of the feature. Hollow ways on this type of geology tend to be much narrower and more steep-sided, as can be seen elsewhere in the vicinity.

The outflow from the conduit house, and possibly also the stream, may have fed a second conduit house much nearer to the abbey on the north side of the cloisters (liturgically the west range). This area has not been excavated but a conduit house is mentioned here in two of the Dissolution surveys - once as 'the condyt house' and again as the 'water howse' (Coppack 1999, 182). Very close to this location there is still a water source on the south side of the village street labelled as 'Spout' on historic Ordnance Survey mapping (Ordnance Survey 1912). The spout has a stone surround with a brick chamber where the water gathers. This source could be a remnant of the monastic supply housed in a modern structure.

Fig 19. View along the line of the former stream channel adjacent to Rievaulx Bank road, June 2018. © Historic England.

From ‘the condyt house’ the water would have been distributed around the church and cloisters along a complex network of pipes and channels but only fragments of this network are now visible. A narrow gutter drains from the corner of the infirmary kitchen on the south of the claustral complex and a second drain is visible on a grassy terrace slightly higher up near the choir of the church. The bulk of the water probably flowed out of the claustral complex along the reredorter drain which remains visible on the south-west (liturgical south) side of the infirmary cloister.

There is also historical evidence for a possible spring on the site of the abbey itself. This comes from Walter Daniel’s biography of Ailred, the third abbot. Daniel records that soon after his arrival in 1134 and while still a novice, Ailred constructed a ‘cassellam testeam’ (translated by Powicke as ‘chamber of brick’) below the novice house ‘into which water flowed from hidden rills’ so that he could immerse himself daily in cold water ‘and ‘so quench the heat in himself of every vice’ (Powicke 1950, 25). This has been interpreted as an expression of Ailred’s affinity for the early Northumbrian practice of daily immersion in water (Fergusson 1999, 62) and as Powicke observed, implies the existence of a spring somewhere close to the Novice House (Powicke 1950, lvi), though quite where that would have been in the 1130s is not known, as the present building was not completed until the 1160s (Fergusson 1999, 130). However, the possibility of a spring on the site of the abbey is worth noting given the spiritual importance that sometimes attached to springs and wells when it came to the siting of religious houses as well as the practical need for a water supply (Morris 1989, 84-92).

Before the construction of the abbey, the water from the springs may have combined with the stream flowing down the side-valley to form a single channel leading to the Rye on approximately the line now taken by the village street. The only visible evidence for this suggested stream alignment comes at the west end of the village where a 90m long gully, about 20m wide and up to 2.5m deep, crosses a field between the road and the river, falling by about 1.5m from east to west (Figure 20). This gully now carries only the small flow of water emanating from an artificial channel that crosses the field to the north. However, the size and orientation of the gulley strongly suggests it was natural in origin, formed by a stream flowing from the east and probably the continuation of the stream mentioned above from the side valley. Presumably it was rendered dry by the diversion of the natural flow higher up to supply the abbey. Where it meets the river, the former stream channel widens to a sub-rectangular depression about 80m long and 30m wide with one side open to the river. This depression does not look entirely natural and may result from cutting back of both the river bank and the stream channel for some unknown purpose. The north corner and bottom of the rectangular depression are cut by a field drain.

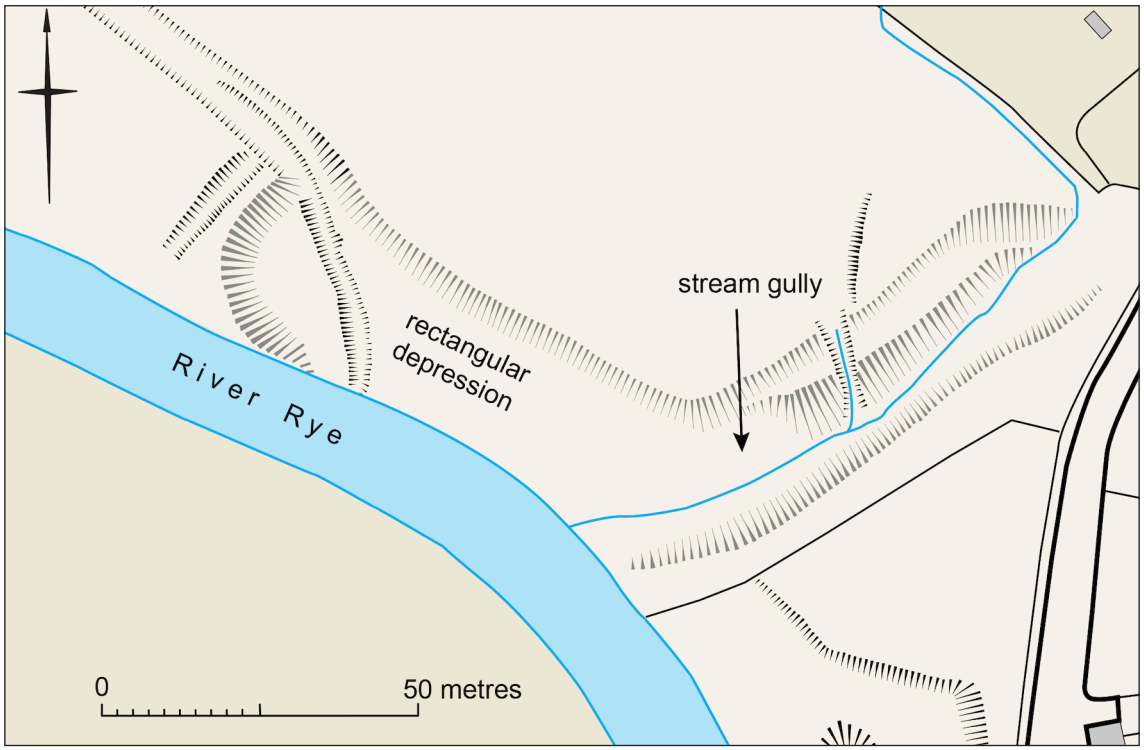


Fig 20. Detail of 2018 survey plan (Figure 40, this report) showing the gully at the south-west end of the village next to the Rye. © Historic England.

The former stream channel has been mistakenly identified in the past as the old bed of an eastwards flowing section of the river. Weatherill identified the channel as the north part of a river bend where the Rye turned away from the west side of the valley, returning 300m further downstream (Weatherill 1954, 350). In the more recent Rievaulx monograph, the map showing the supposed phases in the movement of the river has the feature as part of the first stage of engineering to enable the new course of the Rye upstream on the west side of the valley to return to its original course downstream on the east side (Fergusson *et al* 1999, Figure 2). Both these interpretations are contrary to the natural slope of the feature and therefore can be dismissed.

## The supply from the river

The start of the leat at the northern end of the precinct is now set back and several metres above the river Rye. This is where Atkinson reported seeing traces of a 'dam' situated 'just above a small island lying in the bed of the stream' (Atkinson 1889, lxxii). If so, what he saw is more accurately termed a weir, since the purpose of the feature must have been to raise the water level sufficiently to be drawn off into the leat. Today, although no traces of a weir are visible in the river, there is a distinct band of white water upstream from a small island at just the place where it should be (Figure 21). Stone blocks on the edge of the river to the south of the start of the leat and stone slabs visible in the river bed point to some sort of structure here. However, the junction between leat and river is not well-preserved, partly because a public footpath heading north towards Penny Piece Quarry passes over this point and has caused erosion.

At its start the leat is around 6m wide and no more than 1m deep with steep sides at the point nearest to the river. There is a short length of walling visible immediately to the south of the leat at an angle which is part of the precinct boundary. Stones on either side of the leat suggest it was edged with walling at this point. There is also a short length of walling visible in the river bank which could have been intended to stabilise the bank near the start of the leat. Presumably surviving here is some buried evidence for how the flow into the leat was regulated, such as a sluice gate, which is no longer discernible on the surface.

From here to the edge of the village the leat survives as a shallow, flat bottomed depression about 0.5m deep and up to 8m wide but becoming much shallower as it nears the village with trees growing down the middle (Figure 22). There is a track on the east side of the leat which may once have provided a way across the precinct from the north and indeed this could well have been the route by which stone was brought to the abbey from Penny Piece Quarry rather than along a purpose-built 'canal'. The west side of the leat is embanked to prevent it from overtopping and discharging water onto the valley floor. This embankment is around 0.3m high at the start of the leat to the north but increases notably in height after about 170m. This heightened section is around 30m long and has a layer of cobbles along the top as if the embankment formed the base of a track, though this seems unlikely as the stones are only apparent along this short length. From this point to the edge of the village the embankment reduces in height and becomes a very low, spread feature suggesting it has been deliberately levelled.

Fig 21. View looking west down the Rye from the start of the monastic leat showing the line of rough water crossing the river, April 2005.© Historic England.

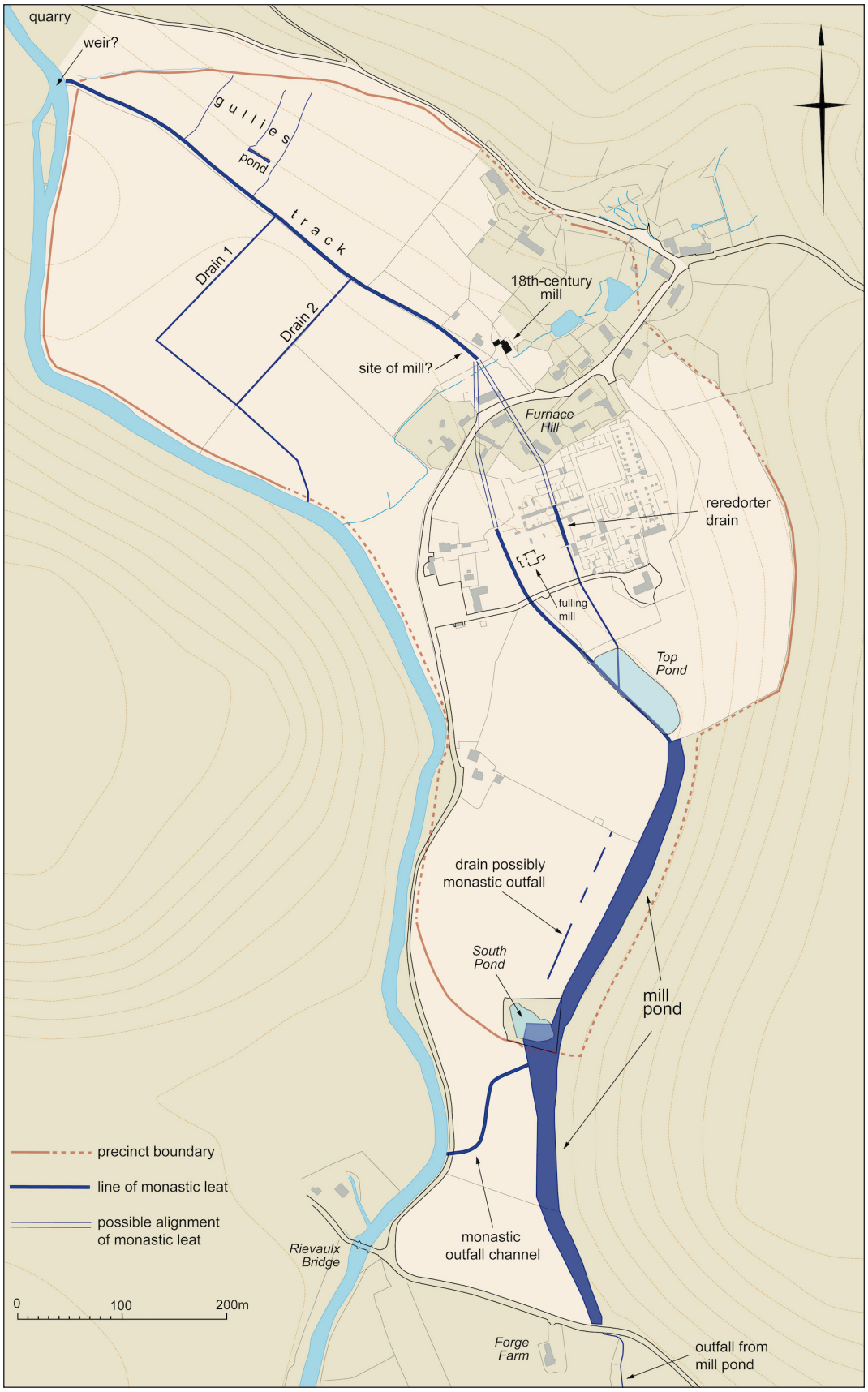


Fig 22. Map of the precinct showing the course of the monastic leat and associated ponds and outfall drain. © Historic England.

