

Archaeological desk-based assessment of a proposed mineral extraction site at Bow Farm, Ripple, Worcestershire/Gloucestershire



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Archive and Archaeology Service
The Hive, Sawmill Walk,
The Butts, Worcester
WR1 3PD

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Author: Andrew Mann: amann@worcestershire.gov.uk
Illustrator: Laura Templeton
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Desk-based assessment of a proposed mineral extraction site at Bow Farm, Ripple, Worcestershire/Gloucestershire.

Andrew Mann

Illustrations by Laura Templeton

Summary

A desk-based assessment was undertaken on behalf of David Jarvis Associates (the Consultant), for Cullimore Group (the Client), at Bow Farm, Ripple, Worcestershire(NGR ref (SO 87695 36388; HER ref WSM 70265). The Client intends to construct a mineral processing plant and begin mineral (sand and gravel) extraction at the site for which a planning application will be submitted. The desk-based assessment has illustrated that the site is likely to contain important prehistoric and Roman archaeological remains and that gravel extraction will have a negative impact of a number of designated and undesignated heritage assets. Of most importance is the proximity of the site to a scheduled monument (Towbury Hillfort) and the impact on its river valley setting.

Report

1 Background

1.1 Reasons for the project

A desk-based assessment was undertaken at Bow Farm, Ripple, Worcestershire (Fig 1). It was undertaken on behalf of David Jarvis Associates (the Consultant), whose client, Cullimore Group (the Client), intends to construct a mineral processing plant and begin mineral (sand and gravel) extraction at the site. The proposed development area straddles the county boundary between Worcestershire (Malvern Hills District Council) and Gloucestershire (Tewkesbury Borough Council) and a planning application will be submitted to both county councils.

The proposed development site is considered likely to affect heritage assets and potential heritage assets, the significance of which may be affected by the application.

The project conforms to a written scheme of investigation prepared by Worcestershire Archaeology (WA 2018). The project also conforms to the *Standard and guidance for desk-based assessment* (ClfA 2014), *Standards and guidelines for archaeological projects in Worcestershire* (WCC 2010), the generic brief issued by Gloucestershire County Council for desk-based assessments (2012) and the *Standard and guidance for historic environment desk-based assessment (ClfA 2014) and to Mineral Extraction and Archaeology: A Practice Guide* (MHEF 2008).

1.2 Planning background

National

Present government planning policy is contained within the *National Planning Policy Framework* (DCLG 2012) of which Section 12 *Conserving and enhancing the Historic Environment* provides guidance as to the conservation and investigation of heritage assets. This is supplemented by detailed guidance (DCLG 2014);

Overall, the objectives of Section 12 of the NPPF can be summarised as seeking the following:

- establishing the desirability of, sustaining and enhancing the significance of heritage assets while putting them to viable uses consistent with their conservation.
- understanding the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring.
- establishing how a new development can make a positive contribution to local character and distinctiveness while drawing on the contribution made by the historic environment to the character of a place.
- recognition that heritage contributes to our knowledge and understanding of the past.
- conservation of England's heritage assets in a manner appropriate to their significance.

The national planning policy guidance (Ministry of Housing, Communities and Local Government, 2014) states that local authorities should plan for the steady and adequate supply of minerals in one of the following ways;

- designating specific sites where viable resources are known to exist, landowners are supportive and the proposal is likely to be acceptable in planning terms.
- designating preferred areas which are areas of known resources where planning permission might reasonably be anticipated.

Worcestershire

The main proposed extraction area falls within Worcestershire and is in the Lower Severn Strategic Corridor, as identified by the updated Minerals Local Plan currently being produced by Worcestershire County Council (WCC 2017). This is one of five strategic corridors in the county that contain key and significant mineral resources, alongside the potential that mineral development will positively impact on green infrastructure at a landscape scale. The third stage consultation suggests that:

"Planning permission will be granted for mineral development within the Lower Severn Strategic Corridor that contributes towards the quality, character and distinctiveness of the corridor through the delivery and enhancement of high quality infrastructure networks" (WCC 2017, 80).

In the national planning framework (Ministry of Housing, Communities and Local Government, 2014) the designation of specific sites for mineral extraction are considered to be of greater priority and Bow Farm was submitted to Worcestershire County Council to consider whether it met the requirements for allocation as a specific site within the Lower Severn Strategic Corridor (WCC 2016, submission ref BO23-1833 nq). At the time it was thought there would be serious constraints to delivering the site, although this was because the specifics of the processing options had yet to be established.

Although the site is within the Lower Severn Strategic Corridor and is likely to be adopted as a specific site it will still be subject to the normal planning application process (WCC 2016). Although this area would usually be under the authority of Malvern Hills District Council, Worcestershire County Council, acting as the Mineral Planning Authority (MPA), has a duty to determine planning applications for new minerals development in accordance with the South Worcestershire Development Plan (SWDP 2016). This was adopted by the District Council in 2016.

Gloucestershire (Tewkesbury Borough Council)

The proposed quarry does not fall within one of the preferred areas as outlined by Gloucestershire's Minerals Local Plan (GCC 1997, 2018). As with Worcestershire, however, because the development is classed as mineral development any future planning application will be determined by Gloucestershire County Council (acting as the Mineral Planning Authority) rather than Tewkesbury Borough Council.

Within the proposed development area only processing plant falls within Gloucestershire and no mineral extraction is proposed here.

2 Aims

The aims and scope of the project are to:

- collect relevant information relating to the historic environment potential of the proposed development area;
- assess the significance of any potential heritage assets;
- assess the impact of the proposed development on these heritage assets; and
- recommend mitigation measures to the Client, to offset detrimental effects of the development.

3 Methods

3.1 Personnel

The assessment was undertaken by Andrew Mann (BA (Hons); MSc) who joined Worcestershire Archaeology in 2004 and has been practicing archaeology since 2001. The project manager responsible for the quality of the project was Robin Jackson (BA (hons.); ACIfA). Illustrations were prepared by Laura Templeton.

3.2 Documentary research

All relevant information on the history of the site and past land-use was collected and assessed. Records of known archaeological sites and monuments within 500m of the proposed development were obtained from both Worcestershire's and Gloucestershire's Historic Environment Record (HER). Historic maps and published sources were also consulted.

The results are mapped on Figures 3-9 and the details of individual features of the historic environment are given in Appendix 1. Event records have been omitted where this would repeat information in other record types, and would not materially affect the assessment. HER references have been used throughout this assessment; reference numbers have the prefix WSM (Worcestershire HER) and GHER (Gloucestershire HER). The unique identity number of scheduled monuments has been given the prefix NHL (National Heritage List).

3.3 List of sources consulted

Cartographic sources (Figs 10-12)

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3.4 Other methods

A site visit was undertaken on 27-03-18 and the photographs taken on that day are reproduced in this report (Plates 1-48) with a corresponding location plan provided (Figure 2). The site reference number used by Worcestershire's Historic Environment Record to record archaeological "events", and site code used in the archive is WSM 70265.

This assessment is limited to consideration of heritage assets and potential assets that are relevant to the application site.

3.5 Impact assessment criteria

The criteria cited in Table 1 have been used in the impact assessment.

<p>Major Beneficial: Demonstrable improvement to a designated heritage asset of the highest order (or its setting), or non-designated asset (or its setting) of archaeological interest of demonstrable significance equal to that of a scheduled monument. Designated assets will include scheduled monuments, grade I/II* listed buildings, grade I/II* registered parks and gardens, registered battlefields, protected wrecks or World Heritage Sites. Improvement may be in the asset's management, its amenity value, setting, or documentation (for instance enhancing its research value). It may also be in better revealing a World Heritage Site or Conservation Area's significance.</p>
<p>Beneficial: Demonstrable improvement to a designated heritage asset (or its setting), or non-designated asset (or its setting) of archaeological interest such that the level of improvement will demonstrably have a minor affect the area and its heritage resource, either at a local or regional level. For instance grade II listed buildings, Conservation Areas and undesignated heritage assets important at a sub-national level. Improvement may be in the asset's management, its amenity value, setting, or documentation (for instance enhancing its research value).</p>
<p>Not Significant: Impacts that have no long-term effect on any heritage asset.</p>
<p>Minor Adverse: Minor harm to a designated heritage asset (or its setting), or non-designated asset (or its setting) of archaeological interest such that the level of harm will demonstrably have a minor affect the area and its heritage resource, either at a local or regional level. For instance grade II listed buildings, Conservation Areas and undesignated heritage assets important at a sub-national level.</p>

<p>Moderate Adverse: Minor harm to a designated heritage asset (or its setting) of the highest significance, or non-designated asset (or its setting) of archaeological interest of demonstrable significance equal to that of a scheduled monument. For instance scheduled monuments, grade I/II* listed buildings, grade I/II* registered parks and gardens, registered battlefields, protected wrecks or World Heritage Sites.</p> <p>Harm to a designated heritage asset (or its setting), or non-designated asset (or its setting) of archaeological interest such that the level of harm will demonstrably affect the area and its heritage resource, either at a local or regional level. For instance grade II listed buildings, Conservation Areas and undesignated heritage assets important at a sub-national level.</p>
<p>Major Adverse: Harm to a designated heritage asset (or its setting) of the highest significance, or non-designated asset (or its setting) of archaeological interest of demonstrable significance equal to that of a scheduled monument. For instance scheduled monuments, grade I/II* listed buildings, grade I/II* registered parks and gardens, registered battlefields, protected wrecks, World Heritage Sites or harm to a building or other element that makes a positive contribution to the significance of a Conservation Area as a whole.</p> <p>Substantial harm to, or loss of, a designated heritage asset (or its setting), or non-designated asset (or its setting) of archaeological interest such that the level of harm or loss will demonstrably affect the area and its heritage resource, either at a local or regional level. For instance grade II listed buildings, Conservation Areas and undesignated heritage assets important at a sub-national level.</p>
<p>Severe Adverse: Substantial harm to, or loss of, a designated heritage asset (or its setting) of the highest significance, or non-designated asset (or its setting) of archaeological interest of demonstrable significance equal to that of a scheduled monument. For instance scheduled monuments, grade I/II* listed buildings, grade I/II* registered parks and gardens, registered battlefields, protected wrecks, World Heritage Sites or the loss of a building or other element that makes a positive contribution to the significance of a Conservation Area as a whole.</p>
<p>Unknown: Where there is insufficient information to determine either significance or impact for any heritage asset, or where a heritage asset is likely to exist but this has not been established, or where there is insufficient evidence for the absence of a heritage asset. For instance where further information will enable the planning authority to make an informed decision.</p>

Table 1: Impact assessment criteria for heritage assets

4 The application site

4.1 Location and size

The application site (NGR 387698, 236698; Fig 1) covers a total area of 88ha, of which 54ha forms the proposed sand and gravel extraction area in Worcestershire and 8ha will form access and haul roads and the processing plant in Gloucestershire.

4.2 Topography, geology and soils

The main proposed extraction area is an L-shaped strip of land located 1.2km from the southern edge of Ripple Village (Worcestershire) and immediately to the south of the M50 motorway. This will be accessed via a new access/haul road adjoining the A38, leading to the new processing plant to the south east in Gloucestershire (Fig 1).

The site is mostly bounded by fields but the extraction area abuts the River Severn to the west, the M50 to the north and Bow Lane to the east. The proposed extraction area also surrounds a lake, which marks the former Cemex quarry on the floodplain, which was active without extensive archaeological monitoring (other than a small evaluation). The eastern road and processing plant is

again mostly bounded by fields but to the north borders a golf course, as well as the A38 to the east.

The land gradually rises from west to east, from approximately 8m AOD on the floodplain of the River Severn, up to 12.5 m AOD on the 2nd gravel terrace (Worcester Member) and then up to 18.0m AOD on the 3rd gravel terrace (Holt Heath Member), before rising up to 32m AOD by the A38. The superficial sand and gravel deposits overlie solid Upper and Middle Triassic Mercia Mudstones of the Branscombe Mudstone Formation (BGS 2018). On the floodplain these are overlain by alluvial clays up to 1.80m deep (Miller *et al* 2004).

In the extraction area the soils are a combination of gleyic brown alluvial soils of the Trent and Clwyd series, along the western half of the site, and alluvium of the Fladbury series, to the east. The soils of the Trent and Clwyd series are stoneless clay and silty clay loams, which are liable to flooding but can be productive as either arable or grass/meadow land. The soils of the Fladbury series are a stoneless clay, also susceptible to flooding and water-logging, necessitating under-drainage and water-table control in order to be successfully used as arable land (Ragg *et al* 1984). Through the Gloucestershire parts of the development, the soils are of the Evesham 2 series that consist of slowly permeable clayey soils which are seasonally waterlogged and the Bishampton 2 series consisting of deep fine loamy soils over slowly permeable subsoils that are also seasonally waterlogged (Ragg *et al* 1984).

4.3 Current land-use

The majority of the proposed quarry area is currently under mixed arable agriculture, although a number of smaller fields remain as pasture (Plates 1-48, Figure 2). The current land-management reflects the nature of the local soils, with areas of extensive water management and associated osier beds.

4.4 Historic land-use and archaeological character

The study area has previously assessed by Mindykowski *et al* (2010) who concluded that the landscape around the application proposed quarry is clustered with isolated farms within a landscape of large regular fields formed through field amalgamation over the last 100 years. This has significantly eroded the historic landscape character of the area, which would have contained smaller fields typical of post medieval enclosure. The area was also dominated by extensive osier beds and water meadow ditches reflecting the waterlogged nature of the area and later medieval and post-medieval landscape management.

The archaeological character of the landscape surrounding the proposed quarry is diverse and there is considerable potential for the survival of archaeological deposits, specifically prehistoric and Roman settlement sites on the gravel terraces, which is borne out by the number of crop marks visible in the region (Mindykowski *et al* 2010). This is also supported by the aggregate resource assessment for Worcestershire (Jackson and Dalwood 2007), which illustrates the popularity of the river valleys for occupation and other activities, and specifically the Severn Valley, through the prehistoric and Roman periods.

5 Heritage assets

5.1 Designated heritage assets

Scheduled monuments

There are four scheduled monuments in the wider study area, although none lie within the proposed development or extraction areas (Fig 3). These include three medieval crosses, in Uckinghall and Ripple (NHL 1014906, 1014907 and 1014908) around 650m north of the proposed extraction area. The largest scheduled monument is the slight univallate hillfort at Towbury Hill, located in Gloucestershire, around 270m to the east of the proposed extraction area (GHER 446, NHL 1005565) (Plate 5, Fig 2). The hillfort is situated on a relatively low lying plateau, at approximately 30m AOD, immediately overlooking the Ripple Brook. It survives as a roughly

triangular enclosed area of approximately 4.2ha, defined by a slight rampart and largely in-filled outer ditch which survives differentially throughout the circuit.

Listed Buildings

There are 28 listed buildings within the Worcestershire part of the study area although the majority of these are located in either Uckinghall or Ripple, around 600m to the north of the proposed extraction area (Fig 4). The only Grade I listed building is that of the church of St Mary the Virgin in Ripple (WSM 07622) (Plate 2, Fig 2) the others all being Grade II listing.

The closest two buildings to the proposed extraction area are both on Bow Lane. These are the former railway station and station master's house (WSM 37341) around 580m to the north of the proposed extraction area, and Puck cottage, a Grade II listed 17th century timber framed house (WSM 42502) only 60m off the eastern edge of the proposed extraction area.

