

# **High Speed Rail (Crewe – Manchester)**

## **Background information and data**

### **Historic environment**

BID HE-005-0MA04

MA04: Broomedge to Glazebrook

Historic environment remote sensing report

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## Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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# 1 Introduction

- 1.1.1 This report presents the results of analysis of remote sensing data relating to the historic environment.
- 1.1.2 Baseline data has been collected for the Proposed Scheme in relation to the Broomedge to Glazebrook area (MA04).
- 1.1.3 All identified heritage assets discussed in this report are shown in the Volume 5, Historic environment Map Book, Map Series HE-01, HE-02, HE-03<sup>1</sup>.
- 1.1.4 The historic environment detailed gazetteer is set out in Appendix A of the Historic environment baseline report (see Background Information and Data: BID HE-001-0MA04). It sets out Unique gazetteer identifier (UID) codes for the heritage assets considered in the baseline data; these are used for reference across all the historic environment reports and maps in the Environmental Statement (ES)<sup>2</sup> and BID reports.
- 1.1.5 The approach to assessing the archaeological potential of the landscape is outlined in the Historic environment summary gazetteer, impact assessment table and archaeological character areas report (HE-002-0MA04<sup>3</sup>). This breaks the study area down into areas of archaeological character; initially into broad Archaeological Character Areas (ACAs), and then more narrowly defined Archaeological Sub-zones (ASZs).
- 1.1.6 The approach used for assessing historic landscape character (HLC) is described in the Historic environment Historic landscape character areas report (HE-003-0MA04<sup>4</sup>). The approach is used to determine Historic Landscape Character Area report (HLCA). HLCA are areas of coherent or distinctive historic landscape characteristics.
- 1.1.7 Within the historic environment reporting, various reference numbers have been used to provide a unique identifier to the heritage assets, HLCA, ACA/ASZ, geophysical survey anomalies and remote sensing features identified. These unique identifiers are referenced throughout the ES, BID reports and Map Books, and in summary are as follows:

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<sup>1</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Volume 5 Historic environment Map Book*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>2</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>

<sup>3</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Broomedge to Glazebrook, Summary gazetteer, impact assessment table and archaeological character areas, Volume 5: Appendix HE-002-0MA04*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>4</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Broomedge to Glazebrook, Historic landscape character areas, Volume 5: Appendix HE-003-0MA04*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

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- heritage assets have been given a Unique gazetteer identifier (UID), for example MA04\_0001. These have been allocated to all heritage assets within the gazetteer of heritage assets, provided in Volume 5: Appendix HE-002-0MA04 (summary gazetteer) and BID HE-001-0MA04 (detailed gazetteer);
- historic landscape character areas have been given a unique identifier, for example MA04\_HLCA02. These have been allocated to all HLCA within the historic landscape character assessment, provided in Volume 5: Appendix HE-003-0MA04;
- archaeological character areas and archaeological sub-zones have been given a unique identifier, for example: archaeological character area MA04\_AC01; and archaeological sub zone MA04\_AC01.002. These have been allocated to all of the assessed archaeological character areas and archaeological sub-zones, provided in Volume 5: Appendix HE-002-0MA04;
- geophysical survey areas and features identified through the geophysical survey have been allocated a unique identifier, for example: geophysical survey area MA04\_GP001, and geophysical survey feature MA04\_GP001.001. These have been allocated to all of the identified geophysical survey areas and features, provided in BID HE-004-0MA04; and
- features identified through remote sensing have been allocated a unique identified, for example MA04\_RS001. These have been allocated to all of the identified remote sensing features, provided in BID HE-005-0MA04.

## 2 Remote sensing

### 2.1 Introduction

- 2.1.1 This report sets out the results of a review, and the systematic mapping, recording, analysis and interpretation of potential archaeological sites from aerial photographs and LiDAR<sup>5</sup> data within the Broomedge to Glazebrook area.
- 2.1.2 The remote sensing was undertaken in accordance with the guidance and standards set out in:
- the Historic England standards for aerial investigation and mapping (formerly known as the National Mapping Programme, NMP)<sup>6</sup>; and
  - the Forum on Information Standards in Heritage (FISH) vocabularies<sup>7</sup>.

### 2.2 Survey objectives

#### Aims of the survey

- 2.2.1 The aim was to accurately map and record the form and extent of archaeological features visible as cropmarks, soil marks, earthworks or structures in order to inform the assessment of baseline conditions for the historic environment.

#### Objectives of the survey

- 2.2.2 The results of the survey have been combined with data from other archaeological assessments carried out as part of the project, such as desk-top studies and geophysical surveys in order to help analyse the archaeological potential of the Proposed Scheme.

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<sup>5</sup> LiDAR (meaning 'light detection and ranging') is a surveying method that measures distance to a target by illuminating the target with pulsed laser light and measuring the reflected pulses with a sensor; this can be used to identify archaeological earthwork evidence.

<sup>6</sup> Winton, H. (2018), *Standards for Aerial Investigation and Mapping projects*, Historic England internal document.

<sup>7</sup> FISH (2020), *Heritage Data; Linked Data Vocabularies for Cultural Heritage*, available online at: <https://www.heritagedata.org/blog/vocabularies-provided/>.

## 2.3 Survey methodology

2.3.1 This section provides an overview of the survey methods. The aims and general method for the remote sensing assessment are set out in the Generic Written Scheme of Investigation (HE-006-00000<sup>8</sup>).

### Data collection

2.3.2 The data collection phase of the survey took place between April 2017 and December 2018. The following sources were consulted:

- historic aerial photographs;
- online aerial and satellite-derived images;
- HS2 vertical aerial photographs;
- Environment Agency vertical aerial photographs;
- HS2 (BLOM Aerofilms) LiDAR data;
- Environment Agency LiDAR data;
- Historic Environment Record (HER) data;
- National Record of the Historic Environment (NRHE) data;
- National Heritage List for England (NHLE) data; and
- historic cartographic sources.

### Data processing

2.3.3 The following processing steps have been carried out on the data used in this survey:

- all spatial data was collated and generated in GIS (Geographic Information System) ArcMap 10.5 using the British National Grid (EPSG: 2770) map projection;
- both the HS2 Ltd and Environment Agency LiDAR datasets were processed using the software Relief Visualisation Toolkit (RVT 1.3) to create eight different advanced visualisation models, prior to their import into GIS ArcMap 10.5;
- the HS2 Ltd and Environment Agency vertical aerial photographic cover was already georeferenced and required no further processing; and
- selected archive aerial photographs were orthorectified (processed to accurately fit the map and terrain) using the software Aerial 5.33 prior to their import into GIS.

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<sup>8</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Generic written scheme of investigation for non-intrusive archaeological survey, Volume 5: Appendix HE-006-000000*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.



## Data presentation

- 2.3.4 A general location plan showing the survey area is shown on Figure 1 at a scale of 1:75,000. Details of sites or features transcribed during this project are presented at a scale of 1:5,000 on Figures 2 to 7 inclusive.
- 2.3.5 When interpreting the results, several factors are taken into consideration, including the nature of archaeological features being investigated, the local conditions at the site (geology, topography etc.). The identified features are categorised by their potential origin and divided into categories that are used in the graphical interpretation of the remote survey data:
- bank;
  - ditch;
  - levelled ridge and furrow;
  - extant ridge and furrow;
  - extent of area;
  - services;
  - structure; and
  - large cut feature.
- 2.3.6 The identified categories are subsequently discussed by the period in which they most likely originated.

