

A417 Missing Link  
TR010056

## 6.8 Detailed Archaeological Mitigation Strategy and Overarching Written Schemes of Investigation

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**A417 Missing Link**

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**Detailed Archaeological Mitigation Strategy and Overarching  
Written Schemes of Investigation**

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# Detailed Archaeological Mitigation Strategy and Overarching Written Schemes of Investigation

## 1 Introduction

### 1.1 Purpose

- 1.1.1 This document is the Detailed Archaeological Mitigation Strategy (DAMS) and an Overarching Written Scheme of Investigation (OWSI) for the A417 Missing Link scheme (the scheme), as secured by DCO Requirement 9. It sets out the scope, principles and standards to which archaeological works proposed as mitigation for the scheme will be carried out.
- 1.1.2 Detailed Archaeological Mitigation Strategy and Overarching Written Schemes of Investigation is secured by environmental commitment CH1 in the Register of Environmental Actions and Commitments (REAC). The REAC described in Table 3-2 of Appendix 2.1 EMP (Document Reference 6.4) presents an initial register which has been developed using information presented in the ES.

### 1.2 Structure of the DAMS and OWSI

- 1.2.1 This document is structured as follows:
- Section 2: the DAMS sets out the strategy for the archaeological works, outlining the works carried out to date which have informed the strategy, the research agenda for mitigation works and the approach to mitigation proposed.
  - Section 3: the OWSI sets out the principles and standards for the archaeological works and will be used as a reference for the Site-Specific Written Schemes of Investigation (SSWSI) which will be produced prior to the works being undertaken.

### 1.3 Roles and responsibilities

- 1.3.1 The organisations/individuals involved in this document are those with an approval or advisory capacity, those involved in supervising the scheme and those involved in carrying out the work. National Highways would be involved throughout. Flow charts setting out the supervisory and approvals process are provided in Appendix A.

#### **Supervisory**

- 1.3.2 National Highways would appoint a contractor to construct the scheme; the contractor will appoint an Archaeological Clerk of Works (ACoW) and an archaeological contractor who will provide oversight over the construction of the scheme.
- 1.3.3 The ACoW will be responsible for oversight over the archaeological mitigation and will coordinate between the archaeological contractor, National Highways, Gloucestershire County Council (GCC) archaeological officer and Historic England.
- 1.3.4 The ACoW will be responsible for monitoring the archaeological mitigation to ensure that the scheme complies with all legislative obligations and requirements of the Development Consent Order (DCO) relating to the historic environment. They will coordinate and monitor archaeological fieldwork, facilitate monitoring

arrangements and with GCC and Historic England access and give tool box talks. The ACoW will ensure that on-site that the works proceed in accordance with the DAMS, OWSI and SSWSIs.

### **Archaeological contractor**

- 1.3.5 The archaeological contractor would be appointed by the contractor. Their role will be to carry out the archaeological mitigation on behalf of National Highways. They will deliver the archaeological mitigation set out in the OWSI, including the production of SSWSIs, off-site analysis, post-excavation, reporting and archive deposition.
- 1.3.6 The archaeological contractor will retain the services of, or have the ability to procure, the following specialists:
- buildings archaeologist/archaeological surveyor;
  - environmental archaeologist(s) with the capability to analyse macro and microscopic faunal and archaeobotanical remains;
  - finds specialists capable of analysing ceramics, metal objects and lithics;
  - geoarchaeologist;
  - human osteologist
- 1.3.7 Further specialists may be required depending on the nature and significance of the archaeological remains encountered.
- 1.3.8 The archaeological contractor will also be responsible for the creation of a strategy and programme for public engagement, to be agreed in consultation with National Highways and include outreach and engagement with the local community and local/regional museums.

### **Advisory and approvals**

- 1.3.9 The archaeological mitigation will be monitored by GCC archaeological officer and Historic England. The archaeological officer will be responsible for the sign off of areas for construction, following the completion of archaeological works, and for approving SSWSIs and reports produced by the archaeological contractor. The SSWSIs will also identify an appropriate museum for the deposition of the archive. The procedures detailed in the Gloucestershire Archaeological Archive Standards<sup>1</sup> will be followed. The museum should also be invited to consult on the collection and sampling strategies and the approach taken to conservation, analysis and discard.

## **1.4 Areas described in this report**

- 1.4.1 The route has been divided into indicative sections which reflect different patterns of archaeological potential (Figures 1-5). These will be refined at detailed design. . By chainage they are:
- Area 1: A417 west of the Air Balloon roundabout (approximate chainage 0+000 to 2+000)
  - Area 2: Air Balloon to Shab Hill junction (approximate chainage 2+000 to 3+000)
  - Area 3: Shab Hill to Cuckoo Pen (approximate chainage 3+000 to 3+500 (west of))
  - Area 4: Shab Hill to Stockley (approximate chainage 3+000 to 4+350)
  - Area 5: Stockley to Cowley roundabout (approximate chainage 4+350 to 5+760)

## **1.5 Revision and Dissemination**

- 1.5.1 The mitigation measures set out in the DAMS and OWSI may be refined during the detailed design stage of the scheme in consultation with GCC and Historic England prior to construction. These changes will be reflected through the Site-Specific Written Schemes of Investigation, secured by DCO Requirement 9.
- 1.5.2 It is the contractor's responsibility to ensure that the details of this DAMS and OWSI and any agreed amendments are known and understood by all site personnel.
- 1.5.3 Copies of the agreed documents would be available on site and the site manager would brief all personnel who could have an impact on heritage assets and unknown buried archaeology. This would be a part of the site induction procedures and written into appropriate site management documents.

## 2 Detailed archaeological mitigation strategy

### 2.1 Purpose and scope

- 2.1.1 The DAMS provides the framework for the archaeological mitigation, describing the approach to mitigation, an overview of the baseline, the results of previous work and the rationale behind the mitigation design. It also presents details of the regional research agenda and establishes specific research questions for the scheme.

### 2.2 Approach to mitigation

- 2.2.1 Archaeological investigations carried out to inform the DCO have established that there are several areas of high value buried archaeological remains within the DCO boundary which will be affected by the construction of the scheme. This includes settlement and funerary remains. Where it has not been possible to mitigate potential impacts through design (i.e. by avoiding identified archaeological remains) a programme of archaeological works will be put in place to ensure a record is made. This would include:

- retention of archaeological remains located within the DCO boundary but outside of the footprint of the road scheme where it is possible for them to be protected from damage during construction, for example, fencing to avoid accidental damage and implementation and monitoring of control measures. This includes areas specifically identified for their archaeological significance where preservation in situ has been built into the design.
- Ploughzone artefact collection, including field walking of fields following ploughing (within arable fields), followed by a potential phase of test pitting in areas of high concentrations of artefacts.
- Window sample transects in areas of geoarchaeological potential, for the purposes of deposit modelling and palaeo-environmental sampling.
- archaeological excavation and recording of remains identified through geophysical survey and trial trenching. This includes the advance excavation of areas of extensive and/or complex remains, such as settlement or burial remains, which will be carried out in advance of the main construction phase.
- archaeological monitoring (watching brief) where no or very limited archaeological remains have been identified through geophysical survey and trial trenching, with a progression to an excavation methodology if remains are found. It is anticipated that, in the majority of cases, recording of these features will not require a Site-Specific WSI, as features which will take considerable time to excavate, such as large or complex remains, will likely have been identified through the evaluation surveys, and accounted for in specific areas of excavation. However, should remains requiring greater time to excavate be identified, the ACoW will liaise between the archaeological contractor and contractor to agree an approach. This could include reallocation of staffing from elsewhere in the site, or reprogramming the area to allow further time for its excavation. While this poses an element of risk to programme and cost, archaeological monitoring has been proposed following geophysical survey and trial trenching, which have informed the identification of areas most likely to contain more extensive archaeological remains.
- building recording of structures to be relocated or demolished as part of the scheme.



- 2.2.2 Areas of archaeological interest or potential which require archaeological mitigation have been identified in the Environmental Statement (ES) and are further described and elaborated in sections 2.3 and 2.4 of this document.
- 2.2.3 If significant archaeological remains are found to extend beyond the limits defined for advance excavation, consideration will be given to increasing these areas to ensure that archaeological sites are recorded as a phase, rather than during construction.
- 2.2.4 Construction is expected to start in early 2023, however, National Highways may be in a position to commence preparatory works in late 2022, subject to the consents and approvals set out in the Consents and Agreements Position Statement (Document Reference 7.2) having been obtained. The programme for archaeological mitigation would be integrated into the preparatory works programme.
- 2.2.5 Fieldwalking, test pitting, advance archaeological excavation, window sample transects and building recording would take place prior to any construction-related top-soil strip or demolition, whilst archaeological monitoring would be carried out throughout construction as appropriate.
- 2.2.6 The archaeological mitigation would also include the analysis and reporting of the archaeological investigations, followed by appropriate publication, dissemination and archiving of the results. A single final report would be produced for the scheme, which will provide a detailed synthesis of the results, integrating them with analysis of their broader landscape and regional context and their contribution to larger research questions. If there is more than one archaeological contractor involved a strategy for incorporating both their results would be agreed. Previous work carried out by Cotswold Archaeology and Wessex Archaeology prior to the determination of the DCO would also be included in the final report.
- 2.2.7 Archaeological work should produce public benefit. The archaeological contractor would work with National Highways to agree a programme of outreach and engagement with the local community and wider interest groups, which would be carried out in parallel with the archaeological and building recording work. This is likely to include, although not limited to, public open days, online and in person talks and displays, and outreach to local schools and educational charities.
- 2.2.8 All archaeological work would be undertaken by suitably qualified professionals and carried out to the ethical and professional standards set out in the Chartered Institute for Archaeologists (CIfA) Code of Conduct, Bylaws, Standards and Policy Statements.

## **2.3 Archaeological works previously undertaken**

- 2.3.1 The assessment of impacts in the ES has been informed by a combination of desk-based studies, geophysical survey and archaeological trial trenching. With the exception of areas which are ecologically sensitive, or where vegetation has prevented access, all areas within the DCO boundary have been surveyed.

### **Historic Investigations**

- 2.3.2 There have been two previous excavations within the DCO boundary. From 1987 to 1988 excavations were carried out in advance of the construction of the Birdlip bypass. This project investigated a crop mark complex which was established to be the remains of a Middle Iron Age farmstead. This site now lies under the existing A417. The second excavation was at Birdlip Quarry and was carried out as part of the A419/A417 Trunk Road Improvement in 1996.

### Birdlip Bypass Excavations (1987 to 1988)

- 2.3.3 The excavations carried out prior to the construction of the Birdlip bypass investigated a crop mark complex discovered by aerial reconnaissance by GCCs Archaeology Service in 1984. The photographs suggested the presence of a prehistoric or Roman settlement comprising several enclosures. Geophysical survey was undertaken in 1984 by English Heritage and a trial excavation by Crickley Hill Archaeological Trust followed in 1985. The 1987-88 excavations were carried out by GCC's Archaeology Service and are published in the Transactions of the Bristol and Gloucestershire Archaeological Society<sup>2</sup>. The earliest remains feature identified was a pit containing Middle Bronze Age pottery. This was associated spatially with a penannular ditch (semi-circular shaped feature), which was thought to be of the same period due to the proximity to the pit and the presence of botanical remains which were characteristic of the Late Neolithic or Early Bronze Age. Struck flint artefacts were also recovered in the area of the penannular ditch, although mostly in unstratified contexts, suggesting that there was early prehistoric activity at the site. The penannular ditch was, as a result, interpreted tentatively as the ploughed down remains of an early prehistoric ritual or funerary monument. If this dating is correct, it would suggest that there were extant remains of the structure still present in the Iron Age, as it is located centrally within one of the larger, later enclosures.
- 2.3.4 These cropmark complex included three enclosures, only one of which was investigated in detail during the 1987-88 excavations. This enclosure was dated to the Middle Iron Age and was interpreted as a farmstead-type settlement. Part of the third enclosure was also investigated, with a possible date from the Late Iron Age, suggesting the three enclosures were not necessarily contemporary, or represented a settlement which expanded and evolved over time. Clusters of pits identified around the perimeter may have been used to store grain or other food products farmed in the vicinity; a mixed arable/pasture approach to farming is suggested by the remains, which included quern stones while there are limited features dated to the late Iron Age, there are finds from this period, suggesting that the site may have had some interrelationship with the Roman road passing nearby.

### Birdlip Quarry (1996)

- 2.3.5 Birdlip Quarry was excavated in 1996 as part of the work carried out in advance of the construction of the A419/A417 Trunk Road Improvement between Swindon and Gloucester. Where the new road joined the existing A417 a new roundabout, Cowley Roundabout, was constructed to the south of Birdlip Quarry. The excavations there were within the DCO boundary and resulted in the discovery of a Romano-British settlement close to the line of the Roman road, Ermin Street<sup>3</sup>. In addition to the Romano-British remains, a series of prehistoric pits were identified, as well as evidence of medieval plough furrows.
- 2.3.6 The settlement developed a short distance from the Roman road, set within a dry valley, originally with circular wooden buildings which were gradually replaced by circular, and eventually rectangular, buildings with stone foundations. Associated features, including pits, a corn drier, wells, ovens and a ditched trackway were also identified. The early buildings follow the 'native' Iron Age building style of wooden roundhouses, although the settlement plan is Roman in character. Given the proximity of the site to the earlier settlement excavated in advance of the Birdlip bypass, it is possible that this settlement replaced it, moving closer to the

Roman road and the opportunities that afforded. The first phase of settlement is dated to c.AD160-180, with settlement continuing into the fourth century. Remains of Ermin Street were also recorded, indicating that the line of the A417 does not fully follow the Roman road and that there is the potential for further remains outside of the current road corridor.

- 2.3.7 Work carried out to inform the ES, described below, indicates that the settlement and its associated field system, extended further north within the DCO boundary.

#### **Work carried out to inform the ES**

- 2.3.8 A baseline of known non-designated heritage assets was produced for a study area of 300m around the scheme alignment by Cotswold Archaeology<sup>4</sup>. This formed part of the baseline for the ES. The archaeological assessment used data from the Gloucestershire Historic Environment Record (HER), National Heritage List for England (NHLE), Gloucestershire Historic Landscape Characterisation (HLC), historic maps, LiDAR and aerial photographs. Archaeological remains, including prehistoric burial mounds, Iron Age and Romano-British sites and medieval settlements were identified. The findings of the archaeological assessment are included in the discussion of known archaeology later in this section of the DAMS.
- 2.3.9 An assessment of the impact of the scheme on designated and non-designated heritage assets, as well as on historic landscape character was carried out in the ES. While impacts arising from changes to the setting of several designated heritage assets were identified within 1km of the DCO boundary, the scheme would not have any direct (physical) effects on these. An assessment was also made of the historic landscape character of the study area and its surroundings. The area is a mostly rural landscape, characterised by the distinctive features of the Cotswold limestone scarp, its high open wolds and the rolling countryside at the base of the escarpment. Five historic landscape character areas were identified, including areas of agricultural land, woodland and the urban area of Brockworth. Due to the nature of the impacts on built heritage and the historic landscape (assessed within the ES as not significant), no mitigation measures have been identified which would be appropriate. As such, designated assets and historic landscape character areas are not considered further in this document.
- 2.3.10 A detailed gradiometer survey was undertaken over all accessible areas within the DCO boundary<sup>5</sup>. The purpose of the geophysical survey was to establish the presence and nature of detectable archaeological features. The survey identified a large number of anomalies thought to be of archaeological origin, the majority of which are thought to be associated with Iron Age/Romano-British settlement activity as well as a probable cemetery of the same date. This is reported in ES Appendix 6.4 Geophysical survey report (Document Reference 6.4).
- 2.3.11 A programme of trial trenching was undertaken which comprised 330 trenches, designed to allow the results of the geophysical survey to be ground-truthed, both where the survey showed evidence of possible archaeological remains and also areas that appeared to be blank areas<sup>6</sup>. This is included in the ES Appendix 6.5 Trial trenching report (Document Reference 6.4).
- 2.3.12 During the DCO Examination period additional geophysical survey was undertaken in areas that were not able to be completed prior to the DCO submission. The results of these surveys are incorporated into the data shown on Figures 1-5.

- 2.3.13 Ground Investigation, accompanied by a geoarchaeological watching brief, is being undertaken during spring/summer 2022. This investigation has not informed the content of this document, however it is expected that results will be available for the production of the Site-Specific WSIs.

### **Known archaeology**

- 2.3.14 The land within the DCO boundary has been divided into five areas as described in section 1.4. The archaeological evidence from each is described below.

#### Area 1: A417 west of the Air Balloon roundabout

- 2.3.15 This area follows the line of the existing A417 between the Air Balloon roundabout to the east of Crickley Hill to Little Witcombe at the base of the Cotswold escarpment. To the north is the important multi-period site of Crickley Hill (Scheduled Monument ID: 1003586) and the archaeological assessment<sup>7</sup> also identified the findspot of a prehistoric worked flint blade on the slopes of Crickley Hill in the northern part of the area. Geophysical survey in the westernmost part of the area, south of the existing A417, provided multiple responses of likely archaeological origin. Trial trenching of a large pit-like anomaly was confirmed to be a pit, with a fill containing multiple flint flakes derived from tool production of likely Neolithic date. Also in this area is a circular feature, tentatively interpreted as being a possible round house of Iron Age/Romano-British date<sup>8</sup>, but indicated by trial trenching to be more likely to be a circular enclosure of probable Iron Age date. A near-by pair of perpendicular responses are thought to continue outside of the survey area to form a probable rectilinear ditched enclosure; a form of enclosure typically of Iron Age or Romano-British date. The trial trenching confirmed an Iron Age date for these remains, interpreting them as being likely representative of an enclosure system and trackway. Colluvium was also identified in the central part of Area 1, south of the current course of the A417 as it climbs along the southern side of Crickley Hill, which may bury earlier deposits.
- 2.3.16 The archaeological evidence suggests that the area was agricultural during the medieval and post-medieval period, with surviving earthwork traces of ridge and furrow and historic hedgerows found in the area around Little Witcombe and along the southern side of the A417. While not identified within the DCO boundary, the archaeological assessment noted the presence of earthworks and evidence of quarrying along the slopes of Crickley Hill to the north of the area and the site of a Second World War barrage balloon just north of the DCO boundary at its western end<sup>9</sup>.

#### Area 2: Air Balloon to Shab Hill junction

- 2.3.17 The area is an area of historically pastoral land on high ground. Within the area is Emma's Grove, interpreted as Bronze Age round barrows, despite their unusual size, and designated as a scheduled monument (ID: 1017079). Geophysical survey undertaken in 2006 identified an enclosure to the north east of Emma's Grove. Trial trenching established an Iron Age date for this enclosure; evidence was also observed for a palisade set into an earth bank. Considering the proximity of the contemporary Crickley Hill hill fort it seems likely that there could have been a functional relationship between these sites.
- 2.3.18 Elsewhere in this area the trial trenching identified dispersed prehistoric archaeological remains in the form of pits and ditches, with several individual finds of worked flint made across the area. An undated skeleton was discovered to the north of the Air Balloon roundabout, together with deposits of colluvium.

### Area 3: Shab Hill to Cuckoo Pen

- 2.3.19 Area 3 includes the existing A417 as it passes Barrow Wake and Cuckoo Pen and covers the land as far east as Birdlip Radio Station. Just to the west of the area, the archaeological assessment identified records of the possible site of a Bronze Age round barrow, an Iron Age cemetery, a possible Roman building and a large quantity of Roman pottery. Further east, north of Shab Hill Farm, the assessment noted the findspot of a Mesolithic microlith <sup>10</sup>.
- 2.3.20 Geophysical survey identified a series of anomalies interpreted as being associated with possible funerary activity. To the north of the area, outside of the DCO boundary, the survey responses show a dense concentration of oval-shaped anomalies orientated on a north-south alignment; an orientation suggestive of a non-Christian burial tradition which could date from the Iron Age through to the Early Medieval period. Within the DCO boundary, 50m south-east of this possible cemetery, the remains of a possible structure were identified. Trial trenching confirmed the presence of a possible enclosed burial at this location, however other geophysical anomalies thought to be potential burials were found to be of natural origin.

### Area 4: Shab Hill to Stockwell

- 2.3.21 This area is currently agricultural land and there are earthwork traces of ridge and furrow, holloways and quarry pits which indicate that it has historically been an area of farmland scattered with small scale extraction. Across the fields several cropmarks have been identified, interpreted as indicating the presence of Iron Age or Romano-British enclosures. In one area, the cropmarks are close to a scatter of Romano-British pottery which supports this interpretation<sup>11</sup>. Further evidence of Iron Age/Romano-British activity was noted in the geophysical survey, with responses being interpreted as a rectilinear enclosure and ditch-like features possibly associated with former field systems. Trial trenching confirmed that these features were related to a late Roman to post-Roman settlement, and evidence was found of a sunken feature building, which is typical of this period.
- 2.3.22 To the south, investigation of long linear geophysical anomalies by trial trenching suggests that these are prehistoric land boundaries; a number of pits containing Bronze and Iron Age pottery and finds were also identified in this area. Worked flint was found in a number of contexts, several of which were alongside Iron Age finds suggesting they were residual, but some features may be of earlier prehistoric date. Trial trenching also identified colluvium in several locations to the south and east of Shab Hill.

### Area 5: Stockwell to Cowley roundabout

- 2.3.23 This area covers the land south of Stockwell to the southern end of the scheme at the Cowley roundabout. The Roman Road of Ermin Street ran along the line of the existing A417, before its turn to the north, traced further west by 'Ermin Way' as it travels through Birdlip. Numerous finds have been made across the area, including Roman jewellery, pottery and coins, and a prehistoric arrowhead. There are also cropmarks and earthworks of undated enclosures and medieval or post-medieval lynchets. North of Birdlip, historic archaeological investigations found evidence of an Iron Age farmstead and a Romano-British settlement. Excavations carried out in advance of the construction of the Birdlip bypass identified a Middle Iron Age farmstead and possible Bronze Age ritual or funerary site. Cropmarks suggest that further remains extended beyond the area excavated for the road

construction but, as the DCO boundary follows the existing road footprint closely, these remains would lie beyond the scheme boundary. At Cowley Roundabout, a Romano-British settlement has been excavated and geophysics indicate that the settlement and field system associated with it extend further north and east from the junction. More modern features, including the site of a Second World War searchlight battery, located in the southern part of the area, and several disused quarries, are also present<sup>12</sup>. Geophysical survey of the area presented multiple responses, anomalies and possible features, including a large area of enclosures and evidence of settlement likely to be of Romano-British date<sup>13</sup>.

- 2.3.24 Trial trenching provided intensive evidence of settlement dating from the Bronze Age to Roman-British periods within this section of the scheme. To the south of Stockwell this took the form of substantial ditches. At Cowley roundabout evidence was found for the continuation of the Romano-British settlement on both the east and west sides of the former Roman road. To the east, evidence comprised an area of boundary ditches, from which was obtained substantial amounts of pottery, metal work and coins, suggesting a broad 4<sup>th</sup> century date for the settlement. Building material was found in the backfill of some ditches, however no evidence was found for any structures.
- 2.3.25 To the west of the former Roman road however, substantial stone foundations were found, together with a possible former yard surface. This area produced large amounts of pottery and metalwork. It was notable that these remains were covered by a substantial depth of colluvium, which likely contributed to their preservation. The colluvium contained a broken flint arrowhead and broken flint blade, potentially prehistoric activity on the higher ground. Worked flint was also found in the features below the colluvium, although in small quantities.

### **Palaeoenvironmental Potential**

- 2.3.26 Several dry valleys, for example around Coldwell Bottom, have potential for alluvial deposits originating from one of more streams as well as the colluvium identified within the evaluation trenches. These deposits may mask earlier deposits of archaeological interest and could contain localised areas of waterlogging including palaeo-environmental remains. In addition tufa producing streams and deposits of fullers earth are known from Shab Hill and Coldwell Bottom.

## **2.4 Research agenda and strategy**

- 2.4.1 The research agenda and strategy underpin all the archaeological mitigation work carried out as part of the scheme. Archaeological excavation is a destructive process, so although the excavation and recording of archaeological remains is carried out as mitigation, as an alternative to their unrecorded destruction during construction, it is imperative that high quality research is carried out during this process. To inform this, archaeological research frameworks have been created both for different regions of the UK and for different periods and types of archaeological remains. These frameworks help to coordinate and focus research, informing the establishment of research questions which will help to fill gaps in current knowledge.
- 2.4.2 The scheme is within the area covered by the South West Archaeological Research Framework (SWARF)<sup>14</sup>, in addition to period-based frameworks which relate to particular types of site or artefacts. In this section the overarching strategic themes identified by SWARF are discussed in relation to their relevance to the scheme, drawing on the evidence of the baseline conditions. Themes A, B,

D and E relate to the archaeology of the region and are a useful framework for considering the research priorities for specific periods. Themes C F, G and H deal more specifically with scientific methods, access, publication and funding and do not directly feed into the research agenda for this scheme, although those relating to methodology have informed the general principles described throughout this document. As such themes C, F, G and H are not described individually here.