One of the problems in this part of the site must have been to control the flow of water issuing from several springs on the steep hillside immediately to the east of the leat, where there are now three deep gullies created by this erosion. Left unchecked these gullies could have damaged the leat, but instead the north and south gullies show signs of having been straightened in places and perhaps lined with sections of stone walling indicating that an effort has been made to manage their flow. The north gully has a prominent 1m high bank on the north side. This is much higher than needed to stop water in the gully from overtopping, suggesting it also acted as a land division. The bank appears to have been flattened beyond the bottom of the slope, but a small part survives on the edge of the leat to show that it once served to guide the discharge from the gully. On the north side of the south gully there is a small artificial pond aligned parallel with the crest of the terrace. It is higher than the gully so receives no water from it, but instead gathers flow from higher up the slope via a narrow inlet at the north-east corner. The survey could find no evidence as to the date or purpose of the pond.

A number of broad channels, at around 30-40m across and no more than 0.5m deep extend from the foot of the hillside and head broadly south-east and south across the valley floor (Figure 23). These were noted by JBA Consulting in their 2015 report and interpreted as palaeochannels of the Rye (JBA Consulting 2015, 4) but they more likely show how water flowed naturally across the valley floor before the construction of the leat.

At the point where the embankment associated with the leat has been levelled, there is a deep field drain heading away at a right angle across the valley floor (Figure 22 Drain 1). The open drain now starts some 10m short of the leat, but the connection is still made by a section of a buried pipe, so that from this point southwards to the village the leat is now dry and is noticeably narrower (Figure 24). The intention behind constructing this field drain, and perhaps its companion 100m to the south (Figure 22 Drain 2), seems to have been to divert water away from the main leat, though why or when is not clear. Around 160m across the valley floor from the leat, the two field drains turn south at right angles and meet to make one drain. This then enters the rectangular depression on the edge of the Rye carving a channel across the floor of that feature. One possibility therefore is that water was taken from the main leat for some purpose or activity sited within this depression, but there is no visible evidence of any structures here or that the water flowed anywhere other than across the floor of the feature and straight into the Rye. Alternatively, these drains could have been added to take excess water out of the main leat and feed it back to the Rye thereby protecting an area lower down the leat from flooding. This may be a monastic arrangement connected with the siting of a mill on the line of the leat beyond this point (see below). Most probably though, they were simply intended to drain the lower reaches of the leat of all its flow after it had become redundant as a water supply, perhaps to remove an obstacle to the expansion of the village.

There is mention of a mill in this vicinity in the Dissolution survey next to a field called Willow Close where osiers were growing (Fergusson 1999, 233). This might have been on the site of the later 18th-century mill and fed in the same way by the group of springs directly above. However, as these springs were probably the main

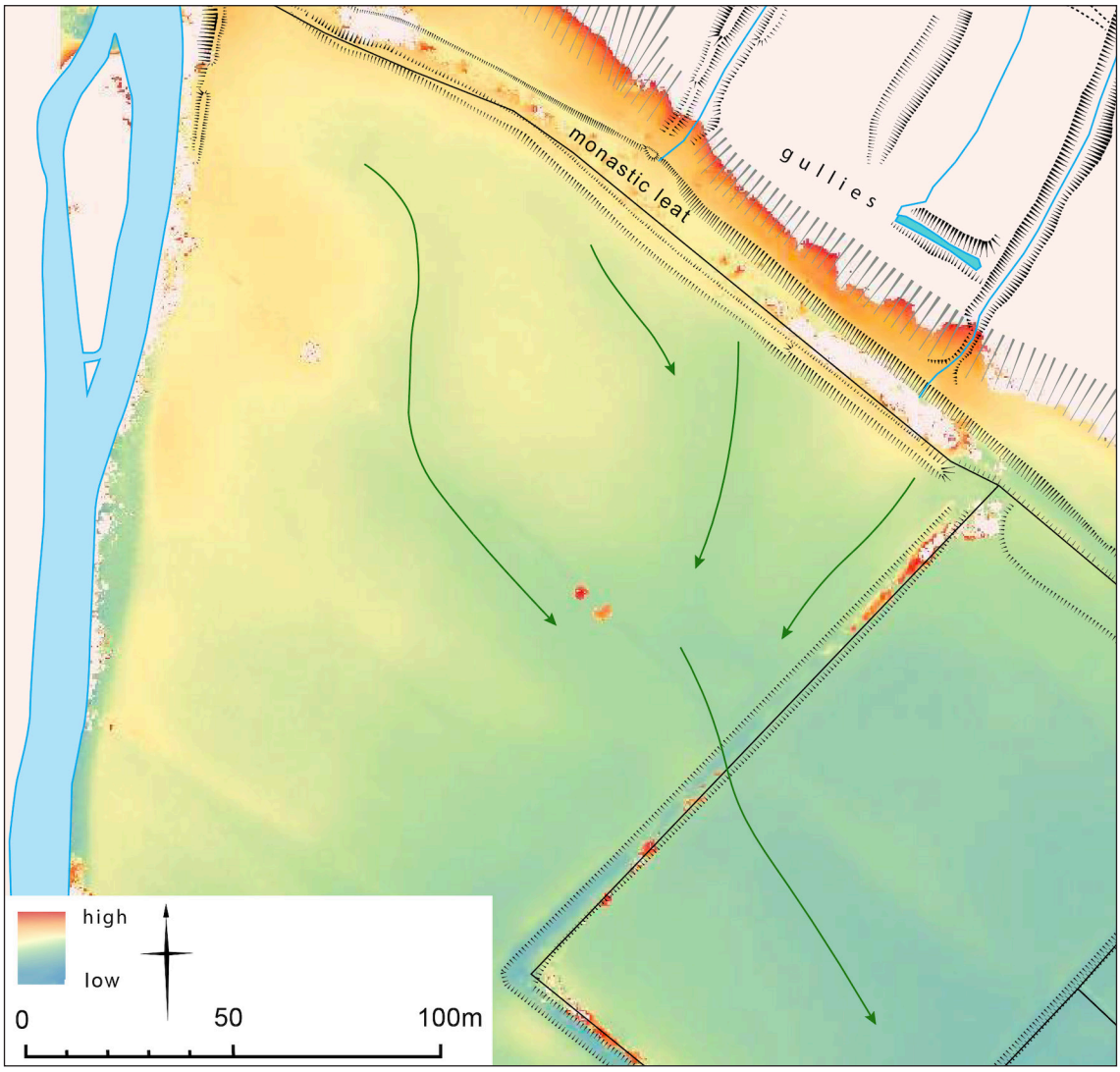


Fig 23. Elevation model showing channels north of the abbey with a depth of no more than 0.5m crossing the valley floor. © Historic England.

source of the water for the abbey they may not have been available for use in milling. Alternatively, a monastic mill could have been on the valley floor next to the main leat where a small dam (for which admittedly there is no earthwork evidence) could have created a head of water stretching for several hundred metres back up the line of the leat.

At the edge of the village the line of the leat is crossed by the tailrace from the 18th-century mill and beyond that point it disappears as a surface feature. Rye noted that the line was obliterated by the dumping of 'refuse carted from the abbey when some clearance of the ruins was made in 1812 and next by the cinders and slag from the Duke of Rutland's ironworks' (Rye 1900, 70). With no visible sign of the leat, its onward course is open to debate. The plan in the latest edition of the English Heritage guidebook shows the leat turning to the south to pass to the west of the claustral range where there is both physical and documentary evidence for a monastic fulling mill and tannery (Fergusson *et al* 2016, 28). On the other hand,

Fig 24. View looking north along the north section of the monastic leat with the line of the track to the east, February 2018. © Historic England.

the Victoria County History depicts it continuing straight to the claustral range (see above Figure 7) where it passes below the refectory to form the reredorter drain flushing the latrine block (Fergusson 1999, 108-9). A third possibility is that both alignments existed with the leat dividing at around the point where it now disappears as a surface feature, as depicted in the recent Rievaulx monograph (Fergusson *et al* 1999, Figure 2).

The suggested former alignment of the leat on the west side of the abbey is seen most clearly on historic Ordnance Survey mapping. The 1912 map shows a bank aligned south-east across the valley floor extending 180m from the rectilinear earthworks defining the site of the monastic fulling mill to the foot of the slope on the east side of the valley. There it turns and defines the west side of a mill pond (then termed 'Canal') stretching down the side of the valley (Figure 25). The line of this feature from the site of the fulling mill to the east side of the valley is not clear on the ground today because of subsequent dumping and landscaping in the area. However, it conceivably defined the line of the leat just as the embankment next to the leat does on the north of the precinct. Of the actual leat itself, the 1912 map seems to indicate some form of narrow channel at the foot of the bank on the side nearest to the site of the fulling mill. This may be the leat and part of it probably still survives on the surface as a 20m long low stone wall next to the foundations of the fulling mill, although all trace of the associated embankment has vanished (Figure 26).

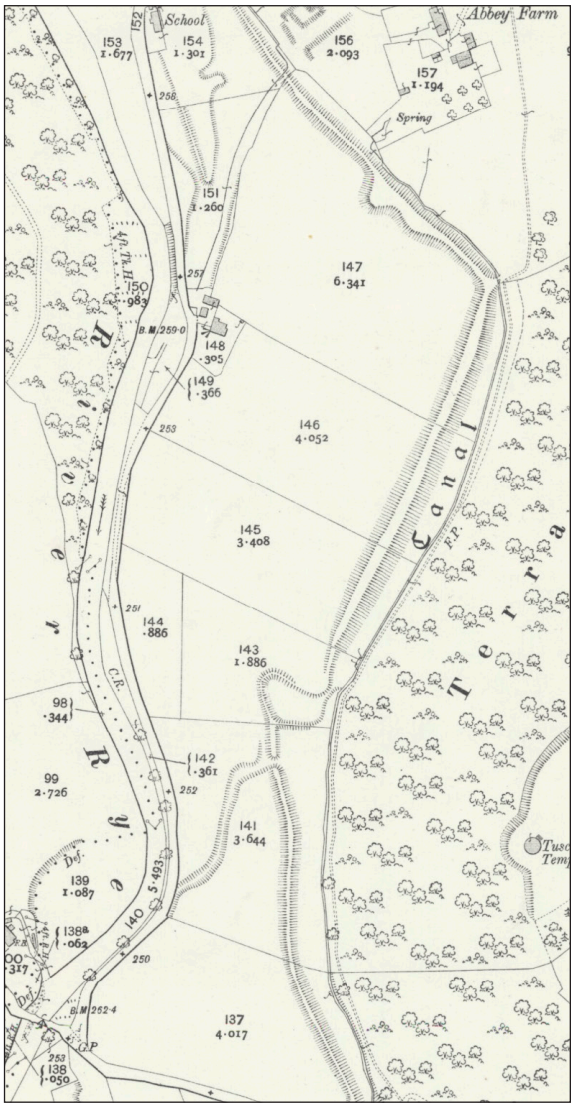


Fig 25. Map showing the south section of the monastic leat and later extension to the south. Reproduced from the 1912 Ordnance Survey map. © Historic England.