## Assumptions and limitations

- 2.3.7 The results and subsequent interpretation of data from remote sensing surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by intrusive archaeological investigation of sub-surface deposits.
- 2.3.8 The HS2 Ltd purpose-flown LiDAR survey took place during the summer, when leaf canopies, foliage and crop growth created unfavourable conditions for the collection of bare earth points. As a result, the quality of the Digital Terrain Model (DTM) generated from this LiDAR data is of low quality for areas beneath tree cover and may not represent a true ground surface model in areas of crops or dense foliage. Where available, the use of Environment Agency LiDAR data of a lower resolution has partially mitigated this issue.
- 2.3.9 The Cambridge University Collection of Aerial Photographs (CUCAP) archive of historic aerial photographs was closed for consultation at the time of this remote sensing survey. Although a small proportion of the collection was available online, the limited nature and low resolution of the images was inadequate for aerial analysis.
- 2.3.10 Local collections of aerial photography, potentially held by the HERs, were not consulted for this remote sensing survey.

## 3 Remote sensing survey results

### 3.1 Survey location

- 3.1.1 The study area for this remote sensing survey covers the entire length of Broomedge to Glazebrook area, which falls within the borough of Warrington and the metropolitan borough of Trafford within Cheshire and Greater Manchester.
- 3.1.2 The study area generally comprised a 700m-wide strip centred on the route of the Proposed Scheme (350m either side). This provided a buffer to offer contextual information for all recorded sites. In total the archaeological remote sensing survey for the Broomedge to Glazebrook area covered an area of 5.1km<sup>2</sup>.

### 3.2 Archaeological background

- 3.2.1 At the end of the last glaciation, the retreat of the ice sheet resulted in the deposition of tills, sands and gravels. Within these, wetlands known as mosses<sup>9</sup> formed on the land around the River Mersey south-west of Manchester. There are no features dating from the early prehistoric period in the Broomedge to Glazebrook area. The analysis of peat deposits from the mosses has provided evidence for Bronze Age and Neolithic agricultural activity. Funerary monuments known as round barrows have been observed around the North Cheshire Sandstone Ridge at Bucklow Hill (see BID HE-001-0MA03). No features representing substantial settlement are seen within MA04 until the Iron Age. An Iron Age promontory fort west of Great Woolden Hall Farm (MA04\_0186), was occupied in this period and associated with farming and salt production. Late prehistoric or Roman field terraces existed at Moss Brow Farm (MA04\_0115). This is possibly associated with the occupation of the study area in the Roman period. However, there are no known Roman roads or settlements.
- 3.2.2 The settlement of Warburton and the Old Church of St Werburg (MA04\_001) may be early medieval in origin. Rixton dates to the 13th century. There is a concentration of moated sites within the study area. These are a status symbol from the 12th to 14th century and found in isolated locations including at Warburton Park (MA04\_0147) and Great Woolden Hall (MA04\_0011). Deer parks also became popular among wealthy inhabitants, with an example of one such park being located at Warburton (MA04\_RS006/ MA04\_0147). A possible Bronze Age funerary mound (MA04\_RS007/MA04\_0142) identified in Warburton Park has been reinterpreted as a likely medieval/post-medieval 'pillow mound', an artificial warren built to house rabbits. Many of the hamlets and small farmsteads at this time are associated with curvilinear field enclosures, characteristic of assarting<sup>10</sup>. Other landholdings appear to have

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<sup>9</sup> Mosses or mosslands are areas of wetland formed from peat.

<sup>10</sup> Assarting is the act of clearing forested lands for use in agriculture or other purposes.

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been formed through enclosure<sup>11</sup>. Watermills, such as at Warburton (MA07\_0172) and Rixton-with-Glazebrook (MA04\_0143) developed along the watercourses to allow the processing of agricultural products.

- 3.2.3 Outside Manchester, the pattern of small villages such as Warburton and Rixton, and rural farmsteads continued in the post-medieval period. The mosses were drained and improved for agriculture and mixed arable farming was replaced by dairy production and market gardening to feed the expanding city of Manchester. The development of infrastructure included the Bridgewater Canal (MA04\_0082), the Manchester Ship Canal (MA04\_0083) and the railway network. The Royal Ordnance Factory (ROF) was established at Risley during the Second World War and defences were located around the munitions factories. The M62 was built and the new housing estates were built around Risley and Partington as the study area became part of the commuter belt for Manchester.

## 3.3 Survey results

- 3.3.1 The results of this survey are summarised below by period. Since the data from the visualised LiDAR and the aerial photographs are mutually supporting the results have not been separated by source.
- 3.3.2 The remote sensing survey mapped 12 individual areas, labelled from MA04\_RS001 to MA04\_RS012. These areas indicate the extent of sites, landscapes or parts of landscapes recorded. They are summarised in the gazetteer of identified features Section 4 (Table 1).

### Medieval (1066 – 1540)

- 3.3.3 A possible medieval moated site (MA04\_RS003/MA04\_0203) was visible on LiDAR as extant earthworks on the southern bank of a meander of the River Bollin. The moated channel is clearly visible; however, it is no longer flooded due to deep cutting of the river channel which now bypasses this earthwork. The line of the former Warrington and Stockport railway, now the Mersey Path, passes adjacent to the south, and truncates a former meander of the river which also fed the moat to the south.
- 3.3.4 John Speed's map of 1610<sup>12</sup> shows the extent of the former deer park at Warburton (MA04\_0147). The outline of this parkland (MA04\_RS006) has been preserved in the landscape through the road layout, field boundaries and cropmarks to the south and east; by the river to the west and by a watercourse to the north, with Warburton Park Farm at the centre. A square earthwork platform (MA04\_RS007/MA04\_0142) within the parkland has previously been interpreted as a possible burial mound. However, it is possible this represents the remains of a pillow mound, which were artificial rabbit warrens. Other features were recorded within the extents of the park, including a low bank that may

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<sup>11</sup> Enclosure is the legal process of enclosing common or marginal land.

<sup>12</sup> Speed, J. (1610), *Map of the County Pallatine of Chester, Atlas. 2.61.1*, University of Cambridge Digital Library.

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indicate the eroded remnants of the northern Park Pale (MA04\_RS018/MA04\_0260) and part of a series of interconnected cut features that are probably fishponds (MA04\_RS016/MA04\_0259).

- 3.3.5 A large, irregular depression immediately south of the farm building complex may indicate the partial remains of the moat associated with the original manor house at this site<sup>13</sup>. Two large, irregular depressions to the north-west of the park, in line with the perimeter, are at locations originally marked as salters, or deer leaps, on an 18th century estate map<sup>13</sup> (MA04\_RS014/MA04\_0262). The locations now appear to have been substantially quarried and a high pressure gas pipeline runs parallel to Red Brook on its southern side. It is unlikely that there will be any remains of the salters.
- 3.3.6 The survey recorded four areas of extant and levelled ridge and furrow (MA04\_RS001, MA04\_RS002, MA04\_RS005, MA04\_RS009) dating from the medieval or early post-medieval periods.

## Post-medieval (1540 – 1901)

- 3.3.7 The survey recorded the extent of Millbank Hall (MA04\_RS008/MA04\_0110), which was set within a walled garden and grounds connected to the Millbank Works. Nothing of the hall, grounds or industrial site remain. The details of these features are recorded within historic mapping. The area is now levelled and Millbank Hall Farm is located on the site.
- 3.3.8 There are no above ground remains of Rixton Corn Mill, or associated Mill Pond and tail race (MA04\_RS010/MA04\_0178), visible on the LiDAR imagery. The site of the former mill is now an agricultural field. However, the route of a former watercourse is visible as cropmarks in the vicinity of the former mill pond. This mill pond is known to have been fed from the west and stopped by a dam which gave its name to the adjacent Dam Lane. Any remaining watercourse has now been diverted and/or culverted.

