

# West Burton Solar Project

## Environmental Statement Appendix 13.2: Archaeological Geophysical Survey Reports (Part 1 of 6)

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Report Prepared for: West Burton Solar Project Ltd.

### Environmental Statement Appendix 13.2: Archaeological Geophysical Surveys

**Prepared by:**

Name: Alice James BA (hons) MSc MCIfA

**Approved by:**

Name: Mitchell Pollington BA (hons) MA MCIfA

Title: Director (Archaeology and Heritage)

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## **1 Introduction**

- 1.1.1 This document has been prepared by Lanpro Services Ltd on behalf of West Burton Solar Project Limited ('the Applicant'). It provides an overview of the methodology and the results of the archaeological geophysical (magnetometer) surveys undertaken across the whole of the West Burton Solar Project ('the Scheme') in support of an application for a Development Consent Order (DCO). The Scheme consists of three electricity generating stations each with a capacity of over 50 megawatts (MW) consisting of ground mounted solar arrays and 'Associated Development'; comprising of energy storage, grid connection infrastructure, cable routes and other infrastructure integral to the construction, operation and maintenance of the Scheme.
- 1.1.2 The geophysical surveys were informed by the results of archaeological desk-based assessments (Lanpro 2022a, Lanpro 2022b, Lanpro 2022c, Lanpro 2023).
- 1.1.3 The geophysical survey methodology conforms to nationally recognised standards, as well as local guidance for archaeological works in Nottinghamshire and Lincolnshire. The geophysical surveys were undertaken by Archaeological Services WYAS (ASWYAS), Northern Archaeological Associates (NAA; now Ecus Archaeology) and Wessex Archaeology. All of which are Chartered institute for Archaeologists (CIfA) Registered Organisations.
- 1.1.4 The geophysical surveys were undertaken between July 2021 and November 2022, and identified clear concentrations of magnetic anomalies within the scheme that are indicative of possible prehistoric, Roman and medieval activity. Evidence of agricultural activity, including ridge and furrow, former field boundaries, land drains and ploughing, as well as anomalies of a modern and geological origin have also been mapped.
- 1.1.5 The results of the geophysical survey, along with supplementary non-intrusive surveys including air photo and LiDAR mapping and interpretation, have been used to inform a programme of evaluation trial trenching undertaken between June and November 2022, and agreed in advance with the Lincolnshire County Council Historic Environment Team (West Burton Project 2022b).

## 2 Survey Areas

2.1.1 Five phases of geophysical survey have been undertaken as part of the proposed West Burton Solar Project (Figure 13.2-1):

- West Burton 1 Solar Site (Appendix 1)
- West Burton 2 Solar Site (Appendix 2)
- West Burton 3 Solar Site (Appendix 3)
- West Burton Cable Route Corridor running between the proposed West Burton solar sites and from the River Trent to the West Burton Power Station (Appendix 4)
- Shared Cable Route Corridor running from fields to the south of Marton to the west of the River Trent (Appendix 5)

2.1.2 The location details for each of the West Burton sites and cable route corridors are tabulated below.

Phase	NGR	Parishes	Height above Ordnance Datum (aOD)	Appendix
West Burton 1 Solar Site	SK 91573 78470	Broxholme Scampton	7m – 8m aOD	1
West Burton 2 Solar Site	SK 89141 77406	Saxilby with Ingleby	5m – 18m aOD	2
West Burton 3 Solar Site	SK 85570 80353	Marton Brampton Stow	5m – 21m aOD	3
West Burton Cable Route Corridor (Lincolnshire section)	SK 89300 77080	Broxholme Saxilby with Ingleby Sturton by Stow Torksey Stow	6m – 21m aOD	4
West Burton Cable Route Corridor (Nottingham Section)	SK 80685 82270	Cottam North Leverton with Hablesthorpe Sturton Le Steeple West Burton	3m – 22m aOD	4
Shared Cable Route Corridor	SK 82940 80916	Rampton and Woodbeck (Notts)	3m – 23m aOD	5

		Marton (Lincs)		
		Brampton (Lincs)		

- 2.1.3 The results of the various environmental studies (including non-archaeological surveys) have been used to inform changes to the Scheme design including the removal of areas from the final redline boundary and adjustments to the proposed cable route. Redline boundaries provided for the geophysical survey reports, appended to this document, reflect the original redline boundaries used for the initial environmental scoping studies. The final redline boundary for the Scheme is shown in Figure 1. Where required, the geophysical survey area has been adjusted to reflect changes to the redline boundary to ensure maximum coverage of accessible land within the Scheme.
- 2.1.4 Where areas could not be surveyed, i.e. due to above ground obstacles making survey impossible or unlikely to yield meaningful results, these have been qualified within the individual geophysical survey reports.
- 2.1.5 Three areas within the West Burton Cable Route Corridor were not surveyed due to access issues with the landowners.

## **2.2 West Burton 1 Solar Site (Appendix 1)**

- 2.2.1 All accessible land within the Scheme was targeted with geophysical survey.
- 2.2.2 The West Burton 1 Solar Site comprises approximately 90ha of arable land to the east of Broxholme in the West Lindsey District of Lincolnshire (Figure 13.2-2).
- 2.2.3 The recorded bedrock geology across the West Burton 1 Site consists of mudstone of the Charmouth Mudstone Formation, sedimentary bedrock formed between 199.3 and 182.7 million years ago during the Jurassic period. Superficial deposits of Mid-Pleistocene Till are recorded in the east and centre of the Site, and alluvium (clay, silt, sand and gravel) occurs adjacent to the course of the River Till (BGS 2023).
- 2.2.4 ASWYAS were used as the geophysical contractor for the West Burton 1 Solar Site.