In the next field to the south a shallow, 80m long depression is all that survives to mark the continuation of the suggested embankment and leat. In all likelihood this feature has been partially filled by the dumping of spoil from the clearance of the ruins to create the shallow depression we see today. The depression now extends as far as a modern pond (called the Top Pond in the hydrological report by JBA Consulting (2015, 10)) where it probably defines the long, south-west edge of that feature. Before the construction of the Top Pond the 1912 map shows that water from a nearby spring (actually the outfall from the reredorter drain) flowed in a channel at the foot of the embankment perhaps utilising what was then a surviving section of the monastic leat.

In order to have continued straight on into the conventual area, as depicted by the Victoria County History (Figure 7), the main leat would have had to cross Furnace Hill on the south side of what is now the village street. The ground here rises up to 4m above the valley floor. However, most of this height is probably the result of built-up of waste from the blast furnace located hereabouts after the Dissolution and of rubble from the demolition of the abbey, so the ridge, if it existed at all in the medieval period, would not have presented the same obstacle. The reredorter drain within the latrine block may therefore be a direct continuation of the monastic leat, now presumably fed by drains within the claustral area. South beyond the latrines the drain disappears below ground for about 90m though its course is detectable again on the ground as a slight ridge towards its outlet in the Top Pond.

If this more direct course was indeed the original line of the leat it is possible that the more westerly alignment came later specifically to supply water to the tannery, bark mill, fulling mill and limekiln mentioned in the Dissolution documents to the west of the claustral area. The siting of these noxious processes so close to the conventual area and the potential diversion of water away from the claustral range to supply them might not have occurred until the later Middle Ages, after the number of monks in residence had markedly declined (Fergusson *et al* 2016, 39).

Fig 26. View looking north toward the abbey ruins showing the possible length of the monastic leat (foreground) with foundations of the fulling mill behind. Alun Bull, May 2015. © Historic England Archive, DP169422.

## Drainage away from the abbey

The leat around the west side of the abbey and the outfall from the reredorter drain joined to form a single outfall channel at a point now encompassed by the Top Pond, which itself has removed all physical traces of this junction (Figure 40). Beyond the Top Pond and extending southwards for over 500m along the east side of the valley, are the earthwork remains of a broad channel, cut into the foot of the valley side with a bank on the west, which Atkinson identified as the 'Second Canal'. This feature is far too wide and long to be simply the outfall drain from the abbey. It may, however, represent more than one period of development, of which the last was as a linear mill pond associated with the post-Dissolution forge at Forge Farm. About half-way down its length, and just within the precinct boundary, the former mill pond it is intersected by a second modern pond (called the South Pond by JBA Consulting). Just beyond the South Pond a sharply-defined ditch heads south-west across the valley floor to the Rye and it is likely that this is the final section of the monastic outfall drain taking water away from the precinct and back to the river. These various features are described in more detail below.

## The Top Pond

The Top Pond is 100m long and 30m wide and is filled more by marsh than standing water. A culvert at the north corner shows where the modern outfall from the reredorter drain enters the pond. Based on an analysis of historic Ordnance Survey mapping, JBA Consulting concluded that this pond was constructed sometime after

the late 1970s (JBA Consulting 2015, 10) as no equivalent body of water or pond embayment is shown here before. There are two mounds along the south-west edge which are probably from pond clearance, or they might be surviving portions of the bank depicted on the 1912 Ordnance Survey map on the west side of the original leat.

Coppack has suggested that the Top Pond might be the site of 'Fysher closse' and of the 'stanke' mentioned in the Dissolution documents (Coppack 1986, 128; Coppack 1999, 183). He suggests that 'Fysher closse' and the 'stanke' were the same area and together indicate the presence of a fish pond - 'stanke' often having this meaning in medieval sources (Coredon and Williams 2004, 264). If this was the case, then whatever pond there was must have left little trace as it escaped being mapped by the Ordnance Survey. Alternatively, the 'stanke' could have been south of the Top Pond on the line of the post-Dissolution mill pond discussed below. A building called 'the iron smythes' is mentioned in the 1539 Survey in the tenure of Lambert Semer to the south of 'Fysher closse'. However, there are no certain traces of any building in the vicinity of the Top Pond, if this is indeed the correct location of the close mentioned in the 1539 document.

### The monastic outfall drain

There is no clear evidence for the line of the monastic outfall drain between the Top Pond and the present South Pond. The mill pond mentioned above, which links the two, may be on the line of an earlier drain and has therefore destroyed all evidence for it, or it could have developed from an earlier broad channel created within the precinct to serve as part of the fishponds mentioned above. A third possibility is that the monastic drain took a very different alignment. The only evidence that this might be the case is a field drain visible intermittently on the ground and on the 2015 digital surface model running just to the east of the bank which defines the west side of the former mill pond. This is more deeply cut and slightly wider than the others in the same field, suggesting a different origin, although not necessarily as part of the monastic outfall.

A more convincing section of the medieval outfall is the sharply-defined ditch that starts just beyond the South Pond, just outside the monastic precinct boundary, and crosses the valley floor in a south-west direction heading towards the river Rye. It is about 1m deep with a 'U'-shaped profile and for most of its length lies within a broader depression which, as mentioned earlier in the report, may be a palaeochannel connected with the Rye (see Section 5.3). On the west the channel ends at the modern road alongside the Rye so there is now no visible evidence for the actual confluence, but it almost certainly continued to the river. Although the most likely interpretation of this feature is that it represents the final section of the monastic outfall drain between the precinct and the river, to the east it clearly cuts across the bank and part way into the bed of the former mill pond, indicating that it has been recut in the more recent past.

### The mill pond

The bed of the former mill pond starts on the north just beyond the south corner of the Top Pond and for the first 260m it is consistently around 8-10m wide. It lies wholly within the National Trust estate and therefore was not examined in detail during the 2018 survey but is described by Addyman Archaeology in their 2016 report (Site 28). Along this length the bed of the pond is quite wet ground, with a water channel running intermittently down its eastern edge (JBA Consulting 2015, 9). To the south the water channel enters the modern South Pond, the excavation of which has destroyed a 50m section of the mill pond. On the other side of the South Pond, the bed of the former mill pond is quite dry and increases in width to 35m, but then gradually narrows along its 270m length until it is just 5m wide at the modern road marking the south edge of the survey area. This change in width is clear on the 1912 Ordnance Survey map (Figure 25).

The embankment on the west side of the former mill pond acted as a dam trapping the water against the east side of the valley, but the section between the Top Pond and the South Pond has clearly been levelled. Its 25m breadth and height of no more than 0.5m is in stark contrast to the prominent and much narrower bank depicted by the Ordnance Survey in 1912 (Figure 25). There is a slight ridge visible in places along the spine of the flattened bank that might be the remains of a former field boundary suggesting that the strip of ground was incorporated in the wider pasture field after the levelling had taken place. Analysis of the 2015 digital surface model shows a number of slight linear depressions at the foot of the levelled bank heading at right angles into the field to the west. They are barely visible on the ground but may be evidence of where water in the channel has seeped below the bank and on to the valley floor (Hannon 2015, 24).

South of the South Pond, the bed of the former mill pond continues along the base of the hillside as far as the modern road from Rievaulx Bridge. The bank on the west side stands up to 1m high and has been cut through at one point to facilitate access across it, while the final 120m was partially levelled in 1999 (Caroe and Partners 2000, 54). The modern road probably marks the site of a dam straddling the bed of the mill pond, from which point water was probably fed to a water wheel at Forge Farm further to the south. Situated outside the survey area, Forge Farm was not examined in detail but no trace of such a leat appears to survive above ground. Beyond Forge Farm a much narrower channel, embanked on both sides, continues for a further 500m taking the outflow from the mill pond back to the river Rye.

The difference in the plan form of the mill pond to either side of the South Pond may indicate that the two lengths are not contemporary. As mentioned above, the mill pond is consistently 8-10m wide between the Top Pond and the South Pond while beyond the South Pond it is 35m wide to start with but narrows to only 5m. One explanation for this difference may be that because the former section is wholly within the precinct it may have monastic origins, possibly as a fish pond as suggested by Addyman Archaeology (Site 28) and therefore possibly the 'stanke' mentioned at the Dissolution as discussed above. It could also have been a mill pond which then doubled in length after the Dissolution to serve a finery/chafery forge at Forge Farm (see below Section 5.7).

## The South Pond

The South Pond is roughly oval in shape around 30m across. It has steep sides which suggests that it has been cut fairly recently (JBA Consulting 2015, 10) but historic mapping indicates that there has been a pond-like enclosure here of roughly the same shape since at least the beginning of the 20th century. The 1912 Ordnance Survey map shows an oval area defined by an earthwork bank on all sides except for a small gap at the north-east corner open to the broader channel of the mill pond (Figure 25). Judging from the map evidence, it is possible that the south side of this area was formed by the precinct boundary, but this now lost due to the recutting of the pond. Though the most likely explanation of the enclosure is that it was a precursor of the South Pond, it is just possible that it is monastic and defined the site of a building constructed hard against the precinct boundary towards the south end of the shorter pre-Dissolution pond. It was possibly the site of a mill or the remains of a dam (Waites 2007, 218; Figure 63). However, these interpretations are impossible to investigate on the ground due to the destruction caused by the South Pond.

## The 'canal' system and the movement of the river

The landscape evidence discussed above gives no support to Atkinson's idea that there were canals to the north and south of the abbey. Atkinson's 'First Canal' on the north of the precinct is simply the leat bringing river water to the abbey. On the south, rather than Atkinson's 'Second Canal', the remains are those of a long mill pond post-dating the abbey. Marked differences in width along the 500m length of the mill pond make no sense in the context of a 'canal' but are clues that the pond developed in several phases, possibly starting in the monastic period.

There is also no landscape evidence that the Cistercians moved the course of the Rye from one side of the valley to the other. This idea stems from Russell mistakenly identifying the remains of the monastic leat and the mill pond as an old stream bed and speculating this was the course of the Rye before the Cistercians arrived. What Russell was not aware of, but which is clear from the 2015 digital surface model, is that the east side of the valley is around 0.5-1m higher than the west in the northern part of the precinct, meaning that surface water would naturally find a route along the west side of the valley and would have to be forced to follow a route down the east side. Relic channels detected as broad, shallow depressions heading south-west and south across the valley floor emphasise this point about the natural direction of water flow. So too does the natural gulley visible in the field on the west side of the village indicating where a stream once flowed into the Rye from the east.

In the southern part of the precinct the 2015 digital surface model shows little height difference between the east and west sides of the valley so the natural direction of water flow across the valley floor is not so clearly determined as it is to the north. Nonetheless, the landscape evidence is clear that what has been taken in the past to be the former course of the river to the east is an artificial pond with a constructed embankment on its west side. The palaeochannel which the monastic outfall drain follows over a short distance may be evidence that the river once had a slightly different alignment, but it does not mean that the monks deliberately moved the river. This is more likely to be an ancient meander, long predating the abbey.

While considering possible changes to the river it is worth pointing out the map evidence first noted by Canon Atkinson (Atkinson 1889, lxx). He drew attention to the way the parish boundary on Ordnance Survey maps (recorded in the mid-19th century but possibly preserving a much earlier course of the boundary, even possibly that of the pre-conquest wapentake) does not consistently follow the central line of the Rye in the vicinity of the precinct, but takes in parcels of land on the west bank as if following earlier meanders in the river's course. Atkinson numbered these meanders 1 to 3 on his map (see Figure 5). The west bank of the Rye lies outside the survey area, but the most likely explanation is that in these specific locations the river has naturally migrated slightly out of the course it followed when the boundary was established.

## 5.6 The layout of the precinct: routes, boundaries and enclosures

It was standard monastic practice to divide the precinct between an inner court, nearest the claustral buildings, where domestic workshops and the guesthouse were located, and an outer court containing agricultural and industrial buildings such as mills, forges and barns (Burton 1994, 146). At Rievaulx there is no firm evidence of the boundary between the two courts, though the Dissolution surveys have been used as evidence that the inner court was a large rectangular area to the north of the claustral buildings, encompassing both the present village street and the houses beyond (Coppack 1999, Figure 149).