## Modern (1901 – present)

- 3.3.9 The remains of the Second World War HMS Gosling Camp 5 are located within the Broomedge to Glazebrook area. These are visible on the historic aerial photographs of the area to the south of Bank Street (MA04\_RS013/MA04\_0204). This includes a training area (MA04\_RS011/MA04\_0205) and a miniature shooting range (MA04\_RS012/MA04\_0206). Whilst overgrown and no longer used, the main wall structure of the shooting range is still extant.

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<sup>13</sup> Lee, A. and Reader, R. (2020), *Historic Environment Assessment: GMSF Land Allocations, Trafford. GMA45 New Carrington*. Unpublished Report.

## 3.4 Remote sensing survey conclusions

- 3.4.1 A total of 12 individual or grouped possible archaeological features were identified by the survey, none of which were previously recorded within the HER, NRHE or NHLE. These include:
- the earthwork remains of a possible medieval moated site next to the River Bollin;
  - the outline of the former deer park at Warburton Park, with several elements relating to the park including the possible remnants of the park pale, fishponds and a pillow mound/artificial rabbit warren within the park. It is also possible that part of the moat associated with the medieval manor house still remains;
  - a post-medieval watermill identified at Rixton Corn Mill that included a mill pond and mill race;
  - the remains of the Millbank Hall estate, a wealthy post-medieval manor with substantial grounds, and the neighbouring works with paper mill; and
  - three remains associated with the outline of former Second World War HMS Gosling Camp 5 military site, including a training area and military shooting range.
- 3.4.2 The remaining four archaeological features identified were all areas of extant and/or levelled ridge and furrow, relating to medieval and post-medieval agriculture. The moated site (MA04\_0203) reflects part of a wider pattern and distribution of moated sites reflecting the drainage patterns of Greater Manchester. There is a concentration of moated sites on the western side of Manchester, below c. 150 mAOD on areas of glacial till<sup>14</sup>. The deer park at Warburton (MA04\_0147) reflects a pattern of medieval land use also visible further south in this part of the Cheshire plain, at High Legh (see BID HE-001-0MA03) as well as at Dunham Massey and Tatton Park.
- 3.4.3 There is little ridge and furrow identified within the study area, suggesting that the land was not utilised for arable agriculture in the medieval or early post-medieval period. This contrasts with the area to the south in Cheshire. In part this is due to areas of former deer parks. However, it appears to reflect the greater proportion of land that was formerly mossland. This includes former mossland east of Warburton and west of Glazebrook (see Volume 5, HE-003-0MA04; in particular, MA04\_HLCA01 and MA04\_HLCA\_03).
- 3.4.4 The post-medieval corn mills reflect the presence of several small stream courses across the landscape that flow towards the River Bollin and River Mersey. The mill at Millbank (MA04\_0110) was originally an iron slitting mill producing nails and wires, with a corn mill and paper mill added at the end of the 18th century. The mills were positioned to take direct advantage of the River Mersey; a weir was constructed across the river to power the mills and a lock added to aid navigation, whilst water from the river was used directly in the paper

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<sup>14</sup> Walker, J. S. F. and Tindall, A. S. (1985), *Country Houses of Greater Manchester*, Greater Manchester Archaeology Unit.

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making process. Sales particulars of 1772<sup>15</sup> suggest that the house was recently built, which may suggest that the house was a later addition to the estate.

- 3.4.5 The Second World War HMS Gosling Camp 5 (MA04\_0204, MA04\_0205, MA04\_0206) was part of the Royal Navy Air Training Establishment Risley. The camp was one of five for HMS Gosling: the headquarters and administrative centre was at New Road, Croft, and the others located at Risley; Lady Lane, Croft; and Lowton. The camp was one of a number of Second World War installations located in the area. Others included ROF Risley (see BID HE-001-0MA05, MA05\_0001), parts of which would later notably become the headquarters of the United Kingdom Atomic Energy Authority.

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<sup>15</sup> Manchester Mercury, 15 September 1772

## 4 Gazetteer of identified remote sensing features in MA04

4.1.1 The following gazetteer provides a summary of the identified features.

**Table 1: Gazetteer of identified features in MA04**

Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
MA04_RS001		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	<p>Area of levelled ridge and furrow observed from historic aerial photographs within enclosed agricultural ground to the north of Bradshaw Lane, north-east of Oak Villa Farm.</p> <p>Area of levelled ridge and furrow observed from historic aerial photographs within enclosed agricultural ground to the south-east of Heatley Heath Farm. The field boundaries have since changed, and it is now divided up into what looks to be smaller pasture plots.</p>	Figure 2	371151 387568
MA04_RS002		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	<p>Area of faint extant ridge and furrow observed within enclosed agricultural ground to the north of Wet Gate Lane Farm, just south of the River Bollin and immediately south of the former railway line. The earthwork is very faint and largely levelled. However historic aerial photographs and modern</p>	Figure 3	370747 388242

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					aerial imagery do provide a glimpse of furrows through water retention. The 1837 Lymm Parish tithe map <sup>16</sup> details that this plot is split into north and south sections, between two occupiers with a ditch boundary.		
MA04_RS003	MA04_0203	Moat	Ditch	Medieval	Possible moated site visible in LiDAR data and historic aerial photographs. Located on the south bank of a meander of the River Bollin near to the Mersey Path, a former railway line. The moat is fed from the southwest and measures approximately 5m across. The entrance to the central moated site is located on the west side and measures approximately 17m across. The former meander of the River Bollin is shown on the 1st edition Ordnance Survey map <sup>17</sup> and the course is visible in historic aerial photographs. The meander was realigned on construction of the railway but may previously have fed the moated site to the north.	Figure 3	370886 388307

<sup>16</sup> Unknown (1837) *Tithe map of Lymm (parish), Cheshire*, held at; The National Archives, Kew, ref: IR 30/5/245.

<sup>17</sup> Ordnance Survey (1882), *Cheshire County Series*, Map Sheet XVII, 1st edition.



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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
MA04_RS005		Ridge and furrow	Extant ridge and furrow Levelled ridge and furrow	Medieval Post-medieval	Group of extant ridge and furrow observed from historic aerial photographs in three areas: 1. Within enclosed agricultural ground on the eastern bank of a stream to the south of Warburton Park, and west of Park Road. 2. Within enclosed agricultural ground to the south of Paddock Lane between Warburton and Mossbrow, and east of Bent Lane. 3. Within enclosed agricultural ground to the east of Warburton, to the west of Warburton Lane and within the extents of the former Warburton Park (MA04_RS006).	Figures 5 and 6	370311 389923
MA04_RS006	MA04_0147	Deer park Park	Extent of area	Medieval Post-medieval	The extents of Warburton Park. John Speed's map of 1610 <sup>18</sup> shows the location, but not extents, of the deer park of Warburton with its old chapel/church to the south-western extent (Old Church of St Werburgh, MA04_0001). The outline of the parkland is still traceable through field boundaries, preserved road layouts and cropmarks. To the	Figure3	370400 390286

<sup>18</sup> Speed, J. (1610), *Map of the County Pallatine of Chester, Atlas. 2.61.1*, held at; University of Cambridge Digital Library.

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					centre is Warburton Park Farm, shown in the 1st edition Ordnance Survey map <sup>19</sup> as Warburton Park. To the east of the main house was a possible leat, drain or spring that flows through the park. The flow passes directly to the south of a square platformed earthwork feature that has been interpreted as a pillow mound or rabbit warren, with the water functioning to contain and protect the rabbits (MA04_RS007/MA04_0142).		
MA04_RS007	MA04_0142	Pillow Mound	Bank	Medieval Post-medieval	Earthwork platform which looks to be square in shape, surrounded by a largely natural dip in topography and with a watercourse flowing immediately to the south. It has been suggested that the platform is a former pillow mound, which was an artificial rabbit warren. The 1st edition Ordnance Survey <sup>19</sup> mapping shows the route of the watercourse as flowing, possibly through artificial channelling, around the south, west and northern edges. This would have	Figure4	370311 390124

<sup>19</sup> Ordnance Survey (1881), *Cheshire County Series, Map Sheet VIII*, 1st edition.