## **2.3 West Burton 2 Solar Site (Appendix 2)**

- 2.3.1 All accessible land within the West Burton 2 Solar Site was targeted with geophysical survey.
- 2.3.2 The Site comprises approximately 305ha of agricultural land centred on the village of Ingleby in the West Lindsey District of Lincolnshire (Figure 13.2-2).
- 2.3.3 Fields N15 to N18 were removed from the redline boundary following the completion of the geophysical survey report.
- 2.3.4 The recorded bedrock geology across the western and central parts of the West Burton 2 Site consists of interbedded mudstone and limestone of the Scunthorpe Mudstone Formation, sedimentary bedrock formed between 209.5 and 190.8 million years ago in the Triassic and Jurassic periods. The bedrock geology across

the eastern part of the Site, the fields immediately adjacent the River Till, comprises mudstone of the Charmouth Mudstone Formation, sedimentary bedrock formed between 199.3 and 192.7 million years ago during the Jurassic period (BGS 2023).

2.3.5 Superficial deposits of clay, silt, sand and gravel alluvium are recorded within the floodplain of the River Till in the east of the Site (Fields N24-N32). The bedrock geology in the west of Fields N6 and N7 is overlain by superficial deposits of Holme Pierrepont Sand and Gravel Member sands and gravels. Within the centre of the Site, across parts of Fields N14 and N15, the bedrock geology is overlain by a small area of river terrace sand and gravel deposits (BGS 2023).

2.3.6 NAA were used as the geophysical contractor for the West Burton 2 Solar Site.

## **2.4 West Burton 3 Solar Site (Appendix 3)**

2.4.1 All accessible land within the West Burton 3 Solar Site was targeted with geophysical survey.

2.4.2 The Site comprises approximately 370ha of land to the south of Stow Park Road / Till Bridge Lane to the east of the villages of Marton and Brampton within the West Lindsey District of Lincolnshire (Figure 13.2-2 and 13.2-3).

2.4.3 Parts of Fields P1 and P4 were removed from the redline boundary following the completion of the geophysical survey report.

2.4.4 The recorded bedrock geology across the majority of the West Burton 3 Site comprises interbedded mudstone and limestone of the Scunthorpe Mudstone Formation; a band of Penarth Group mudstone is recorded along the western edge of the Site. Both geologies are sedimentary bedrock formed between 209.5 and 190.8 million years ago during the Triassic and Jurassic periods. A large band of superficial sands and gravels of the Holme Pierrepont Sand and Gravel Member extends south-north through the centre of the Site, as well as along the western edge of the Site. A small area of Mid-Pleistocene Glaciofluvial sand and gravel deposits are present within the north-west of the Site (BGS 2023).

2.4.5 NAA were used as the geophysical contractor for the West Burton 3 Solar Site.

## **2.5 West Burton Cable Route Corridor (Appendix 4)**

2.5.1 Geophysical survey for the West Burton Cable Route Corridor comprised a 100m survey corridor centred on the initial proposed cable route running between the three solar sites within the West Burton Scheme. It comprises c.120ha of agricultural land traversing parts of 138 fields (hereafter referred to as 'Areas') in the West Lindsey district of Lincolnshire and Bassetlaw district of Nottinghamshire (Figures 13.2-2 and 13.2-3).

2.5.2 The Cable Route Corridor runs south-west from the north-west of West Burton 1 to the north-east of West Burton 2, crossing the River Till to the west of Carriers Farm. The cable route connects the eastern and western sections of West Burton 2 to the south of Ingleby Grange, following the course of Sturton Road. From the north-west



of West Burton 2, it heads north towards Cowdale Lane. At which point it turns west and traverses fields adjacent to Cowdale Lane, before turning north and following the line of the Lincoln and Retford branch railway line, which borders the south-east of West Burton 3. The Cable Route Corridor enters West Burton 3 to the north of farm buildings belonging to Stow Park Farm. The Cable Route Corridor runs from the north-west of West Burton 3 at Poplar Farm, across fields to the south of Marton, towards the River Trent. It crosses the river to the south of Trent Port, after which it continues west toward Coates where it turns north-west and snakes towards West Burton Power Station, crossing Craikbank Lane, Northfield Road, Fenton Lane, Littleborough Road and Upper Ings Lane. The Cable Route Corridor turns west at Common Lane before heading north at North Street Farm towards the West Burton Power Station.

- 2.5.3 Areas N50, N51 and N52 could not be surveyed due to access issues with the landowners.
- 2.5.4 The bedrock geology along the Cable Route Corridor between the West Burton 1 and 2 Solar Sites is recorded as Charmouth Mudstone Formation; Scunthorpe Mudstone Formation is recorded between West Burton 2 and 3 Solar Sites (BGS 2023). Superficial deposits of alluvium (clay, silt, sand and gravel) occur adjacent to the course of the River Till.
- 2.5.5 The geology along the Cable Route Corridor to the east of the River Trent is recorded as interbedded mudstone and limestone of the Scunthorpe Mudstone Formation. A small area of sand and gravel glaciofluvial superficial deposits is recorded in the north-west of West Burton 3 and the adjoining section of cable corridor, otherwise there is no recorded superficial geology. A small band of mudstone of Penarth Group runs through the east of Marton towards Brampton. The geology to the west and immediate east of the River Trent is recorded as Mercia Mudstone Group. Superficial deposits of clay, silt and gravel alluvium occur along watercourses, such as the River Trent and its various tributaries, otherwise the superficial geology is comprises Holme Pierrepont Sand and Gravel Member or is unrecorded (BGS 2023).
- 2.5.6 ASWYAS were used as the geophysical contractor for the West Burton Cable Route Corridor.