- 2.4.3 The overarching research themes contained within SWARF are followed by a discussion of each period as it relates to the archaeology within the scheme, with research questions for each. These have been informed by the archaeological research frameworks, both regional and period specific, for each time period, as well as from the nature of the potential archaeology.
- 2.4.4 Each theme uses the alphabetical signifier used by SWARF. Each research question has been given a letter (based on the name of the period) followed by a number.
- 2.4.5 In addition to SWARF, period-based research agendas and syntheses have also informed the development of this research agenda and should be referred to during the archaeological works as new discoveries emerge. These include, but are not limited to:
- Britons and Romans: advancing an archaeological agenda<sup>15</sup>;
  - The Rural Settlement of Roman Britain<sup>16</sup>
- 2.4.6 Appendix D provides an initial matching of the research themes and questions to each part of the archaeological mitigation. Some questions have not yet been specifically assigned to an area of mitigation but may become relevant during the course of the works, for example if an area thought to have Iron Age features subsequently is revealed to have earlier or later remains as well.

### **Chronology**

- 2.4.7 The periods described in this document, and Table 2-1, are based chronologically on the system set out by the Forum for Information Standards in Heritage (FISH).

**Table 2-1 Chronological periods**

Period name	Sub-periods	Date range
Palaeolithic	<i>Lower Palaeolithic</i> <i>Middle Palaeolithic</i> <i>Upper Palaeolithic</i>	1,000 000 – 10,000 BC <i>1,000 000-150,000</i> <i>150,000-40,000</i> <i>40,000-10,000</i>
Mesolithic	<i>Early Mesolithic</i> <i>Late Mesolithic</i>	10,000 – 4,000BC <i>10,000-7,000</i> <i>7,000-4,000</i>
Neolithic	<i>Early Neolithic</i> <i>Middle Neolithic</i> <i>Late Neolithic</i>	4,000 – 2,200BC <i>4,000-3,300</i> <i>3,300-2,900</i> <i>2,900-2,200</i>
Bronze age	<i>Early Bronze Age</i> <i>Middle Bronze Age</i> <i>Late Bronze Age</i>	2,600 – 700BC <i>2,600-1,600</i> <i>1,600-1,200</i> <i>1,200-700</i>
Iron age	<i>Early Iron Age</i> <i>Middle Iron Age</i> <i>Late Iron Age</i>	800BC – AD43 <i>800-300</i> <i>300-100</i> <i>100-43</i>
Roman	-	AD43 - 410
Early medieval	-	410 - 1066
Medieval	-	1066 - 1540
Post-medieval	<i>Tudor</i> <i>Stuart</i> <i>Georgian</i> <i>Victorian</i>	1540 – 1901 <i>1485-1603</i> <i>1603-1714</i> <i>1714-1830</i> <i>1837-1901</i>
20 <sup>th</sup> Century	<i>Early 20th century</i> <i>Mid-20th century</i> <i>Late 20th century</i>	1901 – 2000 <i>1901-1932</i> <i>1932-1966</i> <i>1967-2000</i>
21 <sup>st</sup> Century	-	2001 - 2100

## Themes

### Theme A: settlement sites and landscapes – urban, rural, maritime and prehistoric

*“The South West has always been predominantly rural and the changing patterns of land use and settlement form a key component of any study of the past. In particular the transition between periods should be addressed by emphasis during excavation on rigorous dating strategies from appropriate contexts<sup>17</sup>.”*

- 2.4.8 This theme focuses on the relationship between settlements and their surrounding landscapes. Within the DCO boundary, the presence of a potential



roundhouse of unconfirmed date, a Roman settlement and an enclosure conservatively interpreted as containing a possible sunken featured building, present opportunities for the detailed examination of this theme across several periods. Outside of the scheme, Crickley Hill and the near-by Roman Road provide associative connections to the wider landscape. There are known connections between prehistoric monuments and tufa springs, and it is likely that these associations continued either ritually or economically into later periods. Acknowledging these relationships enables the examination of connections between the movement of people, ideas, settlement patterns, land the use, and the exploitation of the landscape and its natural resources on a local scale. The analysis and reporting of the archaeological work should seek to synthesise the results within their landscape context, reflecting on the influence of the topography, intervisibility, hiddenness and routeways on the archaeological remains identified.

#### Theme B: artefacts and the built environment – technologies, resources, links to trade

*“The Bronze and Iron Ages are the obvious starting point for artefact-based technologies and research, with again a need for a synthesis of work and collaboration between interested parties... Mineral acquisition and processing needs its own strategy...”<sup>18</sup>*

- 2.4.9 This theme relates to the production and use of resources, including the extraction of rock and minerals and the production of food, and the ways in which the ideas, resources and products were used in the past. The evidence for settlement and burial within the DCO boundary raises the possibility not only for good artefactual recovery, but also for remains of production sites. In particular, the Roman roadside settlement at Cowley roundabout may provide insights into trade along the road, although the trial trenching identified mostly locally produced ceramics. However, a nationally rare ‘Cupid as Hercules’ figurine was found, which is likely to have had Continental origins. The evidence also suggests the presence of a possible Roman cemetery and ritual site within the DCO boundary, raising the possibility for recovering grave goods and/or votive offerings that may themselves reveal elements of local, regional, or even international trade or the movement of objects of cultural value. The landscape also bears traces of quarrying and farming, allowing for the potential to investigate both the extractive stone industry in the area and the changing patterns of agriculture over time.

#### Theme D: social identity and change – transition, identity, territories, religion, conflict and death

*“Priorities which are immediately applicable to the SW strategy include developing integrated approaches to prehistoric landscape; improving understanding of the spatial, typological and chronological context of prehistoric sites and monuments; and raising awareness of the significance of “sites without structures” through improved understanding of ephemeral sites...”<sup>19</sup>*

- 2.4.10 This theme focuses on issues of social relations, identity, religion and conflict. Across the site there is evidence of prehistoric activity, with both stratified and residual worked flint recovered from Areas 1, 2, 4 and 5. In order to gain a wider landscape perspective on prehistoric activity, and assist in identifying any ephemeral remains beyond that found through trial trenching, a programme of ploughzone artefact collection will be put in place before the start of construction,

with any possible sites identified added to the advance excavation areas as appropriate.

- 2.4.11 Several areas of possible Iron Age and Roman date have been identified within the DCO boundary. This provides an opportunity to examine the possible effects of change and social influence brought about by the arrival and establishment of Roman culture. Part of a Roman structure was identified during the trial trenching, located in the southern part of the site (Area 5). This was located close to a watercourse and the Roman road and the artefacts associated with it indicate a possible ritual connection, possibly as a roadside temple/shrine. Further north, in Area 2, a bronze figurine of Cupid as Hercules was also discovered in a deposit of hearth waste. This is a clearly ritual item and the further excavation proposed may reveal if it is an isolated find or part of a wider assemblage of ritual materials. Also in Area 2, a Roman cremation burial was found within a square enclosure.
- 2.4.12 It may also be possible to examine the potential significance of natural elements of the landscape, for example springs, streams and woodland glades, and how these more ephemeral elements of the landscape are recognised and evolve over time. Efforts to connect the archaeological potential within the DCO boundary with known assets and deposits outside of it may also enhance the understanding of social change of a local scale; this could be of particular interest when considering how later Roman administrative areas disrupted or reflected earlier Iron Age territories or areas of influence.
- 2.4.13 The possible roadside temple and the material culture of Roman settlement will be particularly important, alongside any further evidence of burial, which could provide evidence of Roman religion, spirituality, social change and death on a local scale.

Theme E: economies and subsistence – trade, agriculture, transport and communication

*“The movement of objects, people and ideas is most widespread in the more recent periods but, obviously, began with the first humans to explore the region<sup>20</sup>.”*

- 2.4.14 This theme is related to the ways in which trade and communication affected local economies, technologies and practices. This ranges from the adoption of arable farming and stock keeping in prehistory, the effects of the Roman army on local populations and the influences of agricultural improvement and new communications in the post-medieval and modern periods. Review of the desk-based research and geophysical survey results from within the DCO boundary shows a high potential for the continued occupation of settlement sites. This provides the opportunity to assess any surviving plant or animal remains to further the understanding of agricultural practice, animal husbandry and domestication, and, potentially, diet over time. Furthermore, changes in how the landscape and natural resources were used around potential settlement sites within the DCO boundary could be investigated by consideration of assets outside of the DCO boundary; for example, identifying any connections between the Roman settlement within the DCO boundary and the local Roman villas, Roman road, and regional trade centres could deepen our knowledge of substance production, production for trade, and consumption due to social status or cultural identity. As stated in relation to Theme A, the analysis and reporting of the archaeological work should seek to synthesise the results within their landscape context.

- 2.4.15 The Roman road of Ermin Street, used from the Roman period into the present, connected the rural area to major centres of population and trade in the area. The archaeological investigation provides an opportunity to enhance the understanding of road and trade networks and, potentially, how the mobility of people, goods and ideas evolved within the locale over time; how the routeways used and the forms they take synergised with or punctuated the landscape through which they passed.

### **By period**

#### Prehistoric: palaeolithic to bronze age (1,000 000-c800 BC)

- 2.4.16 Excavations carried out in advance of the Birdlip bypass construction found a penannular ditch which was tentatively dated to the Neolithic to Middle Bronze Age period and interpreted as a possible ritual or funerary site<sup>21</sup>. The site was heavily truncated by ploughing making a conclusive interpretation challenging. All remains of this feature were removed by the construction of the existing A417. Some evidence of Neolithic activity was also found during the trial trenching undertaken to inform the DCO) ES Appendix 6.5, Part 1 of 4, 8.4 – 8.7). Beyond this, little evidence for pre-Iron Age activity has been identified within the DCO boundary, but there is considerable amount of evidence from earlier periods from the surrounding area. During the Palaeolithic period this area of Gloucestershire was tundra. The fluvial gravels found in the strata of Gloucestershire contain an abundance of well-preserved large mammal bones such as red deer and horse.<sup>22</sup> Find spots and gravel pits at the nearby Barnwood, and a sewer trench at Brockworth, yielded evidence of lower/mid Palaeolithic human activity while there is evidence that the area near Stockwell Farm, immediately north of the scheme was utilised since c.6500 BC and has provided a plethora of evidence for late prehistoric human activity<sup>23</sup>.
- 2.4.17 The alkaline limestone provides ideal circumstances to unveil rich faunal and human bone assemblages from the Neolithic period within Gloucestershire<sup>24</sup>. There is evidence that the area in the vicinity of the scheme was first domestically occupied during the Neolithic with examples of defended settlements found at Crickley Hill and The Peak, north of Birdlip. There is evidence of the first major occupation of Crickley Hill c. 3rd millennium BC with the remains of the foundations of a causewayed enclosure at the top of the hill<sup>25</sup>. The site comprised of two lines of interrupted ditches cut off the low knoll, accompanied with a bank built of stones taken from the ditch, two built entrances, and pits and post-sockets that outline where structures would've stood. The phasing of the ditches infilling suggests a lengthy but intermittent use of the early site<sup>26</sup>. The newer, larger ditch, drystone walls, fence and depositing of flint arrowheads imply a development of the site's function to a presumably defensive enclosed settlement; however, fire at the site resulted in an immediate end to Neolithic occupation<sup>27</sup>.
- 2.4.18 The Peak, which is located to the south of Crickley Hill, comprises of two concentric arcs of boundary earthworks forming an oval plan and contained evidence of plain bowl pottery, flint tools and the waste material from knapping, animal remains (mostly cattle), human metatarsal bones and traces of cereal production. Evidence of worked flint is similarly found across the whole of Gloucestershire.<sup>28</sup> It is believed that the sites were contemporaneous with one-another and Crickley Hill and The Peak formed a wider single complex<sup>29</sup>.
- 2.4.19 The Gloucestershire landscape is also characterised with Bronze Age barrows. Coberley features two long barrows, with skeletal remains of a small male found

at one of the barrows in the late 18th century<sup>30</sup>. There is also evidence for prehistoric activity surrounding Shurdington with spurs and other earthworks identified in the hills that look upon the village. Shurdington Hill features a Long Barrow which was later landscaped with the plantation of Scots pine at the end of the 19th century<sup>31</sup>. Known as 'Barrow piece', the site was excavated in the 18th century which identified a cromlech that yielded a skeleton and other burial goods that were not detailed in reports<sup>32</sup>.

- 2.4.20 Geophysical survey within the DCO boundary has provided a range of responses and anomalies considered to have an archaeological origin. Across the survey areas, several other anomalies of unknown date are noted as representative of possible extraction or refuse pits, and areas of burning. These possible features are, for the most part, assigned an unknown date and some may be of earlier prehistoric date<sup>33</sup>.
- 2.4.21 One possible Bronze Age feature has, however, been identified in Area 1. A fragmented circular anomaly was identified in this area and, although interpreted as most likely to represent a roundhouse of Iron Age/Romano-British date, the responses could also relate to a Bronze Age round barrow<sup>34</sup>.

### *Research questions*

- P1: Is there evidence which can enhance our understanding of the environmental conditions associated with known prehistoric sites in the vicinity of the scheme. What evidence is there for human activity, settlement, and agriculture?
- P2: Can obtaining high quality dates for small sites (pits and post-holes) contribute to a greater understanding of the spread and use of these sites across the local landscape?
- P3: How does the archaeological evidence contribute to the understanding of the region's monumentality in the Neolithic and early Bronze Age?
- P4: How does the archaeological evidence widen understanding of Neolithic and Early Bronze Age mortuary practice within the region?
- P5: What evidence is there that may improve understanding of agricultural intensification and diversification in later prehistory?
- P6: What do organic remains tell us about food processing and production during this period, and how does this relate to developments in agricultural practice and technology?
- P7: What do organic remains tell us about the domestication and/or husbandry of animals during the period? How does this compare with evidence of hunting or fishing?
- P8: Can evidence from food production, processing and storage provide evidence of peoples relationship to plants and animals in prehistory (i.e. wild foods vs arable produce)?
- P9: Is there evidence which can address the general lack of understanding between the transition from Bronze Age to Iron Age?
- P10: In what ways has the available archaeological evidence widened understanding of the transition from later Bronze Age to early Iron Age material culture?
- P11: What ephemeral evidence is there for the early prehistoric and can this be synthesised with results from the wider area to contribute to a greater understanding of these periods, particularly the Mesolithic to Neolithic and Neolithic to Bronze Age transitions.

- P12: Can prehistoric remains identified provide connections between the known sites in the area, particularly including Peak Camp, Crickley Hill and the round barrows which are spread across the landscape?
- P13: What do features such as pit alignments and cross dykes tell us about management of the landscape and settlement in prehistory?

#### Iron Age (800BC-AD43) and Romano-British (AD43-410)

- 2.4.22 Outside the DCO boundary, sites dating to the Iron Age mostly comprise settlement sites (that include agricultural activity), defensive sites, and findspots<sup>35</sup>. Excavations carried out in advance of the construction of the Birdlip bypass recorded a Middle Iron Age farmstead site, although all the remains of this within the DCO boundary will have been removed by the previous road construction. There is an abundance of evidence from the pre-Roman Iron Age across Gloucestershire, with most of the evidence coming from earthworks and enclosure complexes<sup>36</sup>. The development of the Crickley Hill Neolithic site continued into the Iron Age with the addition of a hill-top enclosure<sup>37</sup>. The development at Crickley Hill in the 7th/6th century BC saw the addition of a new rampart and ditch enclosure spanning nine acres and abutting the previous Neolithic enclosure<sup>38</sup>. The occupation of the hillfort lasted no more than two generations before the site was abandoned. A second hillfort was constructed at the site around a century later with a central “great” roundhouse c. 50 feet in diameter, surrounded by sporadically placed smaller round houses and small square structures that were probably granaries or stores<sup>39</sup>. A final episode of destruction by burning ended occupation on the hill.
- 2.4.23 Further evidence of Iron Age occupation comes from Barrow Wake, on the edge of the escarpment east of Crickley Hill and just beyond the DCO boundary, where a rich cemetery dating to c. 1st century was found during quarrying in 1879: comprising of three burials found under a cairn, in cists lined with limestone flags; and a fourth burial nearby<sup>40</sup>. The ‘Birdlip Mirror’ was also uncovered at Barrow Wake, a pre-Roman bronze decorative piece dating to c. AD50.
- 2.4.24 The major Roman military road, Ermin Street, linked the historic city of Gloucester (Colonia Glevum Nervensis) west of the study area, with Cirencester (Corinium Dobunorum) to the south-west of the site in the 1st century AD. For much of its length the present day A417 follows the alignment of the Roman road, before deviating to the south of Stockwell and continuing its route through Birdlip towards Gloucester. Just north of the road, at the Cowley Roundabout, a Romano-British settlement site was excavated in 1996. Geophysics indicate that there are further settlement remains to the north and east of this site.
- 2.4.25 The Gloucestershire landscape is scattered with Roman villas, including the 3rd – 5th century villa at Great Witcombe, within the study area. Great Witcombe Villa was occupied until the 5th century and evidence was found in the 20th century that suggested it featured a bathhouse complex which may also have been a shrine to a water spirit<sup>41</sup>. Mosaic pavements were also excavated at the same site and are now housed inside a modern building for protection. Further evidence of Roman elite within the study area can be found north of the scheme at Dryhill Villa to the north of Crickley Hill. This was excavated in the mid-19th century and comprised of twelve rooms with a hypocaust, and included painted plaster, Roman coins and pottery. At Coberley, north-east of the study area, evidence of a Roman villa complex was found including trackways, ditches, springs, mosaics and a kiln<sup>42</sup>.

- 2.4.26 Sites of Romano-British date are numerous and indicate the extensive occupation of the landscape. Sites of Romano-British date comprise road alignments, settlement sites (in various scales from villas through to small rural estates), field systems, cemetery sites, occasional single inhumation or cremation burial sites, and a multitude of findspots. The findspots themselves comprise not only single low-value deposits but single deposits of high value (e.g. brooches), coin hoards, and pottery scatters<sup>43</sup>.
- 2.4.27 Geophysical survey of Area 1 revealed a ring-ditch feature interpreted, due to its size and the density of surrounding remains of that period, as a probable Iron Age or Romano-British roundhouse<sup>44</sup>. It was close located next to a probable rectilinear ditched enclosure, a form of enclosure associated with these periods. A possible second round house, interpreted as being either Iron Age or Romano-British in date was identified near to Grove Farm. Further evidence of Iron Age/Romano-British settlement activity was noted in Area 4 with responses being interpreted as recliner enclosures and ditch-like features possibly associated with former field systems and a long linear ditch.
- 2.4.28 Survey of Area 2 revealed a series of anomalies interpreted as being associated with possible funerary activity. The survey responses show a concentration of features interpreted as burials, orientated in a way that suggests a non-Christian burial tradition. South of this possible cemetery is a square anomaly which may represent a ritual building or shrine<sup>45</sup>.
- 2.4.29 The most southerly area, Area 5, presented multiple responses, anomalies and possible features. These responses have been interpreted as originating during the Iron Age and Romano-British periods due to their proximity to, and possible relationship with, the Roman Road of Ermin Street<sup>46</sup>.

### *Research questions*

- IR1: What were the environmental conditions associated with this landscape during the period and how did this influence or affect human activity, settlement, and agriculture?
- IR2: What do organic remains tell us about food processing and production during this period and how does this relate to developments in agricultural practice and technology?
- IR3: What evidence is there for mineral acquisition, through both extraction and exploitation of natural resources and trade, and processing?
- IR4: What evidence is there for the transition from Iron Age culture to Romano-British in the area?
- IR5: In what ways has the archaeological evidence improved understanding of the effects of the Roman army on the local population?
- IR6: What was the impact of Roman influence on Iron Age settlement, trade, politics and cultural practice?
- IR7: In what ways can the archaeological and landscape evidence improve understanding of non-villa Roman rural settlement? Is there evidence for continuity of land tenure/settlement location from IA?
- IR8: In what ways does the archaeological evidence improve and widen understanding of Roman religious practice and burial traditions, especially at transition periods?
- IR9: What was the impact of the Roman empire on farming in terms of practice, technology, and the trade of foodstuffs?

- IR10: What is the relationship between the features identified in Area 5 and the excavated Romano-British site at Cowley Roundabout? Can these features further inform our understanding of this site, its phasing and importance?
- IR11: Is there evidence that can contribute to the wider understanding of Roman rural settlement, such as numbers of buildings, building form, materials, architectural elaboration and relationship to function?
- IR12: Is there evidence that the settlement at Cowley junction played a particular role for traffic passing between Cirencester and Gloucester? A staging post or religious site?
- IR13: Is there evidence for a transition between burial practice in the Iron Age and Romano-British periods, in particular around Barrow Wake. Does this continue into the post-Roman (Early Medieval) period?

#### Early Medieval (410-1066)

2.4.30 Historically, there has been limited visibility of early medieval remains within the archaeological record and there are still gaps in archaeological understanding, particularly in relation to the transition from the end of the Roman period and in the development of rural settlements in the area<sup>47</sup>. There is evidence of continued use or reoccupation of Roman sites in Gloucestershire, notably at Frocester, c18km south-west and, recently discovered, at Chedworth Roman villa, c13km east<sup>48</sup>. In the 5<sup>th</sup> and 6<sup>th</sup> centuries there was also reoccupation of Iron Age hillforts, including Crickley Hill, where two settlement areas dating to the 5<sup>th</sup>-6<sup>th</sup> centuries have been identified. It is conjectured that the hillfort was reoccupied gradually, perhaps with people moving from settlements in the surrounding area in the 5<sup>th</sup> century, the hillfort perhaps conveying status and power as well as security<sup>49</sup>. Geophysical survey within Area 2 revealed a series of anomalies interpreted as being associated with possible funerary activity. As described above, these are considered likely to be of Romano-British date, but the geophysics report allows for a range of possible dates prior to the widespread adoption of Christianity, meaning that there is the possibility that they are of Early Medieval date<sup>50</sup>. A similarly tentative interpretation was given to a large pit-like feature at the centre of a ditched enclosure in Area 3. This has some of the features of a sunken-floored dwelling, a typically Early Medieval type of structure<sup>51</sup>.

#### *Research questions*

- EM1: What were the environmental conditions associated with this landscape during the period and how did this influence or affect human activity, settlement, and agriculture?
- EM2: Are any of the linear earthworks or field systems within the DCO boundary of Early Medieval date and, if so, what evidence can they provide relating to the socio-political situation in the area in this period, such as the origins of later estate, parish and manorial boundaries? Is there evidence that these developed from earlier boundaries?
- EM3: Is there evidence which can address the transition from Romano-British to Early Medieval life in the area, particularly within areas of Romano-British settlement?
- EM4: How does the archaeological evidence aid in the development of methodologies designed to identify Early Medieval rural settlements within the region? Can prehistoric or Romano-British settlement be an indicator?

- EM5: How does the archaeological evidence aid in the understanding, identification and dating of Early Medieval technologies within the region?
- EM6: What does burial evidence, if present, tell us about the transition from non-Christian to Christian religious belief and funerary practice in the Early Medieval period?

#### Medieval and Post-Medieval (1066-1901)

- 2.4.31 Outside the DCO boundary, sites from the Medieval period mostly comprise earthworks including evidence of two deserted Medieval settlements, field boundaries, and a small number of findspots<sup>52</sup>. The area appears to have been largely agricultural in nature, with areas of ridge and furrow and lynchets surviving in places. From the Post-Medieval period there are a far greater number of surviving buildings, although only one of them is within the DCO boundary, the Air Balloon public house.
- 2.4.32 In the Medieval period the area that now includes Gloucestershire was noted as England's 'central province', characterised by large nucleated villages surrounded by extensive open fields<sup>53</sup>, although the area of the scheme is characterised more by hamlets dispersed along routeways, with occasional farmsteads. Most of the fields were enclosed through agreements during the period creating the field system landscape that is recognisable in the present day. The work of Elizabeth and Alan Jack in 2000 aimed to display the Medieval Parishes of Gloucestershire with as little modern intrusion as possible, noting the retained historic character<sup>54</sup>. During the medieval period England's main commerce was the wool trade, with the Cotswolds often recognised as one of the key suppliers for the country, as well as being hailed for the quality of product produced<sup>55</sup>.
- 2.4.33 Close to the scheme, Medieval evidence can be found on the northern slopes of Crickley Hill which were used for grazing by the people of the Brockworth parish<sup>56</sup>. The presence of a small stone structure believed to be a Shepherds hut supports this. Scholarly debate also persists regarding the long mound at Crickley as it has been suggested it is a Medieval pillow mound for the breeding of rabbits<sup>57</sup>. There is evidence of a possible structure in use during the mid to late Medieval period within the boundary of the tennis court on the Stockwell Farm property, although the structure no longer exists<sup>58</sup>. Stockwell was first recorded in the early 13th century when it was encompassed in the Cowley manor estate<sup>59</sup>.
- 2.4.34 The Post-Medieval period saw continued development of infrastructure within the study area, although it largely remained an agricultural landscape. The Cotswolds continued practice of farming the land resulted in the characterisation that they were principally arable by the mid-19th century<sup>60</sup>. At Crickley Hill, quarrying and lime-burning took place from the 18th century into the early 19th century, creating the steep cliffs that now characterise it. Crickley Hill road was an early Toll Road and milestones along its route may be very early in date.
- 2.4.35 Geophysical survey within the DCO boundary provided a range of responses and anomalies considered to have an archaeological origin. Across the survey areas, several other anomalies of unknown date are noted as representative of possible extraction pits while others have been noted as representing possible former field systems, enclosures, and boundaries. Although undated, it is possible that some of these features are Medieval in date<sup>61</sup>.
- 2.4.36 Survey of Area 1 has, however, revealed several features of likely Medieval or Post Medieval date. The first has been interpreted as a ditch-like feature. Positioned roughly parallel to the known ridge and furrow remains, it is likely that



these features are related. Additional linear features have also been identified in the proximity of the same area of ridge and furrow, although the geophysical responses are considerably weaker<sup>62</sup>. Similar responses are observed in the northern part of Area 2 where a series of anomalies along a north-west to south-east alignment have been identified and associated with ridge and furrow cultivation. Broadly spaced, parallel linear anomalies have also been identified in Area 5 and are interpreted as ridge and furrow cultivation patterns of Medieval or Post-Medieval date<sup>63</sup>. Across all the surveyed areas there is also evidence of small-scale quarrying and material extraction activities, many of which correspond to quarries noted on historic maps, which also support the geophysical survey report's conclusions relating to areas of woodland clearance and former field boundaries.