There are 22 grade II listed buildings in the Gloucestershire part of the study area. The majority of these are located in Puckrup, Church End or Shuthonger, mostly of 17th-19th century date, and are either houses or cottages or farm outbuildings (barns and stables). The Church of Saint Mary Magdalene in Twyning (GHER 35997) is also listed, as is the large 18th to 19th century house of Puckrup Hall (GHER 35965) and the 18th century Twynings Farm, which is also associated with a dairy and walled garden (GHER 35959).

Parks

There are no registered parks or gardens in the study area.

Battlefields

There are no registered battlefields in the study area.

Conservation Areas

The historic cores of both Ripple and Uckinghall have been designated as Conservation Areas. No appraisals have been conducted by Malvern Hills District Council, so the individual characteristics and special interest of each are not known, although both preserve a variety of buildings that illustrate their medieval origins.

The village of Church End, Twyning in Gloucestershire is registered as a Conservation Area with Tewkesbury Borough Council. The village is located around 350m to the east of the proposed access road off the A38 and around 1.2km east of the proposed extraction areas. The Conservation Area character statement (Tewkesbury Borough Council 2003) states that the special interest of Church End emanates from;

- the prominent boundary walls, gate piers and railings, which follow the curve of the street.
- the large number of unlisted buildings which retain traditional detailing and materials.
- the historical connections with Winchombe Abbey, visible in the fish ponds of the monastic farm and stone dovecote.

Wrecks

There are no known wreck sites in the study area.

5.2 Undesignated heritage assets

Archaeological sites

Prehistoric to Roman

Within the proposed extraction area there are four sites listed on the Worcestershire HER which have all been identified through aerial photographic assessment (Deeks and Jackson 2003, Figs 6 and 7). These include an east to west aligned double ditched trackway, possibly a droveway to

lead livestock and people from Towbury Hillfort, around 300m to the east, down on to the lower floodplain (WSM 31188). A possible pit alignment to the north of the driveway is likely to be of Iron Age date based upon other examples excavated throughout the Midlands and is likely to have acted as a landscape boundary (WSM 46801). Both the pit alignment and the trackway were examined as part of an ALSF supported evaluation of land to the immediate west of the proposed extraction area (Miller *et al* 2004). Both were shown to survive buried beneath alluvium, at least 1.40m thick on the floodplain. A number of pits/natural features were identified on the projected run of the alignment although in plan they were less convincing as a pit alignment. Waterlogged wood from one of pits was dated to 2410–2130 cal BC (at 94.4% confidence) during the Late Neolithic or Early Bronze Age. The trackway comprised two parallel ditches and associated banks, around 10.75m apart. The ditches and banks appear to have been maintained and repaired on a number of occasions and were eventually butted and sealed by alluvium. To the north of these features are a number of cropmarks indicative of an Iron Age to Roman settlement. This includes numerous pits, probably for grain storage, and enclosures that may have been used for stock management and/or habitation (WSM 01345 and 01089).

Two other prehistoric to Roman settlements visible as cropmarks are also recorded on the Gloucestershire HER (GHER 5540 and 9878) but these are located some distance from the development area, 0.6km and 1.5km respectively.

Roman

To the north of the proposed extraction area are a number of similar cropmarks including probable enclosures (WSM 01343 and WSM 70266). The latter were evaluated in 2004 and shown to be of Roman origin, possibly relating to a Roman agricultural settlement on or near to the floodplain (Miller *et al* 2004).

Although not confirmed archaeologically there is also some conjectural evidence that a Roman fort is located at Ripple (WSM 07627) and a small number of other sites also suggest that Roman activity/settlement may be widespread at Ripple and Uckinghall. These include the presence of ditches (WSM 66944) and a small occupation site (WSM 25282). An antiquarian record of a pottery kiln on the floodplain, only 120m away from the proposed extraction area, also suggests that further Roman activity, possibly of an industrial nature, is present (WSM 01435).

A Roman road is recorded on the Gloucestershire HER running between Birmingham and Gloucester (GHER 8090) (Fig 8) linking the military establishments of Gloucester and Droitwich. Although it is now mostly ploughed out, excavations in the 1960s at Shuthonger Common (Tewkesbury) showed that the road had a clay agger, was 9.75m wide, and was flanked by ditches 4.26m wide and 0.60m deep. The exact position of the road on Gloucestershire's HER is tentative, but it is currently shown to run through the proposed access road off the A38. To the north-east of the proposed extraction area is another possible Roman road (WSM 01436) leading through the putative fort beneath Ripple. The route of the road is conjectural and it has never been proven to exist but if this route is accurate it will run close to the eastern boundary of the proposed extraction area.

Medieval

Medieval occupation to the north and west of the site is well documented. The Victoria County History for Worcestershire (Vol III) records that a Manor of Ripple was in existence from the early medieval period, with a grant being made by Oshere, King of Hwiccas to Frithowald, a monk of Wynfrid, ex-Bishop of Lichfield in 680 (VCH 1913). The estate later passed to the Bishop of Worcester in 1086, at which time it comprised Ripple, Upton-upon-Severn, Welland, Farley, Holdfast, Queenhill, Hill Croome, Early Croome, Croome d'Abitot and Little Malvern. The estate remained in the ownership of the Bishop of Worcester until 1860 when it passed to the Ecclesiastical Commissioners.

The historic core of Ripple is of medieval date and medieval stock enclosures are also visible as earthworks (WSM 46796, GHER 7450). The name Ripple, which applies not only to the village but to the entire manor (and later Parish), has origins in the 8th century as Rippell. The root of this word is believed to derive from the Norwegian word *ripel*, meaning strip, which later became used to describe 'a strip of wood, coppice'. The suggestion that this name refers to the form of the Ripple Manor as a strip/tongue of land flanking the River Severn seems a highly likely explanation (Mawer and Stenton 1927). The village of Twyning in Gloucestershire also has medieval origins and had connections with Winscombe Abbey, although the only surviving remains of the monastic farm which once existed here are the fishponds, visible as earthworks, and a stone dovecote.

Large parts of the proposed extraction area have been shown through aerial photographic assessment to have once been under ridge and furrow cultivation (WSM 28684, 28954 and 46935, Figs 7 and 9). Ridge and furrow remains have also been plotted to the west, and through parts of the proposed new roads and processing plant. These are likely to be of medieval origin, although in places the narrower remains may be the remains of more recent cultivation (Deeks and Jackson 2003). A small rectilinear enclosure bounded by ridge and furrow remains (GHER 4474, Fig 6) is recorded to the south of the access road although the enclosure itself does not extend into the proposed quarry area.

It is likely that a medieval road originally recorded as a Roman road on the Ordnance Survey mapping (1884-1924) (Fig 11), runs through the proposed haul road for approximately 300m (GHER 4476).

Post-medieval

Although not designated, a Civil War battlefield exists around 700m north of the proposed extraction area, just to the north of Ripple (WSM 12993). The battle took place in 1643 and started to the north of the village before parliamentary troops retreated into the village and then fled to Tewkesbury.

There are 16 Historic buildings recorded on Worcestershire HER, of which the majority are farm houses or outbuildings that were recorded during the Historic Farmstead Characterisation project (Hathaway *et al* 2012). Most of these are located in Ripple or Uckinghall around 600m north of the proposed extraction area but the complex of buildings at Bow Farm is located in the middle of the proposed extraction area (WSM 52393). These include the extant remains of a 19th century farm house detached from a U-shaped yard containing traditional outbuildings and a horse turning circle.

Modern

Running along the eastern boundary of the proposed extraction area and through the proposed haul road is the former Aschurch to Malvern section of the Birmingham to Gloucester railway (WSM 11268, GHER 11268, Fig 8). The railway was constructed as standard gauge in the late 1830s and opened in the early 1840s, operating until 1961. In places the embankment of the railway is still visible and elements of this survive in the proposed haul road (Plate 32, Fig 2).

Approximately 1km north of the proposed extraction area are a number of Second World War anti-aircraft earthworks recorded on the Worcestershire HER (WSM 27692). These were seen on aerial photographs from 1945 but have since been infilled. The Government Pipelines and Storage System (GPSS) pipeline (GHER 43288), constructed in 1942, also runs through the proposed access road on a north to south alignment.

5.3 Potential heritage assets

Palaeolithic

No Palaeolithic remains have been recovered from the study area to date. However, as extensive Palaeolithic material has been recovered at Beckford and Aston Mill in similarly dated gravel deposits to the Worcester Member, this indicates that there is potential to discover palaeoenvironmental, artefactual, human and faunal remains here (Russell and Daffern 2014). *In situ* Palaeolithic deposits are unlikely to be encountered but flint and stone tools and faunal remains may be preserved within the gravel bed.

To a lesser extent the proposed extraction area will remove sands and gravels of the Holt Heath member, although the proposed processing plant will also partially sit upon these deposits. Ipswichian fauna, including Hippopotamus, have been found at the base of Holt Heath sands and gravels in the Stour Valley, but it is unknown whether this presence occurs elsewhere in the Severn system. However, interbedded organic beds are known to occur within the Holt Heath gravels elsewhere and may be encountered here.

Mesolithic to Bronze Age

Although little archaeology of this date, other than the single pit identified on the floodplain in 2004 (Miller et al 2004) has been identified locally it is still probable that material of these periods will be encountered during mineral extraction. Although archaeology of this date is not as extensive as later periods, significant isolated remains have been recovered from Severn Valley quarries before. Notably these have been recorded at Clifton Quarry (Mann and Jackson forthcoming), 9km to the north, and to a lesser extent at Ryall Quarry, 2.5km to the north (Barber and Watts 2008). These sites have included archaeological evidence for small scale and transient occupation in the form of rubbish pits, burnt mounds and temporary structures, as well as more permanent monumental remains such as round barrows.

Iron Age and Roman

Archaeology of this date is likely to be extensive across the proposed extraction area and has the potential to extend through the proposed new road system and processing plant area. At least one Roman road is thought to cross the latter and other remains may also be encountered.

The cropmarks focussed in the north-east part of the proposed extraction area (Fig 7) indicate that this terrace was the focus of extensive settlement, probably of later prehistoric and Roman date. The southern limit of this settlement appears to be the east to west trackway/droeway (WSM 31188) which may have connected Towbury Hillfort (GHER 446) to the Severn floodplain. It is possible however that remains here are masked by ridge and furrow or that more discrete remains, which are not easily identified through aerial photography, will extend further south along this terrace.

Other similarly dated remains have been identified on the floodplain, but these appeared to be more agricultural in nature, such as field boundaries. There is the potential for more industrial remains to be encountered on the floodplain as there are antiquarian records of a kiln being present and at Clifton Quarry there is evidence for Roman metal working across the floodplain. Given the regular flooding across the area it is likely the western half of the proposed extraction area will contain more agricultural or industrial remains with settlement being confined to the slightly higher ground of the western gravel terrace.

Medieval

Other than ridge and furrow remains and earlier field boundaries there is no evidence to suggest that archaeological remains of this date will be located in the proposed development area, although isolated finds cannot be ruled out. For the most part the proposed quarry appears to have been under cultivation from the high medieval period onwards and is therefore unlikely to contain much evidence of settlement/occupation. Such settlement is likely to have been consistently focused in and around the three surrounding villages of Ripple, Uckinghall and Church End.

It is possible, however, that Saxon archaeology may be encountered close to the potential late prehistoric and Roman settlement in the proposed extraction area. This is not confirmed but continuity of settlement through the Iron Age to Saxon periods, either on the same location or as settlement shift through the landscape, has been recorded at Ryall Quarry and in other Midland river valley locations.

Post-medieval and modern

The villages of Uckinghall, Ripple and Church End have remained relatively contained with little evidence of expansion beyond their historic centres since their foundation. The proposed development area appears to have remained mostly as agricultural land throughout this period. There is no direct evidence for the early post-medieval land use of the fields surrounding these settlements, although the broader ridge and furrow observed to the south of the study area follows a more east-west alignment indicating a degree of movement in the layout of field systems.

The 1862 map shows field names (Fig 10), which may give some indication of the land use, and often refers to Swineham and Cow Croft, both of which indicate that the land was under pastoral rather than arable usage. This would certainly be suited to local geology and soils and the fact that the area was liable to seasonal flooding.

The 1886 map indicates that several smaller fields noted on the 1862 map have been amalgamated to form larger field units, resulting in fewer boundaries, a process which has continued since.

Palaeoenvironmental deposits

Parts of the proposed extraction area and haul road appear very wet and are likely to contain waterlogged palaeoenvironmental deposits. These are most likely preserved beneath the osier beds recorded on the Worcestershire HER running through the middle of the proposed extraction area (WSM 49195, 49196, 49197, 49198 and 49200). Further waterlogged palaeoenvironmental deposits are likely to be preserved in valley of Ripple Brook, which has previously been shown to contain organic deposits dating to between the Early Neolithic and the 14th Century (Brown 1981). This channel runs through the south-east corner of the proposed extraction area and through the western end of the proposed haul road.

6 Assessment of the significance of heritage assets

6.1 Designated assets

6.1.1 Scheduled monument

Of the four scheduled monuments three are stone crosses in the villages of Uckinghall and Ripple. These are significant in that they reflect the historic medieval origins of the villages and form part of the special character of the Conservation Area. Although the historic core of the villages is protected, the wider setting of these monuments and conservation areas have been affected by the construction of the M50 which dominates the landscape both audibly and visually in certain vistas.

The most significant scheduled monument within the study area is Towbury Hillfort and although the fort is only on a low lying plateau covered by dense tree cover, the hill is visible from many locations across the proposed development area. Slight univallate hillforts are rare, with around 150 examples recorded nationally, and are important for understanding the transition between Bronze Age and Iron Age communities. Despite quarrying and tree growth the hillfort survives comparatively well and will contain archaeological and environmental evidence relating to its construction, longevity, trade, agricultural practices, social organisation, territorial significance, domestic arrangements and overall landscape context.

It is likely to have been positioned here to provide access to and protect the rich resources of the valley, including pasture for grazing animals. It is also possible the hillfort overlooked a crossing of the River Severn, perhaps linked by the trackway/droeway seen as cropmarks in the proposed extraction area. The fort is therefore implicitly connected with the valley terraces and floodplain below. This setting still exists today, but has been negatively affected by previous gravel extraction on the floodplain which has resulted in its removal and replacement with a lake. The hillforts setting has also been negatively affected by the construction of the M50, which is visually and audibly imposing, and by Bow Lane, both of which physically separate the hillfort from the lower gravel terraces and floodplain.

6.1.2 Listed buildings

The only Grade I listed building is that of the Church of St Mary the Virgin in Ripple. The church is well looked after and contains a number of important features including the exceptional 15th century stalls with 16 carved misericords. The church is located in the conservation area and as such forms part of its special character and illustrates the medieval foundations of the village.

The remaining buildings are all Grade II listed. Many of these are located within the Conservation Areas of Ripple, Uckinghall and Church End and have therefore been given protection against adverse developments which may detract from their importance or setting. However, as with all the heritage assets locally the majority have been negatively impacted by the construction of the M50 which is widely visible, forms a physical barrier in the landscape and is constantly audible. Other than the M50 the greatest impact to affect any of these buildings has occurred at Puckrup Hall where a large hotel complex has been constructed in the grounds and the surrounding agricultural land turned into a golf course. To a lesser extent the former Cemex quarry on the floodplain has negatively affected the setting of these buildings as it has removed part of the former floodplain, but as there is considerable distance and very limited intervisibility between them this is not significant.