## **2.6 Shared Cable Corridor (Appendix 5)**

- 2.6.1 The Shared Cable Corridor comprises 158.5ha in the Bassetlaw district of Nottinghamshire and the West Lindsey district of Lincolnshire. The Shared Cable Corridor is proposed to be used by up to 3 schemes: The West Burton Solar Project, The Cottam Solar Project and the Gate Burton Solar Project.
- 2.6.2 Fields 106 to 117 (see Figure 13.2-3) are located within the West Burton Cable Route Corridor and total c.42 ha. The section of the shared cable corridor running between fields to the west of the River Trent to the Cottam Power Station (Fields 118 to 154; see Figure 13.2-3) are not located within the West Burton Cable Route Corridor and

relate to works undertaken for the Cottam Solar Project and Gate Burton Solar Project.

- 2.6.3 The Cable Route Corridor crosses the River Trent to the south of Trent Port at Marton, following which the corridor runs north-west to the south of Marton towards Stow Park Road, intersecting the road to the west of Marton Grange (Figure 13.2-3).
- 2.6.4 The Shared Cable Route Corridor is proposed to be used for up to three separate solar schemes. Information collated as part of desk-based research indicated that there was a high potential for substantial concentrations of buried archaeological remains to be present to the north of the Cottam Power Station in the Bassetlaw district of Nottinghamshire (Lanpro 2023d). Consequently, a wider survey area was used along the Shared Cable Route Corridor due to the additional potential impacts and the extensive evidence for archaeological remains in this area.
- 2.6.5 The geology to the west and immediate east of the River Trent is recorded as Mercia Mudstone Group. Superficial deposits of clay, silt and gravel alluvium occur along watercourses such as the River Trent and its various tributaries, otherwise the drift geology is recorded as Holme Pierrepont Sand and Gravel Member. To the east of the River Trent, a small bank of mudstone of Penarth Group with no recorded drift geology runs through the east of Marton towards Brampton. The geology to the east of Marton is recorded as interbedded mudstone and limestone of the Scunthorpe Mudstone Formation with no recorded superficial deposits (BGS 2023).
- 2.6.6 Wessex Archaeology were used as the geophysical contractor for the Shared Cable Route Corridor.

### 3 Archaeological Baseline

- 3.1.1 Archaeological and historical background information for the Scheme is provided in a series of archaeological desk-based assessments, which should be referred to in parallel to this document (Lanpro 2022a; 2022b; 2022c; 2022d; see **Environmental Statement: Appendix 13.1 [EN010132/APP/WB6.3.13.1]**). The individual geophysical survey reports also provide an overview of the archaeological background to the relevant Sites (Appendices 1-4).

### 4 Aims and Objectives

- 4.1.1 The overall aim of the archaeological geophysical surveys was to obtain sufficient information to establish the presence/absence, and where possible, character of any archaeological remains within the proposed development site. This has enabled an informed programme of trial trench evaluation (West Burton Solar Project 2022b; CFA 2022a; CFA 2022b; CFA 2022c) and allowed reasoned and informed recommendations to be made on the application for development of the site and requirements for further mitigation.

- This aim was achieved through completion of the following objectives:
- To survey a 100% sample of all accessible areas within the scheme.
- To determine the location, extent, and where possible, character of any magnetic anomalies identified within surveyed areas.
- To assess the archaeological potential of magnetic anomalies using available supporting evidence.
- To identify concentrations of possible archaeological features to inform the Scheme design and any requirements for further archaeological investigation.
- To create a detailed report with illustrations and compile an appropriately packaged digital archive to ensure the long-term survival of the collected data.
- The programme of archaeological geophysical survey was carried out with the aim of addressing the general research parameters and objectives defined in the regional archaeological research framework the *East Midlands Historic Environment Research Framework* (EMHERF 2023).

## **4.2 Standards and Guidance**

- 4.2.1 All work was undertaken to fully meet the requirements of all nationally recognised guidance for such work, including standards laid down by the International Society of Archaeological Prospection, the European Archaeological Council (EAC), the Lincolnshire Council Historic Environment Team, Historic England and the ClfA
- 4.2.2 The programme of geophysical survey was managed in line with the standards laid down in the Historic England guideline publication *Management of Research Projects in the Historic Environment (MoRPHE): Project Managers Guide* (2015), as well as to meet the requirements of the National Planning Policy Framework (NPPF; Chapter 16: 'Conserving and enhancing the historic environment'; revised 2021).
- 4.2.3 Guidance of particular relevance to the programme of works were:
- Code of Conduct (ClfA 2022)
  - EAC Guidelines for the Use of Geophysics in Archaeology (Schmidt *et al.* 2015)
  - Archaeology Handbook (Lincolnshire County Council 2019)
  - Standards and guidance on archaeological geophysical survey (ClfA 2020a)
  - Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives (ClfA 2020b)
  - Management of Research Projects in the Historic Environment: PPN3: Archaeological Excavation (English Heritage 2008)

## **5 Methodology**

### **5.1 Data Collection**

5.1.1 The geophysical survey comprised a magnetic survey technique. Magnetic surveys are generally considered to be the most cost-effective and successful technique for identifying a wide range of different archaeological features. Geophysical surveys undertaken for the West Burton Solar Scheme successfully detected potential human activity that appears to date from a range of different time periods. It can therefore be inferred that the soils and type of archaeological features within the areas surveyed are conducive to a magnetic survey technique and that the correct geophysical survey technique was utilised for the Scheme.

5.1.2 All survey work was completed to appropriate standards, as outlined by professional guidelines (ClfA 2020a; Schmidt *et al.* 2015). All survey works was completed by appropriately experienced operators working in line with the ClfA Code of Conduct (2022). The magnetometer survey was undertaken using an appropriate magnetometer system (either cart-based or handheld) with a resolution no coarser than 1m by 0.25m. All data was located using Real Time Kinematic (RTK) differential GPS equipment with a positional accuracy of  $\pm 0.1$ m. Detailed survey methodologies are detailed within final reports.