### *Research questions*

- MPM1: What were the environmental conditions associated with this landscape during the period and how did this influence or affect human activity, settlement, agriculture, and industry?
- MPM2: Is there evidence of medieval pastoralism which can reveal information about its nature (e.g. transhumance practices) and effect on social relations?
- MPM3: What evidence is there for the development of quarrying in the area, including issues of dating, processing and transportation?
- MPM4: Is there archaeological evidence for agricultural improvement in the post-medieval period, and what effect did it have on the historic farming practices of the area?
- MPM5: What can the fabric and structure of the Air Balloon public house reveal of its history and usage as a roadside inn?
- MPM6: What date and style is the milestone north of the road at Crickley Hill? How does it connect with other milestones along the A417?
- MPM7: How did the creation of the Toll Road influence agricultural practice and settlement?

### 20th Century (1901-2000)

- 2.4.37 Outside the DCO boundary, sites from this period are rare, although some heritage assets dating to the Second World War (1939-1945) have been identified scattered across the wider landscape<sup>64</sup>. Gloucestershire was key contributor to the war effort during WW2. Brockworth in the west of the study area was a significant site with military aircraft industry factories and anti-aircraft defences<sup>65</sup>. Close to the DCO boundary, at Shab Hill, was a military radio station, elements of which survive today. In the north of the study area quarrying continued at Crickley Hill, although in decline, up until the mid-20th century<sup>66</sup>. The eastern part of the hill complex known as the Scrubbs was acquired by the National Trust in 1935<sup>67</sup> and was open to the public as Crickley Hill Country Park. Further developments to understanding the site led to the implementation of signposts by the National Trust, educating visitors on the vast history of the site<sup>68</sup>.
- 2.4.38 Within the DCO boundary, potential for the recovery of archaeological deposits from this period is considered low. This is because extant, and most non-extant, structures from this period are already known, including assets from the Second World War such as pill boxes and barrage balloon sites.

- 2.4.39 While geophysical survey within the DCO boundary provided multiple responses characteristic of modern services such as cables and pipelines it also revealed several features associated with changes to the agricultural landscape during the period, including trackways, former field boundaries, field drains and made ground associated with construction<sup>69</sup>.

#### *Research questions*

- 20C1: to what extent can 20th century agricultural practices be demonstrated to have impacted buried archaeological remains? Is there a difference between areas of pasture and arable? To what extent to combe deposits preserve archaeological features?
- 20C2: is there evidence for WWII structures such as aerial bases or foundations for gun emplacements? Does evidence survive for infrastructure that connected them- temporary roads etc?

## **2.5 Strategy for mitigation**

- 2.5.1 The DAMS has been written to comply with the National Policy Statement for National Networks, NPPF, National Planning Practice Guidance and the Design Manual for Roads and Bridges (DMRB). Where possible, impacts on the historic environment have reduced or avoided through the design of the scheme. However, where this has not been possible a programme of archaeological mitigation would be put in place. This includes archaeological excavation and recording, test-pitting, fieldwalking, geoarchaeology, monitoring, reporting, publication, dissemination and archiving. The DAMS and the OWSI forms the framework within which the mitigation would be developed and undertaken.
- 2.5.2 The archaeological mitigation strategy applies to all areas and works required for the scheme, as defined in the DCO. This includes elements such as landscaping, and the decommissioning and reinstatement of land used for compounds, if archaeological remains may be present (i.e. if features have been retained within these areas).
- 2.5.3 A programme of archaeological measures would be put in place to ensure the protection of archaeological remains which are to be retained and the recording of archaeological remains otherwise affected by the scheme. This includes:
- measures put in place to ensure no accidental damage to the bowl barrows at Emma's Grove, a scheduled monument which will be retained and protected
  - the retention of archaeological remains where they have been identified at locations (such as compounds, landscape planting, ecology habitat replacement areas) where it is possible to leave them undisturbed
  - the recording of structures which will be relocated or demolished as part of the scheme
  - the relocation or protection in situ of a post-medieval milestone
  - Ploughzone artefact collection (fieldwalking and topsoil test pitting)
  - the advance excavation and recording of complex archaeological remains identified, including the areas of Romano-British settlement and burial
  - the excavation and recording of sparser areas archaeological features (e.g. pits) that are discovered during archaeological monitoring of topsoil strip during construction
  - a review of existing borehole data and specific archaeological boreholes to obtain palaeo-environmental and geoarchaeological evidence and assist in deposit modelling

- the analysis and reporting of the materials produced through the works described, including appropriate publication, dissemination, public engagement and outreach, and archiving

- 2.5.4 Where wider activities which would require topsoil stripping and/or ground disturbance, such as tree planting, soil and waste storage and landscaping are taking place, archaeological remains would either be protected and retained or excavated and recorded, as detailed in Appendix C and Appendix D. Archaeological remains would be retained without disturbance where this is possible. Dense tree planting has been designed to avoid known archaeological features and a watching brief would be in place during landscaping work to ensure that any previously unidentified archaeological remains are excavated and recorded. In areas where topsoil is being stripped archaeological monitoring will be maintained, and remains would be excavated and recorded. If archaeological remains are identified and there is no requirement, in construction terms, for them to be excavated, the archaeological contractor would liaise with the works contractor, the project manager's archaeologist and the ACoW to agree for them to be retained. This would require them to be reburied and fenced off to prevent damage from exposure and plant movement.
- 2.5.5 In areas where it is known that past activities, such as construction or extraction, have disturbed the ground to the extent that no archaeological remains are likely to survive, no archaeological works are proposed. This includes areas of recent quarrying and the existing footprint of the A417, which is a major, modern road where significant past disturbance is likely. Roads and trackways, other than the A417, would be covered by the wider watching brief to allow for the identification and recording of any features surviving beneath them.
- 2.5.6 The areas where archaeological mitigation would be carried out are referred to as 'sites' in this document. At this stage, 33 sites are proposed, including five for preservation in situ, 16 for excavation where complex and extensive remains are anticipated, 10 for strip, map and sample and two for building/structural recording. These areas will be refined during detailed design. The remaining areas, with the exception of those excluded due to known modern disturbance (roads and quarries), will be monitored through a watching brief. Where archaeological remains are identified outside of the footprint of the works, but within the DCO boundary, these would be retained and protected appropriately during the construction period (see section 3.4).
- 2.5.7 The five sites proposed for preservation in situ are:
- Retained area 1: Trial trenching revealed several pits, a post hole and the terminus of a curvilinear ditch. Artefacts recovered included worked flint, later prehistoric pottery, Roman pottery, and charred material. As this area sits outside of the footprint of the engineering works, these remains will be retained within the development as an area of grassland.
  - Retained area 2: Geophysical survey identified evidence of an enclosure and other discrete anomalies in this area, including a rectangular feature speculatively interpreted as a possible sunken floored building (SFB). Subsequent trial trenching supported this analysis, interpreting the archaeological remains as a possible post-Roman SFB from which early medieval pottery sherds were recovered. Several pits, an enclosure ditch and other ditches were also identified, with finds including Middle to Late Iron Age pottery and Roman pottery. As this area sits outside of the footprint of the engineering works, these remains will be retained within the development.

This area will be fenced and protected from the surrounding development during construction.

- Retained area 3: Geophysical survey revealed a number of anomalies indicative of an interconnected network of rectilinear enclosures, along with a range of other discrete anomalies. Trial trenching identified multiple ditches and post holes, several containing considerable quantities of Roman pottery sherds, alongside ceramic building material and animal bones. A pair of parallel ditches were also found, interpreted as a post-medieval field boundary. As this area sits outside of the footprint of the engineering works, these remains will be retained within the development.
- Retained area 4: This is an area around the scheduled monument of Emma's Grove round barrows (scheduled monument ID: 1017079). This will be fenced and protected from the surrounding development during construction. For further details see section 3.4

2.5.8 It should be noted that during detailed design aspects of the scheme could change, resulting in a variation of the areas listed above.

2.5.9 The 27 sites proposed for advance excavation are:

- Excavation areas 1-3: targeting a number of prehistoric or Romano-British features at the western end of the scheme, including ditches containing Roman pottery, a pit containing 47 fragments of worked flint, interpreted as a knapping deposit, a possible trackway and pair of enclosures from which Middle Iron Age pottery, animal bone and cereal grain fragments were recovered during trial trenching.
- Excavation area 4: An enclosure, identified by trial trenching to date from the Iron Age. To the south east trial trenching uncovered several undated ditches, pits and postholes. Cereal grains were identified from the postholes.
- Excavation area 5: Trial trenching found several undated pits and ditches. An inhumation burial was partially exposed, although not dated.
- Excavation area 6: Undated ditches were identified during trial trenching, along with a pit containing a single sherd of Roman pottery.
- Excavation area 7: Trial trenching identified several undated pits and ditches and an undated circular posthole.
- Excavation area 8: (Several undated pits and an undated ditch were found during trial trenching.
- Excavation area 9: Linear features and an area of combe deposit.
- Excavation area 10: Five undated pits were found in this area during trial trenching.
- Excavation area 11: no survey data available, to be investigated following ecological clearance .
- Excavation area 12: Lidar imagery of the area shows an elongated mound, tentatively interpreted as a barrow within the HER, as included in the Archaeological Assessment<sup>70</sup>. The trial trenching identified a ditch correlating to the position of the possible barrow. No dating evidence was found.
- Excavation area 13: Geophysical survey identified several linear anomalies to the south of a larger complex of features to the north (Retained area 2). Trial trenching recorded ditches cutting into colluvial deposits. Large quantities of early Roman pottery (1st and 2nd centuries AD) were found within the ditches. Cereal grain fragments were identified from samples. Additionally, a pit was excavated which contained Iron Age or 1st century AD pottery.

- Excavation area 14: Geophysical survey identified a linear arrangement of dipolar responses appearing as a long arcing feature. It may be related to a relatively modern field boundary, but trial trenching identified a ditch, not conforming to the alignment from the geophysics, which contained sherds of Roman pottery and a residual flint flake.
- Excavation area 15: Geophysical survey identified a long linear feature thought potentially to be part of an Iron Age or Romano-British field system. Although dating evidence was not found during trial trenching, the ditch itself was confirmed. A separate ditch was, however, found to contain a Roman penannular brooch. A series of sub-circular pits or post holes was also found, which contained prehistoric worked flint fragments.
- Excavation area 16: Trial trenches identified this feature as an Iron Age cross-dyke, which contained pottery, worked flint and animal bone, as well as pits with undated fills.
- Excavation Area 17: Geophysical survey identified a linear anomaly on a N/S alignment. Trial trenching encountered sections of a ditch, parallel at its southern end, which contained two sherds of Iron Age pottery. Intercutting pits, with undated fills, were also recorded.
- Excavation Area 18: Trial trenching in this area identified six irregular pits, all of which contained undated fills. Given the surrounding archaeology it is likely that they indicate prehistoric or Romano-British activity.
- Excavation Area 19: Geophysical survey identified two parallel linear anomalies as well as a weak curvilinear anomaly. Trial trenching identified the ditches. One containing prehistoric worked flint and animal bone, the other containing a 12th-14th century pot sherd. The curvilinear anomaly from the geophysics was not identified, suggesting it might be geological.
- Excavation Area 20: Geophysical survey identified two parallel linear anomalies, thought to be a former boundary or trackway. Trial trenching revealed opposing ditch termini, with fills containing Iron Age pottery, worked flint and animal bone. An undated pit was also recorded.
- Excavation Area 21: Geophysical survey identified a 91m curvilinear feature. Trial trenching confirmed that this feature was a ditch, possibly a field boundary. Parallel ditches were also identified, although the fills excavated did not contain any dating material. This area also contains a combe deposit.
- Excavation Area 22: Geophysical survey identified an extensive area of distinct enclosures arranged perpendicularly along a long curvilinear anomaly. This is interpreted as an area of possible settlement likely, given the proximity to the Romano-British settlement site excavated in advance of the construction of Cowley Roundabout in the 1990s<sup>71</sup> and the known course of Ermin Street, the Roman Road, to be of Iron Age or Romano-British date. Trial trenching across this area revealed multiple ditches, many containing Roman pottery along with ceramic building material, animal bone and small artefacts, including a Roman trumpet brooch and coins. Several of the ditches formed small enclosures. Elsewhere a robber trench, containing limestone rubble, is indicative of the presence of buildings. A quarry pit with Roman pottery was also identified, suggesting that further excavation could provide more evidence of the use of local materials in construction. The most striking find was a ditch which contained a large quantity of health material, likely a dump of hearth waste, within which a small figurine of Cupid as Hercules was found.
- Excavation Area 23: A large number of Roman finds have been made in this area prior to the works associated within the scheme, including copper alloy radiates, coins, flint scraper, trumpet brooch, tweezers, other brooches.

Several features were identified during geophysical survey, including a number of ditch-like features. Through trial trenching a stone spread was identified as well as cuts for parallel walls, potentially an external courtyard surface or trackway. Levelling deposits over this contained Roman pottery, Roman copper alloy coins, a finger ring, an iron mattock or pick head and an iron spade sheath. In another trench a ditch was excavated, containing Roman pottery, animal bone, a glass bead, copper alloy coin, ceramic building material and an iron hoe. Palaeo-environmental analysis found material indicative of crop processing waste. Trial trenching also identified several pits and ditches, which were undated. There is clear evidence of Roman rural settlement.

- Excavation Area 24: Trial trenching identified a spread of prehistoric pits and ditches spread over an extensive area, no clear focus of activity.
- Excavation Area 25: Geophysical survey identified evidence of possible funerary activity across this site and the area to the north (not within the DCO boundary). The evidence is a dense concentration of oval anomalies c2mx1m in size, generally aligned north-south. Historic mapping (1902 OS mapping) indicates that human remains were found at this location in 1979. The orientation is not typically Christian, indicating a likely date Iron Age, Roman or early medieval date. The anomalies within the DCO boundary are less well defined than those to the north, but are centred on a square feature interpreted as an 8x8m outer stone wall with possible inner wall and ditch, potentially with a central pit-like feature. Structures similar to this are often associated with Romano-British religious buildings such as small shrines. Trial trenching of this feature found ditches representing a small square enclosure with central features. A cremation burial with nine sherds of Roman pottery was found, providing further evidence of burial in this area
- Excavation Area 26: Area where a number of post-medieval sites are on historic OS map including The Bell Inn and structures relating to watercourse.
- Excavation Area 27: Undated pits recorded during trial trenching.

- 2.5.10 In order to appropriately assess the archaeological potential of combe and colluvial deposits, transects of purposeful geoarchaeological boreholes are required (carried out by experienced geoarchaeologists). This will provide a deposit model which will assist in the placement and size of trenches. Additionally retained cores will enable investigation of any paleoenvironmental deposits which will inform on the former landscape in relation to the multiperiod human activity indicated by the results of previous investigation and the evaluation trenching carried out in 2020/2021. In order for the transects to provide information on the size and placement of trenches the transects need to be carried out at an early stage of the programme of mitigation. Detailed methodologies will be supplied by specialist contractors within the SSWSIs for each location.
- 2.5.11 The Air Balloon public house, which would be demolished as part of the scheme, would be archaeologically recorded prior to its demolition (ABR\_01). On a smaller scale, prior to relocation, archaeological recording would be carried out on a post-medieval milestone located within the DCO boundary (ABR\_02). This second piece of recording work may not be required should it be possible to leave the milestone in situ.
- 2.5.12 All archaeological work undertaken would be carried out to recognised professional standards and informed by the research agenda contained within this report. It is anticipated that the results may have the potential to contribute to future research and the data produced would be appropriately analysed, reported

and the archive preserved. The results would be published formally and made publicly available.

- 2.5.13 Archaeological works would only proceed in accordance with this DAMS and OWSI, and other documentation submitted and approved to meet relevant DCO Requirements.
- 2.5.14 Details of the archaeological mitigation proposed, and locations and research questions for each site, are provided in Appendix C.

### 3 Overarching written scheme of investigation

#### 3.1 Scope

- 3.1.1 The archaeological mitigation proposed is a programme of works to include archaeological excavation and recording, including areas of strip, map and sample, and watching briefs alongside the retention of designated heritage assets. It has been informed by the Environmental Statement (ES) and previous investigations, which include, desk-based assessment, historic landscape characterisation, geophysical survey and trial trenching.
- 3.1.2 This Overarching Written Scheme of Investigation (OWSI) sets out the principles and parameters within which all archaeological mitigation should be carried out. Site-Specific Written Schemes of Investigation (SSWSI) would subsequently be prepared by the archaeological contractor to provide the details of individual elements of the work. The OWSI also includes details of the communication and monitoring which will be required throughout the archaeological works and provides an initial overview of the approach which would be taken to post-excavation, reporting and archiving.
- 3.1.3 The works described in the OWSI are designed to provide an appropriate level of archaeological mitigation as required by the DMRB<sup>72</sup> and the National Policy Statement for National Networks<sup>73</sup>. All works would be carried out in line within the ethical standards contained within ClfA's Code of Conduct, byelaws and Policy Statements, as listed in Appendix C.

#### 3.2 SSWSIs and method statements

- 3.2.1 The SSWSIs would be prepared to provide the details of each element of the archaeological mitigation at the detailed design stage. They will be informed by the DAMS, this OWSI and results from the geophysical survey (ES Appendix 6.4 Geophysical survey report (Document Reference 6.4)) and trial trenching (ES Appendix 6.5 Trial trenching report (Document Reference 6.4)).
- 3.2.2 The SSWSI would contain a specification for the archaeological works and include details of how the works relate to the research agenda, the purpose of the specific works and the methodology to be used, alongside details of the timing, programme and personnel proposed. It would include a Risk Assessment and Method Statement (RAMS), tied to the specific constraints and proposed methodologies for each area of the works.
- 3.2.3 Site-Specific ecological constraints would also be included in the SSWSI, which would detail the methodology to be taken in relation to protected or controlled species and other constraints.
- 3.2.4 All SSWSIs should refer to the DAMS and OWSI in their preparation. They would be prepared by the archaeological contractor in consultation with the county archaeologist and Historic England. They must be agreed with the county archaeologist and approved by the Secretary of State prior to the start of the element of works described in each SSWSI. This is secured by DCO Requirement 9.
- 3.2.5 Where affected archaeological remains are to be retained an archaeological Method Statement will be put in place by the ACOW that describes the specific protection that would be applied.



### 3.3 Notification of the discovery of significant archaeological remains

3.3.1 Across all the elements of work described in the OWSI, should significant archaeological remains be identified these procedures should be followed. Significant archaeological remains, in the context of this OWSI, include human remains, artefacts which constitute treasure under the terms of the Treasure Act 1996, archaeological remains which could warrant designation by scheduling, or prehistoric artefact scatters that could be of national importance.

3.3.2 No designated assets would be physically impacted by the scheme. Should previously unrecorded archaeological remains of potentially schedulable significance be identified, Historic England would be consulted about the approach to their preservation, either in situ (if practicable) or by record. Such remains would be identified through regular liaison between the archaeological contractor, the project manager, the GCC archaeological officer and Historic England, which would include the monitoring of the archaeological works.

#### Human remains

3.3.3 It is anticipated that human remains will be found during the course of the archaeological works. The strategy for the recovery of human remains is discussed further in section 3.11. Before that strategy can be implemented this procedure must be followed.

3.3.4 The archaeological contractor should obtain a burial license from the Ministry of Justice prior to the start of work on site, to allow exhumation under the terms of the Burial Act 1857<sup>74</sup> and under DCO Requirement 41 (Removal of Human Remains). The details of the license should be included within the SSWSI. Any finds of human remains would be left in situ, covered and protected. In the first instance the archaeological contractor would inform the works contractor, the ACoW and the project manager, National Highways and the county archaeologist. The excavation of the human remains will be undertaken in line with the provisions of the license obtained and following best practice guidance and the codes of practice and ethics for dealing with human remains detailed in Appendix C.

#### Treasure

3.3.5 Should finds falling within the definitions of treasure, under the terms of the Treasure Act 1996 (with subsequent revisions), they shall be reported immediately to county archaeologist, Historic England and the Gloucestershire and Avon Finds Liaison Officer and all subsequent works will be undertaken in accordance with the relevant legislative requirements. To be defined as 'treasure' an object must be at least 300 years old when found and:

- not be a coin but be at least 10% (by weight) precious metal
- be at least two coins in the same find with at least 10% (by weight) precious metal
- objects found associated with the above<sup>75</sup>

3.3.6 It should be noted that the Secretary of State has the powers to designate any object over 200 years old which they consider to be of "*outstanding historical, archaeological or cultural importance*"<sup>76</sup>.

3.3.7 To protect the finds from theft, the finds shall be recorded and removed to a safe place. Where recording and removal is not feasible or appropriate on the day of

discovery, adequate 24-hour security will be provided to protect the artefact(s) from theft or damage.

### **3.4 Retention of heritage and archaeological remains within the DCO boundary**

#### **Scheduled monument**

- 3.4.1 There is one nationally designated heritage asset located within the scheme. This is the scheduled monument: three bowl barrows, known as Emma's Grove round barrows (scheduled monument ID: 1017079).
- 3.4.2 Any unconsented damage to this heritage asset would constitute a criminal offence under the terms of the Ancient Monuments and Archaeological Areas Act 1979<sup>77</sup>.
- 3.4.3 This heritage asset will be retained and protected from inadvertent harm during the works. Prior to the start of any intrusive works, the area of the heritage asset and an exclusion zone approved by Historic England would be fenced off and remain fenced throughout the duration of the works. Specific access will be allowed for the purposes of undertaking ecological vegetation clearance. Ideally, the fencing should be freestanding (e.g. heras) to prevent any unnecessary ground disturbance. Should more robust temporary fencing with earth fast posts be required, the installation of the posts should be monitored archaeologically by watching brief. Alternatively, it may be possible to retain the existing fencing around the woodland for this purpose. Notices indicating the exclusion zone would be displayed clearly on the fence. The fencing would be erected or demarcated to a height at which it would be clearly visible from the drivers' cabins of construction vehicles.
- 3.4.4 Emma's Grove round barrows would be fenced off and inaccessible throughout the construction period, save for specific access for the purposes of undertaking required vegetation clearance and replacement grassland planting. The landscape, ecological and heritage design for the site includes the clearance of existing trees and vegetation from the barrows, which would be replaced by species rich grassland. Such works would include assessment of any damage caused by burrowing animals and remediation works being carried out (such as blocking up entrances) where evidence of damage from burrowing animals is found. This contributes to preservation of the barrows.
- 3.4.5 The details of these protective measures would be established in a Method Statement, produced by the contractor, and approved by Historic England and the GCC archaeological officer. Should archaeological monitoring of post installation be required, the scope and methodology would be detailed in a SSWSI.
- 3.4.6 The protective measures are included in ES Figure 7.9 Environmental Masterplan and ES Figure 7.11 Environmental Masterplan (Document Reference 6.3). All construction and ground works staff working on the scheme would receive a briefing about the approach taken to protect this heritage asset and the approach included in tool box talks throughout the duration of the works.

#### **Archaeological remains**

- 3.4.7 In addition to the scheduled monument, four other areas of archaeological remains will be retained within the development. These are remains which have been identified outside of the engineering footprint of the road (i.e. in areas required for planting or temporary stockpiles and compounds). Planting design

has been arranged to avoid known archaeological remains, meaning that they will be left undisturbed and measures to protect them from plant movement detailed in the EMP. Where topsoil stripping is required for these works outside of the footprint of the road a modified strip, map and record approach to excavation and recording or a watching brief would be employed, depending on the presence/absence of known archaeological remains. This would follow the methodology detailed in sections 3.7 and 3.9 for the monitoring of topsoil removal, retrieval of artefacts and mapping of features, which would then be excavated unless archaeological remains are identified in areas/depths that could be retained beneath the works. In these circumstances the archaeological contractor would liaise with the contractor, the project manager's archaeologist and the ACOW to agree an approach to appropriately protect them. This would require them to be reburied and fenced off to prevent damage from exposure and plant movement. Ideally, freestanding fencing would be used, marked with signage indicating the restrictions on work within the fenced area.

- 3.4.8 The details of these measures would be established in a Method Statement approved by the GCC archaeological officer. The protective measures would be included in the EMP for the construction stage and staff working on the scheme briefed. All archaeological monitoring and recording would be covered with a SSWSI submitted to GCC archaeological officer prior to the start of work.

