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6.7 Environmental Statement – Appendix 8.3 Light Detection and Ranging (LiDAR) Assessment

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Planning Act 2008

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Summary

Wessex Archaeology was commissioned by WSP UK Ltd to undertake an assessment of available LiDAR across a 250 hectare area, centred on a c.12.6km stretch of the A1 in Northumberland between Warreners House Interchange, Morpeth and Felton (between NGR 418220 587890 and NGR 417490 600970). The proposed development involves the widening of current single carriageway to a dual carriageway. The stretch of the existing A1 that is proposed to be replaced will become a local access road.

The aims of the assessment were to process all available Environment Agency LiDAR data for the area, and to transcribe all features of archaeological interest visible within the LiDAR data to National Mapping Programme (NMP) standards.

Of the c.12.6km stretch of the A1, EA LiDAR data was available for a c.2.5 km stretch from a location to the east of Fenrother (NGR 418770 592550) northwards to Causey Park Hag (NGR 418580 595140) and a c.5km stretch from a location to west of Helm (NGR 418420 596280) to the northern end of the Site (417490 600970).

The assessment resulted in the transcription of 71 separate archaeological features and sites of potential historical interest. The dominant feature type was ridge and furrow remains, with concentrations of surviving earthworks visible in the data at Earsdon Mill, Causey Park Bridge and in an area to south of the River Coquet.

A small number of cropmark sites recorded in the NHER appear to have some surviving remains, the clearest example being an enclosure at Causey Park Hag.

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The project was managed on behalf of Wessex Archaeology by Chris Breeden.



LiDAR Assessment - A1 Morpeth to Felton

LiDAR Assessment

1 INTRODUCTION

1.1 Project background

- 1.1.1 Wessex Archaeology was commissioned by WSP UK Ltd to undertake an assessment of LiDAR data across a 250-hectare area (the Site), centred on a c.12.6km stretch of the A1 in Northumberland between Warreners House Interchange, Morpeth and Felton (NGR 418220 587890 to NGR 417490 600970) (**Figure 1**).
- 1.1.2 The proposed development involves the widening of current single carriageway to a dual carriageway. The stretch of the existing A1 that is proposed to be replaced will become a local access road (Highways England 2018: Section 2.3).

1.2 Scope of the report

- 1.2.1 The purpose of this report is to provide a detailed description of the methods employed and the results of the LiDAR assessment.

1.3 Location, topography and geology

- 1.3.1 The Site is located in Northumberland, between Morpeth in the south and Felton in the north and within the parishes of Hebron, Tritlington and West Chevington Thirston, Felton and Newton-on-the-Moor and Swarland.
- 1.3.2 The Site is crossed by a series of watercourses running east to west. From the south, these are the River Lyne at Priest's Bridge; Earsdon Burn at Causey Park Bridge; Longdike Burn, which runs briefly north-south near Bockenfield Bridge; the River Coquet at Mill Banks and Back Burn at Minto's Dean.
- 1.3.3 Existing ground levels range from 33m to 122m AOD (**Figure 2**). The most elevated area of the site lies at Earsdon Mill.
- 1.3.4 The underlying geology is dominated by the Stainmore Formation, a series of mudstones, siltstones and sandstones. Superficial till deposits are also recorded (British Geological Survey online viewer).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Introduction

- 2.1.1 The following archaeological background has been summarised by reference to the Cultural Heritage section (5.4) of the Preliminary Environmental Information Report (PEIR) (Highways England 2018), which itself made reference to Historic England's National Heritage List for England (NHLE) and the Northumberland Historic Environment Record (NHER).

2.2 Archaeological and historical context

Prehistoric and Romano-British

- 2.2.1 A number of prehistoric artefacts have been found within the Site and its surroundings, including Mesolithic flints recovered from a site near West Moor Farm, while remains of a burial mound are located near Helm.
- 2.2.2 An enclosed settlement at Fenrother, visible as cropmarks, provides a rare example of the Romano-British presence in the area, although the site itself lies beyond the Site.

Medieval to modern

- 2.2.3 Evidence for deserted or shrunken medieval settlement near the Site include remains at Bockenfield, Helm, Burgham and Old Felton.
- 2.2.4 Although their exact locations have not been established, a possible hermitage near Helm and St Cuthbert's Chapel (Tritlington and West Chevington) may both lie within, or close to, the Site.
- 2.2.5 The PEIR assessment has established the presence of ridge and furrow remains within the Site and its surrounding. Previous work at Old Felton, to the north of the Site, has also found evidence for surviving ridge and furrow in the area (Wessex Archaeology 2012).
- 2.2.6 Wells have been recorded near Causey Park Bridge and Earsdon Moor, while a number of bridges within the Site have medieval or post-medieval origins.
- 2.2.7 The modern landscape is an open one of "medium to large scale intensive farmland with arable and pasture fields" (Highways England 2018: 45). One notable exception to this is the airfield at Eshott, Thirston (a Second World War RAF airfield), which lies within fields to the north of Bockenfield.

Undated cropmarks

- 2.2.8 A small number of cropmarks have been recorded within or adjacent to the Site. Although of uncertain date, the PEIR suggests that some of these enclosures and ditches may have a prehistoric origin (Highways England 2018: 79).

3 AIMS AND METHODS

3.1 Project aims

- 3.1.1 The main aims of the project are to:
- Process all available EA LiDAR data for the Site, and create a series of visualisations;
 - Transcribe all features of archaeological interest visible within the LiDAR data to National Mapping Programme (NMP) standards;
 - Create a gazetteer of all transcribed features;
 - Report and present the findings of the assessment.