### Internal routes

No definite traces survive of any medieval routes within the monastic precinct to compare with the group of hollow ways already described beyond the boundary. The present village street, where it passes through the site of the gatehouse near St Mary's Church, is almost certainly on a medieval alignment, but whether it continues further as a successor to a medieval road is unknown.

The possibility of entrances at the north and south extremes of the precinct is discussed above (Section 5.4). Both (if original) would have served medieval routes approaching the abbey. As has already been mentioned, there is a strip of level ground between the main supply leat and the foot of the hillside which can be traced for 500m to the north of the village. This could be the route by which stone from Penny Piece Quarry (just outside the suggested north entrance) was brought to the abbey for use in construction, and continued in use thereafter, not least as access along the leat for maintenance. To the south of the abbey, within the National Trust estate, a modern forestry track follows what may have been a route running northwards into the precinct from the putative south entrance. It is bordered by the mill pond on the west side and the foot of the hill slope on the east. However, if this was an important medieval route from the south it has left no trace nearer to the abbey, beyond the boundary of the National Trust estate.

## Internal boundaries and enclosures

There are several earthwork boundaries surviving within the precinct which may have medieval origins and others, no longer extant but shown on historic Ordnance Survey mapping, which are also worth considering in an effort to understand the monastic layout.

A prominent bank on the hillside to the south-east of the church is of particular significance as it appears to mark the line of a wall enclosing the south-east side of the claustral complex (Figure 27). The earthwork is orientated broadly north to south on the same alignment as the church, while a length of masonry visible within the bank points to it being the collapsed remains of a stone wall. To the north the earthwork fades into the steep cutting on the east side of the choir. On the south side the bank turns through a right angle to descend the hillside, with a slight external ditch at the corner. The bank disappears before the bottom of the slope, where Atkins indicated the earthwork of a possible building on her survey plan (Coppack 1999, 176 Fig 148). No trace of this building was noted during the present survey, nor is it visible on the 2015 digital surface model. In the accompanying text Atkins' building is interpreted as the site of the charnel chapel, and the boundary as an area recorded in the Dissolution survey as 'the Kirkgarth' (Coppack 1999, 182). If the boundary originally continued further along the south side of the claustral complex it probably also enclosed the abbot's garden mentioned in the Dissolution survey. It seems reasonable to suppose that this boundary is part of a medieval division, possibly the inner court, separating the church and buildings on the south side of the claustral complex from the rest of the southern precinct. Uphill from this boundary are three slight linear earthworks that probably represent a group of paddocks or small fields extending up to the precinct boundary which may also be medieval in date.

To the west of the claustral buildings in the area now occupied by the visitor-centre car park and extending into the field to the south, the 1912 Ordnance Survey map shows a straight earthwork boundary, partially a bank and partially a single west-facing scarp (Figure 28). The feature, which judging from the map extended for about 100m, defines the west side of an amorphous mound and is coaxial with the claustral range. Though it no longer exists, the boundary may well have been part of the pattern of enclosures within the precinct, defining the edge of a yard or close towards the river and, in the opposite direction, a continuation of the boundary defining the abbot's garden. There is also a short length of bank with a distinct 'dog leg' alignment not mapped by the Ordnance Survey but visible in a field on the opposite side of the road. It is possible that this was also part of the monastic layout.

Much less certainly medieval, however, are the features recorded from aerial photography by the National Mapping Programme in the valley bottom to the south of the abbey (Figure 8). These features were tentatively identified as the remains of a medieval garden (Knight *et al* 2011, 36; Figure 17) but are probably a much more recent network of field drains similar to those plotted across part of the valley floor to the north of the abbey and which also appear on the 2015 digital surface model.

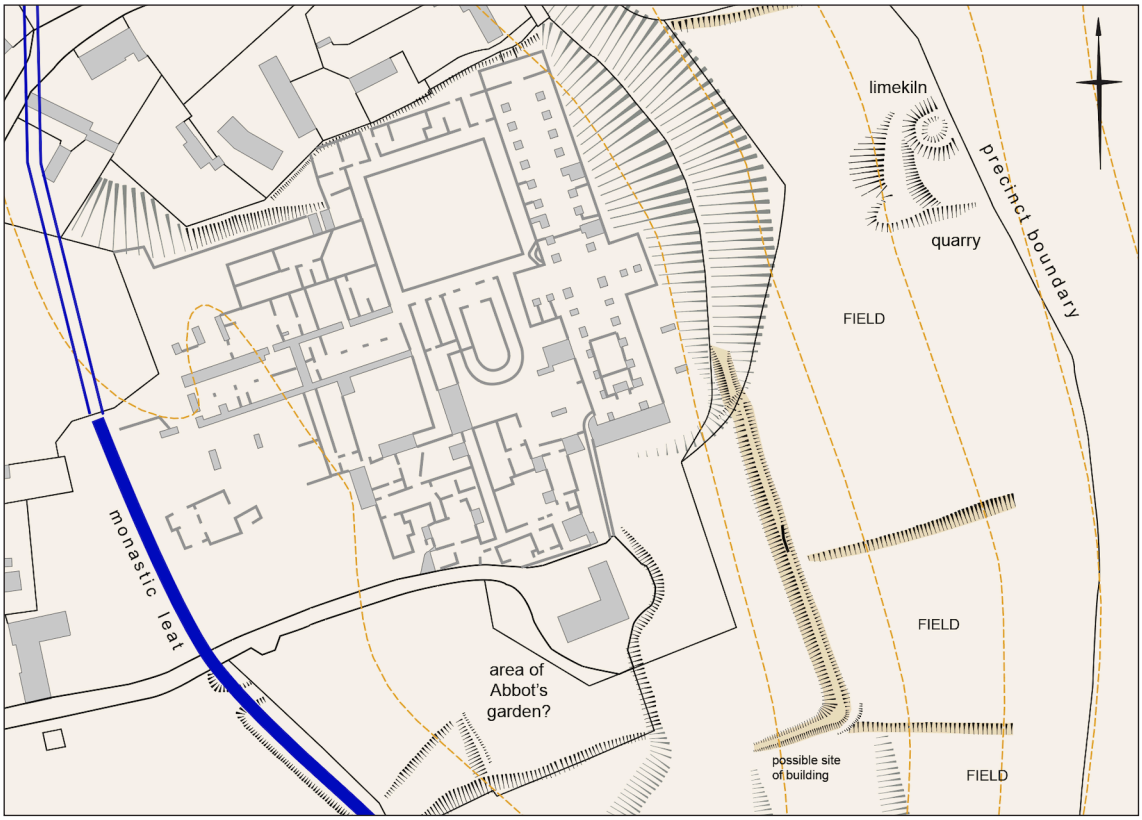


Fig 27. Extract from the 2018 survey plan (Figure 40, this report) showing the possible monastic boundaries to the south and east of the abbey church (in brown). © Historic England.

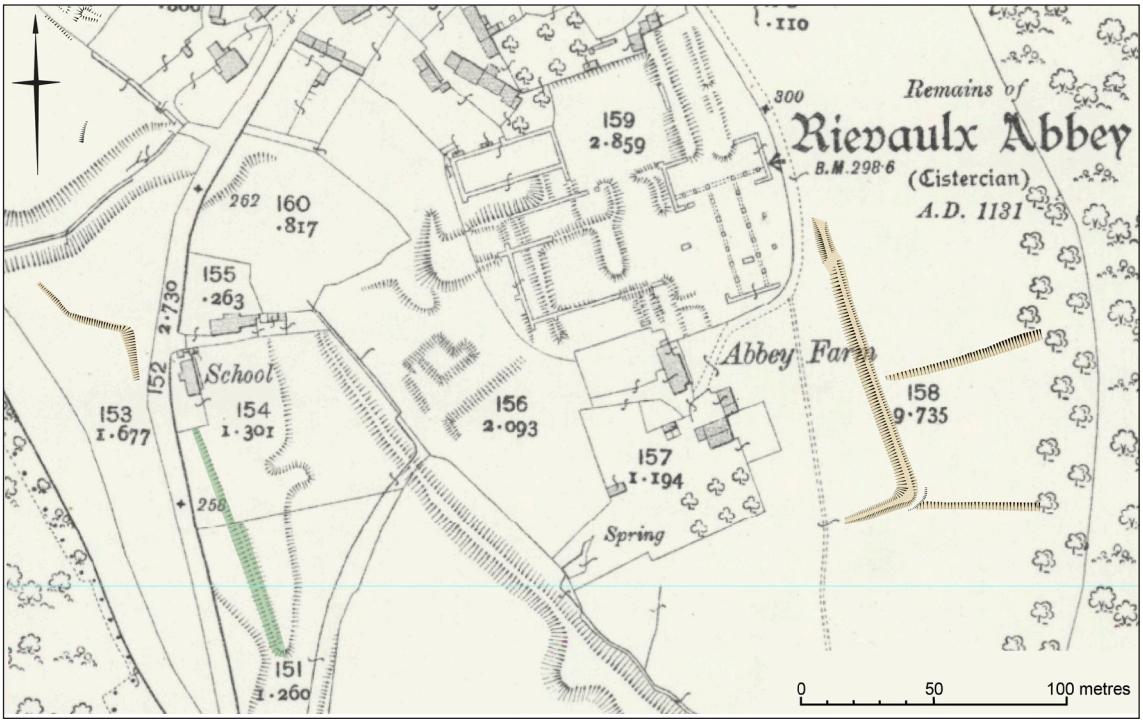


Fig 28. Extract from the 1912 Ordnance Survey map showing the linear feature recorded at that time (green), augmented with possibly related medieval boundaries recorded in 2018 (brown). © Historic England.

As mentioned above, an area of terraced platforms and enclosures survives on the east side of the valley to the north of the abbey. These comprise three terraces, now split between two fields, stepping down the hillside below the precinct boundary. The gradient is quite steep in places, so these terraces were obviously laid out in a coaxial fashion to create more level space in the most efficient way: cutting into and revetting the uphill side, while building up the land below. To the north these terraces clearly end at an obvious boundary. To the south it is likely that the pattern once continued along the valley side towards the abbey although the ground is now built over or landscaped as gardens (Figure 29).

The upper of the three terraces can be traced for about 100m along the contour into the grounds of a private residence where it provides the base for the main house. No survey was undertaken in the grounds of this house and the trees obscured any detail on the 2015 digital surface model. At the north-west end of the terrace, the uphill side is revetted with a drystone wall, now partially collapsed (Figure 30) which then turns downhill as a freestanding wall to cross the middle and lower terraces. In front of the revetment wall are several slight banks which show that this end of the upper terrace was divided into small yards or perhaps the locations of one or two buildings. A hollow way begins at the foot of the revetment wall and heads downhill across the two lower terraces to the foot of the slope. Although it is quite a steep descent, this route must have been well used over a prolonged period to have created such a pronounced feature. The 1996 survey by Atkins (Coppack 1999, 176, Figure 148) shows a spring at the start of the hollow way. No trace of this was observed at the time of the survey although at certain times water may well have flowed down the line of the route contributing to its depth. Just beyond the point where the route meets the bottom of the slope, a mound adjacent to the line of the abbey's main water supply could represent the abutment for a bridge to take the route over the leat (Figure 29). A slight triangular-shaped platform on the east side of the mound could indicate the location of a building in the angle between the putative bridge and the main leat.

The middle terrace is about 100m long by 15m wide. The downslope side is partially revetted by a substantial drystone wall which is now partly collapsed. There are no traces of any structures on the terrace itself, but a narrow ledge appears to have provided access to it, extending some 80m to the north-west and perhaps straddling the nearest of the natural gullies which cut through the hillside. There is a concentration of stones on the surface beyond this gulley hinting at the presence of a track with a stone surface at this point, while the gully itself is edged with a short section of walling that might indicate a bridging point.

The lowest terrace is similarly about 100m long and around 15m wide. A track descends from the south-east corner forming a hollow way towards the foot of the slope. Towards the outer edge of the terrace is a rectangular depression about 15m long and 5m wide which may indicate the site of a structure. However, as one of the short ends of the depression abuts the drystone wall that runs straight down the hill from the uppermost terrace, the feature may be no older than that wall and therefore post-monastic in date.