5.1.3 The geophysical survey covered all accessible land within the proposed cable route; where areas were not considered suitable for survey this was justified in the final reports.

### **5.2 Data Processing and Interpretation**

5.2.1 Data processing and interpretation was undertaken by a competent geophysicist who is well versed in the characterisation of magnetic anomalies.

5.2.2 Data was sufficiently processed using appropriate software. All processes applied to data was detailed and justified in final reports.

5.2.3 Interpretation was undertaken with consideration to available supporting evidence, including, but not limited to, geological, documentary, cartographic, LiDAR and aerial sources. Consideration should also be given to site/ground conditions, topography and features present in the landscape at the time of survey.

### **5.3 Geophysical Survey Reports**

5.3.1 The results of the geophysical surveys are presented in fully illustrated reports.

- Appendix 1: West Burton 1 Solar Site
- Appendix 2: West Burton 2 Solar Site
- Appendix 3: West Burton 3 Solar Site
- Appendix 4: West Burton Cable Route Corridor
- Appendix 5: Shared Cable Route Corridor

## **5.4 Repeatability**

- 5.4.1 Three control areas were established to assess data integrity between the different geophysical survey contractors employed to undertake the work.
- 5.4.2 Control areas were selected that contained features of different origin (i.e. archaeological, agricultural, modern, and geological etc) in order to demonstrate the repeatability of the magnetic survey techniques, as well as consistency between the different magnetometer systems operated by the geophysical contractors used for the Scheme.
- 5.4.3 Data collected in the control areas is reproduced in Appendix 6.
- 5.4.4 Data collected by the different contractors has produced consistent results with features of varying origins being detected and being recorded as anomalies with consistent patterning and increases in magnetic values.

## **6 Summary of Results**

### **6.1 West Burton 1 Solar Site (Appendix 1; ASWYAS 2022)**

- 6.1.1 The majority of the anomalies recorded represented agricultural activity, including field drains, ridge and furrow cultivation, modern ploughing and former field boundaries.
- 6.1.2 A group of linear and short ditch-like geophysical anomalies were recorded on the western side of Field M2. Due to the location of the medieval village of Broxholme, to the immediate west, it was suggested that an archaeological origin was possible, and that they may represent the remains of house plots. However, the interpretation was tentative as it was considered equally plausible that they are agricultural in origin, or possibly represent animal corrals. Therefore an 'uncertain' interpretation was given. The 1824 Ordnance Survey (OS) Old Series map shows the north-west of Broxholme village as extend slightly into the study area at the same location of geophysical anomalies in Field M2. Evaluation trial trenching (CFA 2022a) demonstrated the geophysical anomalies were caused by a series of ditches. One ditch was found to contain pottery (three sherds provisionally dated to the 14/15th centuries), animal bone (sheep/goat) and ceramic building material.
- 6.1.3 Several linear anomalies were identified in the east of Field M3 and interpreted as possibly forming a field system. The relationship between anomalies in Fields M2 and M3 is uncertain but it was considered possible that they are contemporaneous.
- 6.1.4 1.1.1 A linear trend in Field M4 is perpendicular to a former boundary which lies to its immediate east. It is possible that this represents a former boundary predating available historical mapping. Further linear anomalies in Field M5 were interpreted as also possibly representing former field systems.
- 6.1.5 The survey report concluded that, based on the geophysical survey data, the archaeological potential of West Burton 1 was considered to be low.

## **6.2 West Burton 2 Solar Site (Appendix 2; NAA 2022a)**

- 6.2.1 The geophysical survey of the West Burton 2 Site detected numerous magnetic anomalies associated with an agrarian landscape, including former field boundaries, medieval/post-medieval ridge and furrow cultivation, modern ploughing and land drains. Archaeological and possible archaeological responses were recorded within the survey area, comprising possible linear ditches and trends, and possible rectilinear enclosures and sub-circular trends, perhaps indicative of settlement activity. Areas of magnetic disturbance were also mapped that were considered likely to be of a geological origin, such as in fields to the west of the River Trent.
- 6.2.2 Rectilinear, curvilinear and amorphous anomalies were identified in Fields N1 and N2 that were interpreted as being of an archaeological origin. In Field N1, three sides of a possible enclosure, measuring c.60m by 130m, were identified that correspond with a cropmark on aerial imagery. The fourth side was truncated by a bipolar anomaly caused by a modern utility. Several curvilinear and amorphous anomalies were identified adjacent to the enclosure that were interpreted as possibly having an archaeological origin. Several associated features were identified during the evaluation trial trenching (CFA 2022b) and interpreted as probably representing small-scale settlement or agricultural activity dated between the late Iron Age to the early Roman period.
- 6.2.3 Two perpendicular anomalies were identified in the west of Field N2, which were interpreted as possibly forming an enclosure that extended beyond the limits of the Site. Anomalies were targeted by three evaluation trenches, which identified a long curvilinear ditch (CFA 2022b). Although no datable material was recovered from the ditch, a second perpendicular ditch, postulated as possibly being contemporaneous, contained pottery spot-dated to the 2nd century AD.
- 6.2.4 A linear trend of unknown origin was identified running north-west to south-east in Fields N26 and N27. The linear trend corresponds with the location of a short ditch of uncertain date that was identified by air photo and LiDAR mapping (Deegan 2022b) as a shallow earthwork in Field N26. A second section of ditch running on the same alignment appears to the south-east of the River Till and potentially belongs to the same feature.
- 6.2.5 Magnetic anomalies tentatively interpreted as being of a possible archaeological origin were identified in Fields N6 and N7. These comprised a series of rectilinear and amorphous anomalies in the south-east of N6 and a sub-circular anomaly with a diameter of c. 13m in the north of Field N7.
- 6.2.6 Several rectilinear and amorphous anomalies were identified outside the limits of the Site in Fields N15 to N18 that are likely to be associated with the North Ingleby DMV. These anomalies largely correspond with earthworks visible in pasture fields that border the Scheduled core of the medieval village (NHLE 1003570).