### **3.5 Relocation of heritage assets**

- 3.5.1 In Area 1 there is a non-designated milestone located on the northern side of the existing A417. It is currently unknown if it can be retained in situ or if it would require relocation. If it is possible to retain it in situ, the approach detailed in section 3.4 for protective fencing would be followed.
- 3.5.2 Should relocation be required, the milestone would be removed and, following the completion of construction, relocated to a position further back from the road to allow it to be preserved and its relationship with the road maintained. During construction it would be stored in an appropriate environment. An initial condition survey would be carried out by the archaeological contractor and, if required, an appropriate conservator appointed by the archaeological contractor. The results of the condition survey would be used to inform a Method Statement which would describe the procedure for safely moving the milestone. This would include details of:
- any temporary protection required to protect the asset during relocation
  - lifting methods and transportation
  - details of its storage during construction
  - how and where it will be relocated
  - any measures required for maintenance
- 3.5.3 Prior to its relocation it would be recorded to a standard agreed with the GCC archaeological officer on the basis of the standards and best practice guidance published by Historic England<sup>78</sup>. This would follow a simplified version of the methodology contained within section 3.6.

### **3.6 Archaeological building recording**

- 3.6.1 Archaeological building recording is an investigative process for researching and recording built buildings or other structures. ClfA<sup>79</sup> define it as:

*“a programme of work intended to establish the character, history, dating, form and archaeological development of a specified building, structure, or complex and its setting, including buried components, on land, intertidal zone or underwater.”*

- 3.6.2 In the context of the scheme, the purpose of archaeological building recording is to develop a better understanding of the structures in question and create a lasting record of them which can be formally disseminated.
- 3.6.3 There is one built heritage asset within the DCO boundary which will be demolished (the Air Balloon public house). Prior to demolition, archaeological building recording would be carried out. Should the non-designated milestone require relocation, it would also be recorded in situ prior to its removal, storage and eventual relocation (see section 3.5).
- 3.6.4 The archaeological building recording would be carried out to comply with ClfA's standard and to the level of detail outlined in Historic England's guide Understanding Historic Buildings<sup>80</sup>. The levels required would be described in detail in the SSWSI having been agreed in consultation with the GCC archaeological officer. However, it is anticipated that this would comprise Level 1 recording of the milestone and Level 3 of the Air Balloon public house.
- 3.6.5 Level 1 is a basic visual record of the structure in its context, including:
- a sketched plan and other sketches as appropriate (minimum)
  - photographs to include views of the structure in its setting and its appearance from all angles. Further photographs could be taken during its removal and relocation
  - a basic report including its exact location (original and relocated) and a summary of its type, purpose, materials and possible date
- 3.6.6 Level 3 is an analytical record and would include:
- a measured drawing of the existing structure (minimum)
  - photographs to include views of the building in its setting, its external appearance, the principal rooms, particular details of the structure or decorations and any traces of its historic use (i.e. old equipment, graffiti, signage)
  - a written account to include details of the building, its form, function, date and sequence of development as well as research into its history and historic significance
- 3.6.7 The archaeological building recording would be informed by the research agenda, which includes research questions specifically applicable to the recording of both the Air Balloon public house and the milestone. Further research questions would be detailed in the SSWSI as appropriate.
- 3.6.8 The SSWSI would contain full details of the health and safety constraints at the site. While full interior inspection is anticipated as part of the Level 3 recording, this would only be carried out as far as is deemed safe.
- 3.6.9 Details of the standards for recording, reporting and archiving of the archaeological building recording is found in sections 3.10 to 3.15.

### **3.7 Ploughzone artefact collection**

- 3.7.1 In order to gather evidence of wider activity across the landscape and identify possible ephemeral sites which should be added to the advanced excavation or strip, map and record programme, ploughzone artefact collection will be

undertaken in advance of the construction phase. This will include fieldwalking of recently ploughed fields and the hand digging and sieving of test pits through the topsoil following a gridded sample across the Scheme.

- 3.7.2 Fieldwalking will be undertaken following ploughing. The ACoW will liaise with the archaeological contractor and National Highways to programme this appropriately, in advance of the construction phase. Archaeologists with experience of identifying artefacts in the ploughzone will carry out a fieldwalking over a 1m grid of each field, collecting any artefactual material visible on the surface and recording their spatial location.
- 3.7.3 In addition to fieldwalking, a gridded test pitting programme will be applied over the area within the DCO boundary. Test pits will be hand dug to the base of the topsoil and all material dry sieved on site to record the presence or absence of artefacts.
- 3.7.4 Should significant concentrations of artefacts be identified in areas not already targeted by advance excavation or strip, map and sample, the ACoW, in consultation with National Highways, Historic England and GCC will agree an appropriate strategy for excavation and recording.
- 3.7.5 Materials collected through fieldwalking and testpitting will be analysed by the appropriate finds experts, examined statistically (in the case of the test pit data) and included within the interpretation, reporting and archiving of the whole project (see sections 3.11 to 3.15).

### 3.8 Archaeological excavation and recording

- 3.8.1 Archaeological excavation is a detailed process of investigation, the purpose of which is to examine archaeological remains present across a defined area and with the intention of contributing to set research questions and produce a record of the results. ClfA<sup>81</sup> define excavation as:  
*“a programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures and, as appropriate, retrieves artefacts, ecofacts and other remains within a specified area or site on land, inter-tidal zone or underwater. The records made and objects gathered during fieldwork are studied and the results of that study published in detail appropriate to the project design.”*
- 3.8.2 The purpose, as stated by ClfA<sup>82</sup>, is:  
*“to examine the archaeological resource within a given area of site within a framework of defined research objectives, to seek a better understanding of and compile a lasting record of that resource, to analyse and interpret the results, and disseminate them.”*
- 3.8.3 The detailed archaeological excavation and recording proposed targets areas within the scheme where complex archaeological remains have been identified (Appendix D). This includes the area of the Romano-British settlement (AER\_03), the possible temple and cemetery site (AER\_04), the site with the possible sunken-featured dwelling (AER\_02) and the ring ditch/possible round house site (AER\_01). Details of the archaeological potential and research questions for each is presented in Appendix D. All excavation would be informed by the research agenda included in the DAMS in section 2.4.
- 3.8.4 In areas where previous investigations have identified archaeological remains but which have not been specifically targeted for detailed excavation and recording a

strip, map and sample approach would be taken as described in section 2.5 and Appendices C and D. Strip, map and sample is a form of archaeological excavation and recording typically used to ensure the mitigation of effects on archaeology where more isolated archaeological remains are anticipated across large areas. For this scheme, this includes areas where the ditched features of probable Iron Age/Romano-British field systems have been identified, or where there are isolated features such as pits.

- 3.8.5 All archaeological excavation and recording should comply with the ClfA Standard and Guidance for archaeological excavation<sup>83</sup> and other appropriate relevant standards as listed in Appendix B. The following sections detail the general parameters for the work. The SSWSIs would provide greater detail for each site.

### **Topsoil stripping**

- 3.8.6 While the SSWSIs will detail the specific requirements, it is anticipated that the excavation of each site proposed for detailed excavation would begin with machine excavation to remove topsoil and subsoil down to the top of the uppermost archaeological layers. This would be carried out using a 360° mechanical tracked excavator fitted with a toothless ditching bucket. Topsoil would be removed in spits of no more than 200mm depth and care taken to make the surface excavated to as smooth as possible to aid the identification of archaeological remains. Machine excavation would proceed until the top of the archaeological deposits are reached or undisturbed natural deposits are encountered.
- 3.8.7 The machine excavation would be constantly monitored by an experienced archaeologist. The mechanical excavator would not be allowed to track over any areas until they have been inspected and cleared by the archaeologist.

### **Excavation methodology**

- 3.8.8 Once the archaeological horizons have been revealed all further excavation would be carried out by hand by qualified and suitably experienced archaeologists. First the area would be cleaned using hand tools to allow archaeological features and structures to be identified. Following this, features would be excavated by hand. Spoil should be checked for finds and metal-detected. The SSWSI would contain a sampling strategy for each site, to be informed by the specific requirements and research questions for the anticipated archaeological remains. This allows a flexible approach to be taken, determined by an evolving evidence base. However, as a general rule, this should include:
- All features relating to burial or other ritual activity
  - All fills/layers with potential for detailed scientific analysis and/or dating (e.g. post hole fills or features associated with industrial activity)
  - Fifty percent (minimum) fill of features such as pits or ring ditches
  - Twenty percent of features associated with structural remains; and
  - Ten percent of linear features not associated with structural remains, to include terminals and relationships with other features).
- 3.8.9 Sampling should particularly focus on answering the specific research questions identified in the research agenda. This includes focusing on any deposits occurring at the interface between periods and where environmental evidence is a particular focus.



- 3.8.10 The SSWSI would contain details of specific sampling strategies to be employed for the recovery of artefacts and environmental artefacts (ecofacts) (see section 3.11).
- 3.8.11 Should any significant archaeological remains be identified the process outlined in section 3.3 should be followed.
- 3.8.12 Across several parts of the site colluvium has been identified, most notably in proximity to Crickley Hill, Shab Hill and at the very south of the Scheme (see section 2.3). Colluvium may mask earlier archaeological remains and, as a result, particular caution should be taken when signing off areas as complete. An experienced geoarchaeologist should be provided by the archaeological contractor to assist in the identification of colluvium. It may be necessary, in areas where a significant depth of colluvium is present, to undertake augering and potentially test pitting for artefact recovery, to inform the further investigation of sites. Methodologies and method statements for hand or power auger equipment should be included in the SSWSIs, as appropriate.
- 3.8.13 Should excavation encounter areas where archaeological remains are waterlogged, the ACoW will liaise between the archaeological contractor and contractor to establish a working method in line with the Environmental Management Plan. The excavation should be carried out by suitably qualified field archaeologists, with experience working with waterlogged deposits, and the work should be in line with the relevant best practice guidance included in Appendix B.
- 3.8.14 There should be weekly monitoring as a minimum of all excavations carried out by the project manager, the GCC archaeological officer and, where appropriate, Historic England.
- 3.8.15 An appropriate amount of time (a minimum of 9 months) should be allowed within the programme for the archaeological excavation and recording and no preparation or construction work will begin before areas have been signed off by the GCC archaeological officer.
- 3.8.16 The requirements for recording, the treatment of finds and samples, post-excavation, reporting and archiving are detailed in sections 3.10 to 3.15.

### **3.9 Watching brief**

- 3.9.1 A watching brief would be carried out across all areas of the route which are not subject to advance excavation and there is no evidence of past ground disturbance of an extent which would have affected the survival of archaeological remains. In these areas, the archaeological contractor shall undertake monitoring and recording during all ground works which would have the potential to disturb archaeological remains (e.g topsoil stripping).
- 3.9.2 ClfA<sup>84</sup> define a watching brief as:  
*“a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons.”*
- 3.9.3 The purpose of the works is to enable a qualified archaeologist to identify, record and retrieve (as far as is reasonably practicable), remains that may be uncovered in the course of construction activity. The works would result in the preparation of an ordered archive to be incorporated into the post-excavation works of the scheme, and into publication of the results.

- 3.9.4 The watching brief should be carried out in line with the ClfA Standard and guidance for an archaeological watching brief<sup>85</sup> and other appropriate relevant standards as listed in Appendix B.

### **Methodology**

- 3.9.5 The archaeological contractor shall carefully observe all groundworks undertaken within the area of the watching brief which have the potential to contain archaeological remains. Usually groundworks to be observed would include any that involve the removal of topsoil, subsoil, made ground and superficial geological deposits. Machine excavation would be undertaken using a toothless ditching bucket to prevent harm to any archaeological remains present, following the methodology for topsoil stripping outlined in section 3.8.
- 3.9.6 Should previously unidentified archaeological remains be identified are encountered, the archaeological contractor would notify the project manager and the ACoW and agree an approach for excavation and recording (see section 3.8). The archaeological contractor would work with the contractor to demarcate the area where archaeological remains have been identified allowing topsoil stripping to continue elsewhere.
- 3.9.7 In line with Requirement 9, parts (4) and (5), if significant archaeological remains are discovered, as defined in section 3.3, are identified, the following process will be implemented:
- The archaeological contractor will inform the contractor immediately and contact the project manager and the ACoW;
  - The ACoW will ensure that the area of the archaeological discovery is clearly demarcated on site to prevent access.
  - The archaeological contractor will produce a SSWSI and the ACoW will submit this to the County archaeological officer;
  - The County archaeological officer will comment upon and approve this document within 14 working days of submission by the ACoW;
  - Following approval the SSWSI will be enacted on-site.
- 3.9.8 The archaeological contractor shall record the observation on a daily basis. At a minimum this should include:
- the area observed
  - date
  - personnel
  - brief description of the construction works observed
  - type and extent of construction activity
  - depths
  - measure of confidence that any archaeological remains would be observed and reasons for this
  - reasons why any particular areas of the works were not observed, noting those areas not subject to disturbance from construction
  - location and brief description of any modern remains

## **3.10 Recording**

- 3.10.1 Detailed records would be made for all work, including written, drawn, digital and photographic records. Records should be tied into the OS grid and 3D coordinates collected, with levels taken above Ordnance Datum.



- 3.10.2 Archaeological features should, at a minimum, have an individual context record on an appropriate pro-forma record sheets and an accompanying drawn record, normally a plan and section drawing.
- 3.10.3 Other appropriate drawn and written records would also be produced (for environmental sampling etc).
- 3.10.4 A photographic record, including both monochrome and digital images, would be made. Each photograph shall include an appropriate scale, north arrow and a header board detailing (as a minimum) the site code and context/feature number. The archaeological contractor shall also take appropriate record photographs to illustrate work in progress.
- 3.10.5 Digital records shall comply with digital data standards and must be stored in an appropriate location and backed up regularly, with the backups held separately. The SSWSI would detail any specific requirements for format as directed by the digital archive policies of the Museum where the archive would be deposited.
- 3.10.6 The SSWSI would provide specific details of the recording systems to be put in place.

### **3.11 Finds and samples**

- 3.11.1 During excavation artefacts (finds) and environmental artefacts (ecofacts) would be collected. They would be appropriately labelled and packaged on site, with arrangements made for the immediate conservation of artefacts which are deemed to require it. All artefacts and ecofacts, unless agreed with the GCC archaeological officer and the Museum where the archive would be deposited and detailed in the SSWSI, would be retained for analysis.
- 3.11.2 The SSWSI would detail the approach to be taken for bulk and registered finds. Bulk finds are those which typically occur in quantities (i.e. pottery) and which requires no specialised treatment or storage conditions. Registered finds are more unusual or sensitive finds which are recorded in greater detail. They can include metalworks, glass, worked bone and other materials which may require specialised storage or conservation. They are recorded individually. Registered finds may be treasure, as defined by the Treasure Act 1996. In these cases, the approach detailed in section 3.3 must be followed.
- 3.11.3 Where human remains are encountered, specialised methodologies may be required for their excavation. In addition to ensuring that remains are treated with dignity and respect, the complexity and potential for scientific analysis makes human remains and associated grave contexts of particular sensitivity. The SSWSI would provide details on the methodology for each site and their preparation should be informed by best practice guidance, as listed in Appendix B, and the specialist advice of the archaeological contractors human osteologist. It is anticipated that 100% of all burial contexts will be excavated. In the case of discrete cremations, efforts should be made for them to be bulk lifted so that they can be excavated in controlled laboratory conditions following x-radiography. Depending on nature and condition, the same approach may be appropriate for grave goods. Inhumation burials would be carefully excavated, with samples taken from the surrounding soil in order to allow for further analysis.
- 3.11.4 Samples would be taken for environmental analysis, following Historic England's guidance<sup>86</sup>, Environmental Archaeology – a guide to the theory and practice of methods, from sampling and recovery to post-excavation. Details of the sampling strategy for each site would be detailed in the SSWSI.

- 3.11.5 Finds and environmental samples would be analysed concurrently with the archaeological fieldwork to allow interpretations to be developed and refined on site.
- 3.11.6 The archaeological contractor would make appropriate provision for the application of scientific dating techniques and other scientific analyses.
- 3.11.7 The collection, recording, analysis and conservation of artefacts and ecofacts collected during the archaeological fieldwork will comply with the ClfA<sup>87</sup> Standard and guidance for the collection, documentation, conservation and research of archaeological materials. Materials would be cleaned and packaged to recognised standards listed in Appendix B. Further requirements, as dictated by the Museum where the archive would be deposited, would be detailed in the SSWSI.

### **3.12 Post-excavation assessment**

- 3.12.1 Following the completion of archaeological fieldwork an assessment shall be made of the necessary scope of post-excavation analysis required. Consultation with the GCC archaeological officer and Historic England shall be undertaken to establish any additional research objectives that have emerged through the fieldwork. The post-excavation assessment should include, but is not limited to:
  - assessment of the findings against the original research agenda and questions to determine to what extent they have been met and to identify any new research questions to be included in the post-excavation design
  - statement of the quantity and perceived quality of the data in the site archive
  - a statement of the archaeological potential of the data to answer the scheme's research aims
  - recommendations for analysis, data storage and curation
- 3.12.2 Best practice guidance for the compilation of a post-excavation assessment is included in ClfA's<sup>88</sup> Standard and guidance for the collection, documentation, conservation and research of archaeological materials and this should be used to inform and guide the specification for this stage. Further best practice guidance can be found in Appendix B.

### **3.13 Post-excavation analysis**

- 3.13.1 Post-excavation analysis, appropriate to the nature, scale and significance of the findings, shall be carried out following the archaeological works and be informed by the post-excavation assessment and consultation with the GCC archaeological officer and Historic England.
- 3.13.2 Analysis of the finds and ecofacts would follow the ClfA<sup>89</sup> Standard and guidance for the collection, documentation, conservation and research of archaeological materials, as well as specific guidance as appropriate to the materials.

### **3.14 Reporting, publication and dissemination**

- 3.14.1 The archaeological contractor would produce interim reports at intervals detailed in the SSWSI and, on completion of the works, produce a final report on the results of the archaeological works. This would detail the results of the archaeological excavation and watching briefs integrated with the results of the post-excavation and written within the framework of the research agenda contained within the DAMS (and any subsequent revisions to this). The form of this report, together with the number of hard and digital copies required, would be detailed in the SSWSI.

- 3.14.2 The analysis and reporting of the archaeological work will synthesise the results within their landscape context, reflecting on the influence of the topography, intervisibility, hiddenness and routeways on the archaeological remains identified.
- 3.14.3 It is likely that results of at least regional interest will be made during the archaeological mitigation. It is important to ensure that these results are made accessible and are disseminated appropriately. The SSWSIs and post-excavation assessment would detail appropriate avenues for dissemination, such as archaeological journals, public information events and lectures and online materials.
- 3.14.4 A programme of outreach and public engagement will be developed by the archaeological contractor in consultation with National Highways to ensure dissemination of results to the people in the local and regional area and contribute to public benefit.

### **3.15 Archive preparation and deposition**

- 3.15.1 Following the completion of archaeological works the material archive, including finds samples, digital, written, drawn and photographic records and associated report would be deposited in an appropriate archive. Deposition of the archive would be in line with ClfA's<sup>90</sup> Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives.
- 3.15.2 The archive shall conform to best practice standards for the UK both for the artefactual, paper and digital materials produced by the archaeological works (see Appendix B for relevant guidance). A digital record to the project outline should be inputted to OASIS, the online index to archaeological grey literature.
- 3.15.3 The SSWSI would detail the specific requirements of the Gloucestershire Archaeological Archive Standards<sup>91</sup>. The scheme mostly lies within the area covered by the Corinium Museum and the Museum should be invited to contribute and advise on the collection, analysis and storage of materials throughout the development and implementation of the archaeological works.

### **3.16 Communications, monitoring and sign off of archaeological works and documents**

- 3.16.1 Liaison between the archaeological contractor, National Highways, GCC archaeological officer and Historic England would be handled by the project manager and the ACoW. They would arrange for monitoring visits and handle the communication of issues such as the discovery of significant archaeological remains.
- 3.16.2 The GCC archaeological officer and, where appropriate, Historic England, would review and approve all documents relating to the works, including the SSWSIs, interim reports, post-excavation assessment and final reports.
- 3.16.3 The archaeological mitigation would be monitored throughout by the project manager, the GCC archaeological officer and, where appropriate, Historic England. Monitoring visits would be used to track ongoing process and also to sign off on areas which are complete and can be handed over to other contractors.
- 3.16.4 Details of these responsibilities and reporting lines are shown in flow charts in Appendix A.

### 3.17 Programme

- 3.17.1 The archaeological works described in this OWSI would be carried out as part of the preparatory and main works packages. Archaeological mitigation must take place prior to the disturbance of the ground by other preparatory or construction activities and, with the exception of watching briefs, must be signed off before other contractors can move into areas cleared of archaeology.
- 3.17.2 The majority of the archaeological fieldwork would be undertaken during the preparatory works phase. The detailed excavation is likely to take several months to complete and be programmed to start enough in advance of when areas are required by other contractors to prevent undue delays to construction. Strip, map and sample excavation can be integrated more closely with the preparatory works programme, with areas stripped, examined and recorded by the archaeological contractor and signed off on a rolling basis to prevent the need to backfill areas. The watching brief would be carried out on areas not otherwise investigated by excavation during initial groundworks. During the main works any remaining areas requiring a watching brief would be monitored.
- 3.17.3 Following the completion of fieldwork, the post-excavation assessment, post-excavation, reporting and archiving phases will be undertaken. The programme for these would be detailed in the post-excavation assessment.

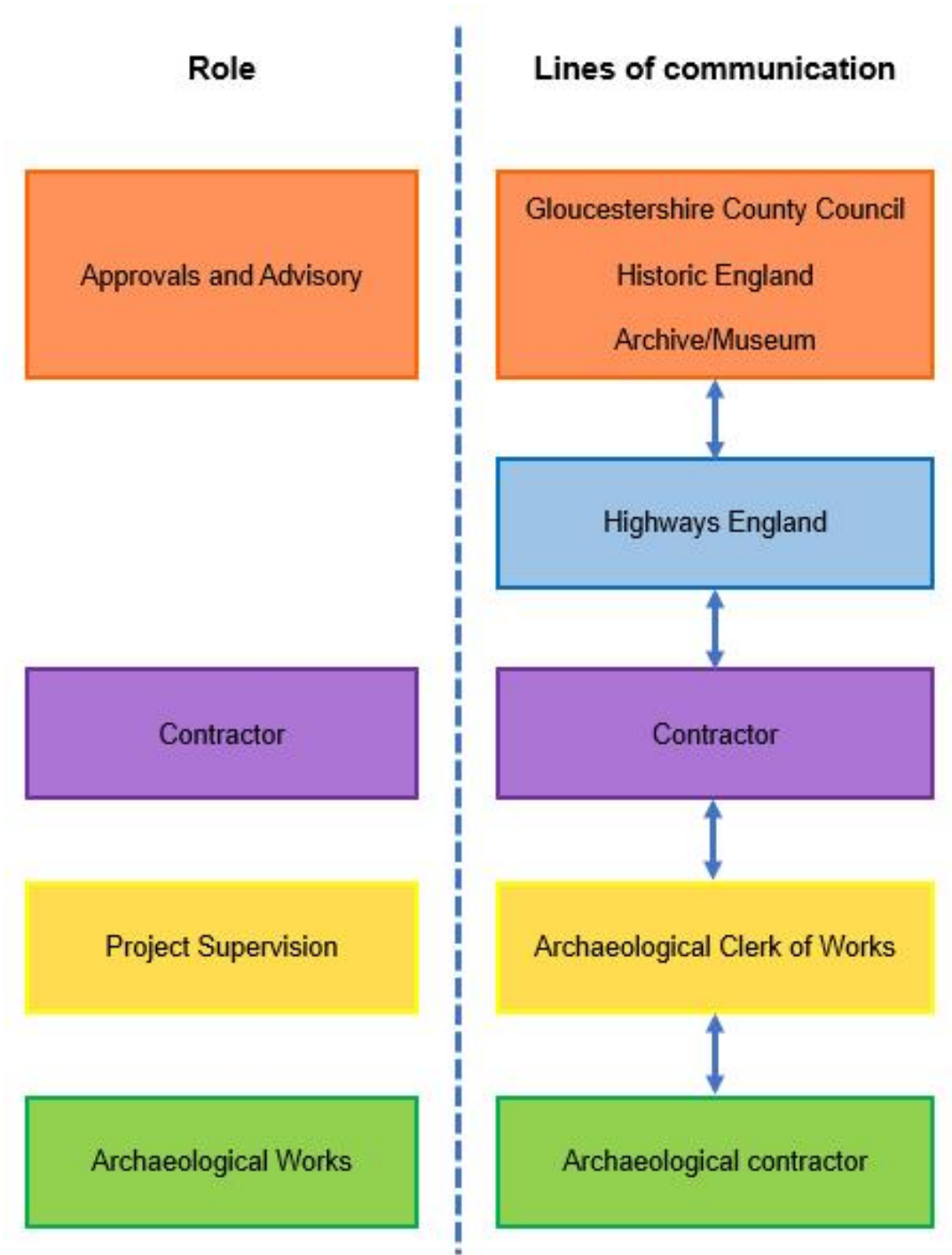
## Abbreviations List

ACoW	Archaeological Clerk of Works
AONB	Area of Outstanding Natural Beauty
BABAO	British Association for Biological Anthropology and Osteoarchaeology
EMP	Environmental Management Plan
DAMS	Detailed Archaeological Mitigation Strategy
DCO	Development Consent Order
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
FISH	Forum for Information Standards in Heritage
HER	Historic Environment Record
HLC	Historic Landscape Characterisation
NHLE	National Heritage List for England
OASIS	Online Access to the Index of archaeological investigation
OWSI	Overarching Written Scheme of Investigation
RIS	Road Investment Strategy
SSWSI	Site-Specific Written Scheme of Investigation
SRN	Strategic Roads Network
SWARF	South West Archaeological Research Framework