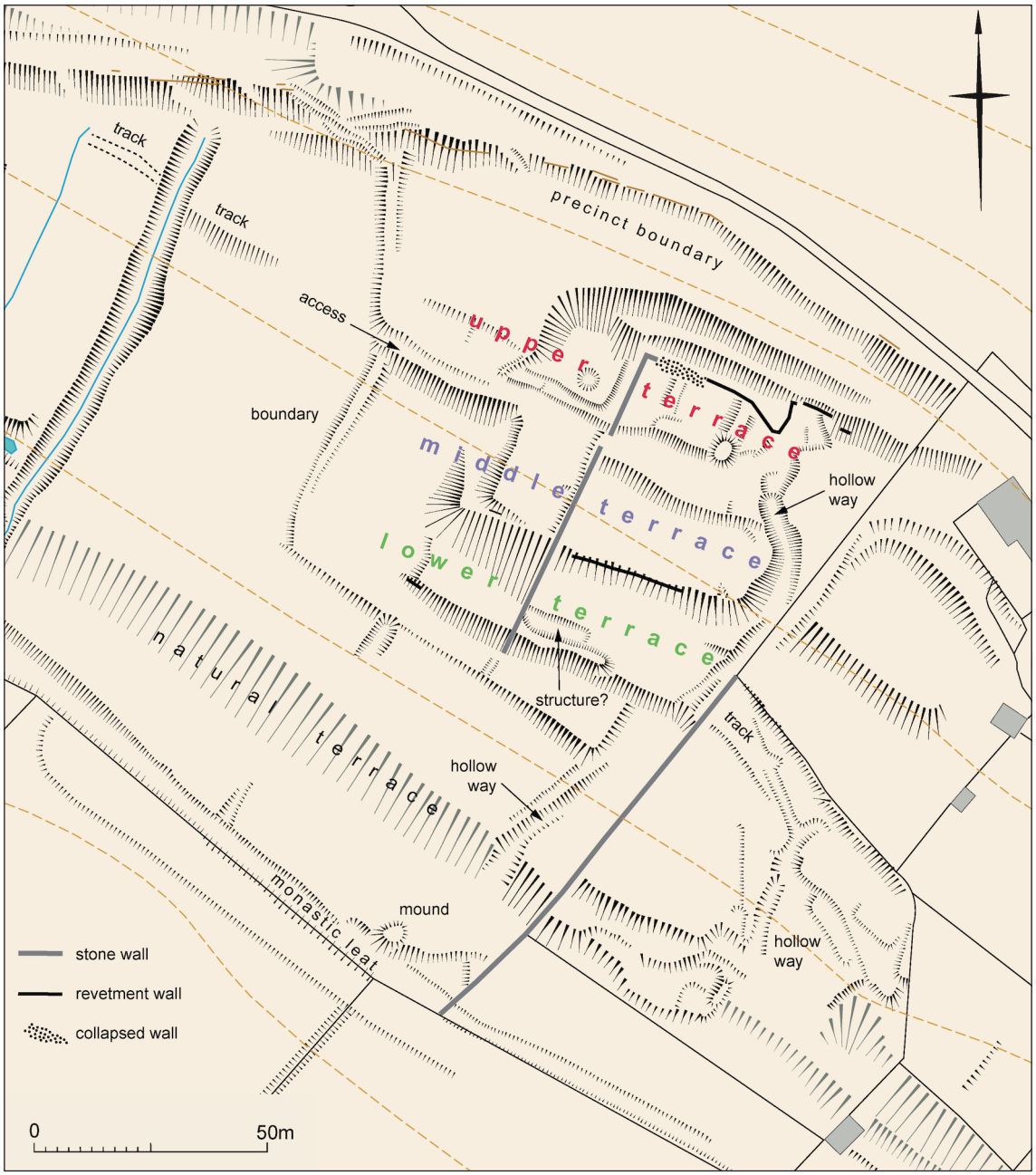


Fig 29. Extract from the 2018 survey plan (Figure 40, this report) showing the terraces on the east side of the valley to the north of the village. © Historic England.

A bank that descends the hillside some 30m beyond the north-west end of the three terraces effectively marks the limit of the utilised slope as beyond it the valley side is largely unaltered. At its downhill end the bank wraps around the lowest of the three terraces to define a further long, narrow enclosure. On the uphill side the boundary changes angle slightly and has a break at the point it meets the ledge that gives access to the middle terrace. It is possible that the upper part of the boundary is different in date from the lower part. Indeed, the chronological relationship of the bank to the terraces is far from certain. Though it appears to mark a definite limit to the terraced area, this does not mean it is contemporary with the terraces and it could in fact pre-date them.

Fig 30. View looking north-east of the stone wall revetting part of the upper terrace, February 2018. © Historic England.

There is no clear boundary to the terraces in the opposite direction, towards the abbey, as the ground is now divided between several private residences or is otherwise overgrown. The area was not investigated by the present survey and does not show up clearly on the 2015 digital surface model. However, the 1996 Atkins' survey does show two long terraces and a possible ditch or hollow way on the slope in this area, and there is also early photographic evidence of terraces here (Figure 31).

The character of the surveyed area suggests a landscape of interlinked working areas, paddocks, buildings and yards extending along the slope with level routes along the terraces and hollow ways connecting these areas with the valley floor. The most likely interpretation is that this area accommodated a range of industrial and agricultural activities within the outer court of the medieval abbey. The Dissolution surveys indicate that by 1539 several closes in this area were leased out to tenants, including one building referred to as the 'Swinehouse' (Coppack 1986, 129). Coppack claims to have identified the location of this building in 1984 but no details are given (ibid 1999, 183). It is also likely that the area continued as a working landscape after the Dissolution and activity might have intensified as the spread of the ironworking industry in the immediate vicinity of the abbey forced other occupations to move further away. Evidence for shaping of the terraces after the Dissolution comes for the observation that the stone revetment walls may have used stone taken from the adjacent precinct wall which in this section is completely robbed out. Hornby's estate survey of 1806 shows one building remaining among the surveyed closes which probably equates to the shallow rectangular feature identified as a building on the lower terrace (Figure 3). It is possible that this is the 'Swinehouse' that Coppack identified, as it is the only earthwork surviving in this area that is recognisably the site of a building. However, its appearance on Hornby's 1806 map only tells us that it was present at that date, and not that it was of any great age at the time.

Fig 31. Photograph from the turn of the 20th century showing terraces and enclosures on the west edge of the village below the road to Bow Bridge; source author's collection.

## Fishponds

Fish were an important source of food in medieval monasteries, and fishponds were common within monastic precincts. At Rievaulx, however, the only extant example is a probable pair found on the valley floor about 160m to the north-west of the abbey ruins (Figure 32). One pond is clearly visible as a rectangular depression 20m long and 6m wide with traces of a slight bank around all four sides, and a gap at the north-east corner which might indicate the water inlet (Figure 33). Abutting the opposite corner is a second rectangular depression which looks like the end of a second pond set at right angles. A slight 'L' shaped bank stands apart from the two fishponds and could have been part of a boundary enclosing this area. Several of these features appear quite strongly on the 2015 digital surface model but were wrongly interpreted by Hannon as part of an ornamental garden (Hannon 2015, 24). The nearest watercourse passes just to the south of the ponds, but this is the outfall from the 18th-century mill and may not have been present during the medieval period. Alternatively, water could have been directed to the ponds from the monastic leat along a now buried channel. The leat passes 60m to the north-east and may have passed about the same distance to the south if, as seems likely, it turned and crossed the valley floor to reach the west side of the claustral range.

Other fishponds surely existed elsewhere in the precinct to satisfy the demands of such a large monastic community. It is very possible that there were other ponds to the south of the abbey along the line of the outfall drain. Possible locations have already been discussed (see Section 5.5 above) and include medieval precursors to the Top Pond as suggested by Coppack and that section of the mill pond which extends from the Top Pond as far as the south boundary of the monastic precinct.


Fig 32. Extract from the 2018 survey plan (Figure 40, this report) showing the location of the fishponds in relation to the possible alignment of the monastic leat. © Historic England.

Fig 33. View of the one of the fishponds looking west, February 2018. © Historic England.

## 5.7 The post-monastic landscape

### The 16th and 17th century ironworking industry

Having evolved from monastic beginnings iron working came to dominate this part of the valley after the Dissolution under the ownership of the Duke of Rutland (Fergusson 1999, 187-8; McDonnell 1972, 43-4). The scale of activity increased with the construction of a blast furnace in 1577 on a site within the present village. The industry is thought to have ended around 1647.

The physical evidence for this period has been discussed in previous accounts (McDonnell 1972; Wheeler and McDonnell 2011) and the present survey has not recorded any significant new information. Some of the most obvious remains are the mounds of ironworking slag visible next to Forge Farm on the south side of the road to Rievaulx Bridge which is outside the limit of the present survey. The forge is probably contemporary with the blast furnace (McDonnell 1972, 48) and has been identified as the site of the documented finery/chafery building where cast iron from was turned into malleable iron by beating (McDonnell 1972, 44). The water-powered hammers used in this process are likely to have necessitated the large mill pond that extends from the forge back towards the abbey ruins along the east side of the valley (see Section 5.6). South of the forge site, water was directed back to the river along a purpose-built embanked drain extending for 500m across the valley floor.

How the mill pond was supplied in this period is uncertain. The medieval weir and monastic leat may have remained in use for a while bringing river water from higher

up the valley through or around the west side of the abbey ruins, but debris from the blast furnace and earlier demolition rubble appears to have eventually blocked this supply. Indeed, the flow might have been deliberately diverted from the leat back to the Rye along Drains 1 and 2 well before reaching the abbey ruins (see Section 5.6 Figure 22). The loss of this water source presumably left the mill pond reliant on flow from the claustral area along the former reredorter drain, which entered the north of the pond as shown on historic Ordnance Survey mapping (Figure 25).

McDonnell also noted iron working slag around Rye House, on the west wide of the valley near the river, and by the side of the modern road from Rievaulx Bridge to Rievaulx village. Although initially quite dismissive of this as a forge site, more recently he has suggested it as the possible site of the hammer smithy contemporary with the blast furnace. (McDonnell 1972, 28; Wheeler and McDonnell 2011, 109). The 2015 digital surface model quite clearly shows a slight mound on the south side of the house that goes under the road and into the small paddock opposite. This could represent the build-up of iron-working debris. However, if there was a hammer smithy at this site, there is no visible evidence of how water was supplied to power the hammers. The map in the latest edition of the English Heritage guidebook also identifies Rye House as the site of a medieval forge but on what evidence is not made clear (Fergusson *et al* 2016, 28). There is a reference at the time of the Dissolution to a building called 'the iron smythes' in the tenure of Lambert Semer to the south of 'Fysher closse' (see Section 5.5 above). Coppack considers this to have been in the vicinity of the Top Pond and therefore much closer to the abbey than Rye House, though there is no archaeological evidence for a forge at this location (see Section 5.5).