6.2.7 Numerous trends were identified across the survey area that generally lacked the increases in magnetic value or patterning for conclusive interpretation. It is probable that they are largely agricultural in nature.

### **6.3 West Burton 3 Solar Site (Appendix 3; NAA 2022b)**

6.3.1 The geophysical survey of the West Burton 3 Site detected magnetic anomalies associated with an agricultural landscape, including former field boundaries, medieval/post-medieval ridge and furrow cultivation, modern ploughing and land drains. Anomalies have been recorded in Fields P4, Q1, Q6, Q7, Q8, Q9, Q11, Q15 and Q16, which were interpreted as being of a potential archaeological origin and possibly indicative of linear ditches associated with possible settlement activity.

6.3.2 A series of fragmented rectilinear anomalies were identified in Field P4, to the west of the Site, that were interpreted as possibly being of an archaeological origin. Interpretation was tentative as anomalies caused by agricultural activity and buried utilities partially masked those considered to have an archaeological potential. Subsequent evaluation trial trenching confirmed that anomalies interpreted as being archaeological were caused by ditches, which contained material dated to the medieval period (CFA 2022c).

6.3.3 Several rectilinear and amorphous anomalies and trends were identified in the north of Field Q9 that were interpreted as forming a roadside settlement to the south of Stow Park Road. Linear anomalies were also identified to the west of Field Q9, in Field Q1. It was not possible to identify if these were agricultural or associated with anomalies considered to be of an archaeological nature to the east. The evaluation trial trenching confirmed that evidence for Roman settlement was present in Field Q9, which extended into the far east of Field Q1. The majority of identified anomalies in Field Q1 were proven to be of an agricultural nature.

6.3.4 A concentration of rectilinear and amorphous anomalies were identified in Field Q6 that were considered to potentially represent settlement activity pre-dating the medieval period. Evaluation trial trenching confirmed the archaeological origin of identified geophysical anomalies, recording a series of shallow features, many of which were considered to belong to a field system (CFA 2022c).

6.3.5 Numerous rectilinear and amorphous anomalies were identified in Fields Q7, Q8, Q15 and Q16 that were considered to form a series of enclosures that were possibly associated with an Iron Age or Roman period ladder settlement. Evaluation trial trenching identified evidence of field systems and settlement activity with an abundance of occupational Roman material (i.e. CBM, pottery etc) within Fields Q7 and Q8 (CFA 2022c). Several sub-square enclosures were identified in Field Q16, which had been obscured by shallow quarrying activity. Further quarrying deposits were identified in the west of Field Q15.

6.3.6 An area of magnetic disturbance was identified in the south-west of Field Q26 that corresponds with the location of a former brick works, which is recorded on 19th-century historical maps.

- 6.3.7 Several fragmented linear anomalies were identified in the south-east of Field Q11, which were interpreted as being of a possible archaeological origin as they lacked the necessary patterning for conclusive interpretation.
- 6.3.8 Numerous trends were identified across the survey area that generally lacked the increases in magnetic value or patterning for conclusive interpretation. It is probable that they are largely agricultural in nature. Otherwise, anomalies were largely considered to be associated with agricultural activity (including former field boundaries, possible former trackways, ponds, ridge and furrow, modern ploughing and land drains) or modern activity, including numerous buried utilities.

#### **6.4 West Burton Cable Route Corridor (Appendix 4; ASWYAS 2023)**

- 6.4.1 The surveys recorded several concentrations of rectilinear and curvilinear anomalies that are possibly indicative of late prehistoric and/or Roman period activity. Anomalies associated with agricultural activity, including former ponds, ridge and furrow, former field boundaries, land drains and modern ploughing, were also identified, as well as areas of magnetic disturbance caused by ferrous material and broad anomalies caused by geological or paleological changes in the substrata.
- 6.4.2 A rectilinear anomaly measuring 64m by 67m spans Geophysical Survey Areas S42 and S43, to the south of Cowdale Lane between West Burton 2 and 3 and was interpreted as forming an enclosure with a possible entrance in the north-eastern corner.
- 6.4.3 An isolated curvilinear anomaly with a diameter of c.10m was interpreted as a possible ring ditch in Geophysical Survey Area S39, to the north of Cowdale Lane between West Burton 2 and 3.
- 6.4.4 A series of weak linear anomalies were identified to the south-east of Stow Park Farm, to the east of West Burton 3, in Geophysical Survey Area S36, which were tentatively interpreted as belonging to enclosures or a field system. The proximity of anomalies in Geophysical Survey Area S36 to Roman find spots (MLI52441 and MLI52453) recorded on the HER may be suggestive that the features date to the Roman period.
- 6.4.5 The HER records two areas of cropmarks that possibly relate to field systems and trackways of an unknown date (MNT4980 and MNT4981) at North Leverton. Air photo and LiDAR interpretation (Deegan 2022b) and geophysical survey (ASWYAS 2023) have mapped an extensive series of cropmarks and magnetic anomalies that are likely to be indicative of prehistoric and/or Roman enclosures and field systems to the south-west of the cable route corridor, which possibly extend into Geophysical Survey Areas S18 to S25.
- 6.4.6 Linear and curvilinear anomalies were identified in Geophysical Survey Area S9 that were interpreted as denoting settlement activity of an Iron Age / Romano- British to medieval date. Given the similarity in the morphology with other identified anomalies it is considered likely that they relate to enclosures dated to the Iron Age and/or Roman periods.