**Background Information and Data**  
 Historic environment  
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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					helped to contain and protect the rabbits.		
MA04_RS008	MA04_0110	Hall House Garden Works Paper mill	Extent of area	Post-medieval	On the south bank of the River Mersey, adjacent to Owlet's Nest Lock and to the west of Partington, was the site of Millbank Hall. The hall was set within a walled garden and grounds which were connected with the Millbank Works. The location of Millbank Hall, denoted 'Millbank', is shown in Burdett's map of 1777 <sup>20</sup> , with a mill symbol shown immediately to its northeast. Greenwood's map of 1819 <sup>21</sup> also shows Millbank along with a 'Paper Mill' denoted to the northeast. The whole site with hall, gardens and works complex is recorded in more detail within the 1st edition Ordnance Survey mapping <sup>19</sup> . The site has been levelled and no structures of the works or hall are now visible.	Figure5	370367 391077
MA04_RS009		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within enclosed	Figure 6	369808 391298

<sup>20</sup> Burdett, P. P. (1777), *Survey of the Country Palatine of Chester*, held at; Royal Collection Trust, ref: RCIN 701241.

<sup>21</sup> Greenwood, G. (1822), *Map of the County of Chester, from an actual Survey made in the years 1820 and 1821*.

**Background Information and Data**  
 Historic environment  
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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					agricultural ground to the northeast of Hollinfare, on the west side of the River Mersey. The plot is to the west of Manchester Road and south of Mount Pleasant Farm.		
MA04_RS010	MA04_0178	Mill pond Tail race Corn mill	Extent of area Ridge and furrow Mill pond	Medieval Post-medieval	<p>Site of former Rixton Corn Mill, with the associated mill pond to the west and former tail race to the east. The mill was demolished in the late 19th century and no extant remains are now visible. The mill was fed by the mill pond to the west, opposite the dam that gave its name to nearby Dam Lane.</p> <p>The mill pond is largely natural and is fed predominantly from the east, but also from feeder ponds to the north. The former tail race is shown on 1st edition county series Ordnance Survey mapping<sup>22</sup>. No extant remains of the channel are visible.</p>	Figure 6	369712 391462
MA04_RS011	MA04_0204	Training area Requisitioned land	Extent of area	Modern	Former military training site within requisitioned agricultural land to the south of HMS Gosling Camp 5, connected with firing range to the	Figure 7	369428 391756

<sup>22</sup> Ordnance Survey (1849), *Lancashire County Series, Map Sheet CIX*, 1st edition.

**Background Information and Data**  
 Historic environment  
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 MA04: Broomedge to Glazebrook  
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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					southeast corner of field. Historic aerial photographs show this as possibly having variable activities laid out within the area, but it is unclear as to the exact nature of these activities. However, possible sports pitches within the main portion have been identified, along with an obstacle course located on the southern edge. It is, however, possible that the area was entirely used for ammunition training.		
MA04_RS012	MA04_0205	Firing range	Structure	Modern	Miniature firing range within southeast corner of an agricultural field, south of HMS Gosling Camp 5. The site is visible on historic aerial photographs that also show probably associated training stations staggered further to the west, but which are no longer remain extant.	Figure 6	369483 391653
MA04_RS013	MA04_0206	Military camp	Extent of area	Modern	Site of former HMS Gosling Camp 5. This was a military camp that was part of wider group of 5 camps within the area under the same name. According to the Royal Navy Research Archive website, HMS Gosling was open from 1942 until 1947 for the	Figure 7	369364 392114

**Background Information and Data**  
 Historic environment  
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 MA04: Broomedge to Glazebrook  
 Historic environment remote sensing report

Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					function of preliminary discipline and weapon training of all Aircraft Maintenance ratings (except Air Apprentices), and also Royal Marine trainees of the Royal Naval Air Station Defence Force activities in support of the Mobile Naval Airfields Organisation and specialist weapons and survival training. <sup>23</sup>		
MA04_RS014	MA04_0262	Deer leap Extractive pit	Large cut feature	Medieval Post-medieval	Two large, irregular depressions visible in LiDAR data along the north-west perimeter of Warburton Park. The depressions coincide approximately with the location of salters (deer leaps) shown in an 18th century estate map, but now appear to be have been quarried out since the estate map was drawn.	Figure 6	370004 390587
MA04_RS015		Extractive pit Pond	Large cut feature	Medieval Post-medieval	Multiple irregular pits and depressions of varying sizes across the extents of Warburton Park, mostly overgrown and beneath tree cover. The precise nature of the pits is difficult to determine on the basis of the aerial evidence, but the irregular	Figure 4	370545 389979

<sup>23</sup> Fleet Air Arm Bases (2020), *R.N.A.T.E Risley, H.M.S. Gosling*, available online at; <http://www.royalnavyresearcharchive.org.uk/FAA-Bases/Risley.htm>.

**Background Information and Data**  
 Historic environment  
 BID HE-005-0MA04  
 MA04: Broomedge to Glazebrook  
 Historic environment remote sensing report

Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					form suggests the remains of quarrying activity. In some cases, they may originally have been purpose-built ponds. Two of these features extend beyond the limits of the available LiDAR data and the full form cannot be recorded. Many of the pits are shown as water filled on Ordnance Survey mapping from the 1881 first edition <sup>24</sup> to the present (Cheshire VIII), other pits shown in the mapping are now no longer visible, presumably silted or deliberately infilled over time.		
MA04_RS016	MA04_0259	Fishpond	Large cut feature	Medieval Post-medieval	Three depressions visible in LiDAR DTM below tree cover. The smallest depression has a square shape and appears to be connected via a small channel to a larger sub-round depression. A further depression is partially visible but extends beyond the available limits of the LiDAR data. Ordnance Survey mapping (Cheshire VIII) from the 1881 first edition <sup>24</sup> to the present has shown a series of interlinking	Figure 4	370802 390265

<sup>24</sup> Ordnance Survey (1881), *Cheshire County Series, Map Sheet VIII*, 1st edition.

**Background Information and Data**  
 Historic environment  
 BID HE-005-0MA04  
 MA04: Broomedge to Glazebrook  
 Historic environment remote sensing report

Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					ponds at this location, with varying formation. The shaped form of the pits suggests that the features are fish ponds, which would be a common feature of a managed medieval parkland.		
MA04_RS017	MA04_0261	Moat	Large cut feature	Medieval Post-medieval	Large irregular depression visible in LiDAR to the south of Warburton Park farm buildings. It is possible that this is a remnant of the moat associated with former manor, although it is not possible to determine this from aerial survey evidence alone.	Figure 4	370213 390158
MA04_RS018	MA04_0260	Park pale	Bank	Medieval Post-medieval	Low, linear bank following the boundary of Warburton Park. The bank is faintly visible from LiDAR data, and the edges are difficult to fully ascertain due to both the minor change in elevation and the poor quality of the DTM definition beneath foliage on the exterior edge of the park boundary. The form of the feature and the coincidence of the bank with the park boundary strongly suggests that this may be a remnant of the Warburton Park pale.	Figure 5	370372 390826