The blast furnace has so far eluded attempts to locate it using geophysics and test excavations in and around the presumed site at Furnace Hill within the village. The 2015 digital surface model shows a rise within this part of the village some of which is probably the build-up of waste from the furnace - the depth of industrial waste may be up to 2m (Caroe and Partners 2000, 44). A prominent grassy mound on the opposite side of the village street from Furnace Hill has been interpreted as part of a dam to control water to the blast furnace during smelting operations (Wheeler and McDonnell 2011, 109), utilising the water flow from the springs and ponds above, which afterwards powered 18th-century water mill (Figure 34). Test excavations have established that the mound is formed from compacted rubble, but it is difficult to see how this isolated feature formed part of a complete dam that has left no other surface traces. The ground rises to the east of the mound such that it would only have been high enough to trap a 10m-wide body of water against the slope, if the dam had carried on northwards for a considerable distance to make a long, narrow pond; but there is no earthwork evidence that this was ever the case. The top of the mound is quite level and to the south merges into a slight rise leading up to the village street. This creates an easy passage from the road which led to the interpretation offered in 2005 that it might have been a viewing platform created to give visitors a more expansive view of the ruins in the 18th or 19th centuries (Barnwell *et al* 2005). This idea is speculative and other interpretations should still be sought. It is possible that the mound has a connection with the period of the iron industry, as McDonnell suggested, but not as part of a dam. It could, for example,

Fig 34. View looking north-east of the mound possibly associated with the post-medieval blast furnace, April 2005. © Historic England.

have supported a timber launder used to convey water at height to power the bellows at the presumed site of the blast furnace on what is now the opposite side of the village street. On a note of caution though, the mound is not shown on historic mapping until the early 20th century, so may well post-date both the iron industry and the picturesque appreciation of the abbey ruins (Ordnance Survey 1912).

## The village and agricultural landscape

### The village

The houses in Rievaulx village largely post-date the end of the iron industry though three cottages at the east end of the village may be contemporary with it (Barnwell *et al* 2005). They are single-storey dwellings with byres testifying to the continuation of agriculture in the valley alongside the iron working industry. The buildings further down the village street to the west came later, with some, such as the old smithy on the north side of the village street, standing on a large mound of earlier slag and cinders. The village street continues as a road down the west side of the valley as far as Rievaulx Bridge. As suggested earlier, it probably did not exist as part of the monastic layout but may have been created during the period of the iron industry to reach the suggested hammer smithy on the site of Rye House. Alternatively, it could have developed later still to give the village a direct link to the important east-west route beyond Rievaulx Bridge.

The village has not changed greatly in size since it was first mapped in detail by Hornby in 1806. That map shows Abbey Farm to the south of the ruins long before it was mostly swept away in the 1950s in order to improve access to the site for visitors. One important survivor is the 18th-century mill north of the abbey, with its associated leat and ponds, which continued in use until the early 1960s and was converted into a private dwelling (Rievaulx Mill) in 1988 (Johnson 1990-91, 22-24; Harrison 2001, 234). The present mill building, though much altered, dates back to 1706 when it was recorded that George Tayler was paid £43 for rebuilding it (Harrison 2001, 234). The foundations of an earlier building were discovered during the conversion of the mill to a private dwelling but, though the remains have been claimed as those of the medieval mill, no archaeological report detailing the discovery seems to exist (Johnson 1990-1, 22; Harrison 2001, 25).

There was no opportunity during the present survey to investigate the network of leats and ponds that lie between the 18th-century mill and the spring source above Arden Lane. Hornby's 1806 survey shows some of the springs and leats but not the ponds (Figure 3). This may be an oversight and should not be taken as evidence that the ponds did not exist, as they do appear on Tukes and Ayer's estate map of 1822 and the ponds and connecting channels appear to have changed little since then. More detailed Ordnance Survey mapping (Ordnance Survey 1912) shows separate channels bringing the outflow from the individual springs together into an upper pond (Figure 35). This is heavily embanked on all but the uphill side as can clearly be seen in an early photograph as well as in the map depiction (Figure 36). The outlet appears to be on the uphill side of the pond, at the north corner, which has the effect of directing the flow away from what was probably its natural course further to the south, closer to the village street. A single channel then directs the flow into a middle pond and from there to a lower pond (shown as dry on current Ordnance Survey mapping) just above the site of the 18th-century mill.

The tailrace from the mill runs across the floor of the valley in an artificial channel along the edge of a field. Occasional stonework visible suggests it was originally stone-lined. After 130m the channel turns at right angles around the east corner of a field to eventually flow into the river along the line of the former stream bed on the edge of the Rye as described earlier in the report (*see* Section 5.5). This course of the tailrace may be less than 200 years old as Hornby's 1806 survey shows it clearly turning to the south-east immediately beyond the mill, presumably following the line of the monastic leat and then disappearing. It has followed its present course since at least the 1850s (Ordnance Survey 1856), though a narrow gully intersecting with the side of the natural channel suggests there have been times when the last section of the tailrace took a more direct route across the field (Figure 32).

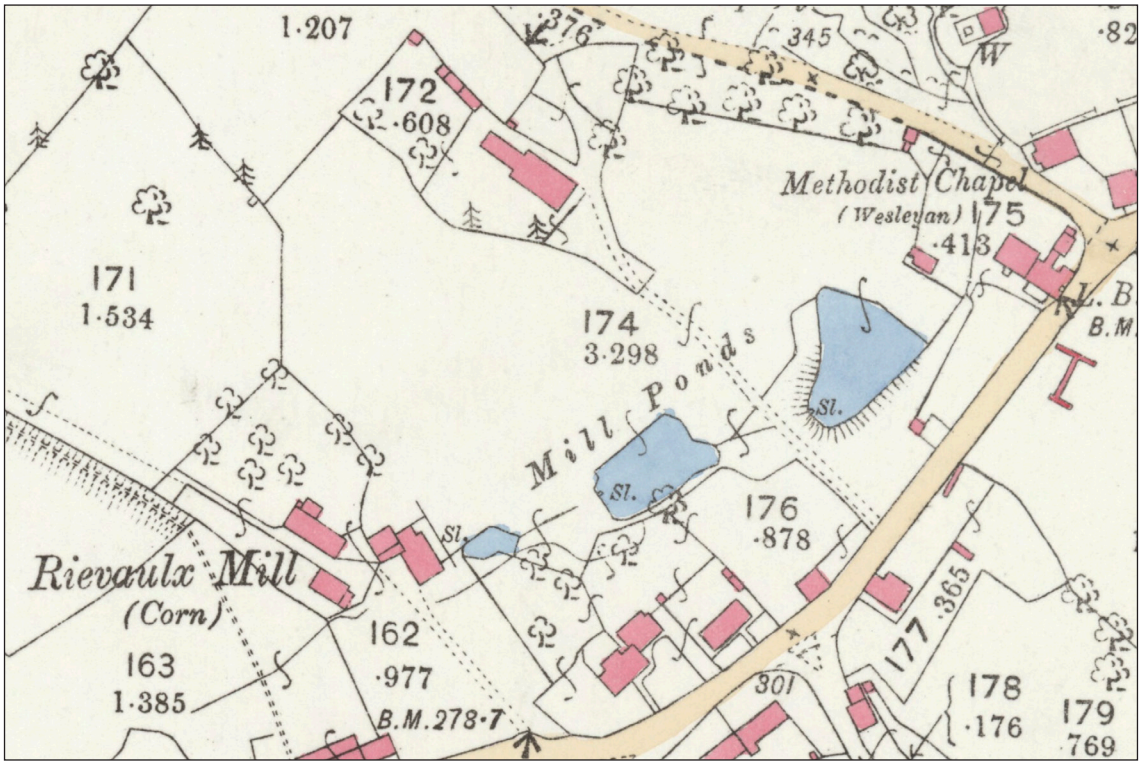


Fig 35. Map showing the mill ponds and interconnecting leats supplying the 18th-century Rievaulx Mill on the north side of the village. Reproduced from the 1912 Ordnance Survey map.

Fig 36. Colourised photograph from the early 20th century looking south showing the embanking on the south-east side of the upper mill pond; source author's collection.

## The agricultural landscape

The pattern of fields reaching across the valley floor to the tree line on the east side of the valley has seen only minor changes over the 200 years since Hornby's map of 1806. Fields have been amalgamated along the valley bottom, though traces of the grubbed out boundaries show up on the 2015 digital surface model and have been mapped from aerial photographs (Knight *et al* 2011, 38). The same two sources bring out dense patterns of parallel field drains across the valley bottom to the north and south of the abbey testifying to recent efforts to keep the land drained and useable as pasture. However, aside from these relatively minor changes, the evident survival of much of the course of the abbey's precinct boundary and of the terraced closes and hollow ways on the east side of the valley testifies to a conservative approach to land management over the past few centuries.

An area of more intensive activity is noticeable on the hillside 120m to the east of the abbey church where a small quarry, with several spoil heaps on the downhill side (Figure 37), obscures the likely line of the precinct boundary (Addyman Archaeology 2016 site 44). The quarry face exposes rock from the Lower Calcareous Grit formation, which is not much used for building stone as it is very difficult to dress and so was otherwise used for rough walling or rubble infill (Senior 1999, 216). As it is so close to the abbey the quarry might date back to the early years of its construction but has clearly been worked since the Dissolution destroying part of the precinct wall in the process. The adjacent mounds, which are clearly shown on the 2015 digital surface model, include a semicircular bank, open to the quarry, which appears to be the remains of a limekiln (Addyman Archaeology 2016 site 65). The limekiln is probably quite recent and used the quarry as the source of stone that was burnt to produce lime for mortar or for spreading on the land to improve the fertility of the soil.

Fig 37. The quarry on the valley side to the east of the church and which destroyed part of the monastic precinct boundary, March 2018. © Historic England.

# 6. SUMMARY AND DISCUSSION

This study has reassessed the landscape of Rievaulx Abbey principally based on evidence captured by the digital surface model created in 2015. Analysis of that model does not give the same intimate understanding of the landscape that can be achieved through a prolonged examination of features and their settings on the ground. However, careful ground checking of the 2015 data, supplemented by limited earthwork survey in 2018, has resulted in the first truly detailed account of the landscape archaeology of the abbey. The major findings of the present survey are brought together and reviewed below and are illustrated in Figure 38 (medieval landscape) and Figure 39 (post-medieval landscape).

The earthwork remains at Rievaulx are not as extensive as those of neighbouring Cistercian sites such as Byland Abbey, Jervaulx Abbey and Fountains Abbey, largely because most of the precinct is a low-lying flood plain unsuited to building with little surviving earthwork archaeology. The decision to dump spoil from the clearance of the abbey in the 1920s and 30s has also deprived us of important earthwork evidence close to the main abbey buildings. Nevertheless, one of the principle discoveries of the survey is that the landscape story is somewhat simpler than that put forward in previous accounts, in which much has been written about the damming of the Rye to create 'canals' and of the engineering undertaken to realign the river.

## 6.1 The choice of site and nature of the pre-monastic landscape

The survey found no evidence of settlement or agriculture in this part of the valley prior to the founding of the abbey, though future archaeological excavations or analysis of sediments from the valley floor could well discover traces of occupation before the 12th century. On the face of it, the absence of any evidence of earlier settlement complements the idea that the Cistercians favoured remote uninhabited locations. However, how remote the site really was when the Cistercians arrived in 1131 is questionable, as it was close to Espec's castle and the growing settlement at Helmsley and what was probably even then a major east-west route across the Rye at the present-day Rievaulx Bridge. The physical characteristics of the site which gave the Cistercians confidence to choose this part of the Rye valley for their foundation are readily apparent. The side-valley has springs providing fresh water and gives an easy approach from the east along what is now Rievaulx Bank. A natural terrace above the valley floor offered protection from flood waters, though given the limitations of that space a strict liturgical orientation for the church had to be abandoned.

While practical considerations must have played a large part in the choice of site, Burton has explored the political circumstances that led the Cistercians to seek out Walter Espec, emphasising his important connections at court and with the hierarchy of the Church in the north of England (Burton 1999, 100-1). They may also have been attracted to an individual who had already demonstrated a generous disposition toward the Church, having previously founded the Augustinian priory at Kirkham.

Other possible influences on the choice of site are more elusive in the historical and archaeological record. The so called 'windypits' may have added an aspect to the landscape which appealed to the Cistercians' more esoteric aim to seek out wild and inhospitable places. As described earlier (Section 2) these natural fissures occasionally 'breathe', a process which appears to have had supernatural connotations in antiquity. Artefacts and burials dating from the early Bronze Age to the Roman period have been recovered from them since the 1950s (McDonnell 1963, 16-27). With the nearest Windypit to the abbey comprising a pair of fissures just across the valley on the side of Ashberry Hill, it is conceivable that one of the factors influencing the choice of site was a desire to rid this part of the valley of any lingering un-Christian beliefs attached to these features.