6.4.7 A former route of Craikbank Lane (MNT6180) was recorded as comprising a double ditched trackway from air photos taken in the 1940s and extends into the north of Geophysics Survey Area S25.

6.4.8 A sub-square enclosure of possible medieval or post-medieval date, located directly to the north-west of Geophysical Survey Area S1, was recorded from earthworks and soilmarks present on air photos and LiDAR (Deegan 2022b). An annex or hollow way is suggested as being present at the north-west corner. The air photo and LiDAR mapping record two ponds to the south-west of the enclosure, within the cable route corridor, one of which is recorded on the 1885 Ordnance Survey map, and mapped as a bipolar magnetic anomaly.

## **6.5 Shared Cable Route Corridor (Appendix 5; Wessex Archaeology 2022)**

6.5.1 To the south-east of Marton, the HER records cropmarks in Field 106 that were interpreted as representing a Roman trackway and field boundaries (MLI52489). The air photo and LiDAR mapping interpreted the cropmarks as comprising a broad compacted surface flanked by two ditches (Deegan 2022a; 2022b). Geophysical survey within the cable route corridor did not identify any anomalies conclusively associated with this feature, which suggests that it has been destroyed by agricultural activity.

6.5.2 To the east of the River Trent, a series of linear and amorphous anomalies were identified in the south-east of Field 113a that are likely to be caused by ditches of a possible Iron Age and/or Roman origin (Wessex Archaeology 2022a). These anomalies possibly correspond with a series of undated cropmarks (MLI54108) recorded on the HER. A watching brief undertaken during the installation of the Blyborough to Cottam pipeline in 1997 did not observe any archaeological features associated with the cropmarks, however a spread of alluvium was identified that contained Roman to post-medieval pottery (Wessex Archaeology 1997).

6.5.3 Several circular anomalies were identified in Fields 115 and 116, adjacent to the eastern bank of the River Trent, and tentatively interpreted as possible ditches and embankments, associated with roundhouses or small round barrows. While these features are topographically expressed in LiDAR data, their interpretation is less than certain, as they could equally relate to natural variation in superficial geological deposits close to the river. Indications of former agricultural activity and 19th-century enclosure of land were recorded throughout the Cable Route Corridor in the form of former field boundaries and areas of ridge and furrow. Other 19th-century activity, such as possible coal extraction pits, demolished buildings at Rectory Farm, and features associated with Marton Pumping Station were also noted.

## **7 Discussion**

- 7.1.1 A magnetic geophysical survey was undertaken across all accessible areas within the Scheme to ascertain the potential for buried archaeological deposits to be present, and where possible suggest their extent and character.
- 7.1.2 Three geophysical survey contractors were used to collect and report on data for the scheme, all of which are Registered Organisations with ClfA. Repeatability tests were used to scrutinise collected data and have demonstrated the geophysical survey technique chosen for the Scheme has provided meaningful data and that a high level of data integrity was achieved.
- 7.1.3 The results of the geophysical survey have identified clear concentrations of magnetic anomalies within the Scheme that are indicative of prehistoric, Roman and medieval activity. Evidence of agricultural activity, including ridge and furrow, former field boundaries, land drains and modern ploughing, as well as anomalies of a modern and geological origin have also been mapped.
- 7.1.4 Concentrations of geophysical anomalies suggested to be of an archaeological origin were tested by trial trench evaluation between June and November 2022. The trial trench evaluation confirmed the extent and nature of archaeological deposits identified through the geophysical survey (CFA 2022a, CFA 2022b and CFA 2022c). It was noted during the trial trench evaluation that anomalies with good patterning and increases in magnetic value correlated with well-defined features; those with weak increases in magnetic value or informal patterning corresponded with shallow ephemeral features. Generally, negligible archaeological features were identified in 'blank' areas where geophysical survey had suggested there was a low potential for buried remains to be present. Where isolated features were present, these were ephemeral and often lacked dating material to confirm an archaeological origin. Consequently, it is considered that there is limited potential for buried archaeological remains to be present in areas where geophysical survey has not identified concentrations of anomalies interpreted to be of an archaeological origin.