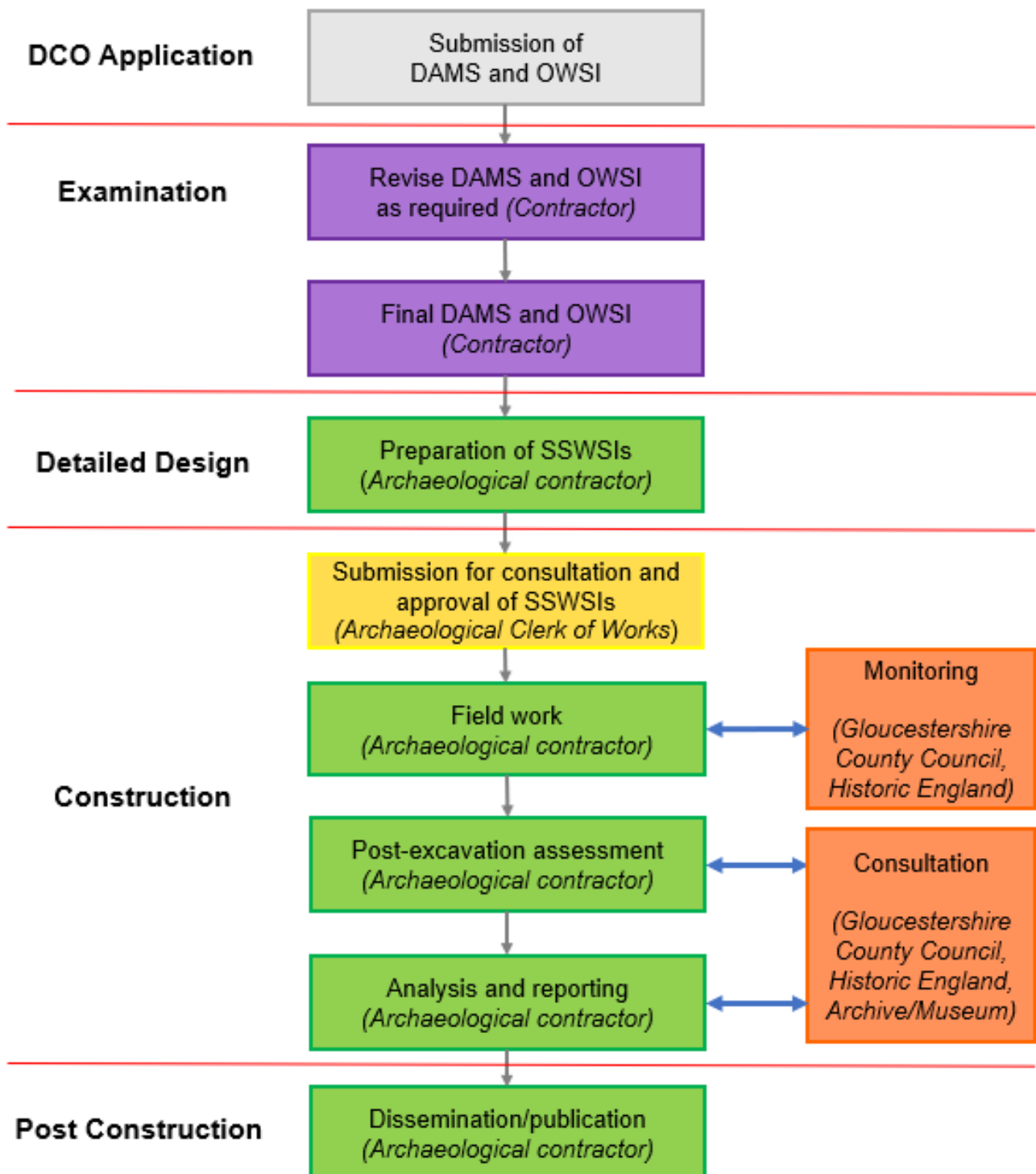
# Appendices

# Appendix A Flow charts

## A.1 Roles and indicative lines of communication

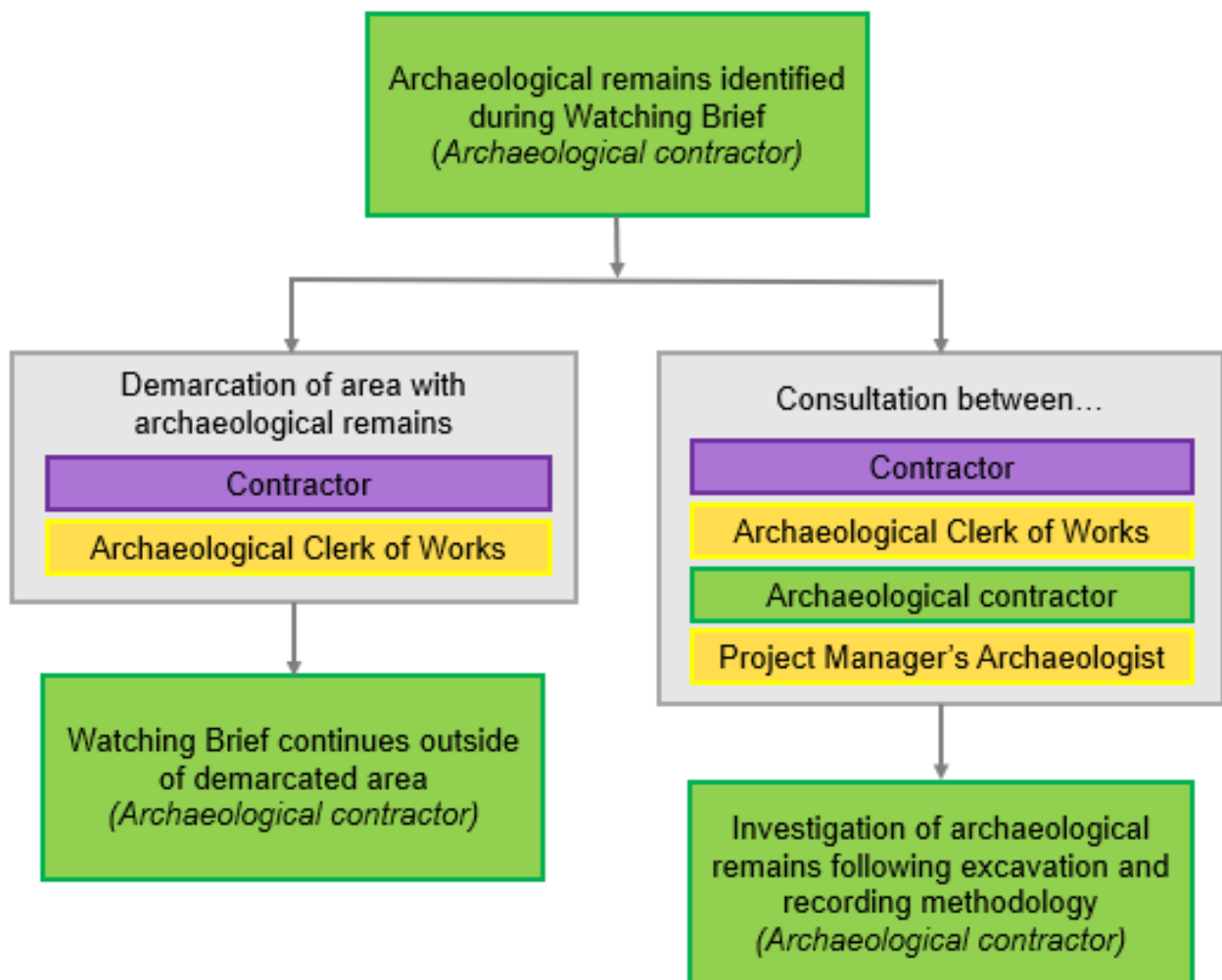


## A.2 Process for development and implementation of the DAMS





### A.3 Process for transition from Watching Brief to Excavation and Recording



## Appendix B Archaeological standards and guidance

B.1.1.1 Table B-1 is a non-exhaustive list of archaeological standards and guidance which are likely to be useful when compiling SSWSIs. They represent both general and more specific best practice standards and guidance. They have been compiled on the basis of the current understanding of the potential archaeology.

**Table B-1 Archaeological standards and guidance**

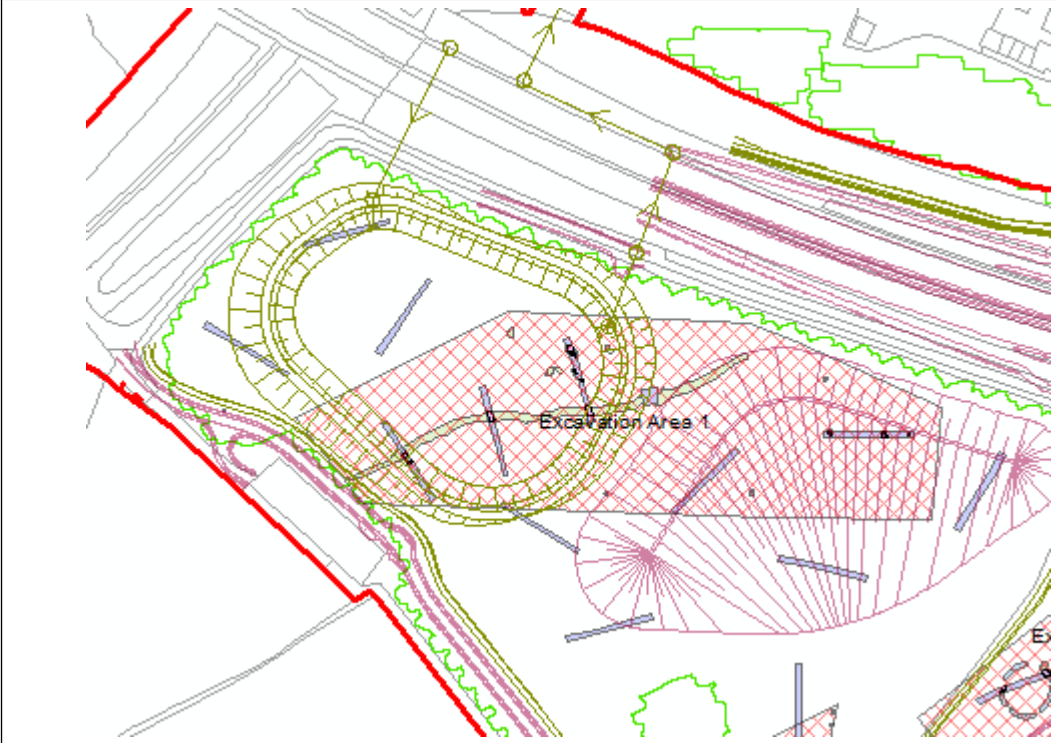
Author/organisation	Date	Document
Archaeological data service	2011	Digital Antiquity Guides to Good Practice
Archaeological archives forum	2007	Archaeological Archives. A guide to best practice in creation, compilation, transfer and curation.
ALGAO	2015	Advice Note for Post-Excavation Assessment
BABAO	2010 (updated 2019)	Code of Practice
		Code of Ethics
Brickstock, R.J.	2004	The production, analysis and standardisation of Romano-British coin reports.
Brown, A. and Perrin, K.	2000	A model for the description of archaeological archives. Information management and collections.
Brown, D.H.	2011	Safeguarding Archaeological Information. Procedures for minimising risk to undeposited archaeological archives.
		Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation.
Cole, S.	2017	Photographing Historic Buildings
ClfA	2020	Code of Conduct
		Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives.
		Standard and guidance for the collection, documentation, conservation and research of archaeological materials.
		Standard and guidance for archaeological excavation
		Standard and guidance for archaeological watching brief.
		Standard and guidance. Appendices
	2018	Policy Statements
	2020	Standard and guidance for the archaeological investigation and recording of standing buildings or structures
ClfA and BABAO	2017	Updated Guidelines to the Standards for Recording Human Remains
DCMS	2008	Treasure Act 1996 Code of Practice
Historic England	2006	Guidelines on the X-radiography of archaeological metalwork
	2010	Waterlogged Wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood.
	2011	Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation.


Author/organisation	Date	Document
	2015	Management of Research Projects in the Historic Environment. The MoRPHE Project Manager's Guide.
	2015	Geoarchaeology: using earth sciences to understand the archaeological record.
	2015	Archaeometallurgy: Guidelines for Best Practice
	2015	Digital image capture and file storage
	2016	Understanding Historic Buildings. A guide to good recording practice.
	2016	Preserving Archaeological Remains
	2017	Organic residue analysis and archaeology. Guide for good practice.
	2018	Waterlogged organic artefacts. Guidelines on their recovery, analysis and conservation.
	2018	Our Portable Past: Guidance for Good Practice
	2018	The role of the human osteologist in an archaeological fieldwork project.
	2018	3D Laser Scanning for Heritage: Advice and guidance on the use of laser scanning in archaeology and architecture.
	2019	Animal bones and archaeology: recovery to archive
McKinley, J.I and Roberts, C.	1993	Excavation and post-excavation treatment of cremated and inhumed human remains. (Institute of Field Archaeologists Technical Paper, 13)
Museums and Galleries Commission	1992	Standards in the museum care of archaeological collections
Paul, S. (ed.)	2018	Gloucestershire Archaeological Archive Standards. A countywide standard for the creation, compilation and transfer of archaeological archives in Gloucestershire.
Prehistoric Ceramics Research Group (Study Group for Roman Pottery and Medieval Pottery Research Group)	2016	A Standard for Pottery Studies in Archaeology
Walker. K.	1990	Guidelines for the preparation of excavation archives for long-term storage. (UKIC)
Watkinson, D.E. and Neal, V.	2009	First Aid for Finds. Rescue and UKIC

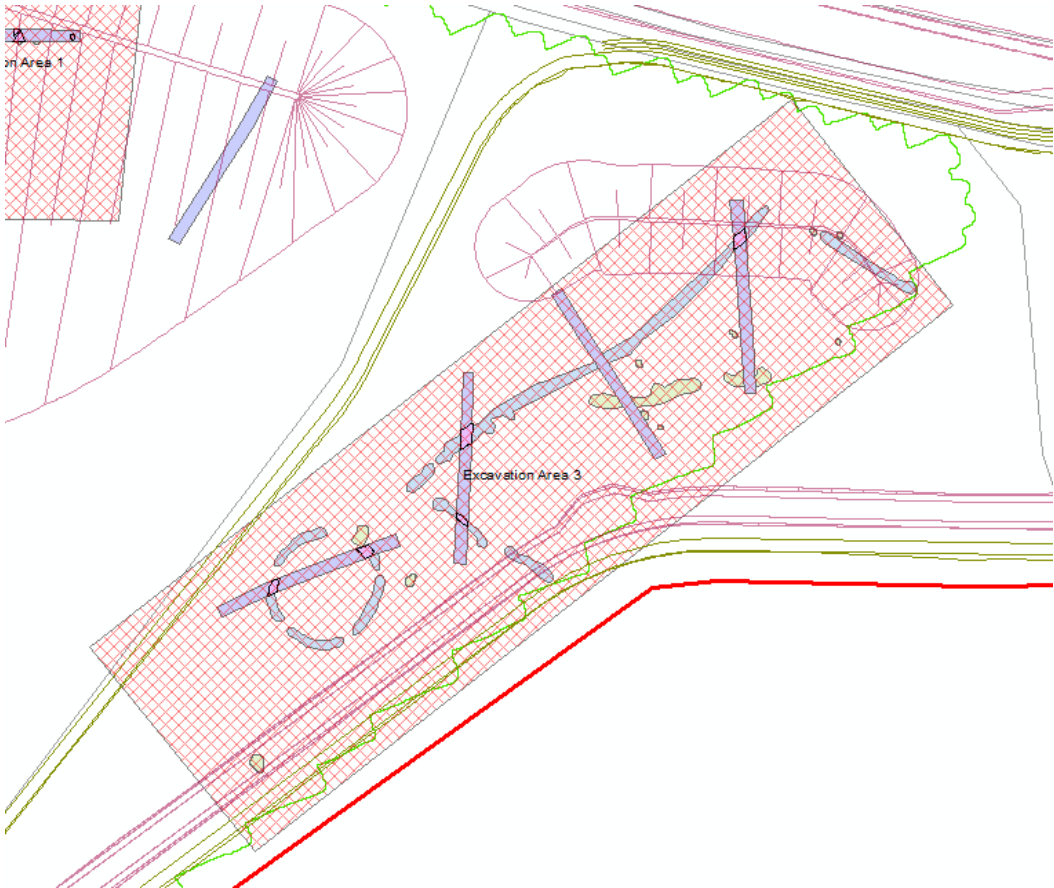
## Appendix C Applying the research agenda

- C.1.1.1 This appendix gives indicative details of the archaeological potential for each site proposed for archaeological mitigation.
- C.1.1.2 The research themes and questions relevant to each site are detailed below. Where themes and questions which are less likely to be relevant, they are included on the basis of possible interpretations and placed within parenthesis. Some of the questions currently included in the research agenda have not yet been applied, but may become relevant as the mitigation work is carried out.

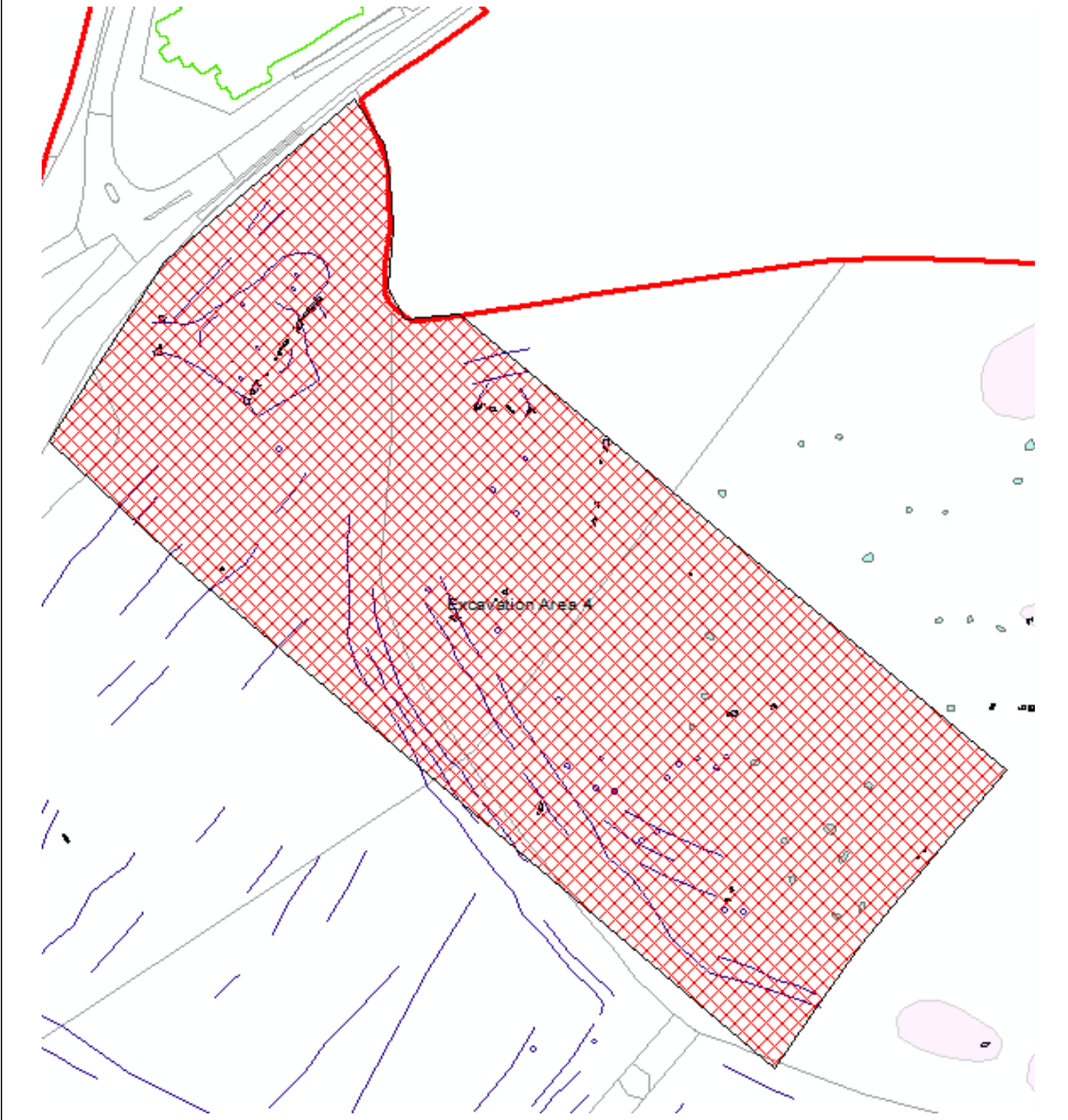
**Table C-1 Archaeological potential and research questions**

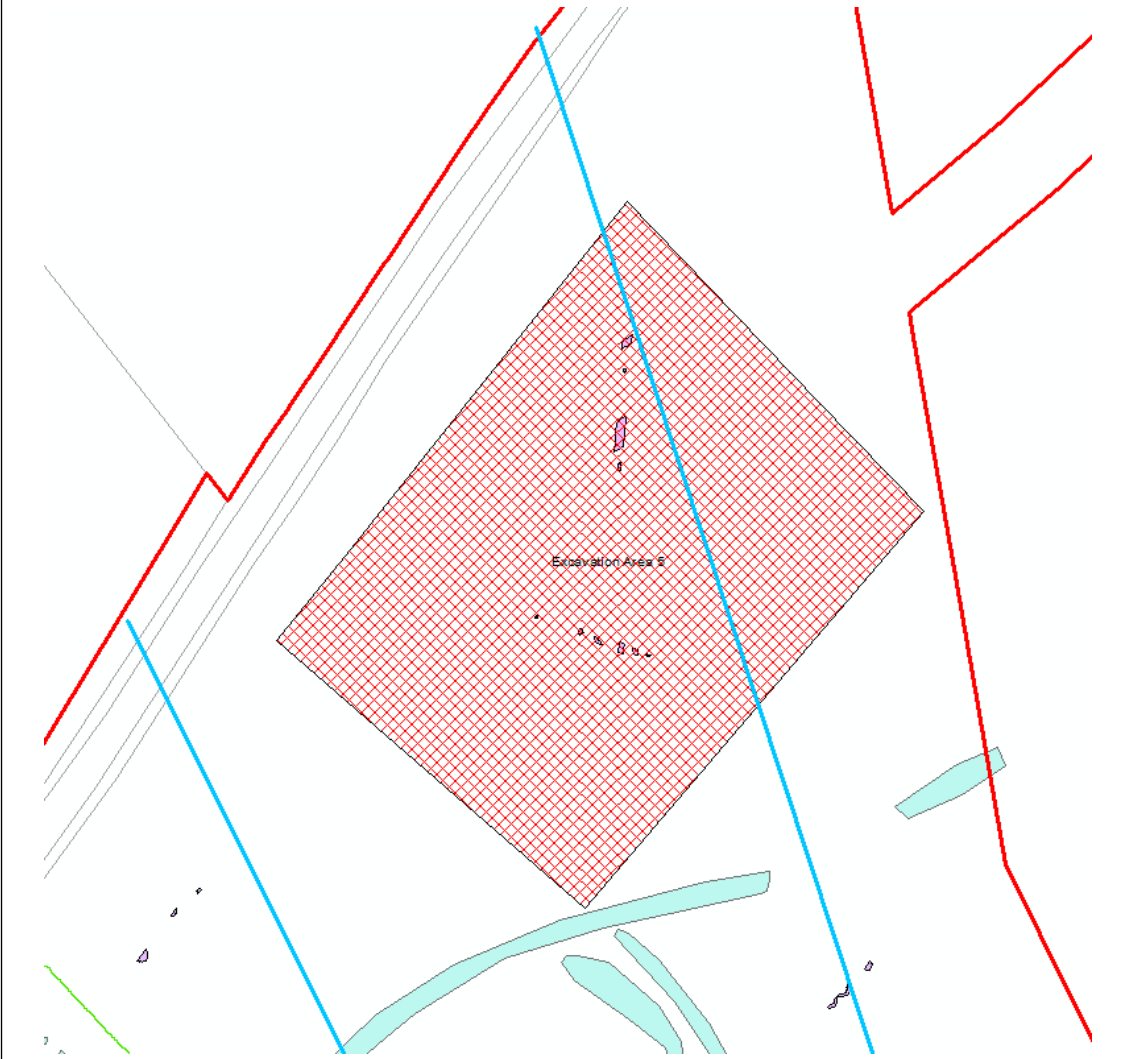
Archaeological potential and research questions by site	
Excavation area 1 (1.1 ha)	
	
<p>Geophysical survey revealed a long curvilinear anomaly. Trial trenching revealed a ditch containing Roman pottery and animal bone, and a pit which contained 47 fragments of worked flint, interpreted as a knapping deposit. Charred hazelnut shell and charcoal were also recovered.</p>	
<p>Themes: A, B</p>	
<p>Research questions: P1, P2, P8, P11, P12, IR2, IR9</p>	