Walter Espec's first monastic foundation in Yorkshire, at Kirkham, lies over 15 miles from his estate centre at Helmsley. The grant of the site at Rievaulx to the Cistercian Order suggests that he aspired towards a different kind of relationship here, one perhaps based on much closer physical ties. How this played out over the 25 years prior to his death in 1153-4 can only be conjectured, but Espec seems to have developed strong spiritual bonds with the abbey, to the extent that he is believed to have joined the community as a monk in his final years (Powicke 1950, xcix). We can only speculate whether the choice of the abbey's site by the Rye was influenced at all by the fact that Espec's castle stood next to the same river. It is possible that Espec gained comfort from this connection, perhaps viewing the river as an embodiment of his spiritual attachment to Rievaulx and finding solace that the waters flowing past his castle were in some sense sanctified by having first washed the sacred lands of the abbey. This suggestion is admittedly entirely conjectural, but it is worth considering as an indication of the complex themes that might lie behind the bare words of the contemporary descriptions of the founding of the abbey.

## 6.2 The Monastic Landscape

### Precinct boundary

Apart from the abbey ruins themselves, the clearest element of the monastic layout to survive is the precinct boundary. Atkinson was the first to define the general course of the boundary and it is shown in some detail on her survey plan from 1996. Addyman Archaeology (2016) have made a detailed record of the section that passes into the National Trust estate on the east side of the valley. On the south and east sides, the boundary was formed by a stone wall, now a stony bank, with an intermittent exterior ditch which on the steep south-east side of the valley appears more like a ledge cut into the slope and on the south-west side is probably a natural palaeochannel. The ledge may have had the practical function of allowing access for construction work on the steep hillside while on the north-east side of the precinct the ditch may have acted as a route, one of several hollow ways leading to the Rye crossing at what is now Bow Bridge. It is also conceivable that the ditch and ledge marked the first definition of the boundary on the east side of the precinct before the construction of the wall, though this suggested sequence is not evident in the earthworks and would need to be explored through excavation.

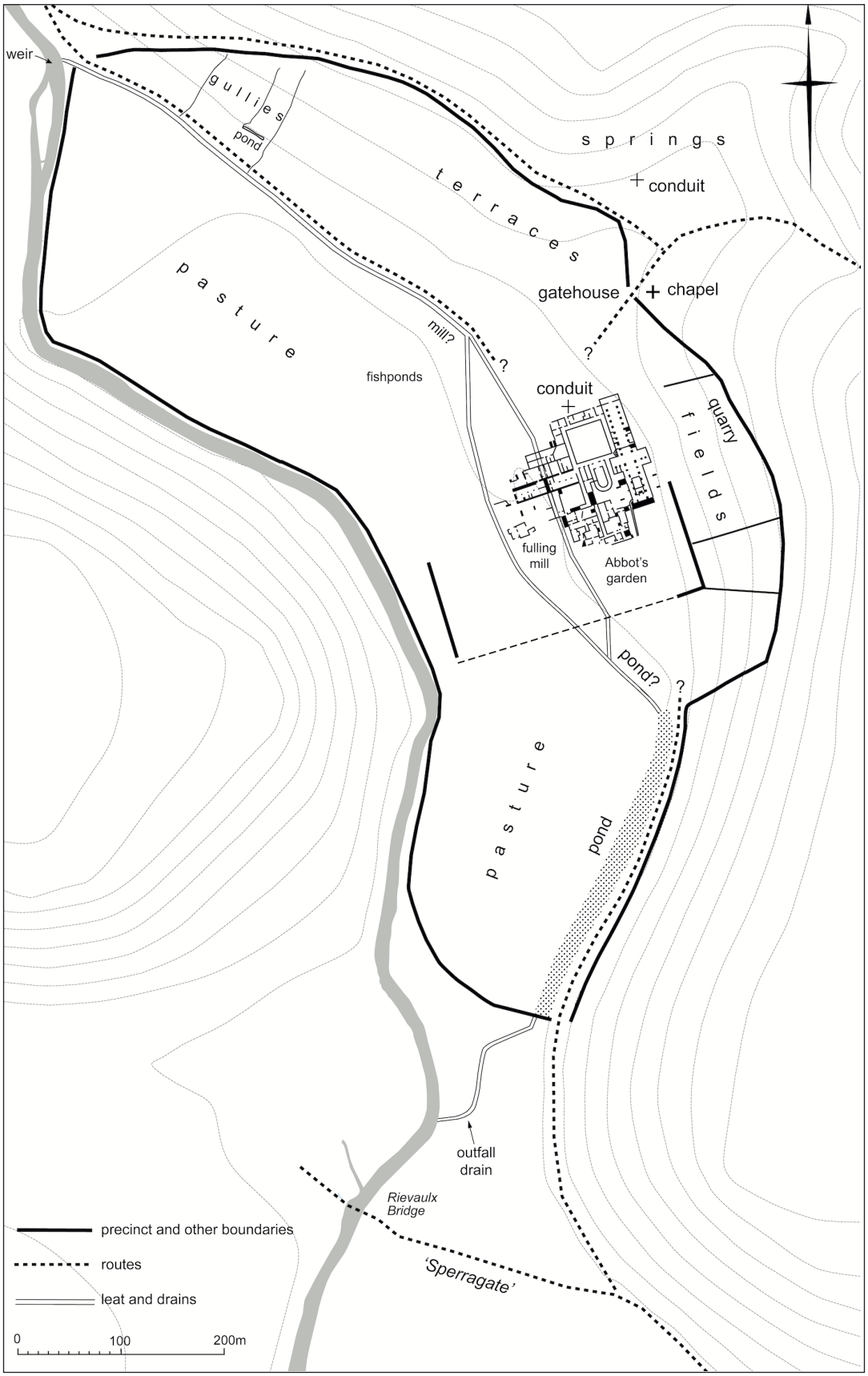


Fig 38. Conjectured medieval layout identifying the main features discussed in the text. Contours are at 10m intervals. © Historic England.

On the west side the precinct boundary survives less well, with just a few short stretches of stone wall foundations remaining visible along the river's edge. These are at threat from erosion and pose a significant conservation challenge. They confirm, however, that the river must have acted as the boundary along the west side of the precinct, and also emphasise the importance of the wall as a symbolic barrier, since the river by itself would have formed a clear limit to the precinct on this side of the abbey.

A major question still remains about the alignment of the boundary in relation to the gatehouse on the east side of the precinct. The present survey has put forward reasons to dispute the layout suggested by Coppack, who places the outer gatehouse some distance along the main approach road (Rievaulx Bank) requiring the precinct boundary to take an abrupt change in alignment to the east to meet it. The present survey has argued that the known gatehouse site is a stronger candidate as it fits better with the established alignment of the precinct boundary, the location of the probable gate chapel and the medieval road alignment down Arden Lane to the Rye crossing at Bow Bridge. This leaves the site of the inner gatehouse, where access was gained to the church and claustral ranges, still to be located. One location worth considering lies around 60m down the village street from the suggested outer gatehouse, where a short lane branches off to the south directly opposite the abbey church, perhaps perpetuating the route into the inner precinct. Between this junction and the outer gatehouse the village street is quite narrow and walled on either side, and therefore retains something of the character of the expected monastic arrangement in which the route between the inner and outer gates would have been enclosed and tightly controlled to prevent unauthorised access (Jecock *et al* 2011, 86).

When the precinct boundary was laid out it could have been aligned so as to encompass all the springs in the side valley to the east from whence the abbey drew fresh water, these being less than 50m distant. Perhaps this was not a concern or perhaps there was some impediment to this course of action. Could it be that the route down to the crossing of the Rye at Bow Bridge, represented by the hollow ways below Arden Lane, was already in existence when the Cistercians acquired the site? If this was the case, then the Cistercians apparently made the decision to align the precinct boundary alongside this existing route which necessitated leaving the springs a short distance outside.

### Water Management

The evidence that the abbey utilised the water supplied by the springs in the side valley and constructed at least two conduit houses is reasonably clear, though the network of pipes, conduits and channels is now largely missing. That the abbey also drew water from the Rye for use in various craft and industrial activities in the outer court, and to help flush waste water back to the river, is also amply demonstrated by the earthworks. The main channel or leat that facilitated this is an obvious earthwork feature, except where it has been obscured by the expansion of the village, widespread dumping associated with the abbey's demolition, detritus spread by the iron industry and later earthmoving associated with the clearance of the abbey

ruins. It is possible that the leat originally continued straight into the claustral range to emerge again as the still-active reredorter drain. It was later realigned (or a new branch was added) to supply the fulling mill and other industrial operations which were active at the west side of the claustral range at the time of the Dissolution. Beyond the abbey it is likely that the waste water fed into at least one pond on the east side of the valley, with the possibility also that the modern Top Pond had a medieval precursor mentioned in the Dissolution documents (Coppack 1999, 183). The outfall beyond the monastic precinct is still clearly visible on the ground crossing the valley floor south-westwards where it took the waste water back to the Rye.

The landscape evidence indicates that the Cistercians undertook no other major water management schemes, a conclusion which is markedly at odds with previous interpretations. With variations, these state that the monks moved the river in stages from the east to the west side of the valley and that they diverted water into 'canals' in order to transport stone for building work. Admittedly, major monasteries were perfectly capable of creating sizeable water courses, such as the Monk's Lode at Sawtry or the 'Saxon' canal at Glastonbury, and nearby Byland Abbey and/or Newburgh Priory are thought to have altered the course of several minor streams in an effort to drain their lands in the 12th century (Jecock 2011, 6-7). However, the landscape evidence demonstrates that the supposed 'canal' to the north of the abbey is simply the line of a leat bringing water from the Rye, and the 'canal' to the south is just a pond: a feature that possibly originated in the medieval period but which was adapted and extended after the Dissolution as a mill pond serving the forge at Forge Farm. The reason for past misunderstanding of the field evidence is that essentially too much reliance has been placed on documents contained in the Rievaulx Cartulary and too little close scrutiny has been given to the earthwork evidence. The use of documents as the primary source of evidence is found quite widely in early archaeological studies of monastic landscapes, whereas more modern scholarly thinking (i.e. Everson and Stocker 2011, 17-24) warns that this approach can skew understanding, and advocates investigation of the landscape as the foundation for more balanced research.

## The internal layout of the precinct

There is not enough earthwork evidence surviving to recover the internal layout of the monastic precinct nor to indicate how it might have changed over the lifetime of the abbey. The basic division of the precinct of a Cistercian abbey between the inner and outer courts has left no definite visible trace on the ground at Rievaulx. One possibility, as depicted by Coppack (1999, 177 Figure 149), is that the inner court lay entirely to the north of the abbey. However, no trace of a definite medieval boundary exists along any part of the suggested perimeter, while his proposed location of the gatehouse into the inner court can be disputed, as discussed above.

The valley floor was probably used by the monks primarily as pasture, though fish ponds also survive near the present village close to the presumed line of the monastic leat and may be inferred elsewhere. The valley side on the east is where most of the evidence for medieval activity survives in the form of boundaries and enclosures as well as, of course, the abbey ruins themselves. The most significant medieval

boundary surviving in this area is the stony bank on the hillside immediately above the abbey that wraps around the east and south sides of the church. As it is laid out coaxially with the church, this bank is likely to be monastic in origin and may even be part of the perimeter of the inner court with enclosures stretching away from it uphill, as previously suggested by Hannon (2015, 18).

Written evidence for the internal layout of the precinct comes from the five Dissolution documents from which Coppack attempted to plot the location of buildings and closes as they existed at the end of the abbey's life (Coppack 1986; 1999). There are few linear measurements in the documents, so his plan relationships and the sizes of individual structures are entirely conjectural, though the relative areas of some of the closes can be estimated from their measurements in acres and roods. The documents indicate that the complex of terraced platforms and enclosures surviving on the east slope to the north of the abbey were part of a much larger complex of closes, agricultural buildings and tenanted dwellings continuing to the edge of what is now the village street. The stone walls that cross the complex and support several lengths of terrace could well be re-using stone from the precinct boundary, which in turn indicates that the area continued in use after the Dissolution and that everything visible today on the hillside is not necessarily medieval. Various 'ings' or meadows are recorded at the Dissolution on the low lying ground of the valley floor (Coppack 1999, 182-3), as we would expect from the landscape evidence.