6.1.3 Conservation Area

There are three Conservation Areas in the study area and include the historic cores of Ripple, Uckinghall (Worcestershire) and Church End (Gloucestershire), although Church End is the only one for which a Conservation Area appraisal has been produced. All three preserve elements which illustrate their medieval origins and contain a large number of listed and unlisted buildings that retain traditional detailing and building materials. Although important historical elements are missing, such as the manorial farm at Church End, elements including the fish ponds and dovecotes survive that demonstrates their original composition.

These villages have not been subjected to extensive expansion, which cannot often dwarf and assimilates other historic village centres, diluting their historic and architectural importance. Of the three Conservation Areas in the study area Ripple has undergone the most expansion, specifically to the north and east of the village. All three have had unsympathetic development occur close to the Conservation Area which negatively impacts upon them, including an industrial complex at Abbots Court, immediately south of Church End, the large modern farm/barn complex to the east

of Uckinghall and a sewage treatment works to the north of Ripple. The negative impact of these has in most cases been limited by topographical or woodland buffers.

As with all the heritage assets locally the majority have been negatively impacted by the construction of the M50 which when visible forms a physical barrier across and is constantly heard in the landscape. Church End is less affected by this due to its distance from the motorway, but the motorway can be seen from the southern sides of both Ripple and Uckinghall. To a lesser extent the former Cemex quarry on the floodplain has negatively affected the setting of these Conservation Areas as it has removed part of the former floodplain, but as there is considerable distance and very limited intervisibility between them this is not significant.

6.2 Undesignated assets

6.2.1 Historic buildings

There are 16 historic buildings recorded on Worcestershire HER, the majority of these are farm houses or outbuildings that were recorded during the Historic Farmstead Characterisation project. As most are located in the Conservation Areas of Ripple or Uckinghall their original setting has not been adversely affected by significant development. The closest to the proposed extraction area is the complex of buildings at Bow Farm (WSM 52393). These consist of the partially extant 19th century unlisted farmstead with unconverted buildings, a regular courtyard of U-plan and additional, prominent detached elements to the main plan. The farmhouse is detached and set away from the yard and large modern sheds have been erected to the side of the site. Although there has been a partial loss (less than 50%) of traditional buildings the setting of the complex is well preserved with almost no development in the surrounding landscape since the production of the inclosure map of 1862. The main change to the original setting is the recent loss of hedgerows, as the smaller fields which originally surrounded the farm have been amalgamated to facilitate modern farming practices. The other main change to the surrounding landscape is the loss of agricultural land to quarrying on the floodplain in the last 10 years, just to the north of the proposed extraction area.

6.2.2 Sites of archaeological interest

Nature of the archaeological interest in the site

Although not confirmed there is some potential for the Worcester and Holt Heath gravel terraces to contain Palaeolithic remains. It is unlikely *in situ* occupation remains would be encountered but redeposited faunal and artefactual remains may be exposed when the gravels are extracted.

The 2004 evaluation across the floodplain to the north-west identified evidence for prehistoric remains and confirmed the extension into this area of two of the cropmarks present in the proposed extraction area; including the possible pit alignment (shown to be of potential Late Neolithic/Early Bronze Age date) and the trackway (of probable Iron Age date) were located here buried within alluvial deposits. Similarly dated remains should be expected across the proposed extraction area, although unlike the later settlement cropmarks these are likely to be more dispersed. It is also highly probable that burnt mounds and their associated structures will be encountered and should be expected along the edge of any waterlogged areas and palaeochannels.

The cropmarks that cover the north-east part of the proposed extraction area imply that there is a late prehistoric to Roman settlement covering the northern half of the eastern field. These will likely be the remains of small farmsteads practicing mixed agricultural regimes, although the number of pits visible in the cropmarks (possibly for grain storage) may indicate that the occupants were heavily engaged with arable production. This would not be uncommon as the central Severn Valley appears to have been a focus for arable production throughout the Iron Age and Roman periods

(Mann and Jackson forthcoming; Barber and Watts 2008). It is probable that the floodplain was not occupied but that it was used for agricultural or industrial purposes such as pottery production. At least one Roman road is also likely to cross the site.

Ridge and furrow remains are likely to be encountered across most of the proposed development area but there is little evidence to suggest medieval occupation. Such activity is likely to have been focused in and around the villages of Ripple, Uckinghall and Church End and the hamlet of Puckrup which are all within 1km of the site and above the floodplain. Although settlement remains are not expected, at least one medieval road crosses the site.

Post-medieval archaeology is likely to have been limited to agricultural remains, including field boundaries, ridge and furrow, ponds and osier beds. There appears to have been little new construction in the proposed development area during this period other than Bow Farm and the inclosure map suggests that the land around it was all owned/farmed by the Pankhurst family. The former railway is also known to cross the proposed development site.

The waterlogged nature of the proposed extraction area, as indicated by the number of osier beds and visible during the walkover survey, indicates that there is a very high potential for the preservation of organic remains and palaeoenvironmental deposits. At least one of these has been investigated before (Ripple Brook) and been shown to contain waterlogged palaeoenvironmental deposits dating to between the Neolithic and 14th century (Brown 1981).

Relative importance of the known archaeological interest in the site

The potential later prehistoric to Roman settlement in the north-east part of the proposed extraction area is considered likely to be of regional importance and will further contribute to our understanding of settlement patterns and agricultural regimes in the central Severn Valley during these periods. There is, however, potential that the settlement is connected to and linked with Towbury Hillfort to the east via the driveway at the southern end of the settlement. Such relationships are potentially of national importance and such connections have the potential to demonstrate how the hillfort and its environs were used during the period. Therefore, this may have the potential to contribute towards a number of themes identified within regional research frameworks, particular in the south-west region (Webster 2008), such as Research Aim 40: Improve our understanding of agricultural intensification and diversification in later prehistory (Webster 2008, 289) and Research Aim 29: Improve our understanding of non-villa Roman rural settlement (Webster 2008, 286). Whilst potentially important and liable to contribute to regional research frameworks, the previously permitted quarry on the floodplain has negatively impacted on these remains with only a minimal level of investigation undertaken and this reduces their potential as does the likely impact of the medieval ridge and furrow on survival.

Earlier prehistoric (Neolithic-Bronze Age) archaeological remains are quite rare through the central Severn Valley and when encountered are either very ephemeral or dispersed. Their presence would be of regional importance, although as with the later and Roman prehistoric remains, this potential is reduced by previous quarrying and the likely impact of the ridge and furrow on survival.

The waterlogged parts of the proposed quarry have the potential to preserve important palaeoenvironmental remains that have been identified as an important local resource for landscape reconstruction research as they are increasingly vulnerable to disturbance (Watts 2011, 120). These deposits may also help to address south-west regional Research Aim 17: Improve the quality and quantity of environmental data and our understanding of what it represents. In turn this data will help address Research Aims 19, 20, 21, 22 and 23 which relate to the application of this data to the better understanding of past environments and agricultural regimes (Webster 2008, 282-285). There may be some negative impact on these as a result of the previously permitted quarry on the floodplain.

The potential medieval road which runs along the proposed haul road route is possibly of regional importance and provides the opportunity to investigate the road system in terms of the network,

construction and maintenance, as identified as Research Aim (Webster 2008, 202). The railway embankment is probably of only local importance but it does have the potential to address, although limitedly, Research Aim 48: widen our understanding of post-medieval and modern transport and communications (Webster 2008, 291).

Physical extent of the archaeological interest in the site

At present the only confirmed archaeological sites are present in the north-east part of the proposed extraction area and include a possible late prehistoric to Roman settlement site. It is very probable that further prehistoric and Roman features are present across the remaining proposed extraction area. It is also known that two roads (one Roman and one medieval) cross the proposed new road/processing area as does the former railway embankment. The haul road crosses important palaeoenvironmental deposits in Ripple Brook, which may also contain important waterlogged archaeological remains.

Across the floodplain archaeological remains are likely to be buried by up to 1.80m of alluvium as indicated by the 2004 evaluation to the north (Miller *et al* 2004) and by the 19th century reports by A J Allies who inspected the potential Roman pottery kiln after its discovery by workmen (WSM 1435). To the east, however, the steep terrace edge (Plate 6, Fig 2) is likely to have protected the eastern half of the proposed development from significant alluvial aggradation, although alluvium may have also have covered archaeological remains close to Ripple Brook. The steepness of the hill where the proposed processing plant is going may also have been prone to erosion and archaeological remains at the base of the hill may be covered by colluvium. These alluvial and colluvial deposits are likely to have protected the remains from medieval and modern ploughing regimes and thus the survival and condition of remains in these areas may be better than elsewhere.

As the remains are clear as cropmarks across the eastern half of the proposed extraction area this suggests they are not significantly buried and may have been truncated by modern ploughing and sub-soiling as well as by medieval arable practice as evidenced by the ridge and furrow. Although some damage to the cropmarks may have been caused they are still of likely archaeological interest/importance and there are no areas which are not of archaeological potential.

7 The impact of the development

7.1 Impacts during construction

The proposed development will affect the following heritage assets and this impact has been categorised as described in Table 1.

Any prehistoric and Roman settlement features in the north part of the proposed extraction area will be completely removed during mineral extraction. The impact of the development on these is considered to be **Minor Adverse**, but their removal will also have an impact on Towbury Hillfort (see below).

Any prehistoric and Roman remains, probably of agricultural or industrial nature, on the floodplain to the west of the proposed extraction area will be removed during mineral extraction. The impact of the development on these, based upon the current knowledge, is considered to be **Minor Adverse**. Although not confirmed archaeologically the possibility of a Roman pottery kiln and perhaps production site on the floodplain has the possibility to be of national significance. If this was located its destruction would be considered to be of **Moderate Adverse**, however it is noted that the location of this is far from certain and it may lay in an area already removed by the existing quarry.

The medieval and Roman roads which cross the proposed processing plant and access roads will likely be completely removed during construction, although it is difficult to assess how well these have survived. Their removal, if present, would be considered to be **Minor Adverse**.

Part of the former railway embankment crossing the proposed processing plant will be probably be removed. As this will most likely be little more than an earth and stone bank its removal would be considered to be **Not Significant**.

The ploughed out remains of ridge and furrow will be removed during construction, through the both the proposed extraction areas and through the construction of the new roads and processing plant. As these former earthworks have already been ploughed out and as other similar remains are extensively recorded in the surrounding landscape their removal would be considered to be **Not Significant**.

The proposed new haul road will cross the Ripple Brook, whose valley has been shown to contain important palaeoenvironmental remains. Should these deposits be removed here, as such remains are likely to be preserved along the majority of this valley, the damage caused to them would be considered to be **Not Significant or Minor Adverse**.

7.2 Residual impacts

The proposed development will have the following impacts on setting of heritage assets outside of the development area.

Scheduled monuments

The three medieval crosses, in Uckinghall and Ripple (NHL 1014906, NHL 1014907 and NHL 1014908) lie around 650m to the north of the proposed extraction area. Their distance from the proposed development and the local buffers (both structural, arboreal and topographical) mean that the impact of the development on these is considered to be **Not Significant**.

Towbury hillfort directly overlooks the proposed extraction area and the removal of the gravels and floodplain via gravel extraction will significantly alter the setting of the fort and remove the resources the forts inhabitants would have been utilising and protecting. The potential that the fort was connected to the floodplain, a river crossing and valley settlement via a trackway/droeway also means that significant connections between the two zones will be lost.

The construction of Bow lane has already broken this connection, as has the construction of the M50 with the landscape to the north. However, gravel extraction would remove this landscape zone completely, not just limiting the access/connection between the two, and this change would be considered to be **Major Adverse**. This is more pronounced with the eastern half of the proposed extraction zone as there is intervisibility between the hillfort and the terrace. However, as there is 4-5m drop between the terrace edge and the floodplain and as the fort is only on a low plateau there is very little intervisibility between the floodplain and the hillfort. At present it is not known how the quarry will be reinstated but if the eastern half was to be restored to agricultural land, similar to the current state, then this negative impact may be reduced as the intervisibility between the hillfort and its setting would be partially restored. If this was done the effect of the quarrying would be temporary and the impact of the development on Towbury Hillfort would be reduced to **Moderate Adverse**.

Conservation Areas

There are three conservation Areas in the study area, with Ripple and Uckinghall approximately 650m to the north and Church End approximately 400m west of the proposed quarry entrance and 800m west of the proposed processing plant.

There is some intervisibility between the southern sides of Ripple and Uckinghall and the proposed quarry extraction area although this is somewhat buffered by the natural topography, vegetation and the M50 which sits at the northern end of the proposed extraction area. For the most part views from the conservation area would be impeded except from the upper floors of buildings to

the south of the villages or from the church tower. The proposed impact of the development on these conservation areas would therefore be considered to be **Minor Adverse to Not Significant** during extraction. However, if an earth bund or vegetation buffer was erected across the northern side of the proposed extraction area during the length of the quarrying operations this would further reduce the impact to **Not Significant**.

Church End is some distance from the proposed quarry and the positioning of the processing plant against a steep, north-west facing hillside also means that it is hidden from the Conservation Area. Therefore the impact of the development on this Conservation Area is considered to be **Not Significant**.

Listed and Historic Buildings

The majority of the listed buildings in the study area are located within the Conservation Areas discussed above and for similar reasons (the limited intervisibility) the impact of construction on these buildings is considered to be **Not Significant**. There are however a number of other buildings outside of the surrounding villages which will be considered separately.

The former railway station and station master's house (WSM 37341) lie around 580m to the north of the proposed extraction area. The natural topography, other non-historic buildings, the M50 and Bow Lane crossing over the M50 provide a significant buffer and the impact of construction on the building is considered to be **Not Significant**.

Puck cottage, a Grade II listed 17th century timber framed house (WSM 42502) is the closest listed building to the proposed development and is located only 60m off the eastern edge of the proposed extraction area. During development the cottage will be shielded by a dense thicket running along the edge of the Bow Lane which should provide a significant buffer to the proposed extraction area, reducing its impact during extraction **Not Significant** (Plate 5, Fig 2). However if the eastern side of the proposed extraction area is not restored after quarrying operations are completed the original landscape setting (rural farm land) of the cottage will be lost and the impact on the building will be considered to be **Minor Adverse**.

The Grade II listed barn and cottage of 17th Century date (GHER 35734 and 35735) are located approximately 230m west of the proposed extraction area, along Puckrup Lane. These are shielded from the main extraction area by a steep sandstone cutting, which blocks intervisibility between the two areas. The buildings are also located around 450m north of the proposed haul road and processing plant, but much of this area is blocked by the natural topography and existing vegetation, including a dense thicket running along the northern side of the proposed processing plant area (Plate 42, Fig 2). As the original setting (managed farmland) of these buildings has already been compromised by the construction of the golf course the impact of the development is considered to be **Not Significant**. These buildings could be further protected by infilling any gaps in the vegetation along the northern limits of the haul road, processing plant and access road.

The collection of buildings at Puckrup are around 680m to the west of the proposed extraction area and around 400m north of the proposed access road/processing plant. The intervisibility between them and the extraction area is very poor (Plates 43 and 44, Fig 2) and they are adequately shielded from the extraction area by the natural topography and vegetation. The original setting (managed farmland) of these buildings has also been compromised by the construction the golf course (Plate 45, Fig 5) to the south and a large hotel complex to the immediate south of Puckrup Hall. The latter does shield the buildings from access road and processing plant, as does the dense thicket to the north of the proposed processing plant. The impact of the development on these is considered to be **Not Significant**. The buildings could be further protected by infilling any gaps in the vegetation along the northern limits of the haul road, processing plant and access road.