Excavation area 2 (0.3 ha)

<p>Several linear anomalies were identified through geophysical survey. Trial trenching revealed an undated ditch, a ditch containing Roman pottery, animal bone and a single piece of human bone, and a ditch containing Middle Iron Age pottery. The latter has been interpreted as being possibly part of an Iron Age or Roman trackway.</p>
Themes: A
Research questions: IR6, IR7

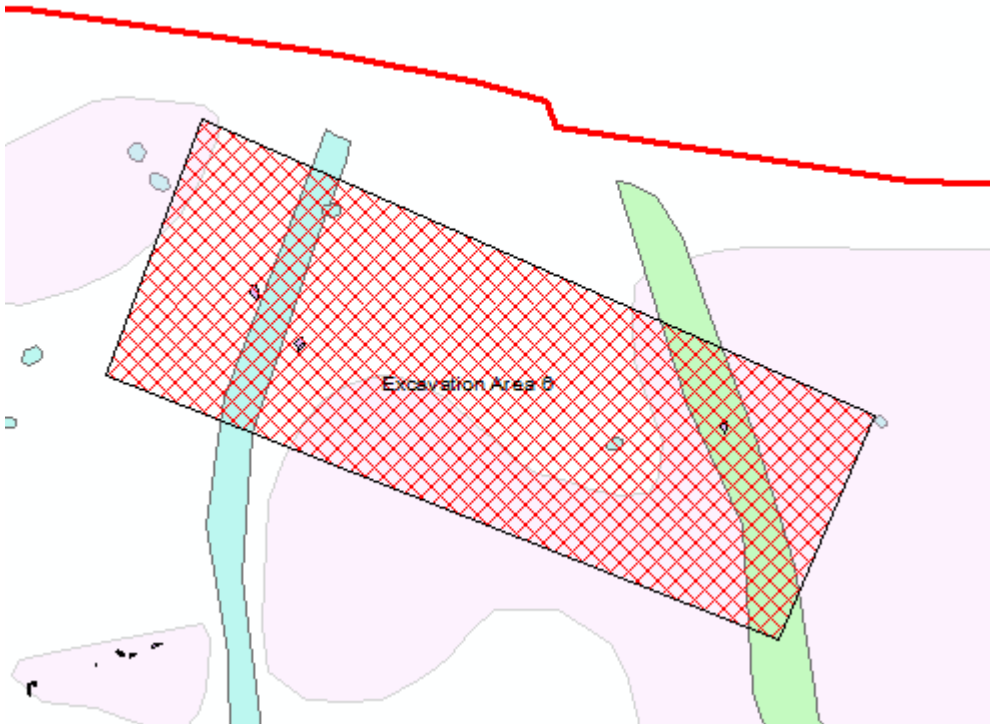
<div>Excavation area 3 (0.5 ha)</div> <div></div>	
<p>A possible rectilinear enclosure and circular feature, either a ring ditch or an enclosure, were identified through geophysical survey. Trial trenching revealed curvilinear ditches, part of the circular feature noted in the geophysical survey, which was interpreted as a circular enclosure. Although datable finds were not recovered charred plant remains and other palaeoenvironmental evidence were recorded. North of this ditches were identified, containing Middle Iron Age pottery, animal bone, cereal grain fragments and charcoal.</p>	
<p>Themes: A, B, E</p>	
<p>Research questions: P1, P5, P6, P7, P8, P12, IR1, IR2</p>	

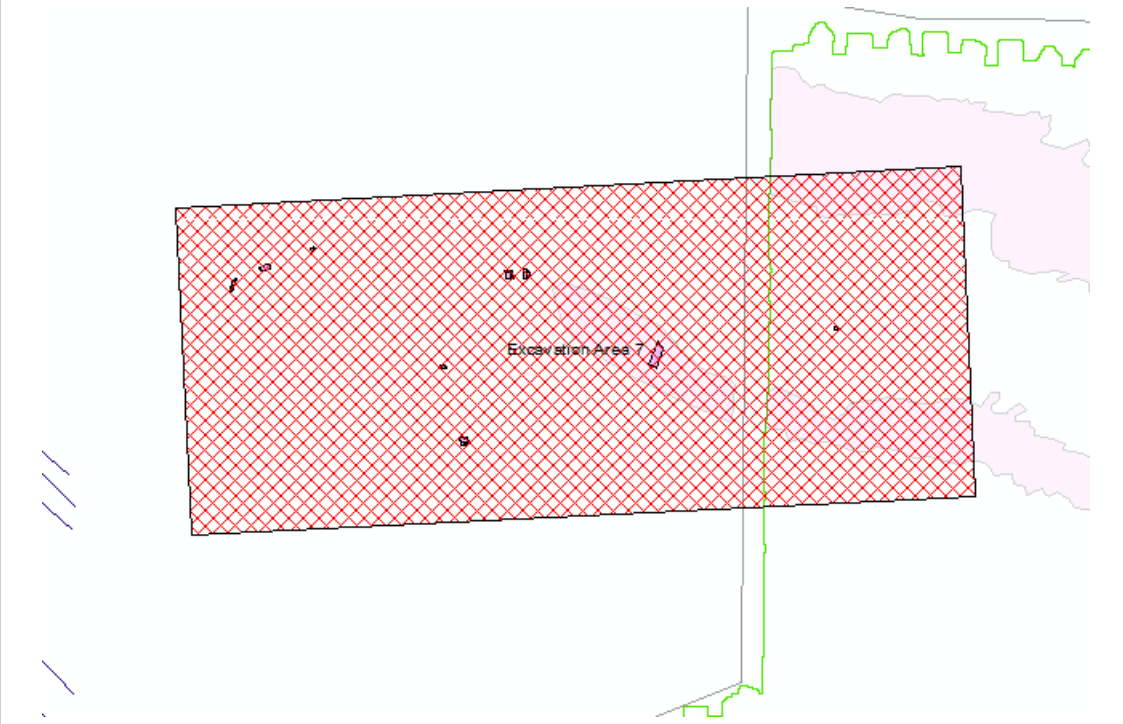


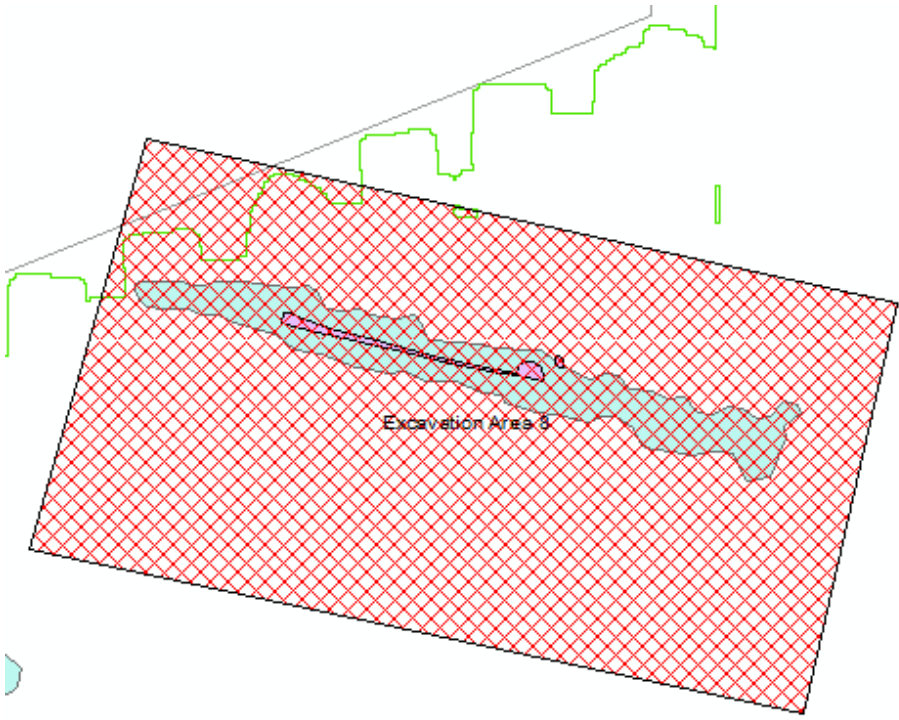
<div>Excavation area 4 (3.5 ha)</div>  <p>The map shows a large area outlined in red, filled with a red cross-hatch pattern. This area is labeled 'Excavation Area 4' in the center. To the north and west of this area are blue lines representing ditches or boundaries. To the east are several small, irregular shapes in light green and light purple, possibly representing vegetation or other features. The map is oriented with North at the top.</p>	
<p>An enclosure, identified by trial trenching to date from the Iron Age. To the south east trial trenching uncovered several undated ditches, pits and postholes. Cereal grains were identified from the postholes.</p>	
<p>Themes: A</p>	
<p>Research questions: P1, P2, P5, P6, P7, P8, P11, P12, IR1, IR2, IR7, IR9, EM1, EM2, MPM1, MPM2, MPM4 (depending on date)</p>	

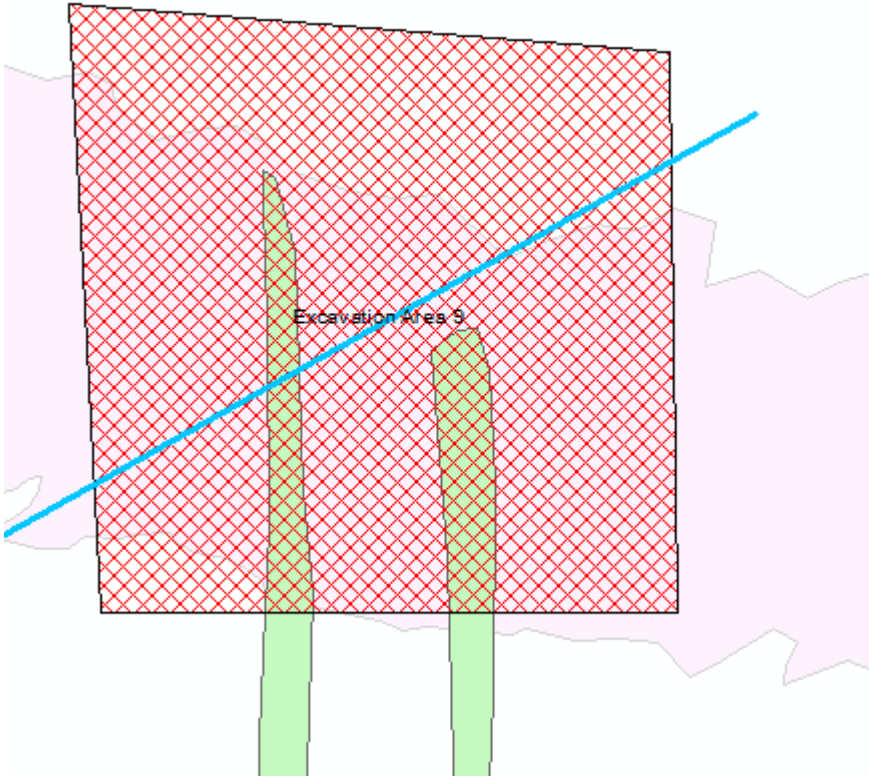
Excavation area 5 (0.6 ha)

<p>Trial trenching found several undated pits and ditches. An inhumation burial was partially exposed, although not dated.</p>
<p>Themes: A, D</p>
<p>Research questions: P2, P4, IR8, EM6 (depending on the date of remains)</p>

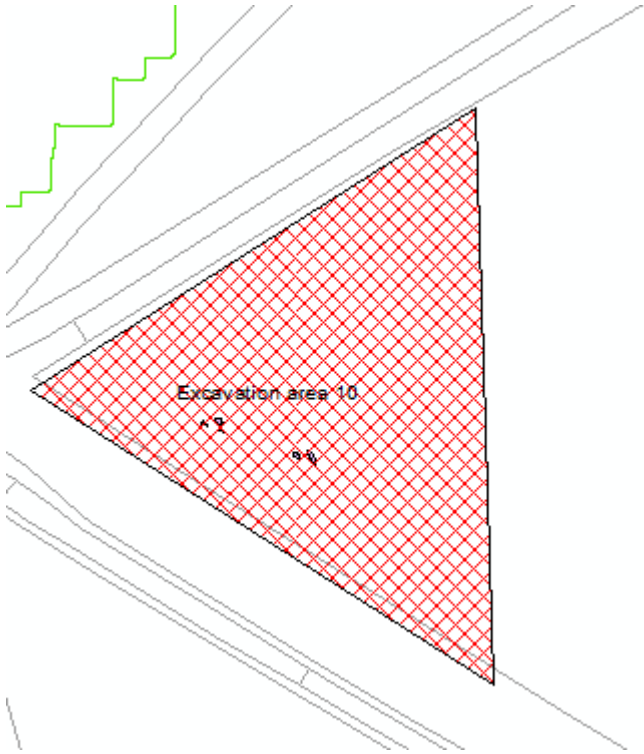


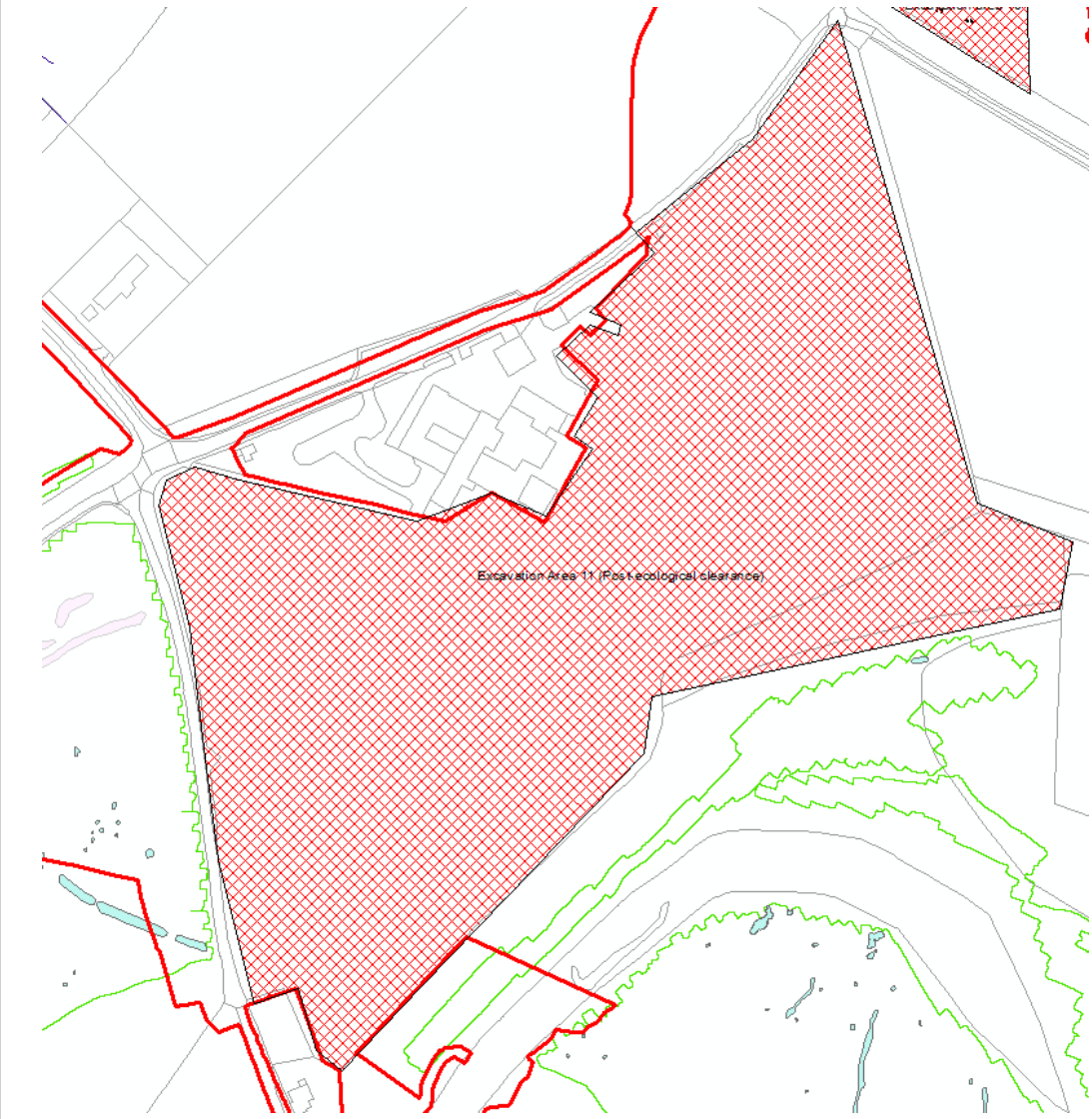
Excavation Area 6 (0.5 ha)

Undated ditches were identified during trial trenching, along with a pit containing a single sherd of Roman pottery.
Themes: A
Research questions: P5, P11, P12, IR7, EM2, MPM2, MPM4 (depending on date)

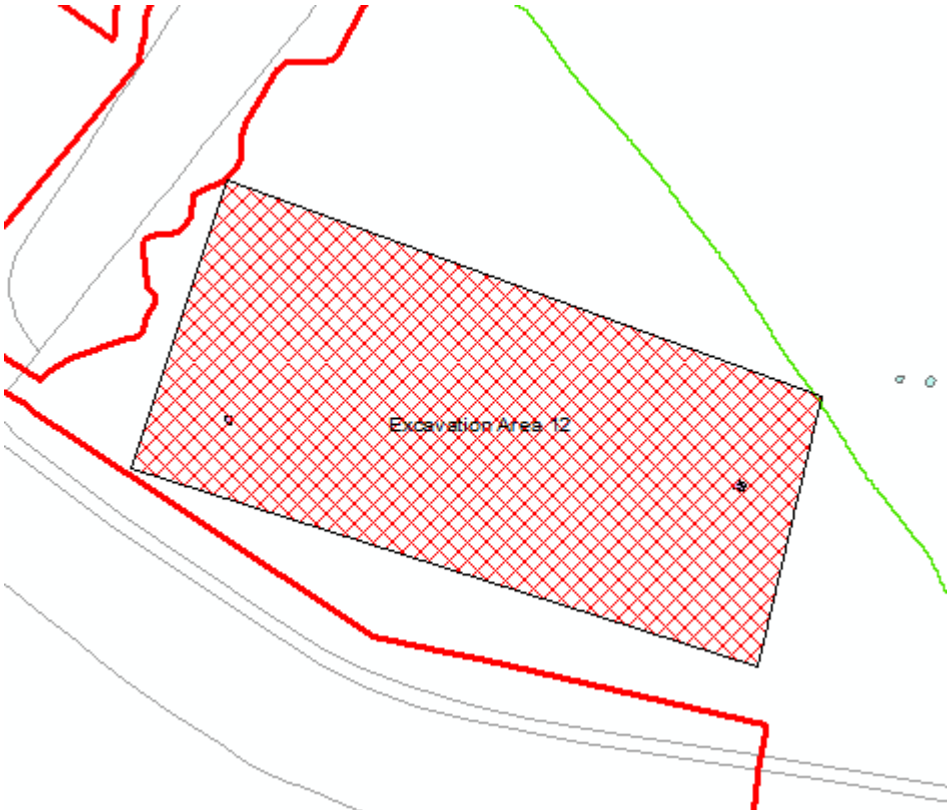
Excavation Area 7 (1.1 ha)	
 A map showing a rectangular area labeled 'Excavation Area 7' with a red cross-hatch pattern. The area is situated on a light grey background. To the right of the excavation area, there is a green stepped line representing a boundary or topography. To the left, there are blue diagonal lines. The text 'Excavation Area 7' is written in the center of the red-hatched area. Several small black dots are scattered within the hatched area, likely representing trial trenching locations. The map is enclosed in a black border.	
Trial trenching identified several undated pits and ditches and an undated circular posthole.	
Themes: A	
Research questions: P5, P11, P12, IR7, EM2, MPM2, MPM4 (depending on date)	

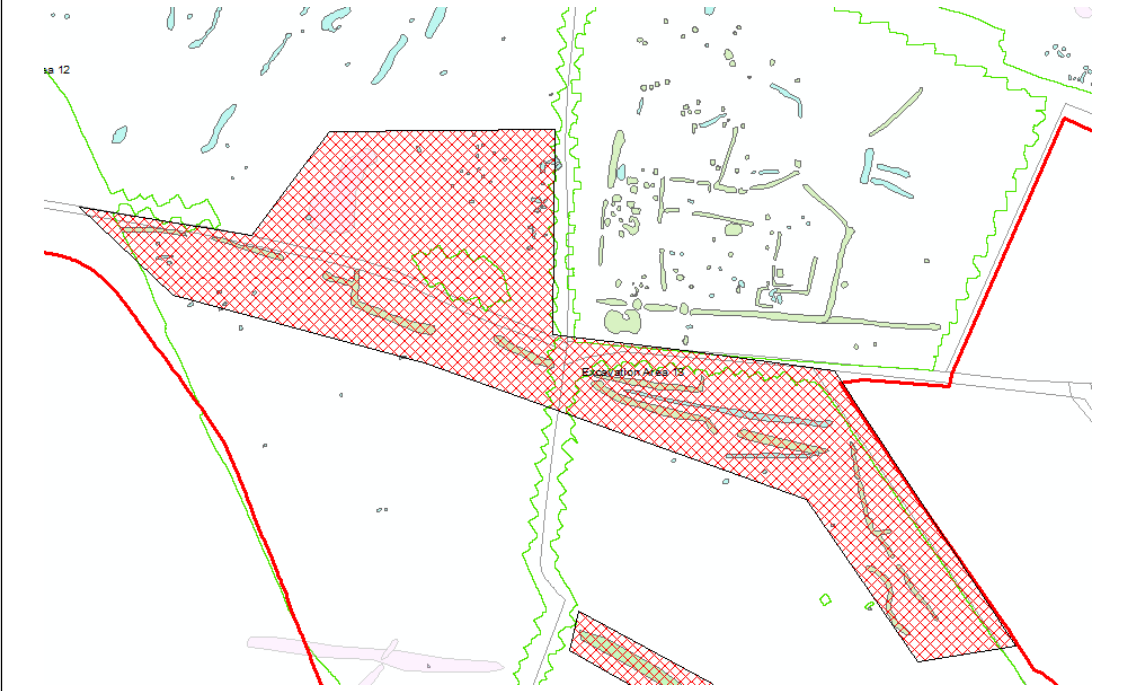
Excavation Area 8 (0.1 ha)

Several undated pits and an undated ditch were found during trial trenching.
Themes: A
Research questions: P5, P11, P12, IR7, EM2, MPM2, MPM4 (depending on date)

Excavation area 9 (0.1 ha)

Linear features and an area of combe deposit
Themes: A
Research questions: P5, P11, P12, IR7, EM2, MPM2, MPM4 (depending on date)

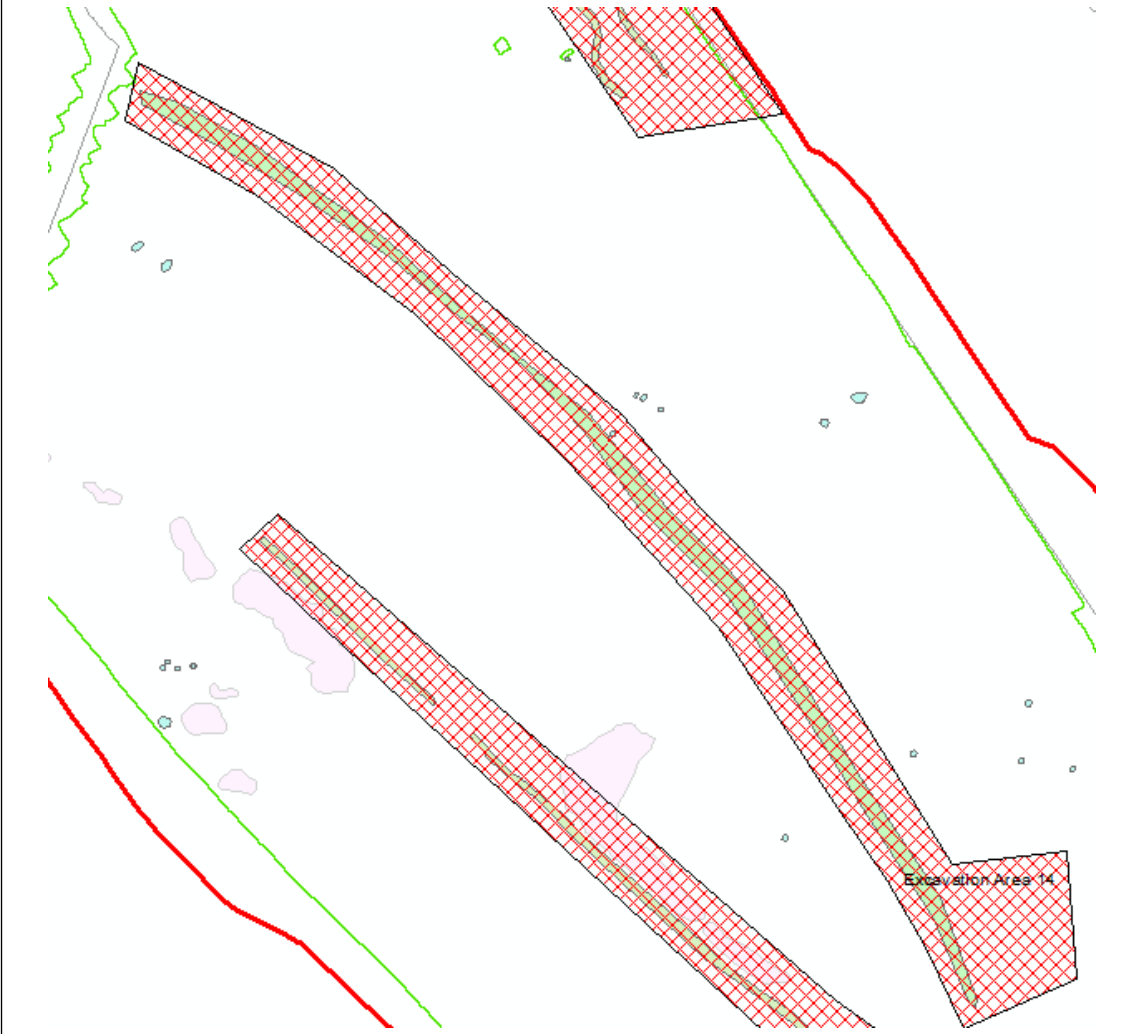
Excavation Area 10 (0.2 ha)