## 6.3 The Post Monastic Landscape

The surrender of the abbey to the King's Commissioners in December 1538, followed soon after by the sale of the abbey estate to Thomas Manners, the first Earl of Rutland, brought about rapid change to the use and physical appearance of the site. The demolition of most of the church and other claustral buildings may have delivered the Earl a quick profit from the sale of the building materials, though it has been pointed out that the difficulty of carting great quantities of stone out of the valley could have restricted the appeal of the site as a quarry (Fergusson 1999, 187). The Earl was well connected at court and so it may be the case that the destruction of abbey was less about releasing stone for resale and more about making a very dramatic and public demonstration of his loyalty to the crown, especially so soon after the unsuccessful northern revolt of 1536, the Pilgrimage of Grace, in defence of the monasteries and the old religious order. How far the destruction extended is not clear, but other elements lost at this time could have included the inner court boundary and gatehouses and other buildings noted in the Dissolution surveys beyond the main abbey range. Presumably many of these buildings were quite humble in construction compared to those of the abbey. Apart from some inhabited by tenants, many buildings of little salvage value might have been destroyed simply to free the landscape of its past associations. Alternatively, it may be that the picture of immediate and extensive destruction is exaggerated and that redundant monastic structures along with the inner court boundary disappeared only gradually with the growth of the iron working industry and the later expansion of the village.

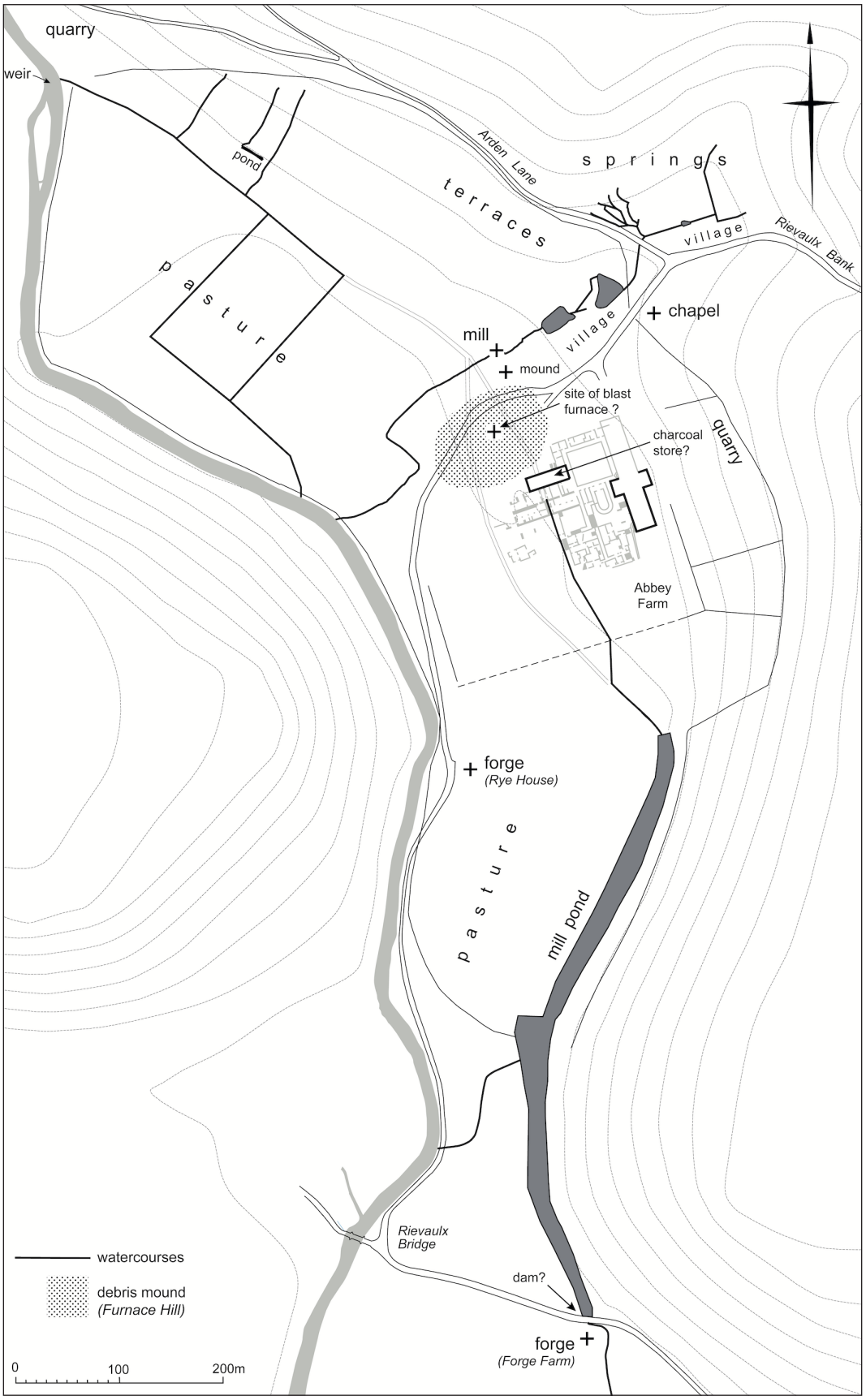


Fig 39. Conjectured post-medieval layout identifying the main features discussed in the text. Contours are at 10m intervals. © Historic England.

The masonry shells of the eastern arm of the abbey church and the refectory survived destruction adding enormously to the picturesque character of the ruin that has been so much valued over the last couple of centuries. Their survival may be entirely fortuitous and explained both by a loss of appetite for destruction and by a drop in demand for reused stone after so much else had already been taken. More particularly, the refectory may have survived as a charcoal store for the post-Dissolution forges and the nearby blast furnace constructed in 1577, though excavation has so far failed to confirm this interpretation (Wheeler and McDonnell 2011, 109). That the eastern arm of the church escaped destruction was possibly more than just a matter of chance and could reveal the Earl of Rutland's more complex attachment to the site than merely that of a 'fierce aggressor' bent on destruction and profit. This is because Thomas Manners was a descendent of the Ros family who could trace their association with Rievaulx back to the 1150s when Robert I de Ros inherited the estates of his uncle, Walter Espec. Through this inheritance the Ros family became the patrons of both Rievaulx Abbey and Kirkham Priory. Initially the family showed favour to Kirkham, choosing it as their burial site and adorning the priory gatehouse with their coat of arms, but later generations, from the late 14th-century onwards, chose to be buried at the east end of Rievaulx's abbey church (Fergusson *et al* 2016, 12). It is conceivable (though not susceptible to proof) that Thomas Manners, having amply demonstrated his loyalty to the Crown by rendering the church unusable for worship, retained the shell of the east end of the church as a screen around the resting place of several generations of his family. He may even have felt impelled to save the fabric in the knowledge that his ancestor, Robert II de Ros loaned the abbey most of the money to pay for the construction of this part of the church in the 1220s (Jamroziak 2005, 48).

The development of an iron industry at Rievaulx and the construction of a blast furnace close to the abbey ruins has left few direct traces in the landscape. At the blast furnace site the only visible indication is that waste from the workings is thought to account for the build-up of the ground below parts of the village, in particular Furnace Hill, though some of this elevation is also due to the spread of demolition rubble from monastic buildings. The limited archaeological excavations and sampling that have taken place in and around the village and the abbey ruins have so far revealed little structural evidence of the industry. However, the final form of the mill pond to the south of the abbey, extending down the east side of the valley to the forge site at Forge Farm, is best understood as part of the changes connected with the iron industry. Judging from its length and width the pond would have retained a large body of water, sufficient to guarantee a constant supply for the operation of the forge.

The end of iron production in the middle of the 17th century left the valley solely to agricultural use. Sections of the precinct boundary, though in disrepair, survived as field boundaries while other parts were robbed for stone or, as most notably on the hillside to the east of the ruins, destroyed by quarrying. The numerous field drains visible on the ground and on the 2015 digital surface model testify to the enormous efforts needed right down to the present day to maintain the productivity of the valley floor.

Aesthetic considerations also came to the fore. The construction of Rievaulx Terrace in the 1750s led to writers like Arthur Young to comment not only upon the picturesque appearance of the ruins but also on the contribution of the wider valley to the overall quality of the view (Young 1771, 83-86). To suggest that such attitudes encouraged a more 'conservative' approach to managing this part of the Duncombe Estate is entirely speculative, but it is clear from map evidence that the landscape saw no radical changes from the early 1800s to the point where the site passed into the Guardianship of the Commissioners of Works in 1917. More specifically, it is possible that the desire to enhance the 'romantic' appearance of the landscape explains the levelled and spread character of a long stretch of the embankment bordering the wide channel to the south of the abbey, improving the ground as pasture, whilst removing a perceived eyesore close to the abbey ruins. However, the so-called viewing platform within the village is perhaps one of the more questionable interpretations given in the 2005 leaflet (Barnwell *et al* 2005). Though the top of this feature offers an elevated view of the ruins and the wider valley, such as might be appreciated by an 18th-century admirer of the Romantic landscape, this feature could equally be a much earlier product of the iron working industry, or a dump of earth and stone post–dating the earliest Ordnance Survey maps.

Since 1917 the needs of the visitor have arguably been the greatest single factor in developing the Rievaulx landscape, beginning with the opening up of the ruins and the dumping of the resulting debris on adjacent fields in the 1920s and 30s. This was followed by the demolition of most of Abbey Farm and the excavation of adjacent monastic buildings in the 1950s. More recent decades have seen the expansion of the visitor centre and the car park as the popularity of the site continues to increase.

# 7. SURVEY METHODOLOGY

The 2015 digital surface model provided the starting point for the survey. A detailed description of how the model was created can be found in the accompanying report (Hannon 2015, 12-16). In summary, the imagery to create the model was acquired from an unmanned aerial vehicle (UAV) flying over the site in predetermined transects at a height of about 80m above the valley floor. The resulting series of photographs had sufficient overlap to allow them to be processed to create a single 3D image of the ground surface fixed to Ordnance Survey National Grid using Agisoft Photoscan Professional software.

Parts of the site with complex earthwork remains not showing clearly on the 2015 digital surface model because of vegetation and tree cover were selected for detailed ground survey in February and March 2018 using a combination of Trimble R10 GNSS satellite receivers and a Trimble 5600 Total Station Theodolite (TST). These areas principally lay on the east side of the valley to the north of the abbey church. All readings acquired using the electronic instruments were fixed to Ordnance Survey National Grid. The survey of the remainder of the site, which was by far the larger area, was undertaken by checking on the ground the features showing on the 2015 digital surface model and then digitising those of archaeological interest in QGIS software. The data from the electronic instruments was added to the same QGIS project file to create a unified record of the earthwork archaeology. Other map detail was added from existing mapping under Historic England's licence (number 100024900) from the Ordnance Survey.

The QGIS software also allowed manipulation of the 2015 digital surface model to highlight subtle changes in height of the ground surface, picking out for example the natural ridge underlying part of the village and the broad channels crossing the valley floor on the north of the precinct.

The final survey plan and other report illustrations were prepared using Adobe Illustrator software.

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Penny Piece Quarry
Arden Lane
Rievaulx Bank
St Mary's Church
Rievaulx Mill
Furnace Hill
quarry
River Rye
Ashberry Hill
Top Pond
Rye House
Bank Wood
Terrace
Rievaulx
South Pond
Rievaulx Bridge
Forge Farm
Rievaulx Abbey
project area
0 50 100 200 metres

Fig 40: 2018 earthwork plan of Rievaulx Abbey reproduced at 1:3000 scale. Contours are at 10m intervals. © Historic England.

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