The final group of Grade II listed Buildings outside of the Conservation Areas are located at Shuthonger (Gloucestershire) around 420m away from the proposed processing plant and 850m away from the proposed extraction area. The buildings lie on the crest of a hill at around 34m AOD

overlooking the river valley (Plates 46-48, Fig 2). These include a detached house of early 18th century, with later 18th and 19th century extensions, attached dairy and walled garden, known as Twyning Farm (GHER 35959), a detached cottage of the late 18th century, with 19th century extensions, known as Crown Cottage (GHER 35969), a large detached house of early to mid-19th century date known as Shuthonger House (GHER 35970) and a detached house of early to mid-19th century date known as Shuthonger Villa (GHER 35972). The natural topography towards the access road and processing plant, which is positioned behind a steep slope means that they are moderately shielded from these areas. The only major gap is along the southern edge of the processing plant where the natural ridge hiding most of the processing plant ends (Plate 47, Fig 2). This could easily be infilled with a large earth bund and or vegetation so that these buildings would be completely shielded from the processing area. The impact of this part of the development on this group of buildings would then be considered to be **Not Significant**.

The position of these buildings on a high point on the valley edge means that they will have a good view across the proposed extraction area. Little can be done to buffer them against the effects of the development during mineral extraction. Should the eastern half of the proposed extraction area be reinstated after quarrying is completed however then the effects of the development would be reduced and considered to be **Minor Adverse**.

The closest historic building to the development is the Bow Farm which sits in the middle of the proposed extraction area (Plates 7-11, Fig 2). The complex is only partially complete but more than 50% of the traditional buildings survive. The original setting of the complex has also been compromised as the small fields, typical of inclosure, which would have surrounded the farm, have in recent years been amalgamated in line with modern farming practices. The removal of this land around the farm would further negatively impact the building and disconnect it from its setting completely. Little can be done to buffer the complex from the effects of mineral extraction other than forming a bund around the entire complex, which would still isolate the structures in a bubble. If the eastern extraction area and land around the farm complex were restored after quarrying is completed then the effects of the development would be reduced and considered to be **Minor Adverse**.

7.3 Unknown impacts

Although much is known about the archaeological potential of the proposed quarry area there are a number of areas where the potential has not been proven, specifically in four large areas of the proposed quarry. These include;

- the floodplain, where there are antiquarian and more recent evaluation reports to suggest that prehistoric and Roman remains exist there.
- the south-eastern side of the proposed extraction area, around Bow Farm, which although having the potential to contain similar remains to those indicated by cropmark evidence in the north-east area, has not produced cropmarks indicative of such settlement remains .
- the proposed processing area covers approximately 5 hectares and, although it is flanked by a medieval road and a railway to the west and a Roman road to east, little is known about this area. Given its size it could contain archaeological remains, which may have been protected from plough damage by colluvium.
- there are a number of waterlogged zones across the proposed quarry, including the Ripple Brook valley and the former osier beds running between the east and west sides of the proposed extraction area. The latter is likely to be the remains of a former palaeochannel. These will almost certainly contain important waterlogged palaeoenvironmental and archaeological remains. Although they will remain largely intact and are not targeted to be extracted it is not known how the changing hydrology of the area during gravel extraction will affect these deposits.

8 Recommendations

Where there are areas of unknown archaeological potential within the proposed development area (Section 7.3) (Fig 13: Unknown Potential), it is proposed that further investigation of these areas should be undertaken through a staged programme of geophysical survey followed by targeted trench evaluation and auger survey to better establish the presence/absence of archaeological assets in these areas and further define their extents and potential to enable an informed decision to be made regarding appropriate treatment (mitigation) should permission be granted.

It is also recommended that further investigation be undertaken of those areas where the available evidence indicates the presence of archaeological remains (Fig 13: Identified Potential) in order to better define their extents, date, character, survival and condition to enable an informed decision to be made regarding appropriate treatment (mitigation) should permission be granted.

No scheduled monuments are present in the proposed development area that would formally require Scheduled Monument Consent to be obtained from Historic England. They should however be contacted during the planning process to gain their opinion on the development and how it may impact on the scheduled monument of Towbury Hillfort, to the east.

9 Publication summary

Worcestershire Archaeology has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, Worcestershire Archaeology intends to use this summary as the basis for publication through local or regional journals. The client is requested to consider the content of this section as being acceptable for such publication.

A desk-based assessment was undertaken on behalf of David Jarvis Associates (the Consultant), for Cullimore Group (the Client), at Bow Farm, Ripple, Worcestershire, county (NGR ref (SO 87695 36388); HER ref WSM 70265. The Client intends to construct a mineral processing plant and begin mineral (sand and gravel) extraction at the site. The desk-based assessment has illustrated that the site is likely to contain important prehistoric and Roman archaeological remains and that gravel extraction will likely have a negative impact of a number of designated and undesignated heritage assets.

10 Acknowledgements

Worcestershire Archaeology would like to thank the following for their kind assistance in the successful conclusion of this project, Anthony Cook (David Jarvis Associates), Adam Mindykowski (Worcestershire County Council Historic Environment Adviser) and Charles Parry, Archaeologist for Gloucestershire County Council (Development Management).