Five undated pits were found in this area during trial trenching.
Themes: A
Research questions: P5, P11, P12, IR7, EM2, MPM2, MPM4 (depending on date)


<div>Excavation Area 11 (6.3 ha)</div> <div></div>	
No survey data available, to be investigated following ecological clearance	
Themes- to be agreed once available for investigation	
Research questions- to be agreed once available for investigation	

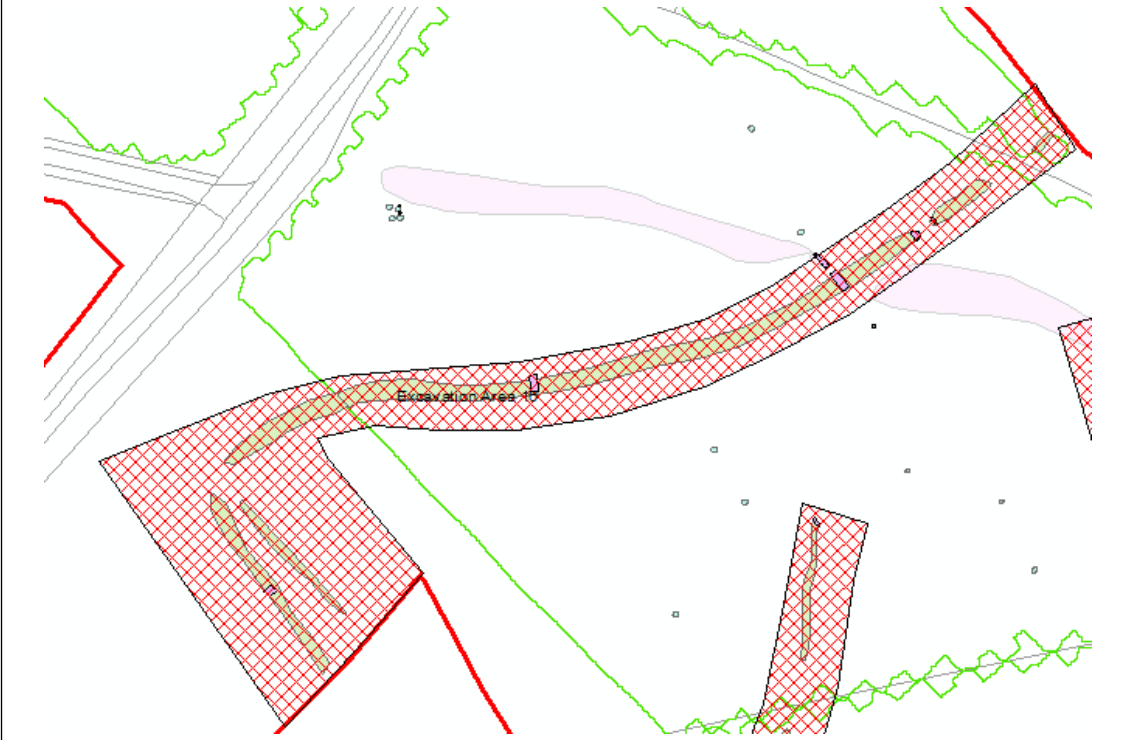
Excavation Area 12 (0.5)

<p>Lidar imagery of the area shows an elongated mound, tentatively interpreted as a barrow within the HER, as included in the Archaeological Assessment<sup>92</sup>. The trial trenching identified a ditch correlating to the position of the possible barrow. No dating evidence was found.</p>
<p>Themes: A, D</p>
<p>Research questions: P3, P4, P5, P11, P12, IR7, EM2, MPM2, MPM4 (depending on date)</p>

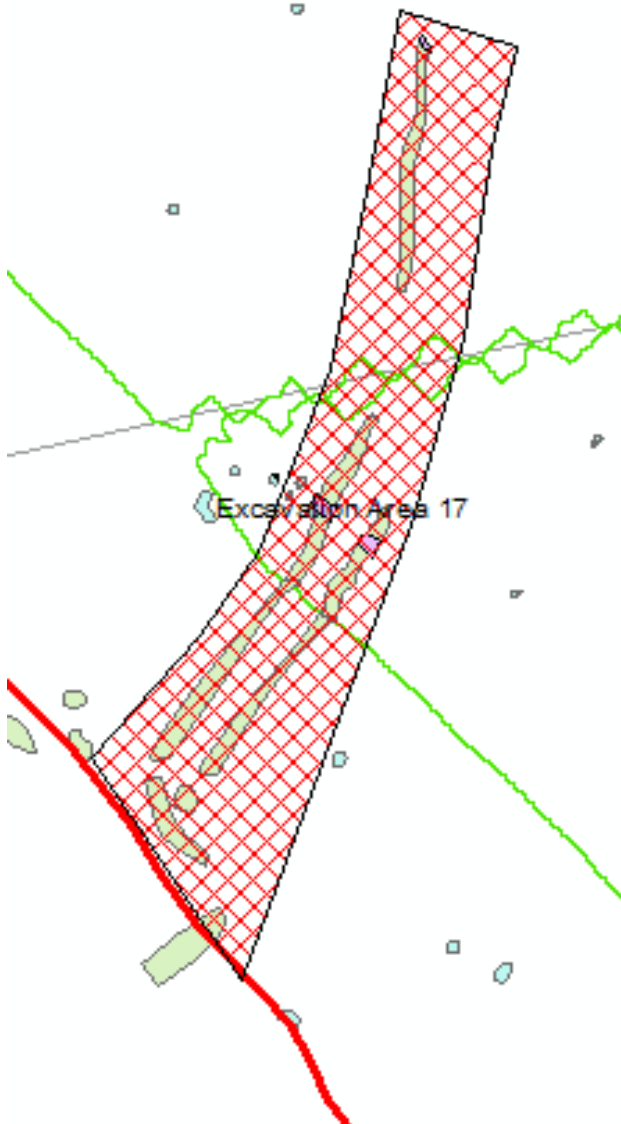
<div>Excavation Area 13 (1.5 ha)</div> 	
<p>Geophysical survey identified several linear anomalies to the south of a larger complex of features to the north (Retained area 2). Trial trenching recorded ditches cutting into colluvial deposits. Large quantities of early Roman pottery (1<sup>st</sup> and 2<sup>nd</sup> centuries AD) were found within the ditches. Cereal grain fragments were identified from samples. Additionally a pit was excavated which contained Iron Age or 1<sup>st</sup> century AD pottery.</p>	
<p>Themes: A, B, D, E</p>	
<p>Research questions: IR1, IR2, IR4, IR6, IR7, IR9</p>	

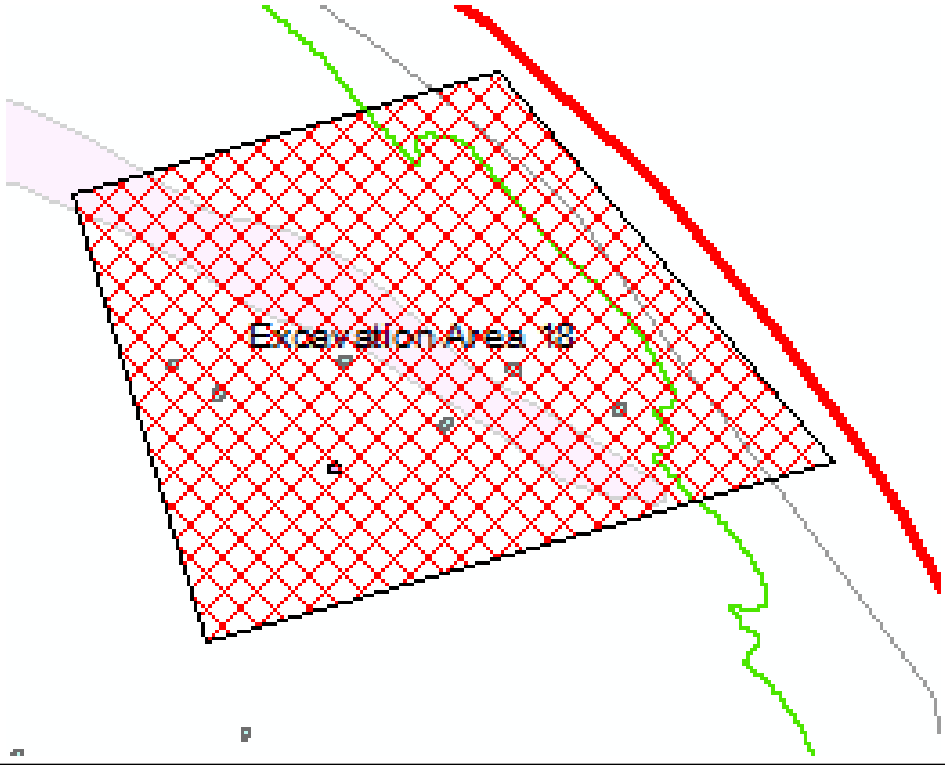


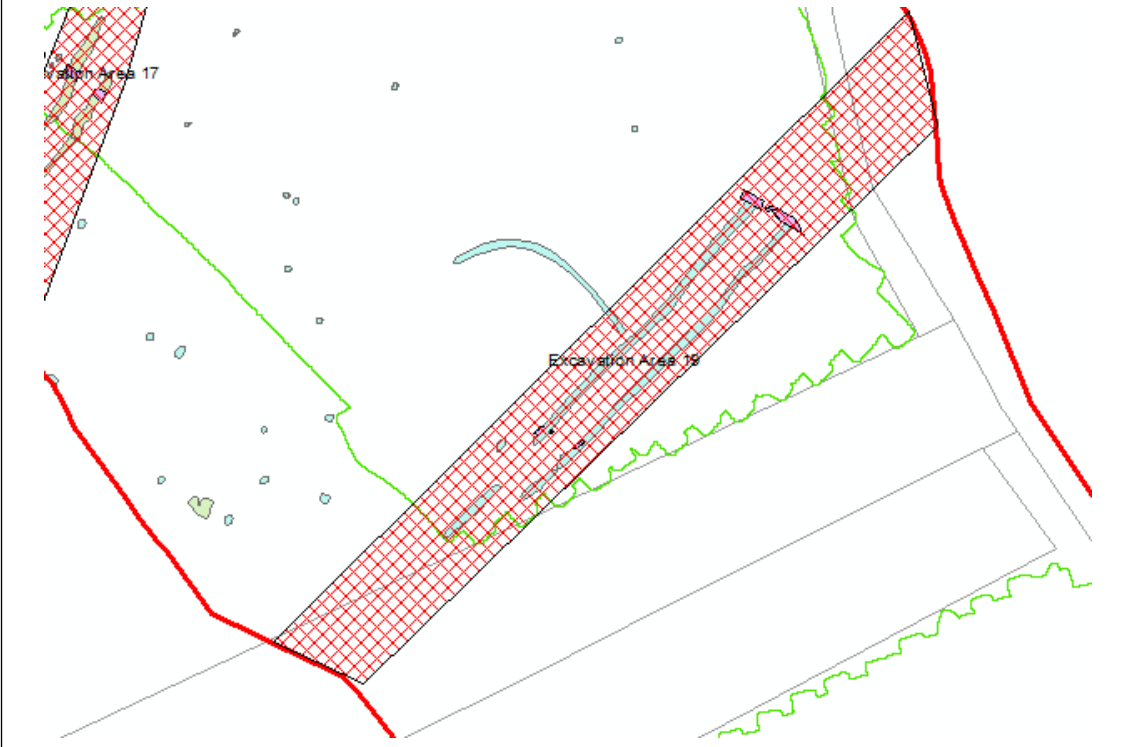
Excavation area 14 (0.5 ha)
 <p>The map displays a large, elongated area outlined in red with a red cross-hatch pattern, representing the excavation site. This area is oriented diagonally from the top-left towards the bottom-right. Within this area, there are several smaller, irregularly shaped regions also outlined in red with a red cross-hatch pattern. The background of the map is white, with various colored lines and shapes indicating geographical features: a prominent red line runs diagonally across the upper right, a green line runs diagonally across the lower left, and several small, irregularly shaped areas are colored in light blue and light purple. The text 'Excavation Area 14' is written in a small, black font in the bottom right corner of the map area.</p>
<p>Geophysical survey identified a linear arrangement of dipolar responses appearing as a long arcing feature. It may be related to a relatively modern field boundary, but trial trenching identified a ditch, not conforming to the alignment from the geophysics, which contained sherds of Roman pottery and a residual flint flake core.</p>
<p>Themes: A</p>
<p>Research questions: IR7, IR9</p>

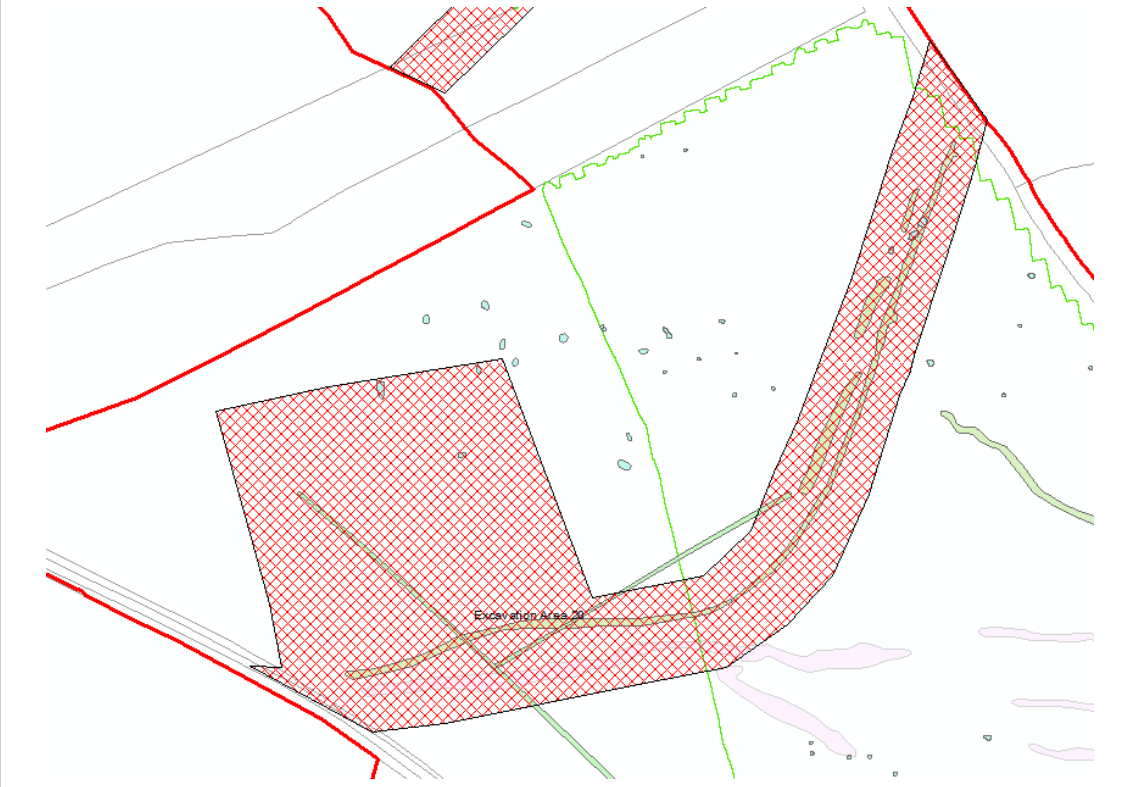
<div>Excavation area 15 (0.7 ha)</div> 	
<p>Geophysical survey identified a long linear feature thought potentially to be part of an Iron Age or Romano-British field system. Although dating evidence was not found during trial trenching, the ditch itself was confirmed. A separate ditch was, however, found to contain a Roman penannular brooch. A series of sub-circular pits or post holes was also found, which contained prehistoric worked flint fragments.</p>	
<p>Themes: A, B, E</p>	
<p>Research questions: P2, P12, IR5, IR6</p>	

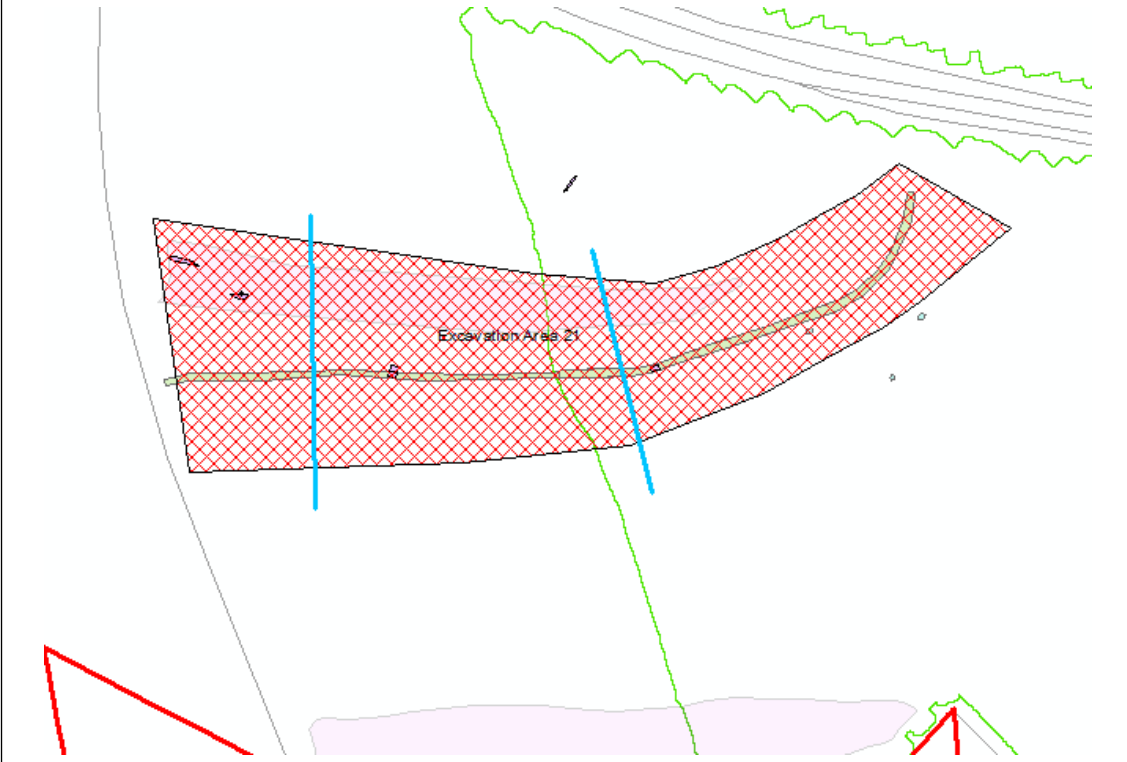
<div>Excavation area 16 (0.5 ha)</div> 	
<p>Trial trenches identified this feature as an Iron Age cross-dyke, which contained pottery, worked flint and animal bone, as well as pits with undated fills.</p>	
<p>Themes: A</p>	
<p>Research questions:IR4, IR6, IR9</p>	

Excavation area 17 (0.2 ha)	
 A map showing a rectangular area with a red cross-hatch pattern, labeled 'Excavation Area 17'. The area is oriented diagonally. A green line, possibly a boundary or road, runs horizontally across the middle of the area. A red line runs along the bottom-left corner. There are several small blue and green shapes scattered around the area, possibly representing buildings or vegetation. The text 'Excavation Area 17' is written in blue in the center of the hatched area.	
<p>Geophysical survey identified a linear anomaly on a N/S alignment. Trail trenching encountered sections of a ditch, parallel at its southern end, which contained two sherds of Iron Age pottery. Intercutting pits, with undated fills, were also recorded.</p>	
<p>Themes: A</p>	
<p>Research questions: IR4, IR6, IR9</p>	

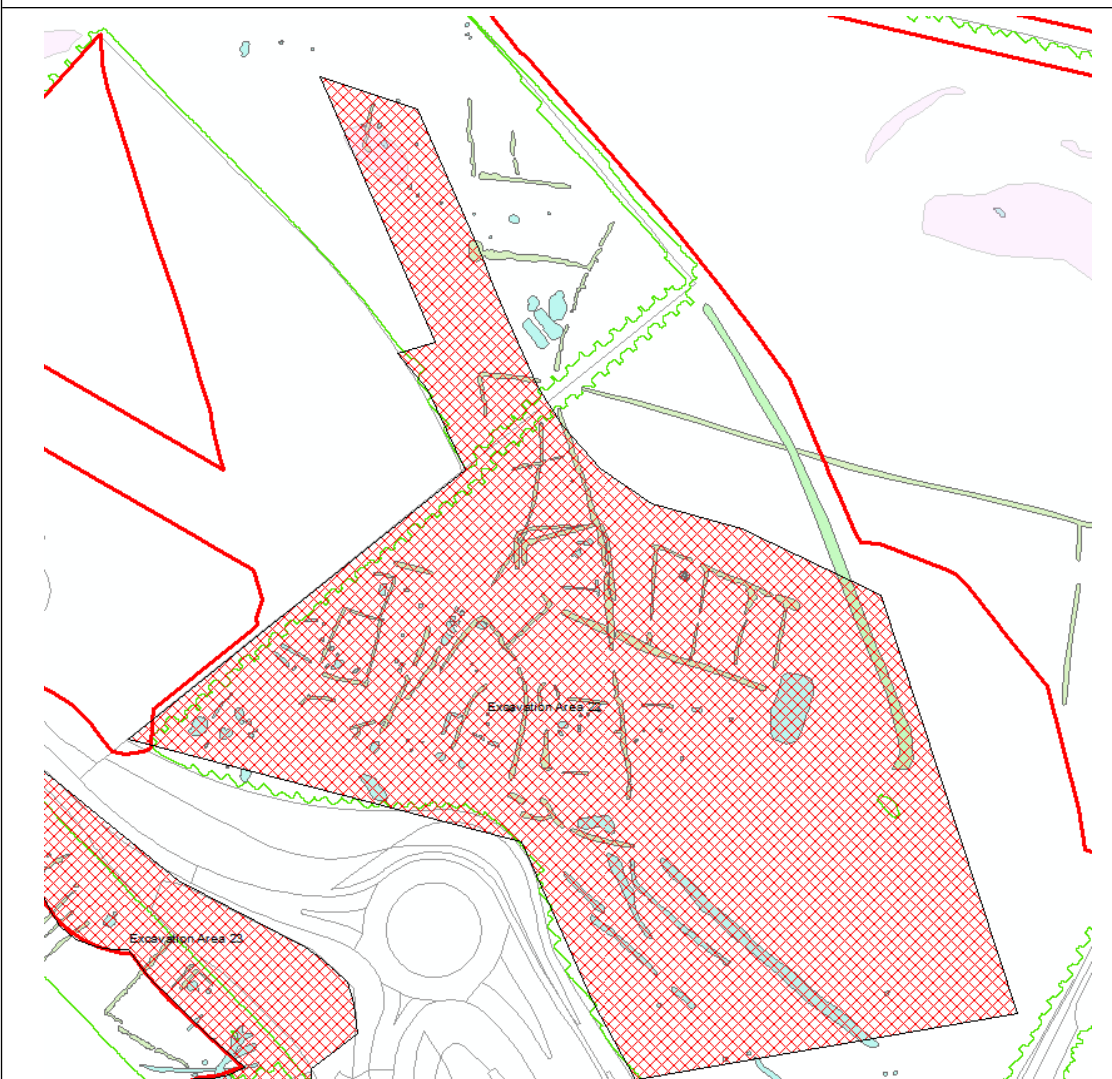
Excavation area 18 (0.2 ha)
 A map showing the location of Excavation Area 18, which is a rectangular area outlined in black and filled with a red cross-hatch pattern. The area is labeled 'Excavation Area 18' in the center. Surrounding the area are various colored lines: a green line, a red line, and a grey line. A small purple shaded area is visible to the left of the excavation area. The map is set against a light grey background with some faint grid lines.
<p>Trial trenching in this area identified six irregular pits, all of which contained undated fills. Given the surrounding archaeology it is likely that they indicate prehistoric or Romano-British activity.</p>
<p>Themes: A</p>
<p>Research questions: P2, P5, P9, P11, P12, IR4</p>