## 5 List of acronyms

5.1.1 The following acronyms have been used in this report.

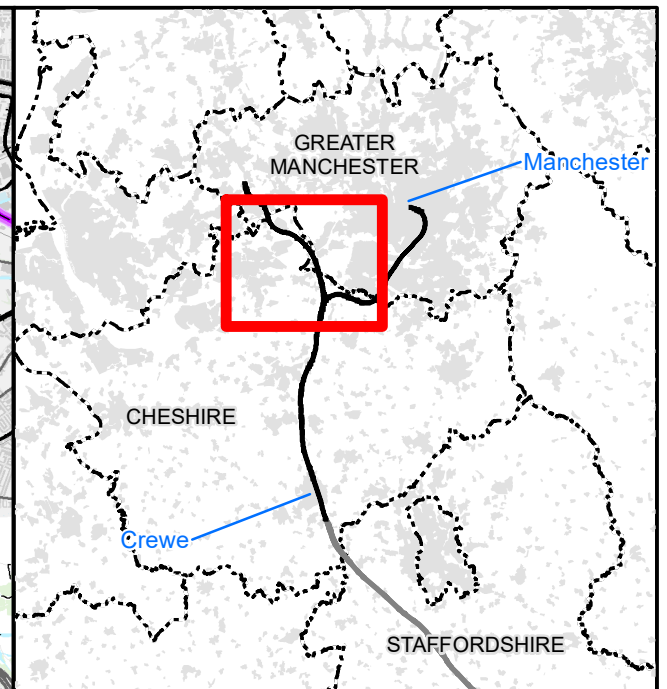
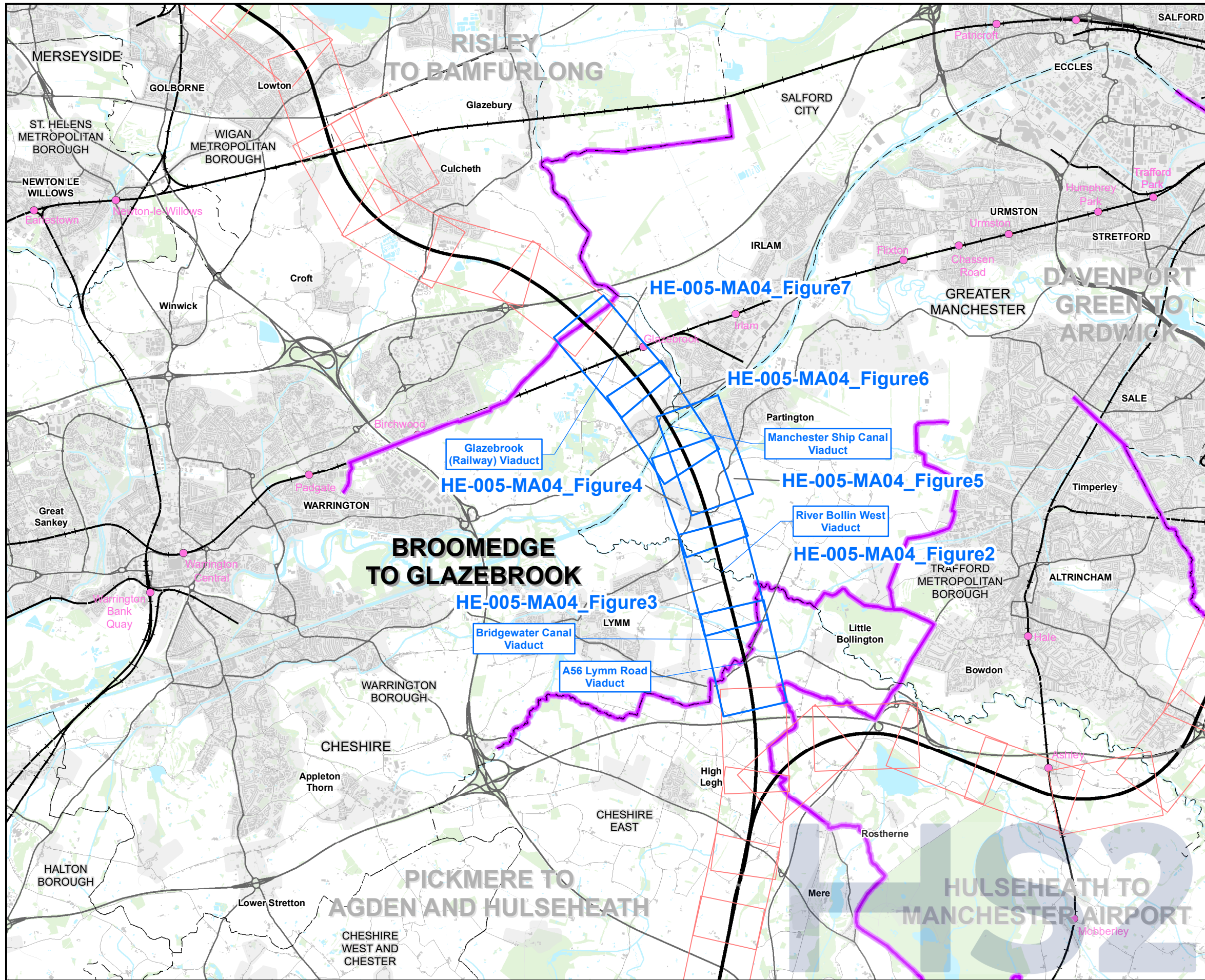
**Table 2: List of acronyms**

Acronym	Meaning
ACA	Archaeological Character Area
ASZ	Archaeological Sub-zone
BID	Background Information and Data
CUCAP	Cambridge University Collection of Aerial Photographs
DEFRA	Department for Environment, Food & Rural Affairs
DSM	Digital Surface Model
DTM	Digital Terrain Model
GIS	Geographical Information System
HER	historic environment record
HLC/HLCA	Historic landscape character/ Historic Landscape Character Areas
LiDAR	Light Detection and Ranging
NHLE	National Heritage List for England
NMP	National Mapping Programme
NRHE	National Record of the Historic Environment
PDF	Portable Document Format
RAF	Royal Air Force
RMSE	Root Mean Square Error
RVT	Relief Visualisation Toolkit
SLR	Single Lens Reflex
UID	Unique gazetteer identifier

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**Map Series Information:**

These maps show the results of the remote sensing surveys in relation to the land required for the construction of the Proposed Scheme.

- Main Map Legend**
- Route in tunnel
  - Route on surface
  - Depot, station, headhouse or portal building
  - Community area boundary
  - Existing railway station
  - County boundary
  - District/Borough boundary
  - Map sheets included in this community area
  - Map sheets not included in this community area

Map Number	HE-005_MAO4_Figure1
Map Name	Remote Sensing Survey Index map
Community Area MA04: Broomedge to Glazebrook	