Figures

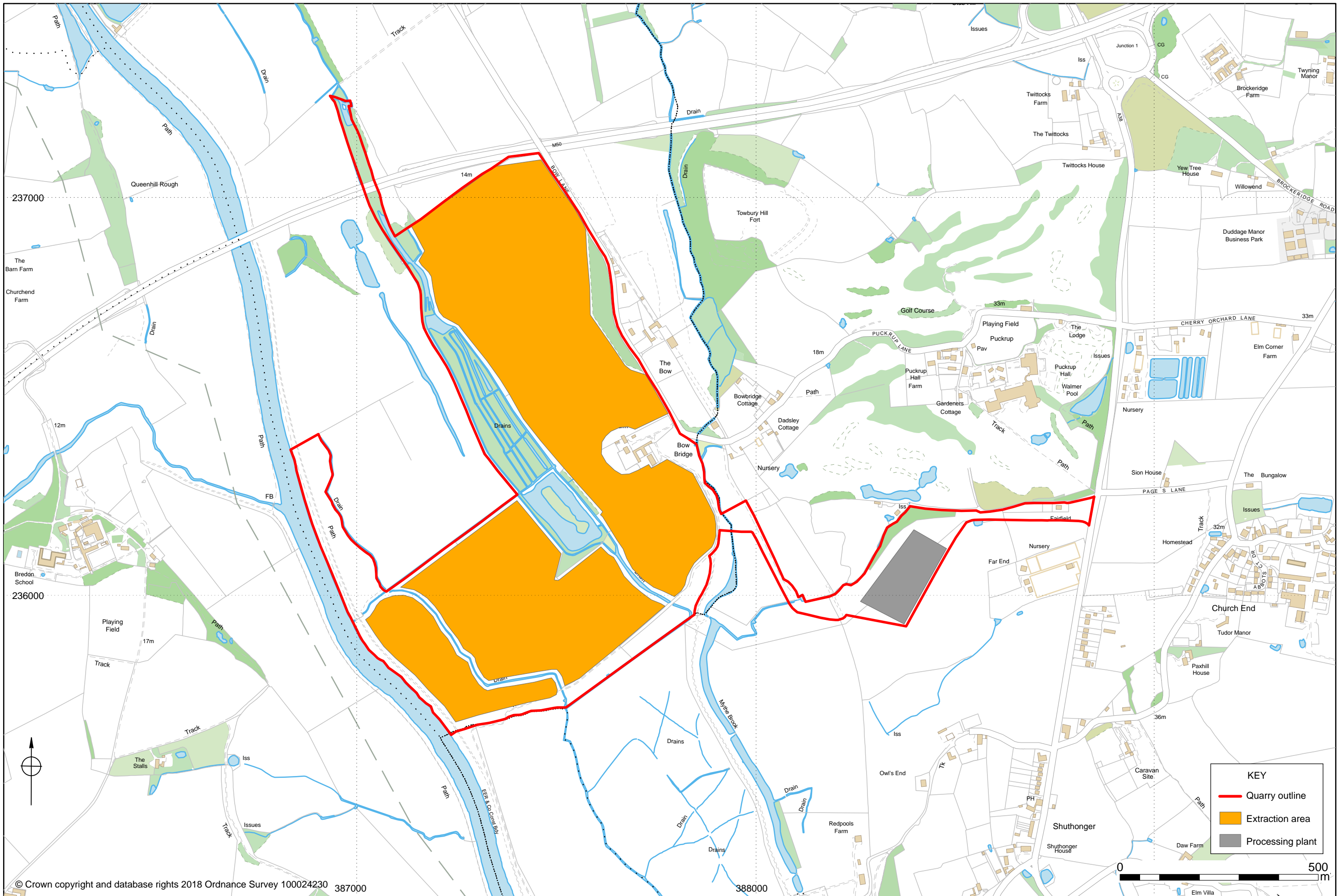


Figure 1: Location of site, extraction area and processing plant

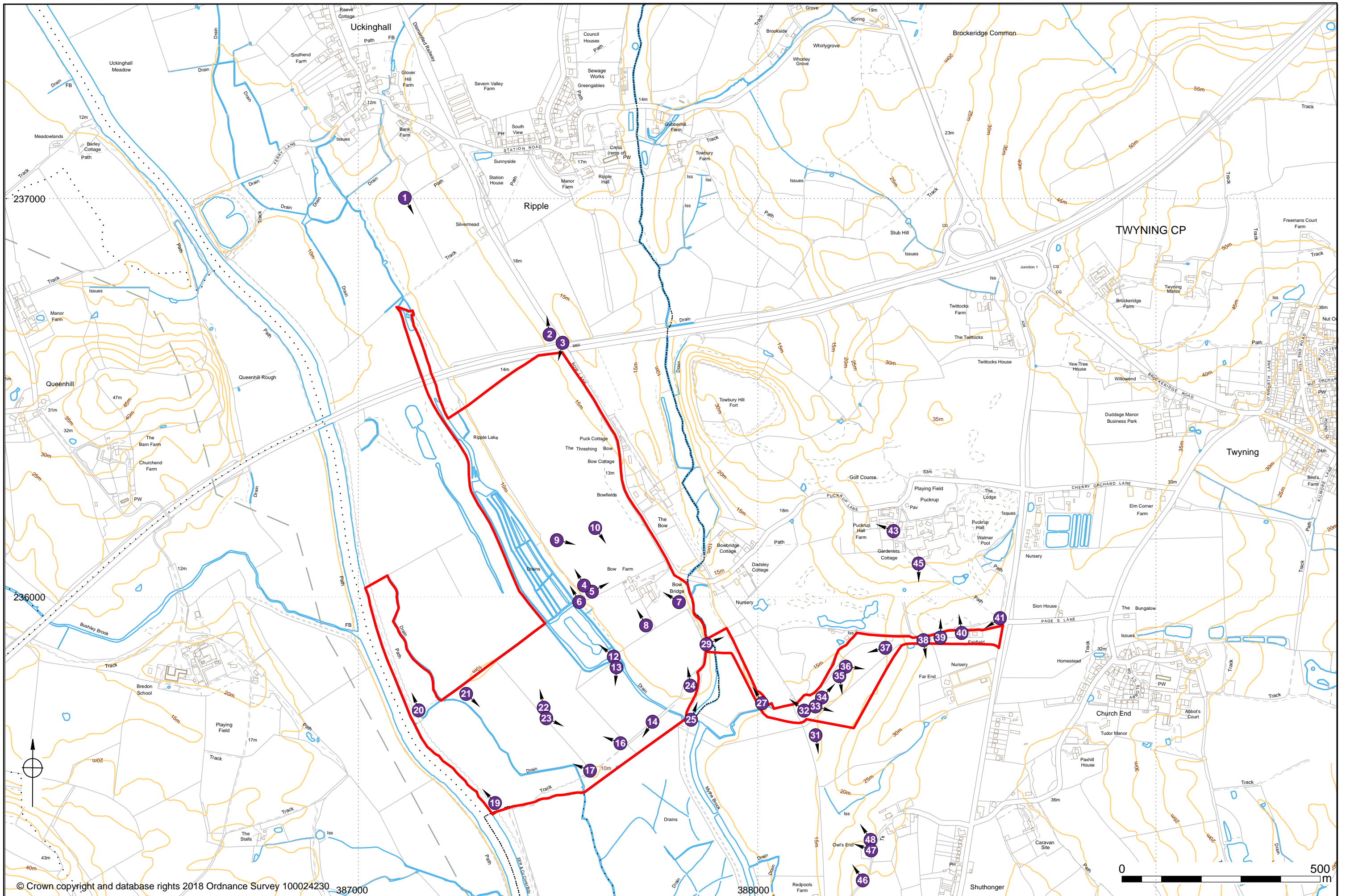


Figure 2: Location of plates

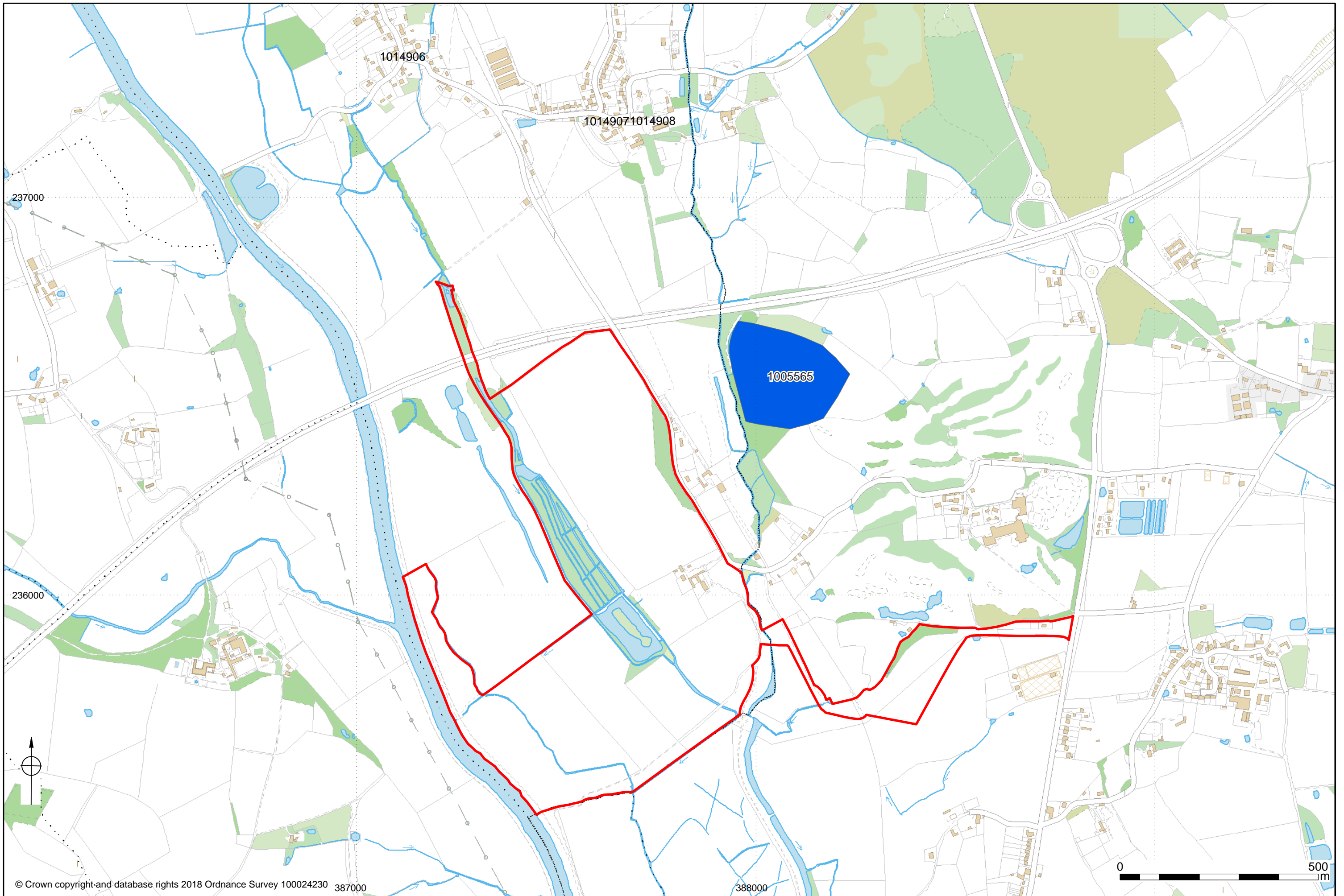


Figure 3: Scheduled Ancient Monuments in the study area

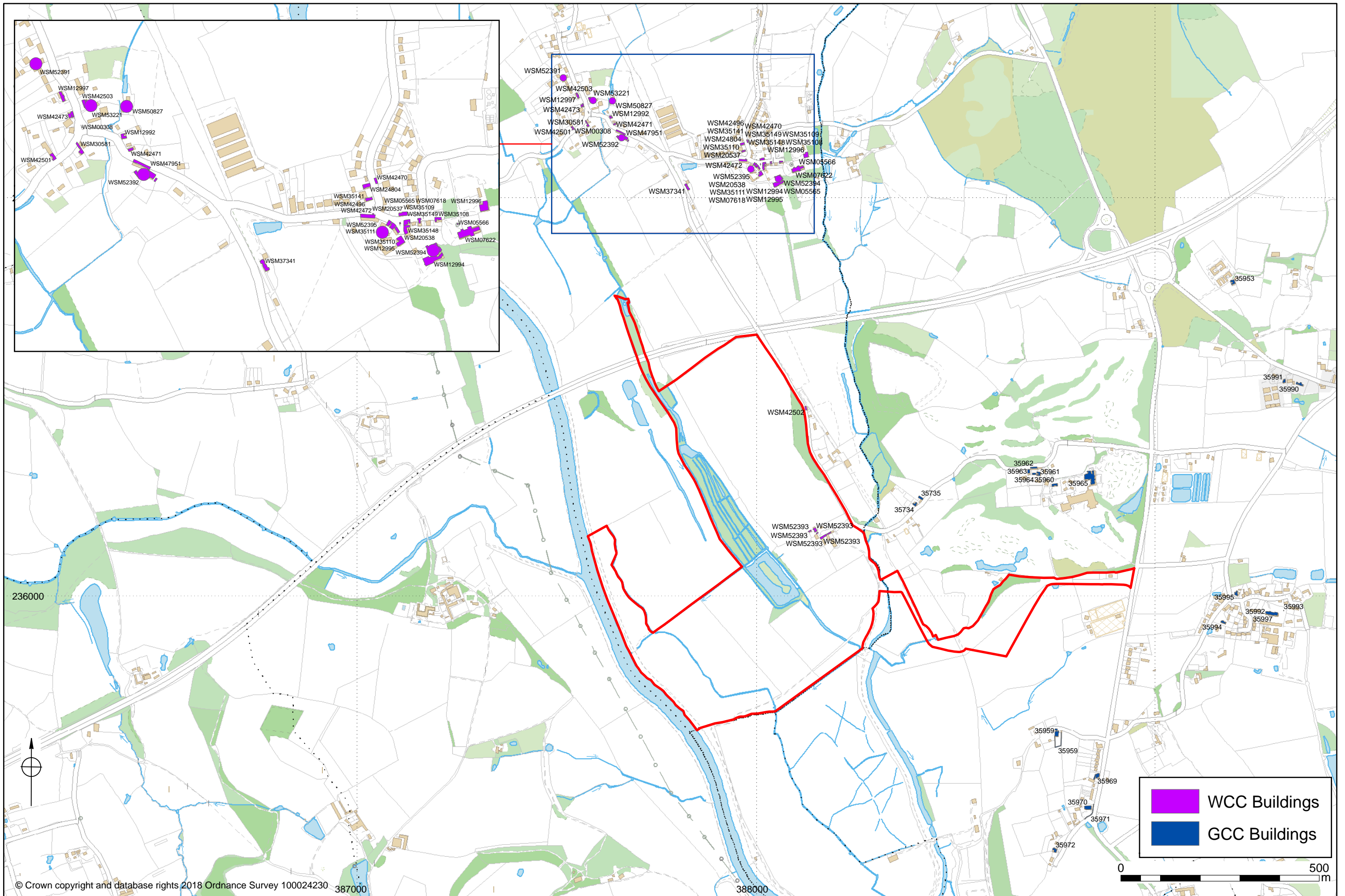


Figure 4: Historic and Listed Buildings in the study area

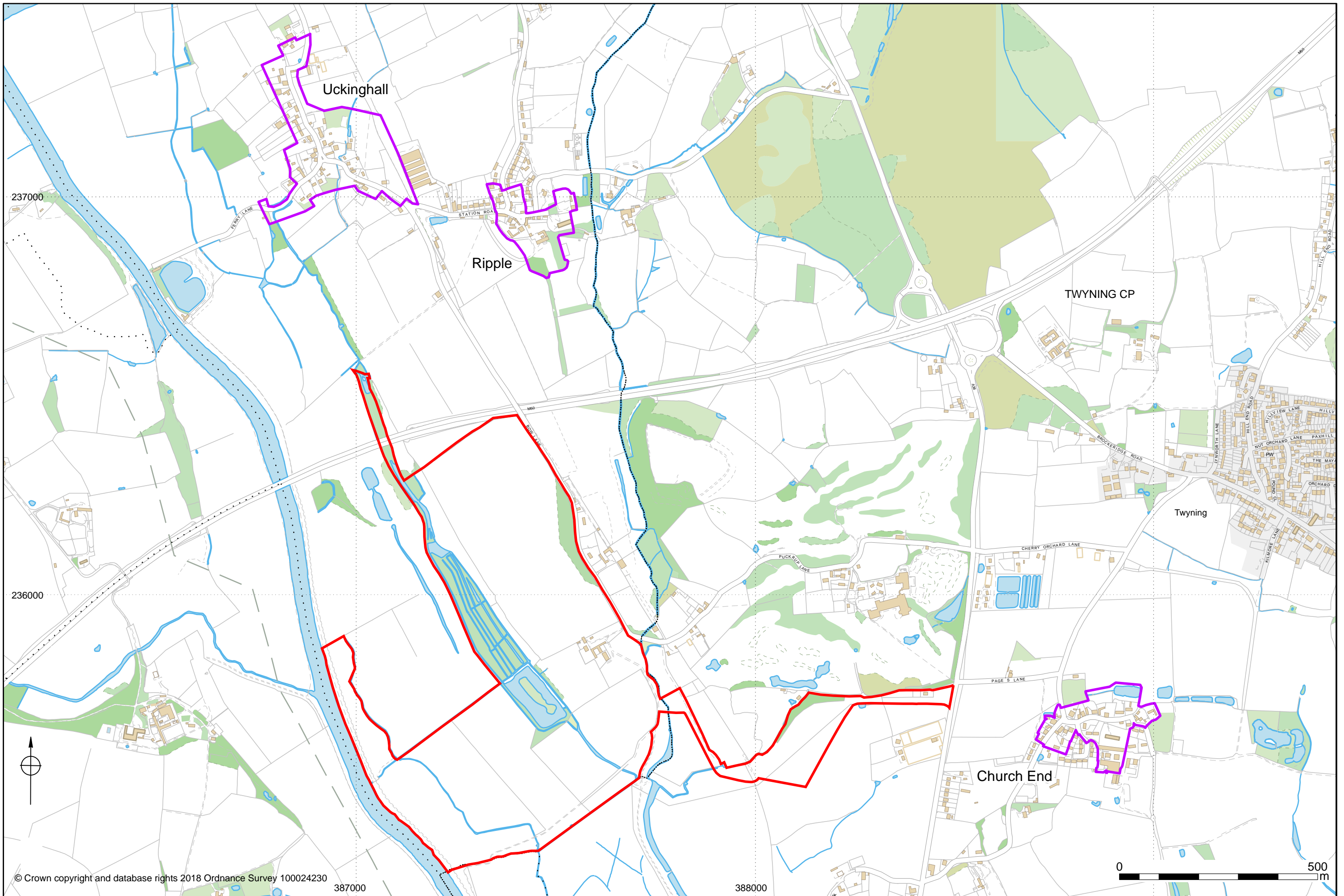


Figure 5: Conservation Areas in study area, Uckinghall, Ripple and Church End

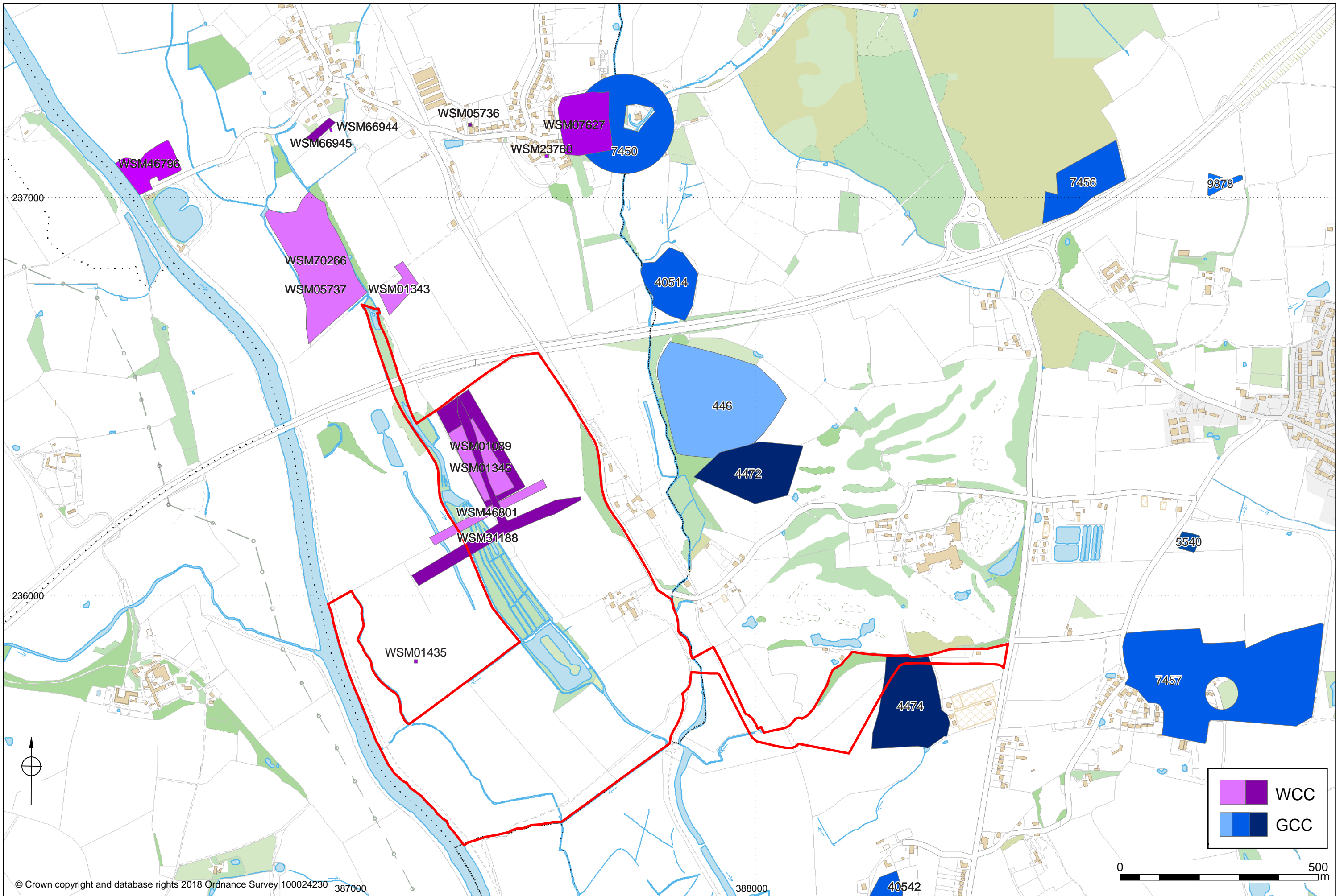


Figure 6: Settlement/Activity areas recorded on the HER in the study area

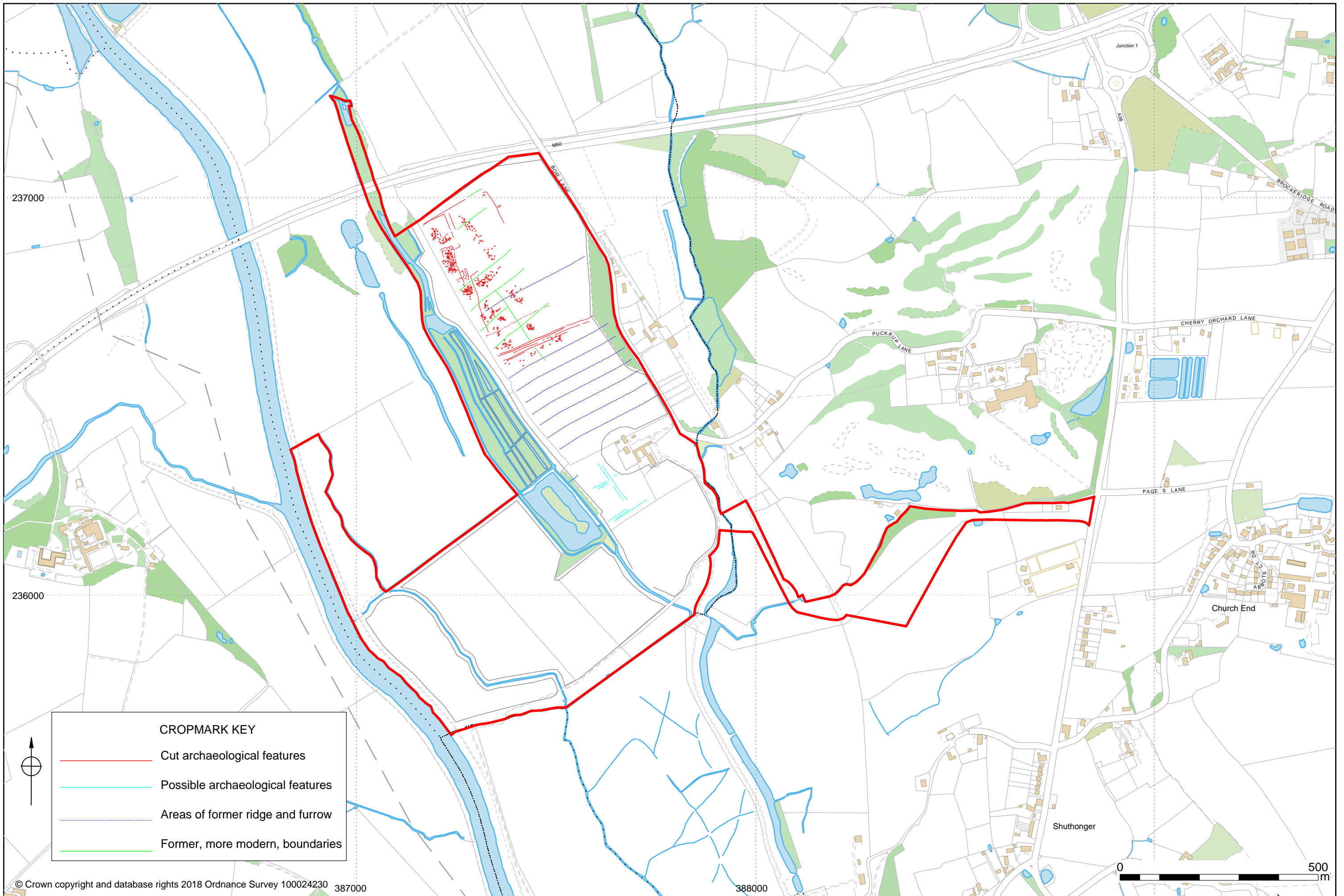


Figure 7: Cropmarks in proposed eastern extraction area

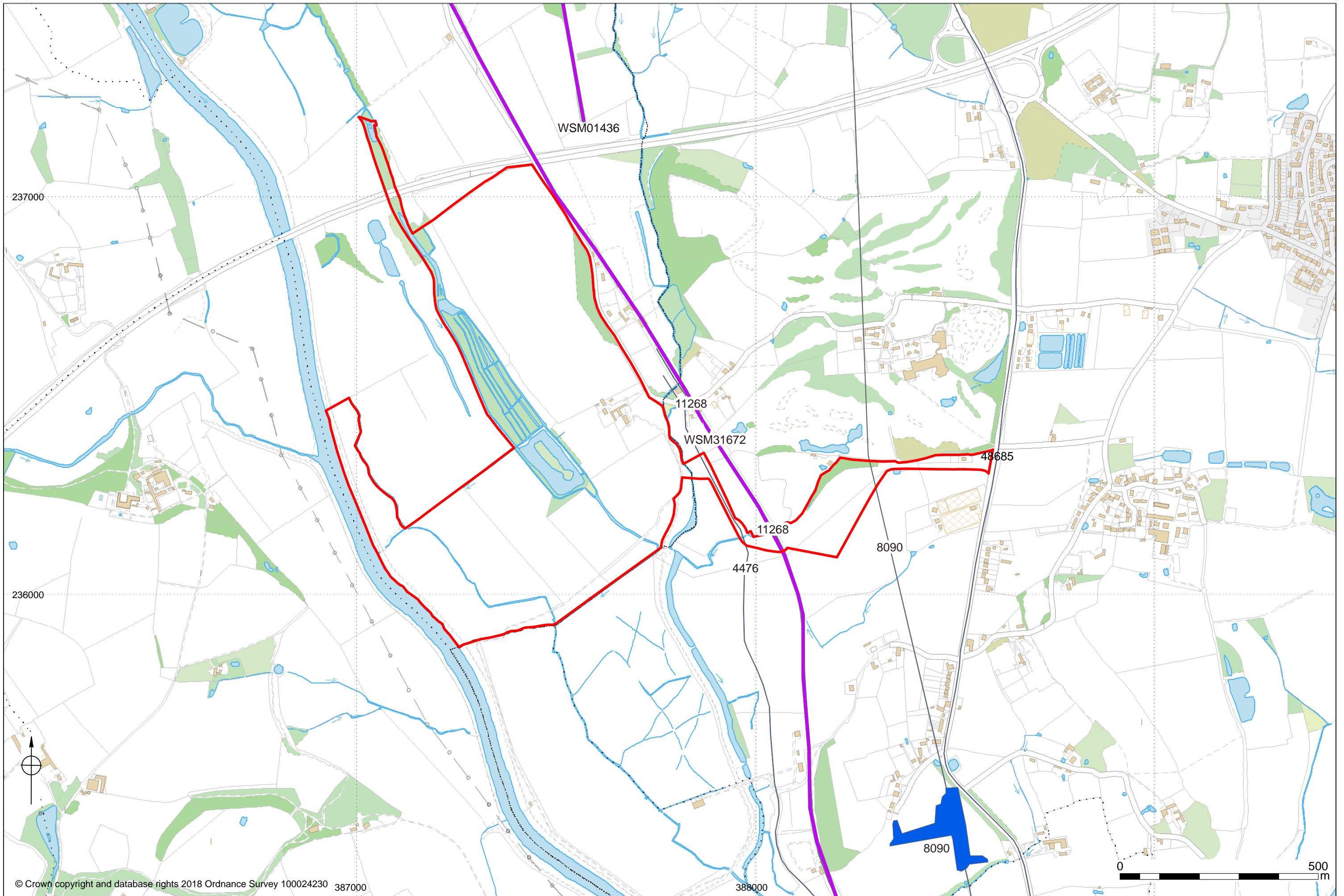


Figure 8: Roads and railways in the study area

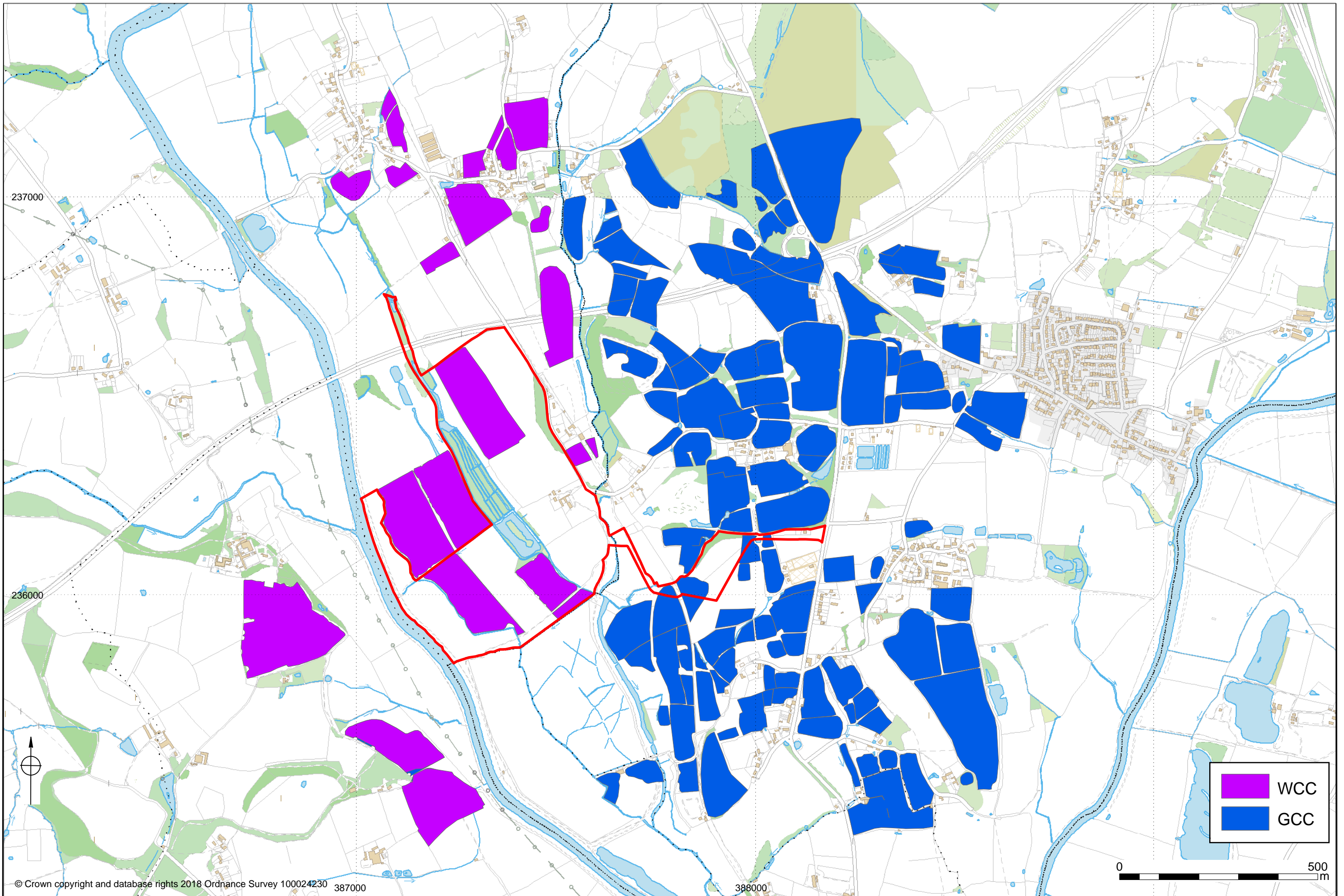


Figure 9: Areas of ridge and furrow in the study area



Figure 10: 1862 enclosure map

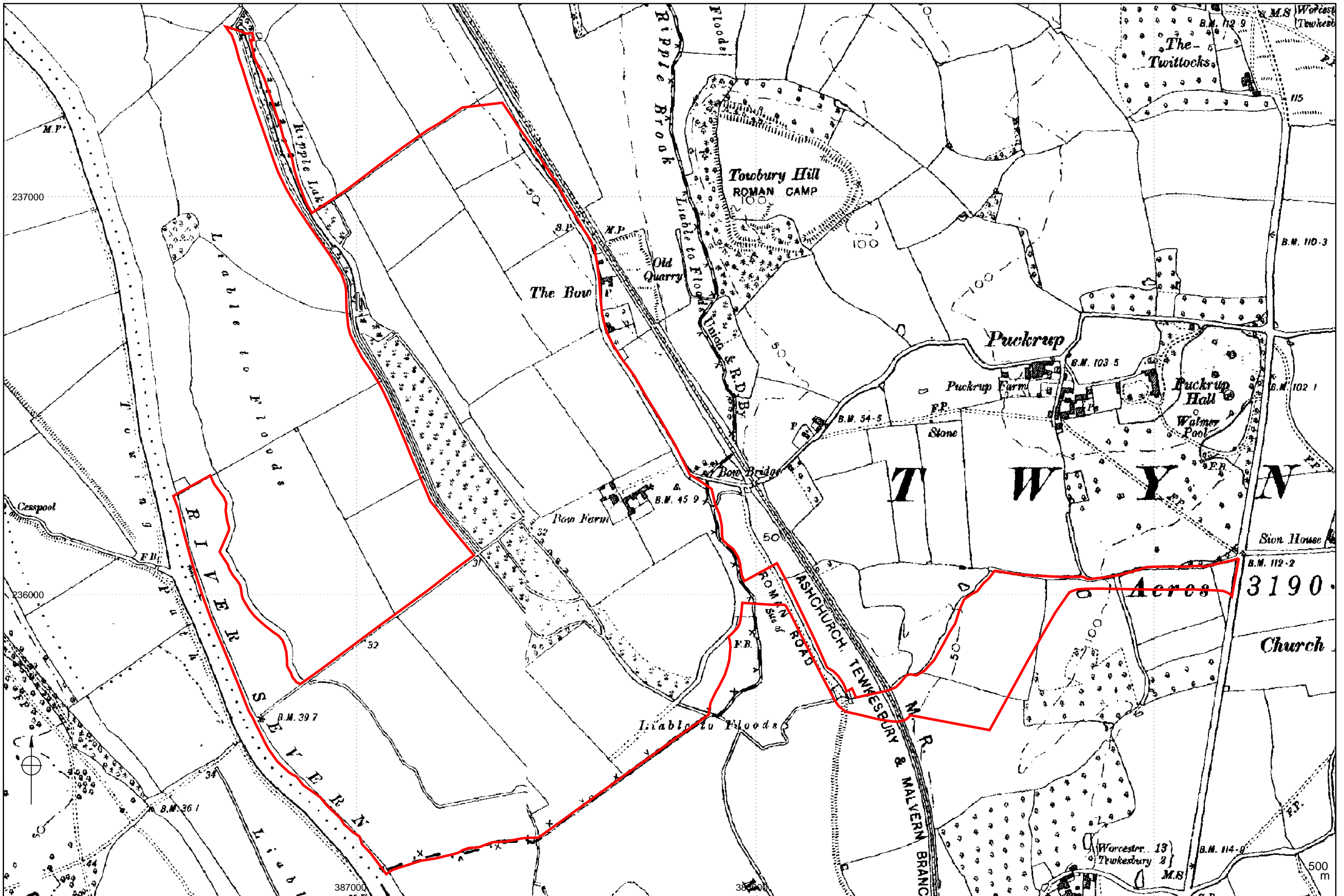


Figure 11: OS mapping 1905

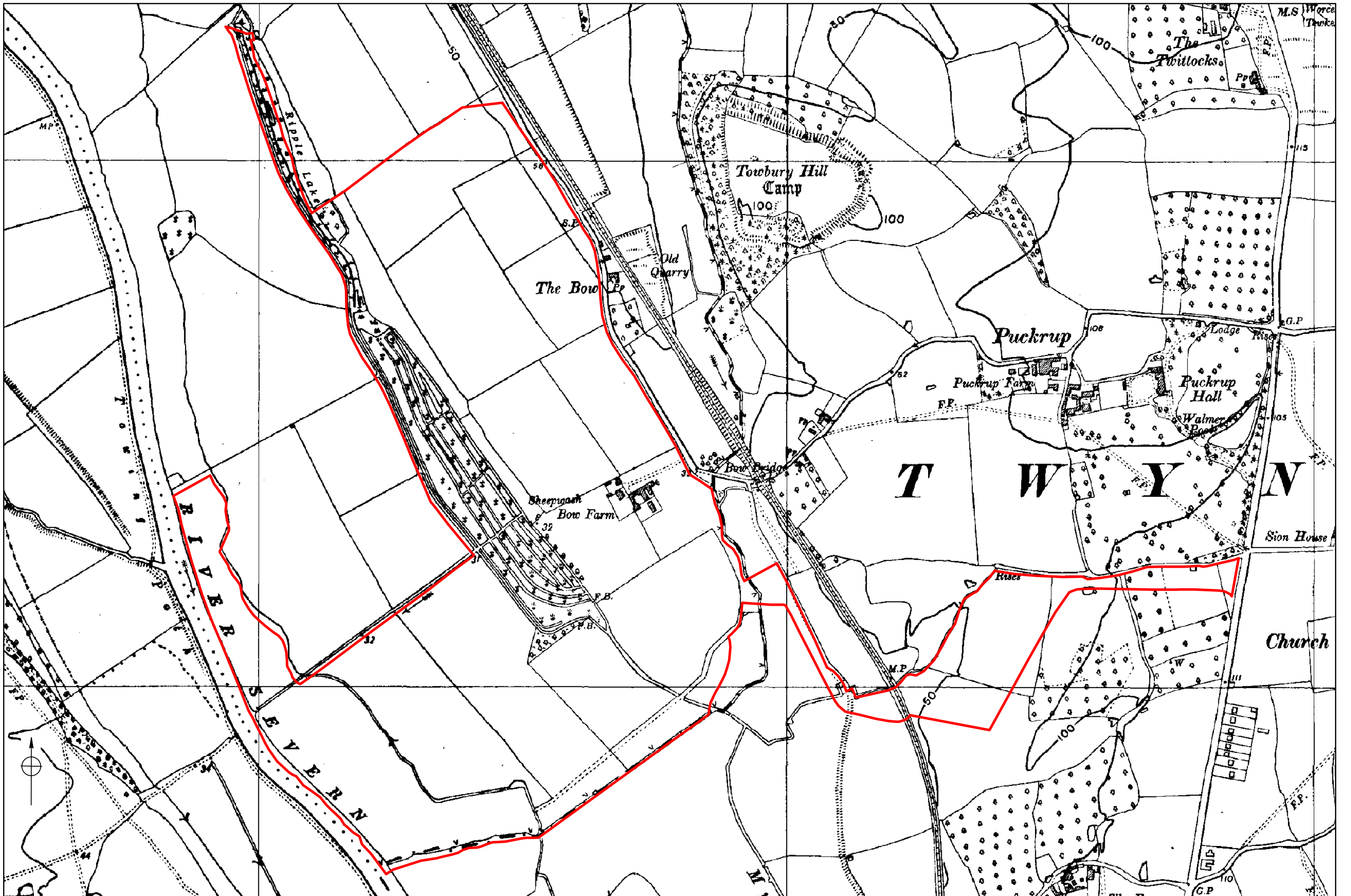


Figure 12: OS mapping 1954

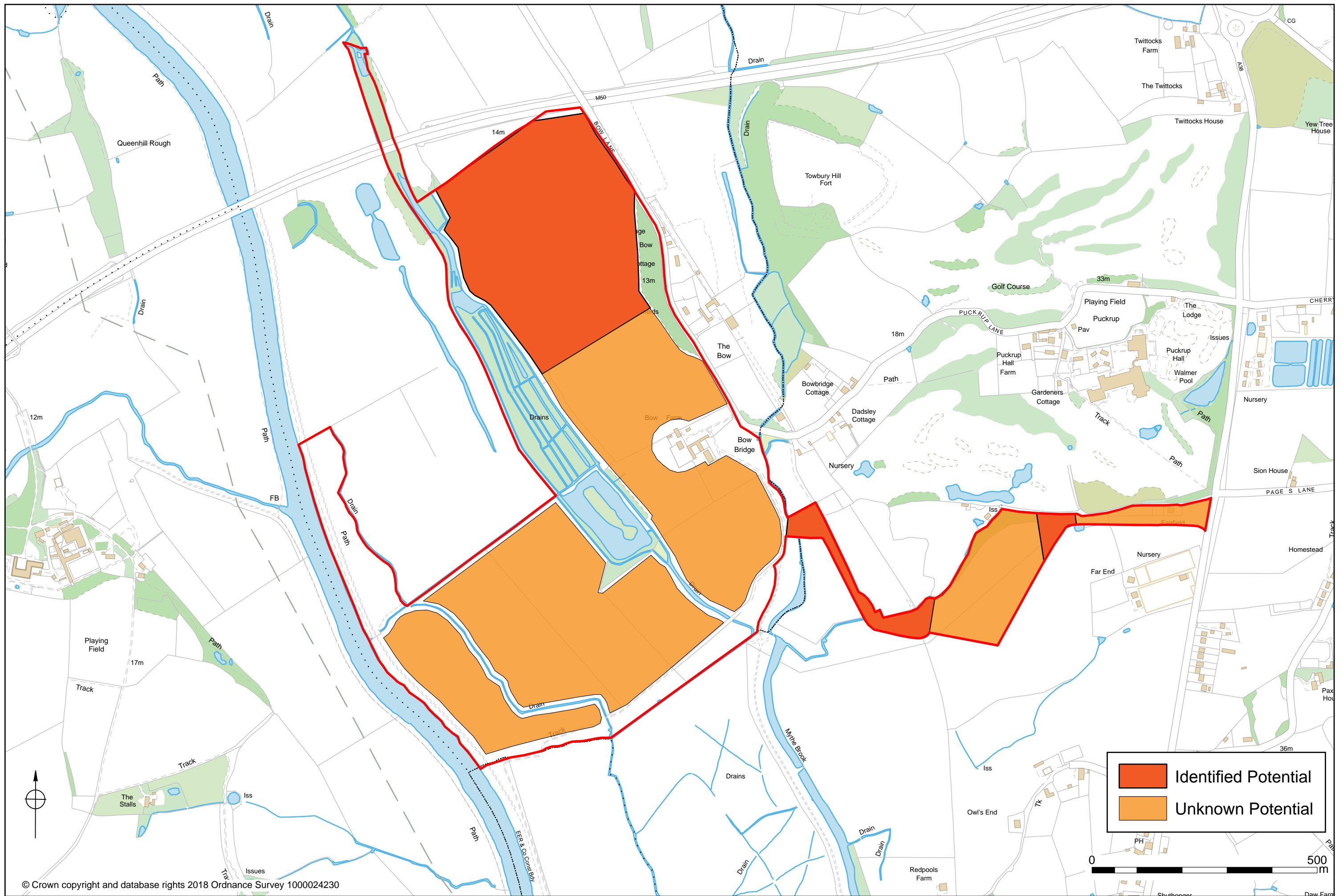


Figure 13: Areas of archaeological potential

Plates



Plate 1: View south towards proposed extraction area from Uckinghall



Plate 2: View north-east towards Ripple from the bridge crossing the M50 on Bow Lane



Plate 3: View south-west to the north limits of the proposed extraction area, taken from the bridge crossing the M50 on Bow Lane.



Plate 4: View north across the eastern proposed extraction area towards Ripple and Uckinghall.



Plate 5: View north-east towards Towbury Hillfort (GHER 446, SAM 73) from the eastern proposed extraction area



Plate 6: View of gravel terrace edge between the eastern gravel terrace (Worcester Member) and the floodplain.



Plate 7: view north-west towards Bow Farm (WSM 52393)



Plate 8: View north towards Bow Farm (WSM 52393)



Plate 9: View south-east towards Bow Farm (WSM 52393) from north eastern proposed extraction area



Plate 10: View south towards Bow Farm (WSM 52393) from north eastern proposed extraction area



Plate 11: View east towards Bow Farm (WSM 52393) from south eastern proposed extraction area



Plate 12: View north across former lake and osier beds between the western and eastern proposed extraction areas



Plate 13: View south across western proposed extraction area



Plate 14: View south-west in western proposed extraction area



Plate 15: View south-west across the western proposed extraction area



Plate 16: View north-west across the western proposed extraction area, M50 visible in distance



Plate 17: View north-west across the western proposed extraction area



Plate 18: View east across the western proposed extraction area



Plate 19: View north across the western proposed extraction area, on the eastern bank of the River Severn



Plate 20: View north across the floodplain, north of the western proposed extraction area on the eastern bank of the River Severn



Plate 21: View facing south-west across the western proposed extraction area



Plate 22: View north across the western proposed extraction area, M50 visible in distance



Plate 23: View south-east across the western proposed extraction area