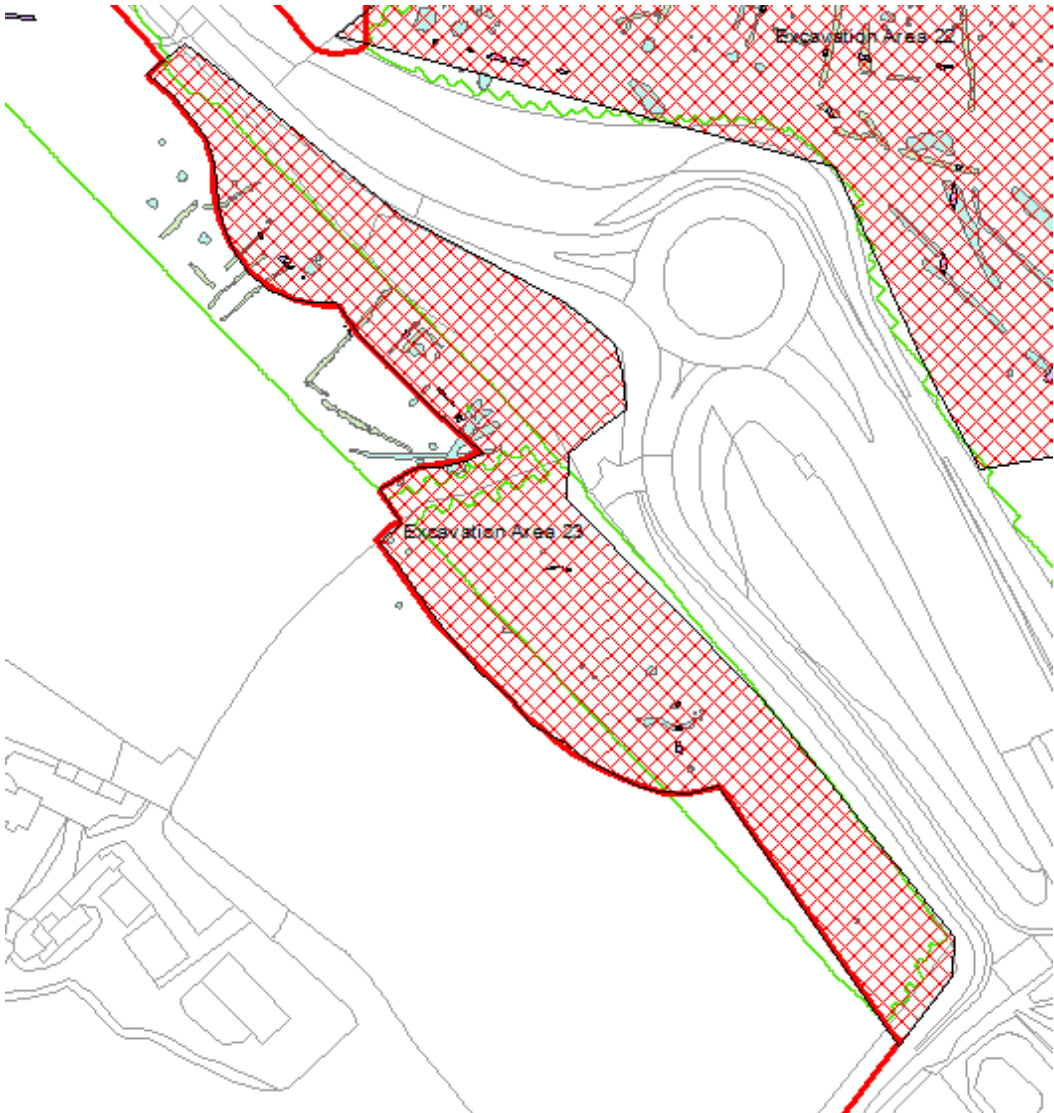
Excavation area 19 (0.3 ha)	
 <p>The map displays a site plan for Excavation Area 19, which is a rectangular area shaded in red cross-hatching. To the top left, a smaller area is labeled 'Excavation Area 17' and is also cross-hatched. The map features several green lines representing geophysical survey results, including two parallel linear anomalies and a weak curvilinear anomaly. A red line indicates the boundary of the excavation area. A blue line represents a ditch. A small pink rectangle indicates the location of a trial trench. The map also shows a road and a field boundary.</p>	
<p>Geophysical survey identified two parallel linear anomalies as well as a weak curvilinear anomaly. Trial trenching identified the ditches. One containing prehistoric worked flint and animal bone, the other containing a 12<sup>th</sup>-14<sup>th</sup> century pot sherd. The curvilinear anomaly from the geophysics was not identified, suggesting it might be geological.</p>	
<p>Themes: A</p>	
<p>Research questions: P5, P12, MPM1, MPM2</p>	

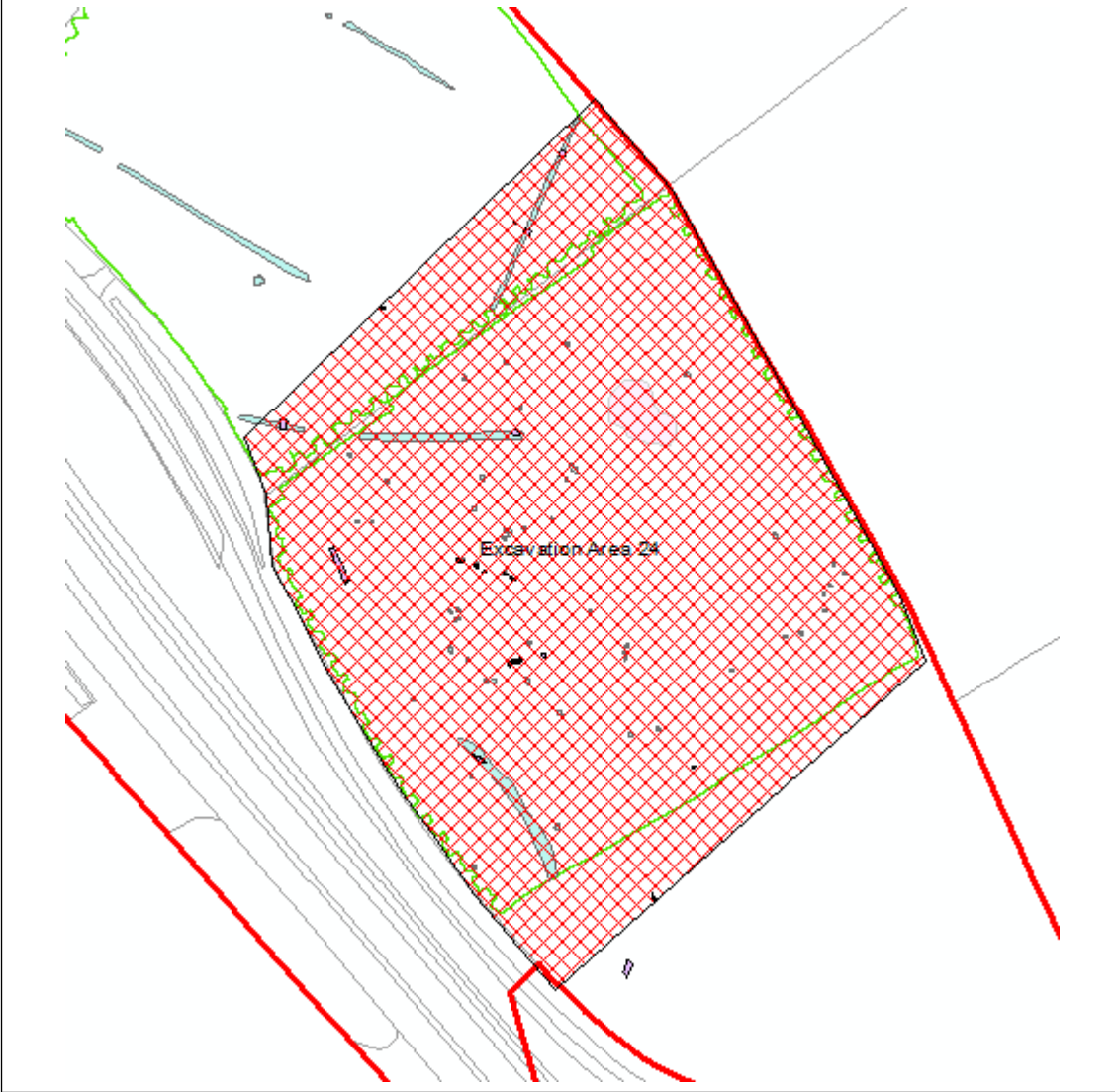
Excavation area 20 (1.8 ha)
 <p>The map displays a large area outlined in red, labeled 'Excavation Area 20'. Within this area, there are several green lines representing geophysical survey results. A prominent green line runs diagonally across the center, with several smaller green lines branching off. The area is also marked with various symbols, including small blue dots and larger green shapes, indicating specific features or findings. The map is titled 'Excavation area 20 (1.8 ha)' in the top left corner.</p>
<p>Geophysical survey identified two parallel linear anomalies, thought to be a former boundary or trackway. Trial trenching revealed opposing ditch termini, with fills containing Iron Age pottery, worked flint and animal bone. An undated pit was also recorded.</p>
<p>Themes: A</p>
<p>Research questions: P9, P11, P12, IR7, IR9</p>

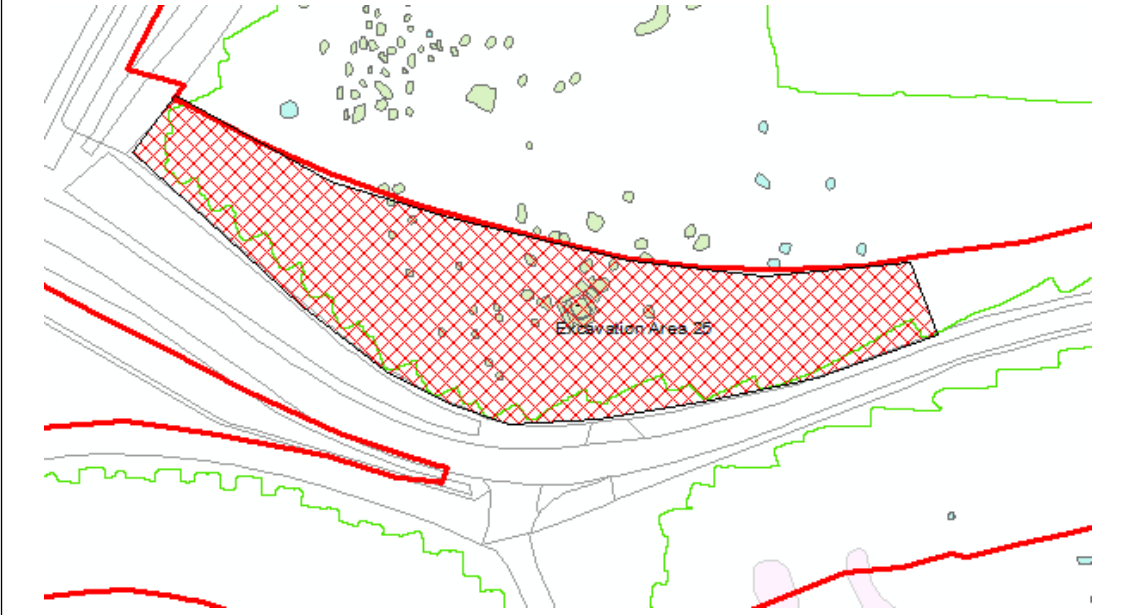
Excavation area 21 (0.63 ha)	
	
<p>Geophysical survey identified a 91m curvilinear feature. Trial trenching confirmed that this feature was a ditch, possibly a field boundary. Parallel ditches were also identified, although the fills excavated did not contain any dating material. This area also contains a combe deposit.</p>	
<p>Themes: A</p>	
<p>Research questions (depending on date): P5, IR7, IR9, EM2, MPM2, MPM4</p>	

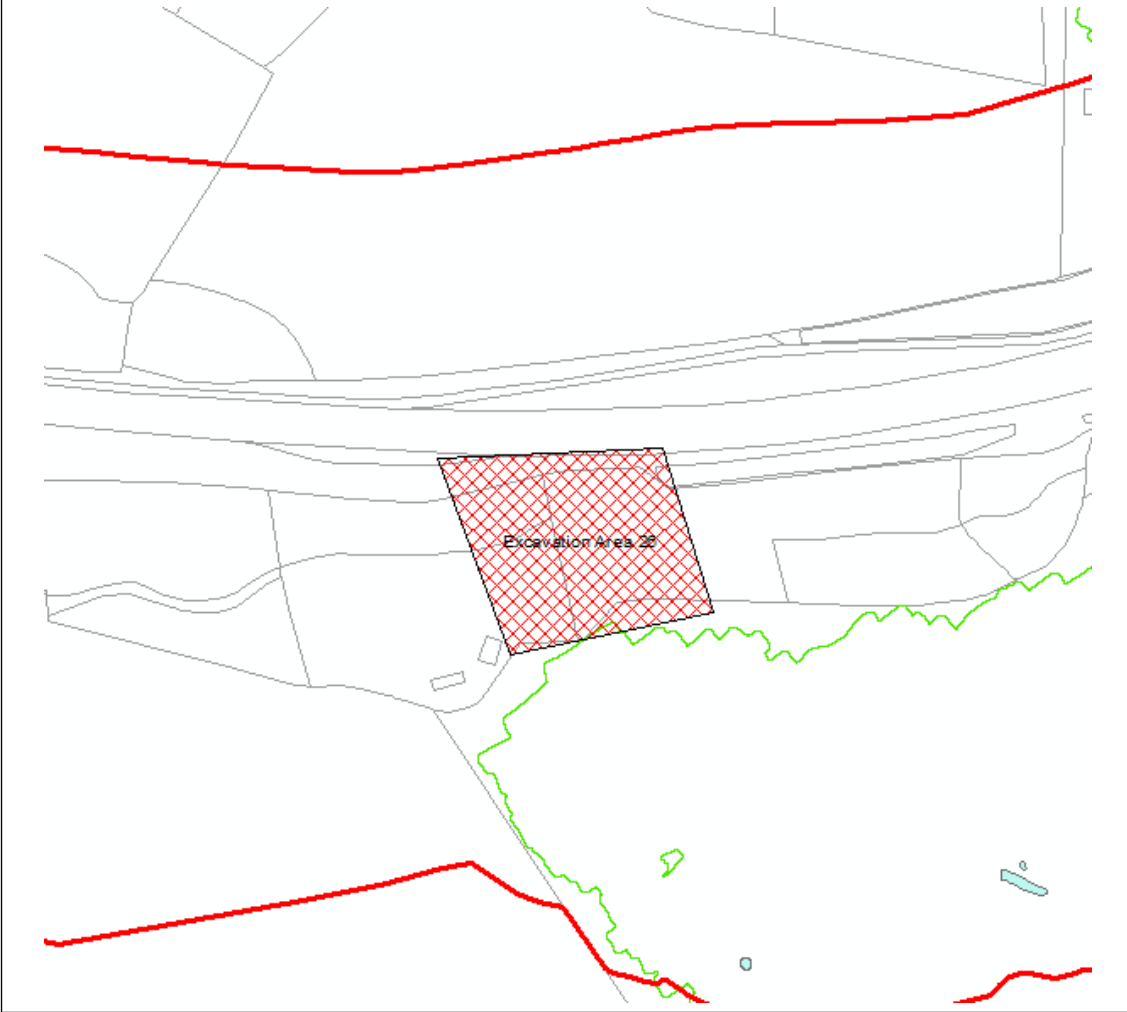


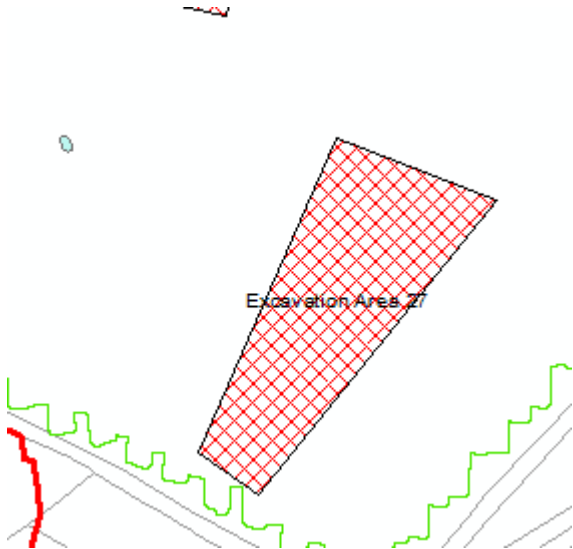
<p>Excavation area 22 (5.9 ha)</p> 	
<p>Geophysical survey identified an extensive area of distinct enclosures arranged perpendicularly along a long curvilinear anomaly. This is interpreted as an area of possible settlement likely, given the proximity to the Romano-British settlement site excavated in advance of the construction of Cowley Roundabout in the 1990s<sup>93</sup> and the known course of Ermin Street, the Roman Road, to be of Iron Age or Romano-British date. Trial trenching across this area revealed multiple ditches, many containing Roman pottery along with ceramic building material, animal bone and small artefacts, including a Roman trumpet brooch and coins. Several of the ditches formed small enclosures. Elsewhere a robber trench, containing limestone rubble, is indicative of the presence of buildings. A quarry pit with Roman pottery was also identified, suggesting that further excavation could provide more evidence of the use of local materials in construction. The most striking find was a ditch which contained a large quantity of health material, likely a dump of hearth waste, within which a small figurine of Cupid as Hercules was found.</p>	
<p>Themes: A; B, D, E</p>	
<p>Research questions: IR1, IR2, IR3, IR4, IR5, IR6, IR7, IR8, IR9, IR10, IR11, EM3, 20C1, 20C2</p>	

Excavation area 23 (1.8 ha)

<p>A large number of Roman finds have been made in this area prior to the works associated within the scheme, including copper alloy radiates, coins, flint scraper, rumpet borrrch, tweezers, other brooches. Several features were identified during geophysical survey, including a number of ditch-like features. Through trial trenching a stone spread was identified as well as cuts for parallel walls, potentially an external courtyard surface or trackway. Levelling deposits over this contained Roman pottery, Roman copper alloy coins, a finger ring, an iron mattock or pick head and an iron spade sheath. In another trench a ditch was excavated, containing Romna pottery, animal one, a glass bead, copper alloy coin, ceramic building mateiral and an iron hoe. Palaeoenvironmental analsysis found material indicative of crop processing waste. Trial trenching also identified several pits and ditches, which were undated. There is clear evidence of Roman rural settlement.</p>
<p>Themes: A, B; E</p>
<p>Research questions: IR1, IR2, IR4, IR5, IR6, IR7, IR9, IR10, IR11, IR12, IR13</p>

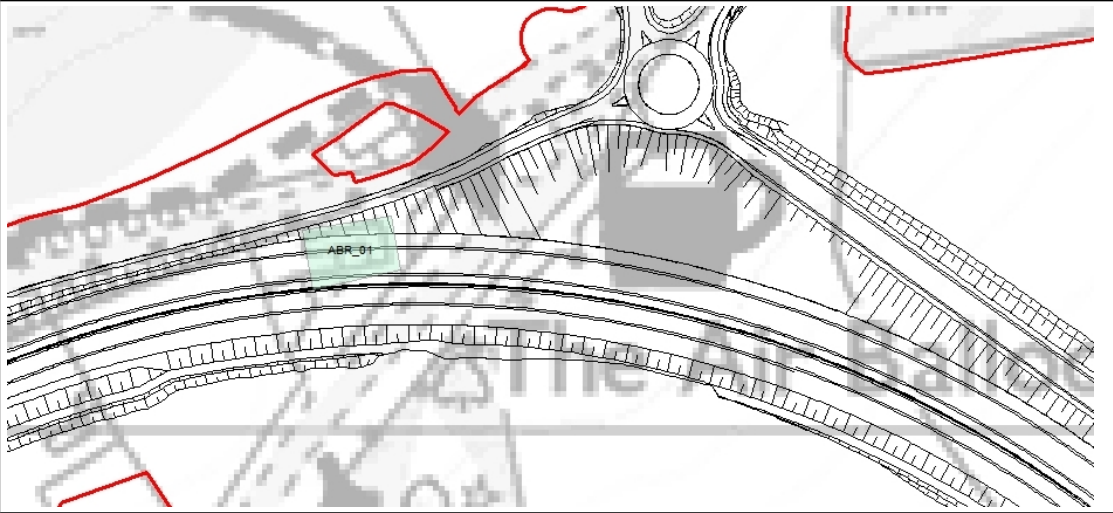
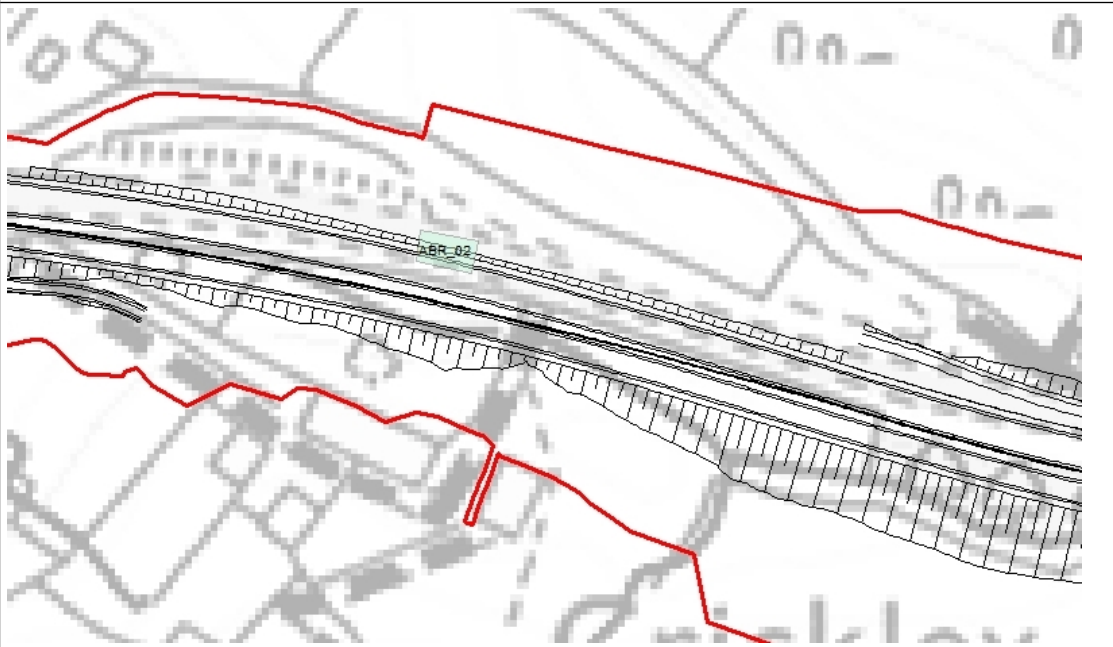
<div>Excavation area 24 (3.7 ha)</div> <div></div>	
<p>Trial trenching identified a spread of prehistoric pits and ditches spread over an extensive area, no clear focus of activity.</p>	
<p>Themes: A</p>	
<p>Research questions: P1, P2, P5, P6, P7, P8, P11, P12, IR1, IR2, IR7, IR9, EM1, EM2, MPM1, MPM2, MPM4 (depending on date)</p>	

<p><b>Excavation area 25 (0.4 ha)</b></p> 	
<p>Geophysical survey identified evidence of possible funerary activity across this site and the area to the north (not within the DCO boundary). The evidence is a dense concentration of oval anomalies c2mx1m in size, generally aligned north-south. Historic mapping (1902 OS mapping) indicates that human remains were found at this location in 1979. The orientation is not typically Christian, indicating a likely date Iron Age, Roman or early medieval date. The anomalies within the DCO boundary are less well defined than those to the north, but are centred on a square feature interpreted as an 8x8m outer stone wall with possible inner wall and ditch, potentially with a central pit-like feature. Structures similar to this are often associated with Romano-British religious buildings such as small shrines. Trial trenching of this feature found ditches representing a small square enclosure with central features. A cremation burial with nine sherds of Roman pottery was found, providing further evidence of burial in this area.</p> <p>Several Iron Age and Roman archaeological finds have been made in the vicinity of Barrow Wake, west of the current course of the A417. This includes a reported Iron Age cemetery at Barrow Wake, a large quantity of Roman pottery and a possible Roman building (Jorge, 2019). Trial trenching found natural deposits which may relate to the nearby Iron Age funerary activity.</p>	
<p>Themes: B, D</p>	
<p>Research questions: IR4, IR8</p>	

<div>Excavation area 26 (0.2 ha)</div> <div></div>	
Area where a number of post-medieval sites are on historic OS map including The Bell Inn and structures relating to watercourse.	
Theme: B, E	
Research questions: IR4, IR8	

Excavation area 27 (0.2 ha)

Undated pits found during trial trenching
Themes: A
Research questions: P5, P11, P12, IR7, EM2, MPM2, MPM4 (depending on date)



ABR1

<p>The non-designated Air Balloon public house would be demolished as it stands within the engineering footprint of the scheme. Archaeological building recording would be carried out prior to demolition.</p>
<p>Themes: B, E</p>
<p>Research questions: MPM5</p>
ABR2

<p>There is a non-designated milestone located on the northern side of the existing A417. It will either be retained in situ (if possible) or relocated following recording.</p>
<p>Themes: E</p>
<p>Research questions: MPM6</p>

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