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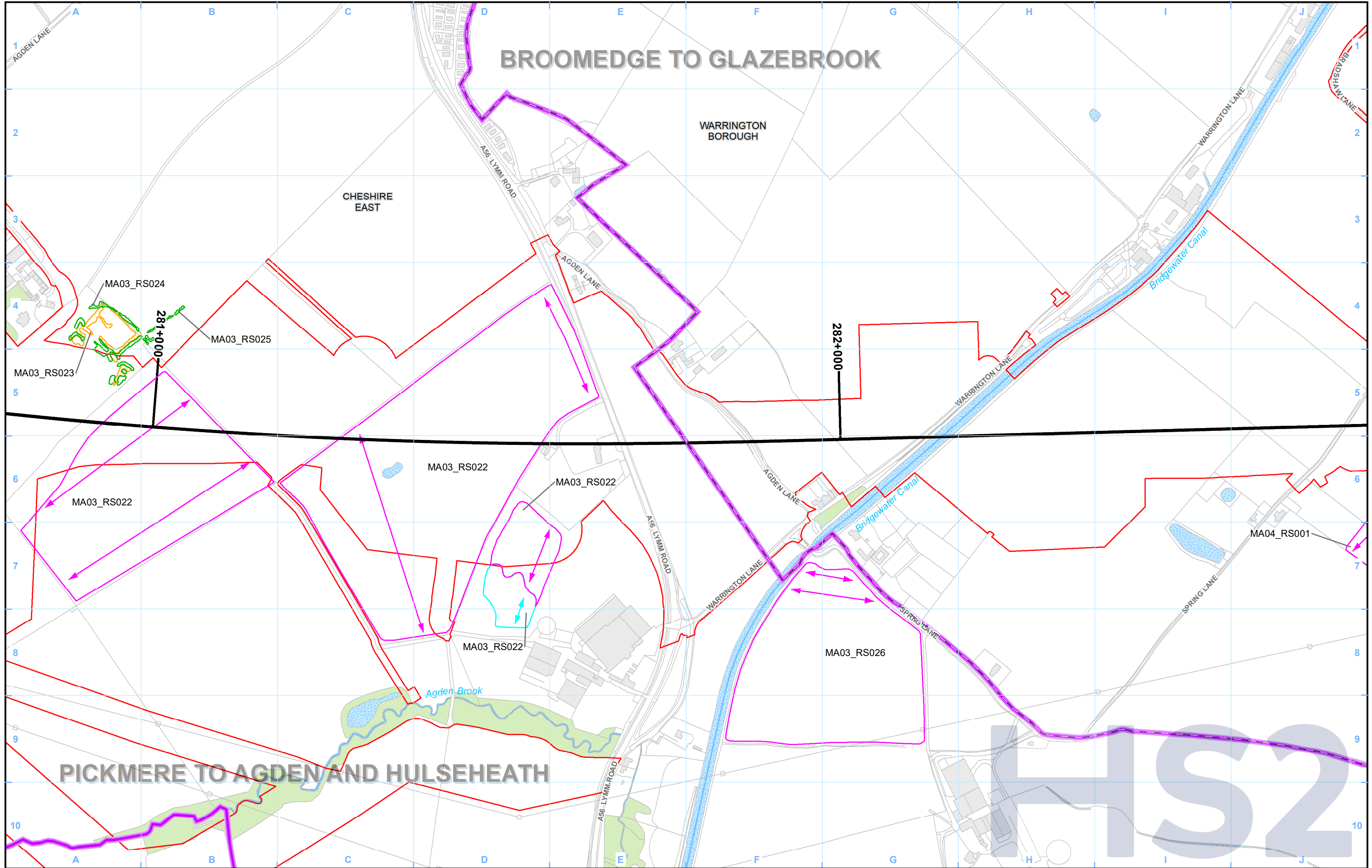
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# BROOMEDGE TO GLAZEBROOK



Legend		
	<b>Remote sensing feature type</b>	

Map Number: HE-005\_MA04\_Figure2

Map Name: Remote Sensing Survey Interpretation

Community Area MA04: Broomedge to Glazebrook

**HS2**

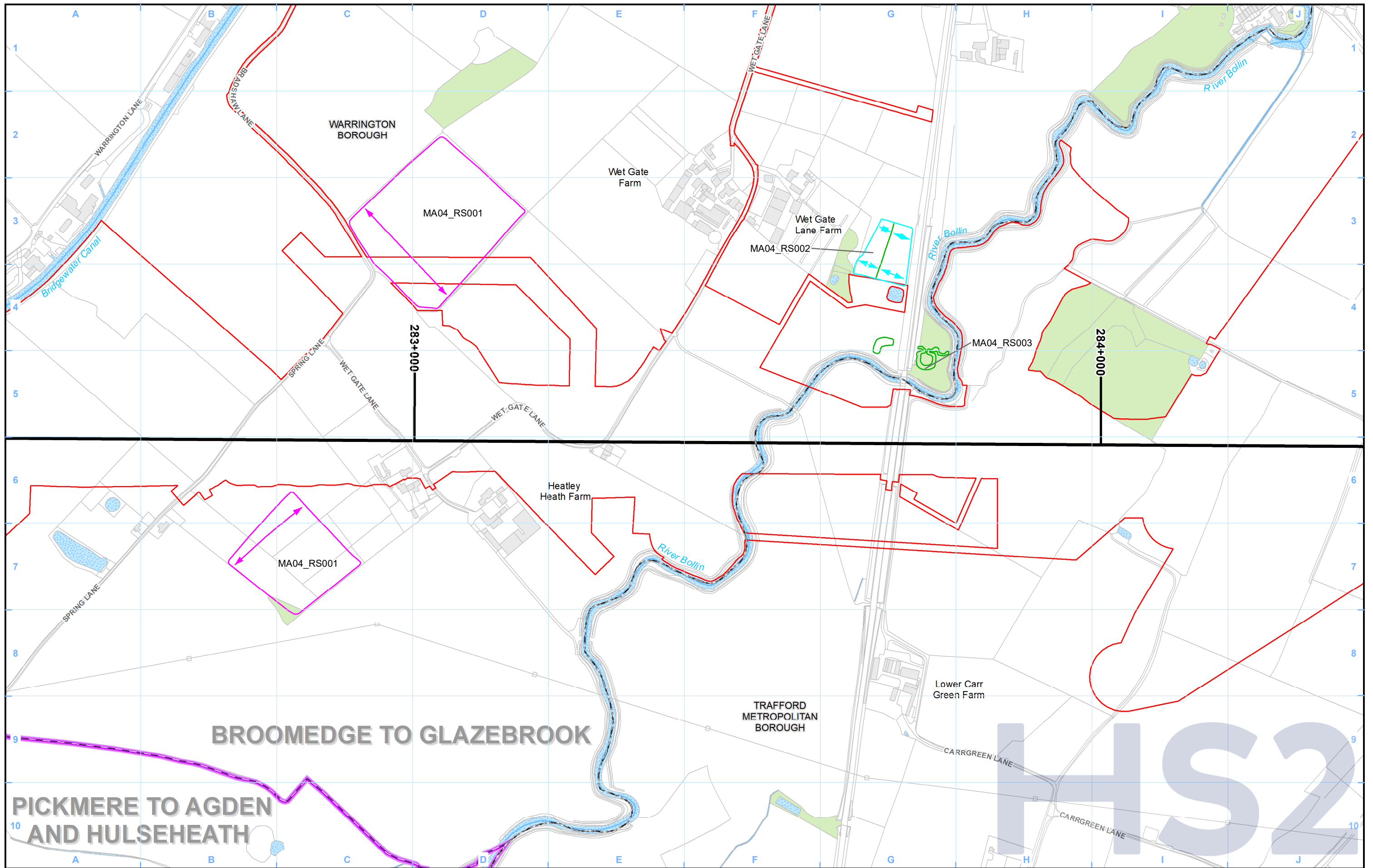
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Legend		
	<b>Remote sensing feature type</b>	

Map Number	HE-005_MA04_Figure3
Map Name	Remote Sensing Survey Interpretation
	Community Area MA04: Broomedge to Glazebrook