Plate 24: View north across the southern limits of the western proposed extraction area



Plate 25: View north-east across the southern limits of the western proposed extraction area



Plate 26: View north-west across the south limits of the western proposed extraction area



Plate 27: View north across the Ripple Brook Valley, showing the proposed haul road route and the approximate position of the medieval road to the right (GHER 4476)



Plate 28: View south through the Ripple Brook Valley



Plate 29: View east showing the approximate location for the haul road crossing Ripple Brook Valley into the extraction area.



Plate 30: View south of proposed quarry



Plate 31: View south of proposed quarry towards Red Pools Farm, Owl's End



Plate 32: View north-west of railway embankment (WSM 11268, GHER 11268) in the corner of the proposed processing plant area.



Plate 33: View south-east across the proposed processing plant area



Plate 34: View north-east across the proposed processing plant area



Plate 35: View south across proposed processing area



Plate 36: View south-east across proposed processing plant area



Plate 37: View west across proposed processing plant area



Plat 38: View south across proposed access road



Plate 39: View north toward Puckrup Hall (GHER 35965) behind visible hotel from the proposed access road



Plate 40: View north towards Puckrup Hall (GHER 35965), behind visible hotel from the proposed access road



Plate 41: View west from proposed access point off the A38



Plate 42: View south-east from Bowbridge Cottage (GHER 35734) and barn (GHER 35735) towards proposed processing plant area.



Plate 43: View north-west across Puckrup Hall farm barn (GHER 35963, towards the proposed extraction area



Plate 44: View west from Puckrup towards the proposed extraction area



Plate 45: View south from Puckrup, across the golf course, towards the proposed access road and processing plant



Plate 46: View north-west from Owl's End across the Severn Valley and the proposed extraction area

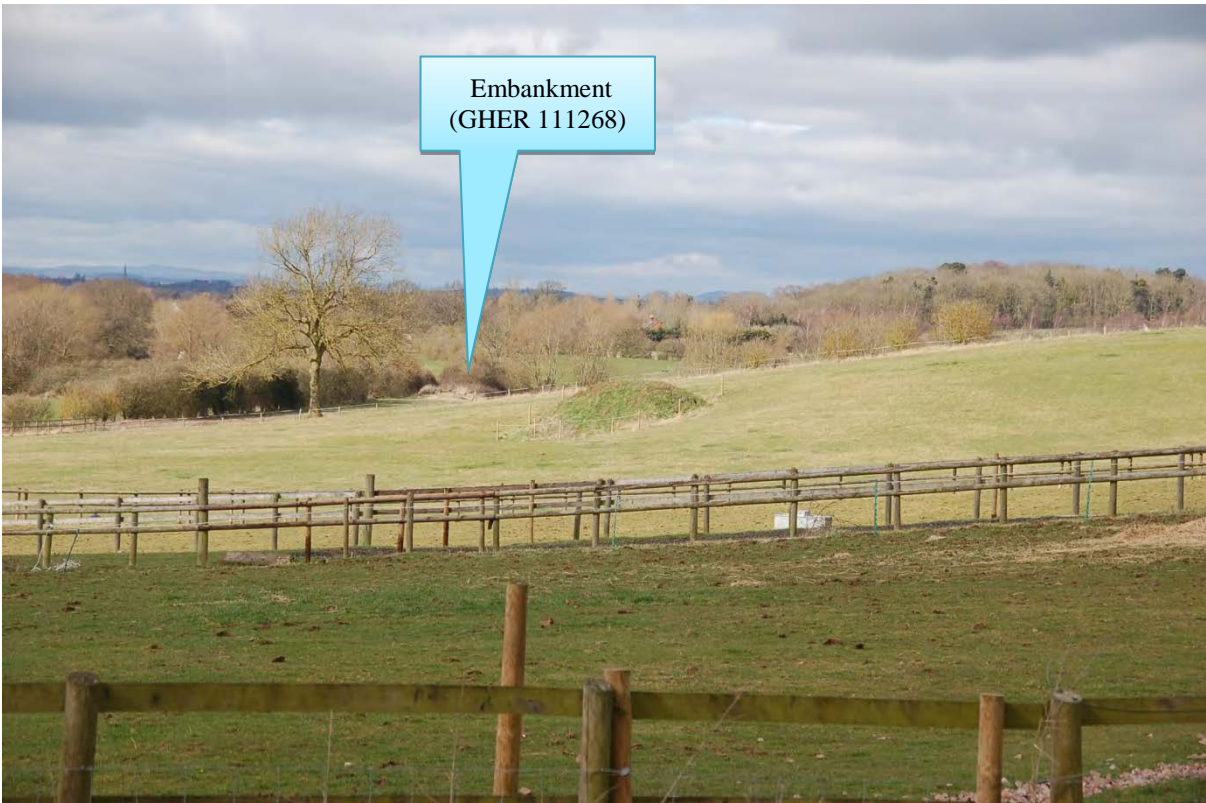


Plate 47: View north-west, next to Red Pools Farm, Owl's End, towards the proposed processing plant area. The railway embankment (WSM 11268, GHER 11268) is visible in the middle of the photo



Plate 48: View north-west, next to Red Pools Farm, Owl's End, towards the proposed extraction area. Bow farm (WSM 52393) is visible in the middle distance.

Appendix 1: Historic assets registered with the Historic Environment Record (those within the application site are indicated in bold)

Scheduled monuments listed on the Worcestershire and Gloucestershire HERs

HER Ref	Name	Type	Date	NHL Number
Worcestershire				
WSM00308	Uckinghall Cross, Ripple	VILLAGE CROSS	LATE 11TH CENTURY AD to 21ST CENTURY AD	NHL 1014906
WSM05565	Ripple Village Cross, Ripple	MARKET CROSS	MEDIEVAL	NHL 1014907
WSM05566	Palm Cross in churchyard, Ripple	CHURCHYARD CROSS	LATE 11TH CENTURY AD to 21ST CENTURY AD	NHL 1014908
Gloucestershire				
GHER446	Towbury Hill Camp	Hillfort	Late Bronze Age-Early iron Age	NHL 1005565

Table 2: Scheduled monuments in the study area

Historic buildings listed on the Worcestershire and Gloucestershire HERs

HER Ref	Name	Type	Date	Status