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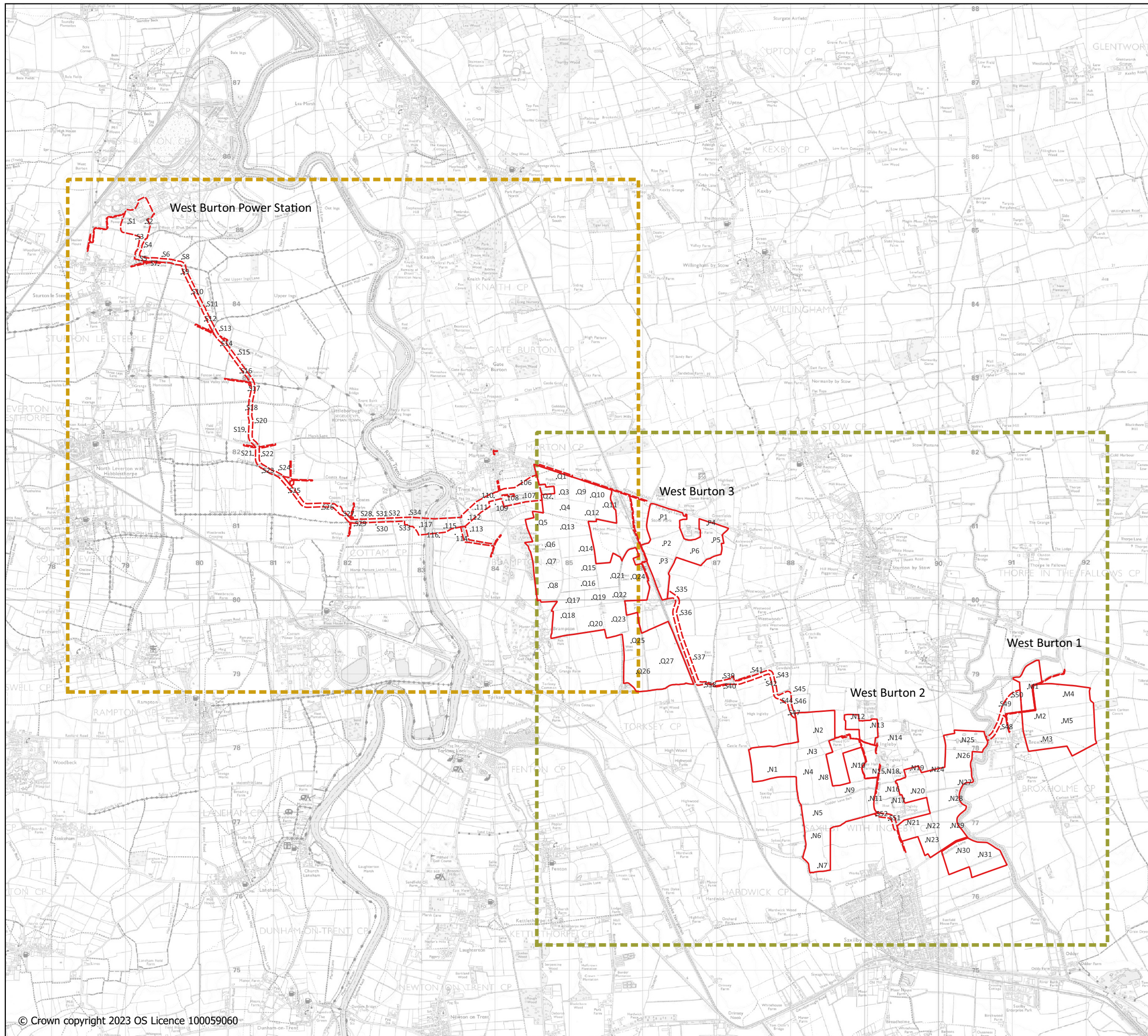
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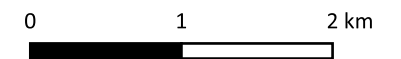
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## Figures