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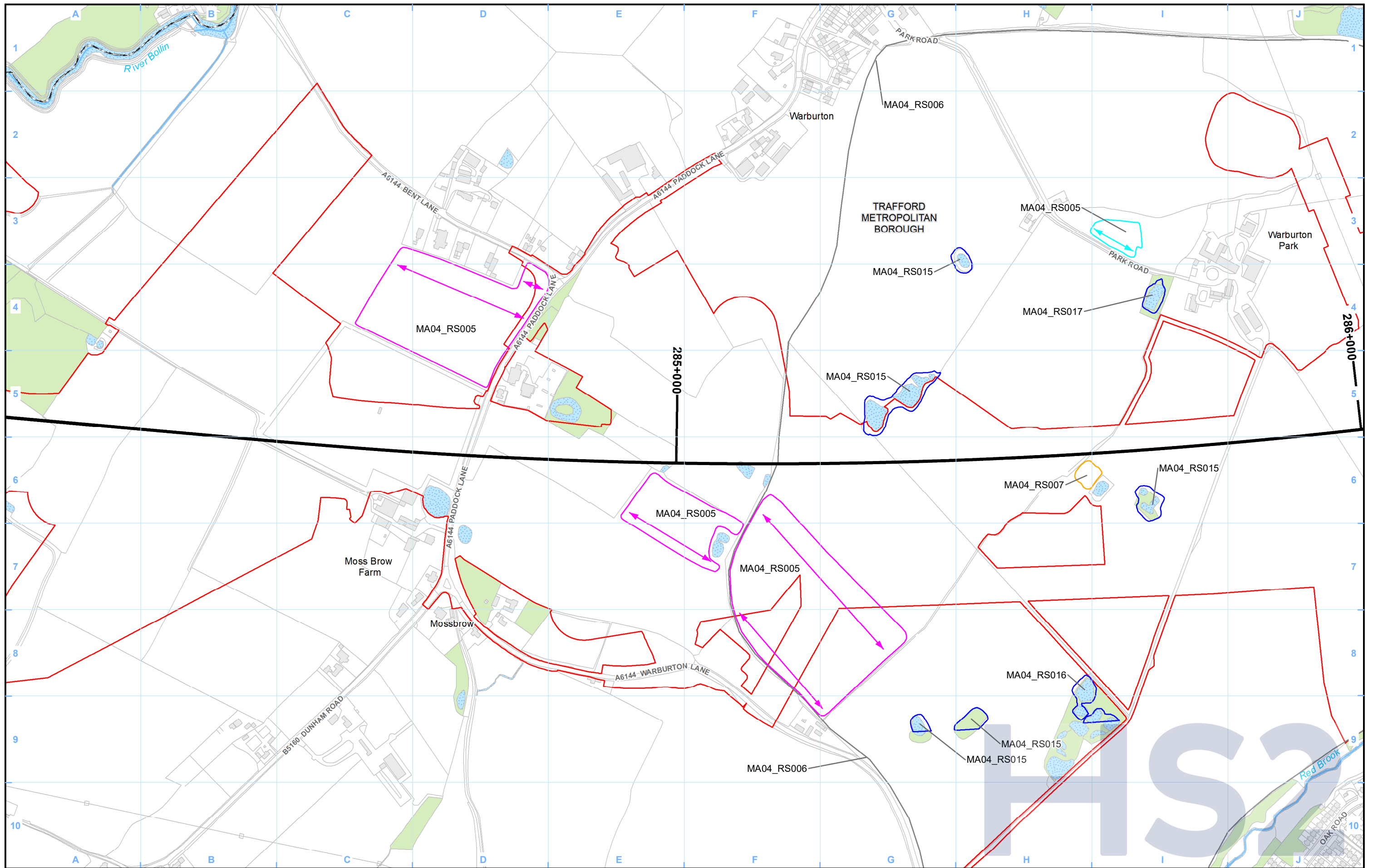
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Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Land potentially required during construction
	Community area boundary
	County boundary
	District/Borough boundary
	Watercourse
	Water body
	<b>Remote sensing feature type</b>
	Bank
	Ditch
	Levelled ridge and furrow area
	Levelled ridge and furrow direction
	Extant ridge and furrow area
	Extant ridge and furrow direction
	Extent of area
	Large cut feature
	Services
	Structure
	T-hachure

Map Number HE-005\_MA04\_Figure4

Map Name Remote Sensing Survey Interpretation

Community Area MA04: Broomedge to Glazebrook

**HS2**

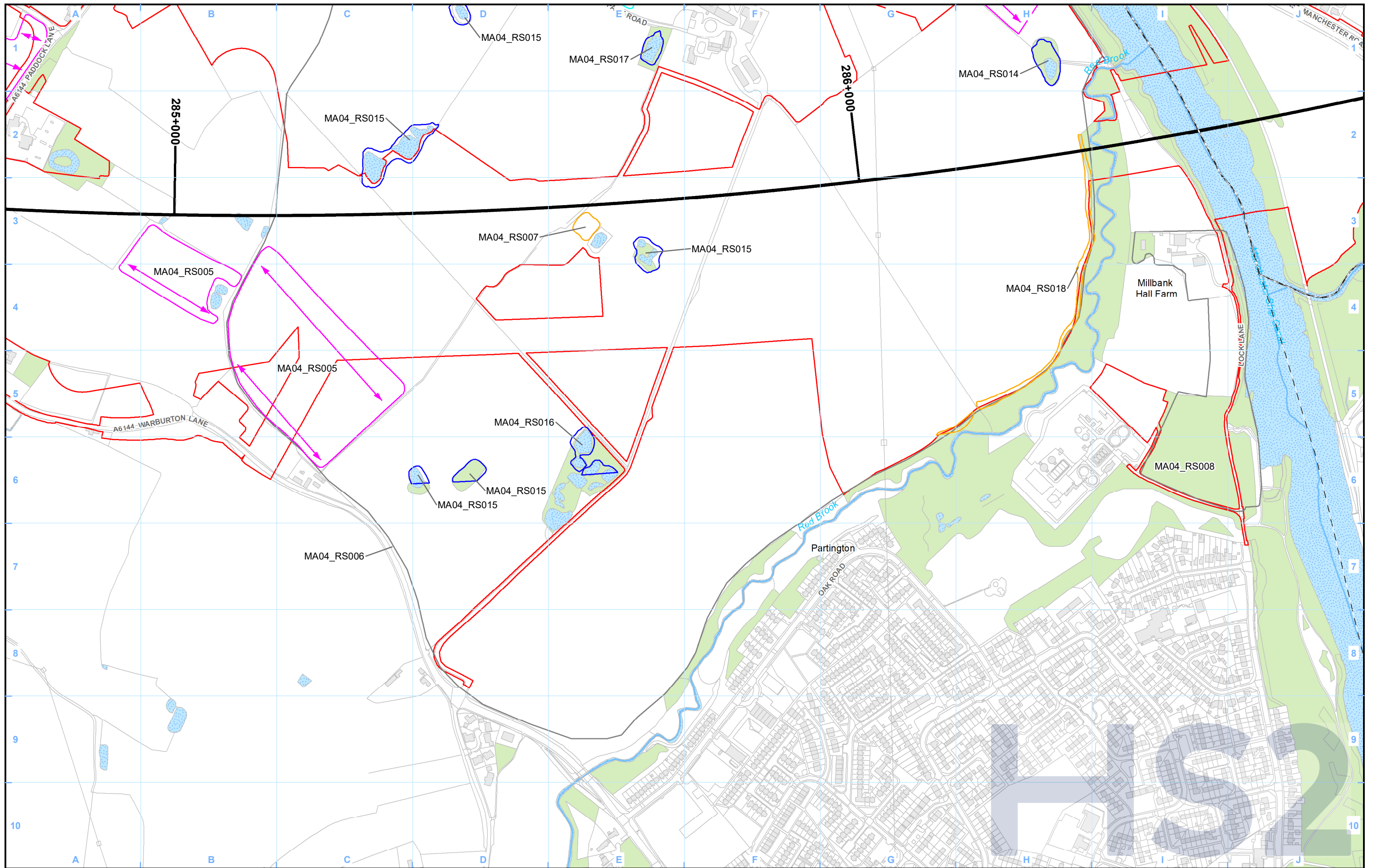
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Legend		
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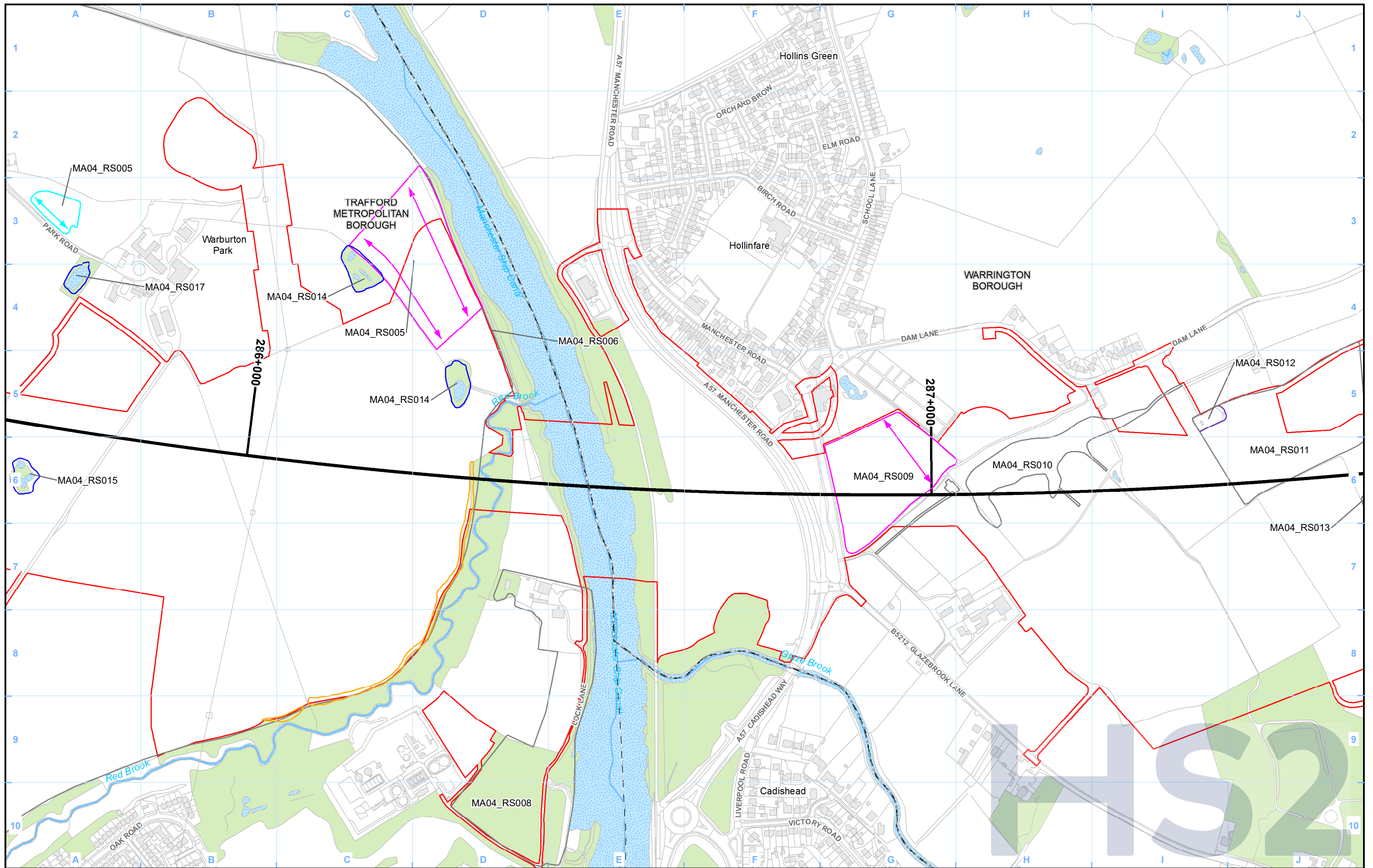
Map Number: HE-005\_MA04\_Figure5  
 Map Name: Remote Sensing Survey Interpretation  
 Community Area MA04:  
 Broomedge to Glazebrook