WSM07622	St Mary The Virgin's Church, Ripple	MINSTER; CHURCH; WALL PAINTING; CHURCH; WAR MEMORIAL	ROMAN 5TH CENTURY AD to 21ST CENTURY AD	I
WSM12992	Glover Hill House, East of Uckinghall Cross, Ripple	TIMBER FRAMED BUILDING; HOUSE	17TH CENTURY AD to 21ST CENTURY AD	II
WSM12994	Ripple Hall, Ripple	COUNTRY HOUSE	18TH CENTURY AD to 21ST CENTURY AD	II
WSM12995	Manor Cottage (Almshouses), Ripple	ALMSHOUSE	17TH CENTURY AD to 21ST CENTURY AD	II
WSM12996	Old Rectory, Ripple	Rectory; HOUSE	18TH CENTURY AD to 21ST CENTURY AD	II
WSM12997	The Thatch, Uckinghall, Ripple	TIMBER FRAMED BUILDING; HOUSE	17TH CENTURY AD to 21ST CENTURY AD	II
WSM20537	Ripple Cottage, Ripple	HOUSE	17TH CENTURY AD to 21ST CENTURY AD	II
WSM20538	Manor Farm, Ripple	TIMBER FRAMED BUILDING; FARMHOUSE	16TH CENTURY AD to 21ST CENTURY AD	II
WSM24804	Wiston Cottage (formerly The Cottage), School Lane, Ripple	Cottage; TIMBER FRAMED BUILDING	17TH CENTURY AD to 21ST CENTURY AD	II
WSM26375	The Ferryman's Cottage/Barley House, Uckinghall	DWELLING	POST MEDIEVAL	
WSM30581	Sunnybank Cottage, Ferry Lane, Uckinghall	TIMBER FRAMED BUILDING; Cottage	17TH CENTURY AD to 21ST CENTURY AD	II
WSM35108	Church Cottage, The Cross, Ripple	Cottage	19TH CENTURY AD to 21ST CENTURY AD	II
WSM35109	Timber Cottage, The Cross, Ripple	Cottage; TIMBER FRAMED BUILDING	17TH CENTURY AD to 21ST CENTURY AD	II
WSM35110	Hayes House, The Cross, Ripple	Cottage; TIMBER FRAMED BUILDING	17TH CENTURY AD to 21ST CENTURY AD	II
WSM35111	Jasmine Cottage or Homeland, The Cross, Ripple	Cottage	19TH CENTURY AD to 21ST CENTURY AD	II
WSM35141	Corner Cottage, School Road, Ripple	Cottage	17TH CENTURY AD to 21ST CENTURY AD	
WSM35148	1 and 2 The Cross, Ripple	Cottage	17TH CENTURY AD to 21ST CENTURY AD	II
WSM35149	3 and 4 The Cross, Ripple	HOUSE; TIMBER FRAMED BUILDING	17TH CENTURY AD to 21ST CENTURY AD	II
WSM37341	Railway Station Office and Station Master's House, Ripple	RAILWAY STATION; STATION MASTERS HOUSE; SIGNAL BOX; GOODS YARD; RAILWAY	19TH CENTURY AD to 21ST CENTURY AD	II
WSM42470	Rose Cottage, The Cross, Ripple	TIMBER FRAMED BUILDING; Cottage	17TH CENTURY AD to 21ST CENTURY AD	II
WSM42471	Elm Tree Cottage, Ripple	TIMBER FRAMED BUILDING; Cottage	17TH CENTURY AD to 21ST CENTURY AD	II
WSM42472	Manor Farm Barn, Ripple, Malvern Hills	BARN; HOUSE	18TH CENTURY AD to 21ST CENTURY AD	II
WSM42473	Cob Walls (The Post Office), Uckinghall, Ripple	TIMBER FRAMED BUILDING; HOUSE	17TH CENTURY AD to 21ST CENTURY AD	II
WSM42496	K6 Telephone Kiosk outside Manor Farm Barn, Ripple	Telephone Kiosk	20TH CENTURY AD to 21ST CENTURY AD	II
WSM42501	Ferry Lane Cottage, Ferry Lane, Uckinghall	TIMBER FRAMED BUILDING; Cottage	17TH CENTURY AD to 21ST CENTURY AD	II
WSM42502	Puck Cottage, Bow Lane, Ripple	TIMBER FRAMED BUILDING; Cottage	17TH CENTURY AD to 21ST CENTURY AD	II
WSM42503	Ivydene, Uckinghall, Ripple	FARMHOUSE	POST MEDIEVAL to 21ST CENTURY AD	
WSM07618	Stocks and whipping post, by Preaching Cross, Ripple	STOCKS; WHIPPING POST	POST MEDIEVAL to 21ST CENTURY AD	
WSM47951	Bank Farm, Uckinhall	FARM COMPLEX	18TH CENTURY AD to 21ST CENTURY AD	
WSM50827	Glover Hill Farm (Outfarm), Ripple	OUTFARM	19TH CENTURY AD to 21ST CENTURY AD	
WSM52391	Smithend Farm, Ripple	FARMSTEAD	19TH CENTURY AD to 21ST CENTURY AD	
WSM52392	Bank Farm, Ripple	FARMSTEAD	19TH CENTURY AD to 21ST CENTURY AD	