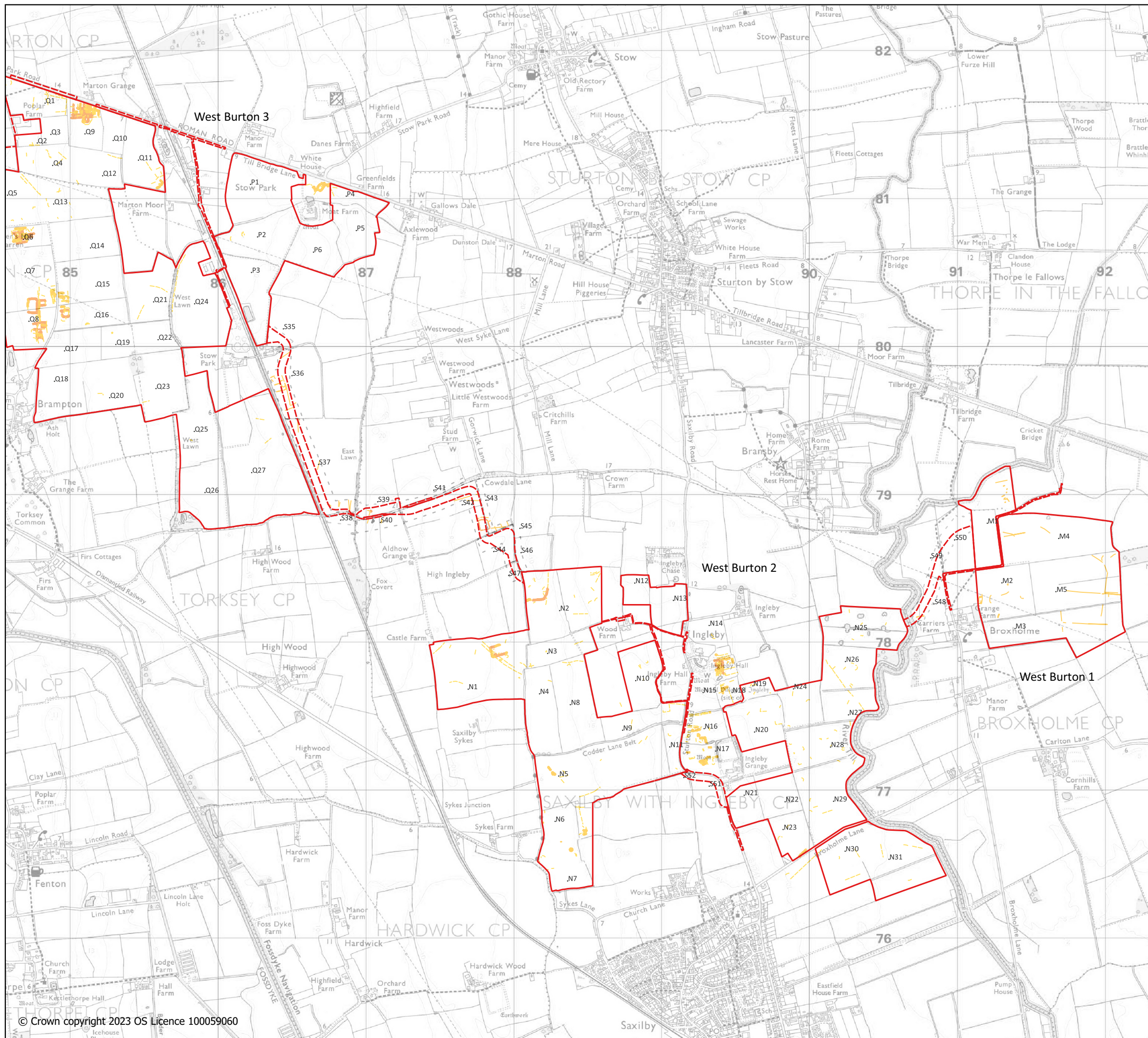


-  Proposed Solar Site
-  Proposed Cable Route Corridor

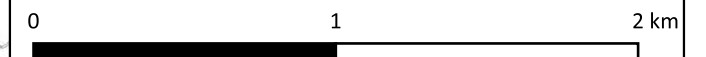


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Figure App.13.2-1  
Location of the West Burton Solar Scheme  
development sites

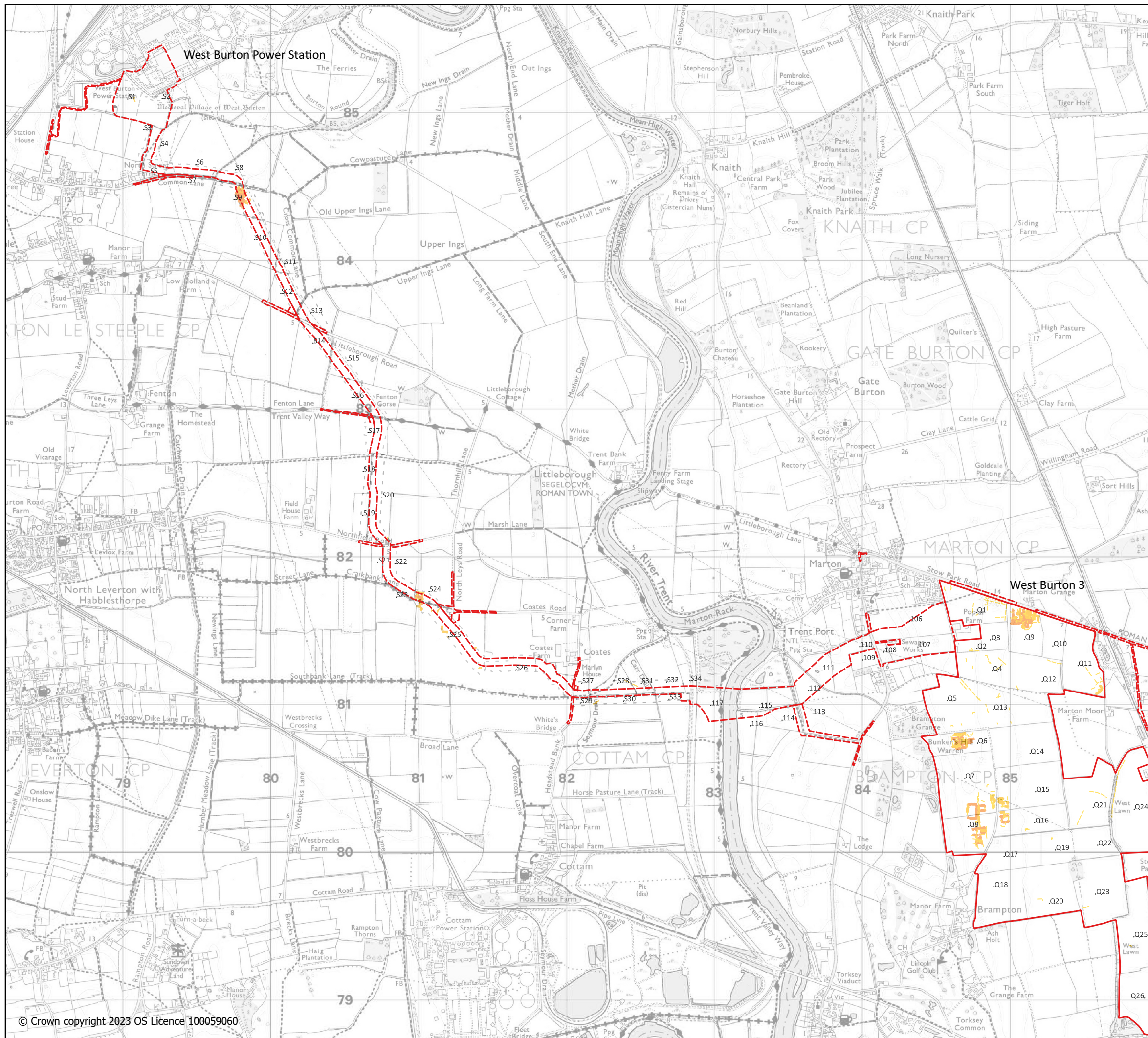


- Proposed Solar Site
- Proposed Cable Route Corridor
- Geophysics anomalies: 'archaeology'
- Geophysics anomalies: 'possible archaeology'
- Geophysics anomalies: 'trend'

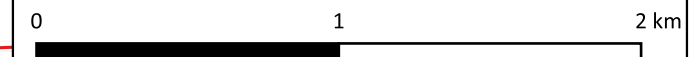


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**Figure App.13.2-2**  
Location of survey areas within West Burton 1 and 2 Sites and adjacent West Burton Cable Route Corridor with anomalies considered to have an archaeological potential



- Proposed Solar Site
- Proposed Cable Route Corridor
- Geophysics anomalies: 'archaeology'
- Geophysics anomalies: 'possible archaeology'
- Geophysics anomalies: 'trend'



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**Figure App.13.2-3**  
Location of survey areas within West Burton 3 Site and adjacent West Burton Cable Route Corridor with anomalies considered to have an archaeological potential