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Legend		
	<b>Remote sensing feature type</b>	

Map Number HE-005\_MA04\_Figure6

Map Name Remote Sensing Survey Interpretation

Community Area MA04: Broomedge to Glazebrook

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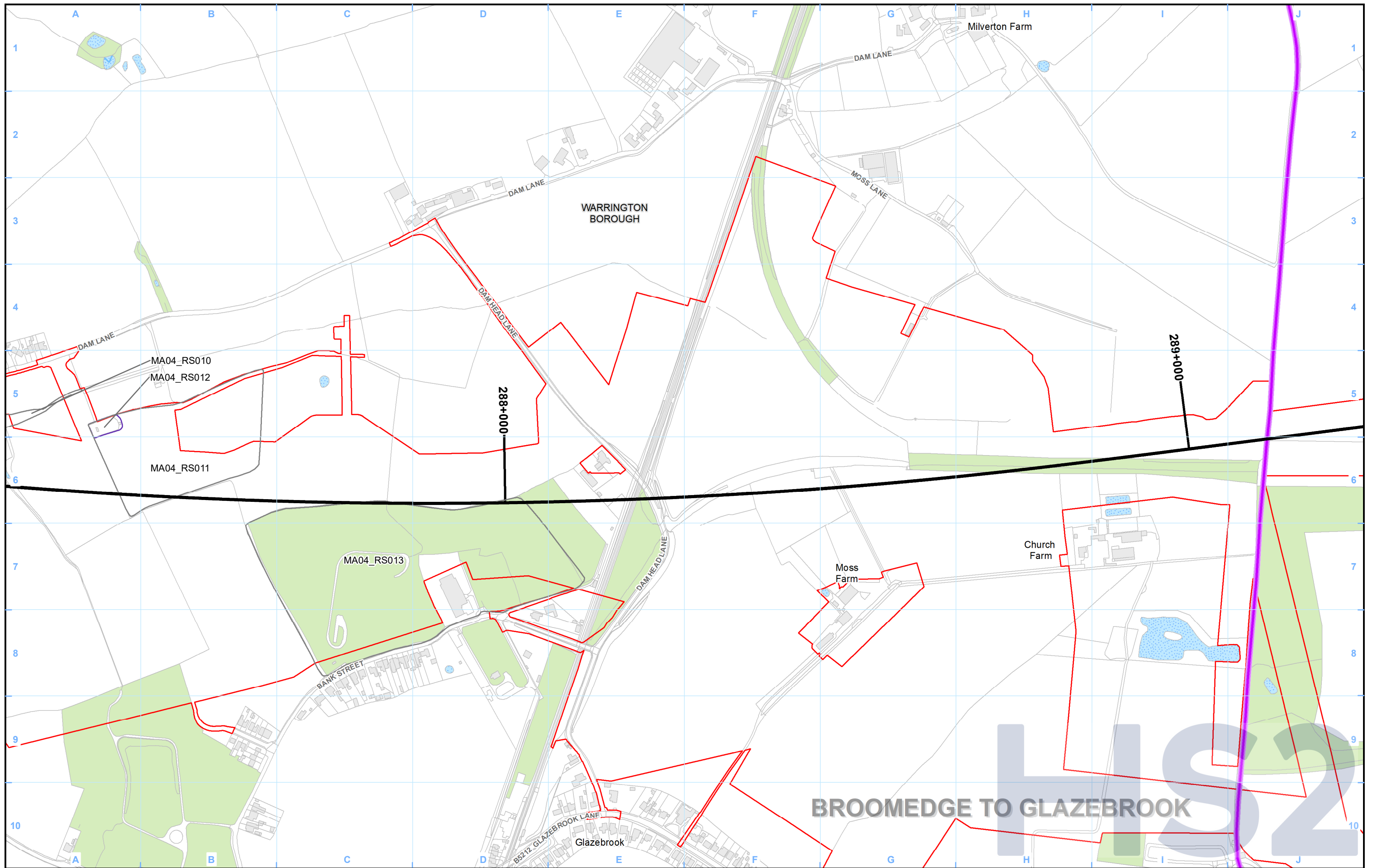
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Legend		
	<b>Remote sensing feature type</b>	

Map Number	HE-005_MA04_Figure7
Map Name	Remote Sensing Survey Interpretation
	Community Area MA04: Broomedge to Glazebrook

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