WSM52394	Ripple Hall, Ripple	FARMSTEAD	18TH CENTURY AD to 21ST CENTURY AD
WSM52395	Manor Farm, Ripple	FARMSTEAD	16TH CENTURY AD to 21ST CENTURY AD
WSM53221	Ivydene, Ripple	FARMSTEAD	19TH CENTURY AD to 21ST CENTURY AD
WSM52393	Outbuildings at Bow Farm, Ripple	OUTBUILDING	19TH CENTURY AD to 21ST CENTURY AD
WSM52393	Outbuildings at Bow Farm, Ripple	OUTBUILDING	19TH CENTURY AD to 21ST CENTURY AD
WSM52393	Outbuildings at Bow Farm, Ripple	OUTBUILDING	19TH CENTURY AD to 21ST CENTURY AD
WSM52393	Outbuildings at Bow Farm, Ripple	OUTBUILDING	19TH CENTURY AD to 21ST CENTURY AD
WSM52393	Outbuildings at Bow Farm, Ripple	OUTBUILDING	19TH CENTURY AD to 21ST CENTURY AD

Table 3: Historic buildings in the Worcestershire study area

HER Ref	Name and description	Date	Status
GHER 5963	Barn, located about 30m soythwest of Puckrup Farmhouse, Puckrup, Twyning.	19TH CENTURY	II
GHER35734	Detached cottage known as Bow Bridge Cottage, Twyning.	17TH CENTURY	II
GHER35735	Barn located about 10m northeast of Bow Bridge Cottage, Twyning.	17TH CENTURY	II
GHER35953	Farmhouse known as Brockeridge Farm, Twyning.	18THCENTURY	II
GHER35959	Detached house with attached dairy and walled garden, known as Twyning Farm, Owl's End Lane, Twyning.	18-19TH CENTURY	II
GHER35959	Detached house with attached dairy and walled garden, known as Twyning Farm, Owl's End Lane, Twyning.	18-19TH CENTURY	II
GHER35960	Detached house known as The Bothy, Puckrup, Twyning.	17-18THCENTURY	II
GHER35961	Farmhouse known as Puckrup Farmhouse, Puckrup, Twyning.	19TH CENTURY	II
GHER35962	Stables located about 20m northwest of Puckrup Farmhouse, Puckrup, Twyning.	19TH CENTURY	II
GHER35964	Barn and pigsties located about 10m south of Puckrup Farmhouse, Puckrup, Twyning.	19TH CENTURY	II
GHER35965	Large detached house, with later extensions, known as Puckrup Hall, Puckrup, Twyning.	18-19TH CENTURY	II
GHER35969	Detached cottage known as Crown Cottage, Shuthonger, Twyning.	18TH CENTURY	II
GHER35970	Large detached house known as Shuthonger House, Shuthonger, Twyning.	19TH CENTURY	II
GHER35971	Status boundary wall, gates and gate piers, boundary features associated with Shuthonger House, Shuthonger, Twyning.	19TH CENTURY	II
GHER35972	Detached house known as Shuthonger Villa, Shuthonger Common, Twyning.	19TH CENTURY	II
GHER35990	Detached house with later extensions, known as The Fountain, Twyning Green, Twyning.	17TH CENTURY	II
GHER35991	Detached house known as Duddage, Twyning Green, Twyning.	17TH CENTURY	II
GHER35992	Status pair of matching gravestones located about 9m south of the nave of the Church of Saint Mary Magdalene, Twyning village, Twyning.	17th CENTURY	II
GHER35993	Table tomb to members of the Healing family, located in the churchyard of the Church of Saint Mary Magdalene, Twyning village, Twyning.	19TH CENTURY	II
GHER35994	Detached house, formerly a pair of cottages, known as Glebe Cottage, Twyning village, Twyning.	17TH CENTURY	II
GHER35995	Detached house including wall and railing, known as The Rookery, Twyning village, Twyning.	18-19TH CENTURY	II
GHER35997	Anglican parish church, known as the Church of Saint Mary Magdalene, Twyning village, Twyning.	12TH CENTURY	II*

Table 4: Historic buildings in the Gloucestershire study area

Monuments listed on the Worcestershire and Gloucestershire HERs

HER Ref	Name	Type	Date
WSM01089	Cropmarks, South West of Hillfort, Ripple	PIT ALIGNMENT; ENCLOSURE	EARLY BRONZE AGE to ROMAN 5TH CENTURY AD
WSM01343	Two Possible Late Prehistoric or Roman Rectilinear Enclosures, South-West of Ripple	RECTILINEAR ENCLOSURE; FIELD; SETTLEMENT	EARLY NEOLITHIC to ROMAN 5TH CENTURY AD
WSM01345	Iron Age to Roman Settlement, West of 'The Bow', Ripple	PIT CLUSTER; ENCLOSURE; SETTLEMENT	EARLY IRON AGE to ROMAN 5TH CENTURY AD
WSM01435	Romano-British Pot Kiln, West of Bow Bridge, Ripple	POTTERY KILN	ROMAN
WSM01436	Possible Roman Road, North and South of Ripple	ROAD	ROMAN
WSM05736	Enclosure, Northwest of the Bow, Ripple	ENCLOSURE	Unknown
WSM05737	Cropmarks, south of Uckinghall	SITE	Unknown
WSM07627	Possible Roman fort, Ripple	FORT	ROMAN
WSM12993	Site of the Battlefield at Ripple, 1643	BATTLEFIELD	17TH CENTURY AD
WSM22939	Uckinghall Ferry, Ripple	LANDING STAGE	POST MEDIEVAL
WSM23760	Medieval Village, Ripple	SETTLEMENT	MEDIEVAL
WSM25282	School Lane, Ripple	OCCUPATION SITE	ROMAN
WSM27692	Aircraft Landing Obstacles, Uckinghall Meadow, Ripple	AIRCRAFT OBSTRUCTION	World War Two
WSM30752	Irregular Enclosure, Bushley.	ENCLOSURE	EARLY NEOLITHIC to ROMAN 5TH CENTURY AD
WSM31188	Possible Trackway, South of The Bow, Ripple	TRACKWAY	EARLY IRON AGE to ROMAN 5TH CENTURY AD
WSM31672	Railway (disused) - Ashchurch to Malvern - Section BEA/5	EMBANKMENT; RAILWAY	19TH CENTURY AD to 21ST CENTURY AD
WSM39971	Site of possible Fish Weir, River Severn	FISH WEIR	POST MEDIEVAL
WSM39972	Cinders in bank of river	INDUSTRIAL	POST MEDIEVAL
WSM46428	Boundary ditch, The Paddock, Ripple	BOUNDARY DITCH	Unknown
WSM46765	Tree enclosure ring, Bushley, Malvern Hills	TREE ENCLOSURE RING; OVAL ENCLOSURE	POST MEDIEVAL
WSM46782	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46796	Possible Medieval or Post Medieval stock enclosure, Ripple	STOCK ENCLOSURE?; RECTANGULAR ENCLOSURE; DITCHED ENCLOSURE?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46797	19th century gravel pit, Ripple	GRAVEL PIT; TRAMWAY	POST MEDIEVAL
WSM46798	Linear ditch of uncertain provenance, Ripple	DITCH; DRAINAGE DITCH?; BOUNDARY DITCH?	Unknown
WSM46799	19th century extractive pit, Ripple	EXTRACTIVE PIT; SAND PIT?; GRAVEL PIT?	POST MEDIEVAL
WSM46801	Later Prehistoric or Roman Pit Alignment, Ripple	PIT ALIGNMENT; FIELD BOUNDARY?; BOUNDARY?	EARLY NEOLITHIC to ROMAN 5TH CENTURY AD
WSM46802	Medieval or Post Medieval water channels, Bushley	DRAINAGE DITCH; WATER CHANNEL	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46810	Area of Medieval and Post Medieval ridge and furrow cultivation, in the vicinity of Bushley	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46920	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46921	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46922	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46923	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46924	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46926	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46927	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46928	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46929	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46930	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46931	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46932	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46933	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND;	LATE 11TH CENTURY AD to 19TH CENTURY AD

		NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	
WSM46934	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46935	Area of Medieval and Post Medieval ridge and furrow cultivation, Ripple	RIDGE AND FURROW; DRAINAGE DITCH; PLOUGH HEADLAND; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46970	Medieval and Post Medieval ridge and furrow cultivation, Bushley	RIDGE AND FURROW; DRAINAGE DITCH; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM46971	Medieval and Post Medieval ridge and furrow cultivation, Bushley	RIDGE AND FURROW; DRAINAGE DITCH; NARROW RIDGE AND FURROW; STEAM PLOUGHED RIG?	LATE 11TH CENTURY AD to 19TH CENTURY AD
WSM49193	Osier Bed, east of Churchend Farm, Bushley	OSIER BED	POST MEDIEVAL
WSM49194	Meander Movement, South West of Bow Farm, Ripple	Meander Movement	POST MEDIEVAL
WSM49195	Osier Bed, South West of Ripple Brook Farm, Ripple	OSIER BED; POND	POST MEDIEVAL to 21ST CENTURY AD
WSM49196	Osier Bed, South West of Ripple Brook Farm, Ripple	OSIER BED; POND	POST MEDIEVAL to 21ST CENTURY AD
WSM49197	Osier Bed, Ripple Lake, Ripple	OSIER BED	Unknown
WSM49198	Osier Bed, North West of Bow Farm, Ripple	OSIER BED	POST MEDIEVAL to 21ST CENTURY AD
WSM49198	Pond, South of Ripple Lake, Ripple	POND	POST MEDIEVAL
WSM49199	Ripple Lake, Ripple	LAKE	POST MEDIEVAL
WSM49200	Osier Bed, west of Ripple Lake, Ripple	OSIER BED	POST MEDIEVAL
WSM49209	Palaeochannel, east of The Stalls, Bushley	PALAEOCHANNEL	POST MEDIEVAL
WSM49397	Pond, north east of The Stalls, Bushley	POND	POST MEDIEVAL
WSM49398	Pond, north east of The Stalls, Bushley	POND	POST MEDIEVAL
WSM49400	Pond, south east of Bow Farm, Ripple	POND	POST MEDIEVAL
WSM49401	Pond, south of Severn Valley Farm, Ripple	POND	POST MEDIEVAL
WSM49402	Pond, west of Silvermead, Ripple	POND	POST MEDIEVAL
WSM49403	Osier Bed, South of Ferryman's Cottage, Holdfast	OSIER BED	POST MEDIEVAL
WSM49405	Marsh, The Ferryman's Cottage, Holdfast	MARSH	POST MEDIEVAL
WSM49407	Marsh, Barley House, Holdfast	MARSH	POST MEDIEVAL
WSM49408	Pond, Barley House, Holdfast	POND	POST MEDIEVAL to 21ST CENTURY AD
WSM49409	Boundary Ditch, Ferry Lane, Ripple	DITCH	POST MEDIEVAL to 21ST CENTURY AD
WSM49410	Pond/Reed Bed, Ferry Lane, Ripple	POND	POST MEDIEVAL to 21ST CENTURY AD
WSM49411	Pond, south of Ferry Lane, Ripple	POND	POST MEDIEVAL to 21ST CENTURY AD
WSM55983	Other, River Severn	ENVIRONMENTAL DEPOSIT	Unknown
WSM56055	Palaeochannel, Bushley Brook, Bushley	PALAEOCHANNEL	Unknown
WSM66944	Roman Ditch on Land South West of Uckinghall	DITCH	ROMAN
WSM66945	Undated Ditches and Pit on Land South of Uckinghall, Ripple, Worcestershire	DITCH; PIT	Unknown
WSM70266	Possible Iron Age or Roman Enclosure, West of Station House, Ripple	DITCH	LATE IRON AGE to ROMAN 5TH CENTURY AD

Table 5: Monuments in the Worcestershire study area

GHER446	Towbury Hill Camp is an Iron Age hillfort which is located to the north of Puckrup Farm, Twyning.	Iron Age
GHER4472	A possible undated enclosure, boundary ditch or field boundary and drainage system are visible as cropmarks to the south of Towbury Hill, Twyning.	Undated enclosure
GHER4474	Enclosure, Farnfield	Undated enclosure
GHER4476	A probable medieval road between Ripple and Tewkesbury is partially visible as earthworks, Twyning.	Undated
GHER5540	A late prehistoric or Roman settlement site is visible as a cropmark to the south of Elm Corner Farm, Twyning.	Roman
GHER7450	Medieval Village of Ripple	Medieval
GHER7456	Medieval Settlement	Medieval
GHER7457	Site of Twyning medieval settlement, Twyning.	Medieval
GHER8090	The Roman Road between Birmingham and Gloucester, was almost ploughed level by 1957. Ditched perpendicular to the flanking ditches are also visible, suggesting a junction, Twyning.	Roman
GHER9878	A possible Later Prehistoric to Roman site is visible as cropmarks to the north of Twyning Green. The site may be that of either a trackway or storage pits, Twyning.	Late prehistoric/Roman
GHER11268	The Birmingham and Gloucester Railway, with branches to Evesham and Tewkesbury, later taken over by the Midland Railway.	Post medieval
GHER40514	A medieval to post medieval water meadow is visible as earthworks to the south of Ripple. The site is located immediately to the east of Ripple Brook, Twyning.	Medieval
GHER40542	A medieval settlement is visible as earthworks to the west of Shuthonger, Twyning.	Medieval
GHER43288	Route of the Government Pipelines and Storage System (GPSS) pipeline constructed in 1942.	Modern
GHER48685	Route of the Tewkesbury turnpike including the great road to London from Tewkesbury.	Post medieval

Table 6: Monuments in the Gloucestershire study area