3.2 Data Processing

- 3.2.1 The LiDAR assessment was undertaken using Environment Agency (EA) Digital Terrain Model (DTM) LiDAR data provided by the client. The data were acquired in ASCII raster format with a 1m horizontal resolution and a vertical accuracy of $\pm 5\text{cm}$. The DTM data is pre-filtered, with vegetation and buildings removed, resulting in a 'bare earth' model of the terrain. The Site has complete partial coverage at 1m resolution.
- 3.2.2 The EA data portal was checked prior to commencement of the assessment. No additional data were available, with the result that 241 hectares of the Site have data coverage. LiDAR data were not available for the Hebron parish section of the Site.
- 3.2.3 Of the c.12.6km stretch of the A1, EA LiDAR data is available for:
- a c.2.5 km stretch from a location to the east of Fenrother (NGR 418770 592550) northwards to Causey Park Hag (NGR 418580 595140);
 - a c.5km km stretch from a location to west of Helm (NGR 418420 596280) to the northern end of the Site (417490 600970).
- 3.2.4 In total, EA LiDAR data was found to be available for 241 hectares of the Site.
- 3.2.5 The data were merged prior to analysis using ArcGIS 10.5 Advanced in order to create a single DTM for the site, from which a number of subsequent datasets were derived.
- 3.2.6 The Relief Visualization Toolbox 1.3 (Kokalj et al. 2011; Zakšek et al. 2011) was used to provide additional outputs, including a local relief model (LRM). The creation of a LRM involves removing the elevation trend of the larger landscape from the DTM, helping to enhance features of potential archaeological interest. The LRM was created because "archaeological features are generally of a much smaller scale than the landforms on which they lie" (Kokalj and Hesse 2017: 20). Through the creation of a LRM, "a less biased representation of small-scale topographic features [is created] and reflects more truthfully the relative heights and depths of these features with respect to the surrounding landscape" (ibid.: 22), increasing their visibility.
- 3.2.7 ArcGIS 10.5 Advanced was used to both display and analyse the survey datasets, and to record features of archaeological and historical interest. In addition to the 'out-of-the-box' tools available, the Spatial Analyst extension was used to provide additional tools that allow possible archaeological features within the datasets to be enhanced, aiding interpretation.
- 3.2.8 The LRM was displayed in ArcMap 10.5 using the recommended style settings for flat terrain and undulating (Kokalj and Hesse 2017: 23), with features tending towards banks visible as high values and those tending towards ditches visible as low values.
- 3.2.9 Point cloud (LAS) data was downloaded from the EA data portal in order to produce a LiDAR intensity dataset. The dataset displays the return strength of the laser pulse and is useful for detecting changes in the soil (Historic England 2018: 10-12).

3.3 Data Interpretation

- 3.3.1 The datasets described above were used to digitise features of archaeological and historical interest using ArcMap 10.5; the features were mapped in accordance with guidance developed by the NMP (English Heritage 2010a). The features were recorded in a geodatabase that uses standard NMP forms and corresponding symbology.

- 3.3.2 Each component of an archaeological feature was mapped and, once complete, was contained within a 'monument polygon'. Each monument polygon represents the full extent of the recorded feature (English Heritage 2010b). A monument polygon can contain a single feature (e.g. a round barrow) or several associated features (e.g. a series of intermittent banks forming a trackway).
- 3.3.3 Monument polygons were assigned consecutive chronological numbers from south to north, starting with **WA01**. A complete list of monument polygons, alongside descriptions of the transcribed features within, can be found in **Appendix 1**. The NGR is calculated as the centroid of the monument polygon.
- 3.3.4 Features intersecting the Site were recorded to their full extent, where the coverage of the LiDAR data allowed.

4 ARCHAEOLOGICAL RESULTS

4.1 Introduction

- 4.1.1 The assessment resulted in the transcription of 71 separate features, distributed evenly across the two areas containing LiDAR data (**Figures 3-7**).
- 4.1.2 Ridge and furrow is the dominant feature type, with concentrations in the areas around Earsdon Mill, Causey Park Bridge and south of the River Coquet. Many of the remains are narrow and appear well-defined in the processed datasets.
- 4.1.3 A small number of cropmark sites recorded in the NHER appear to have some surviving low earthworks, the clearest example being an enclosure at Causey Park Hag (**WA37**; NHER 11367, see **Figure 8**).
- 4.1.4 The following section details the results by feature type.

4.2 Ridge and furrow

- 4.2.1 Remains of ridge and furrow are present across the Site. Most examples display straight and narrow sets of ridges, although a small number displaying a very shallow 'S'-shape are also present.
- 4.2.2 The southernmost possible example of ridge and furrow, **WA01**, is located to the east of Broom Plantation and appears to be cut by a ditch feature **WA02**. A block of remains **WA03** lies 100m to the north-east on the very edge of the Site and to the north of Portland House and are comparatively well-defined with narrow ridges at intervals of approximately 5m.
- 4.2.3 A larger group of well-defined ridge and furrow, covering an area of approximately 30 hectares, lie 500m to the north-west of **WA03**, in the area around Earsdon Mill, **WA07-WA14**. Most of these examples display narrow ridges. Although lying in the same modern field, **WA09** and **WA10** lie perpendicular to one another, while a likely former field boundary, **WA15**, acts as a boundary between **WA13** and **WA14**. Both **WA11** and **WA12** are cut a linear bank feature (**WA05**). The feature is likely to represent a modern track running between adjacent fields.
- 4.2.4 A group of fields containing possible ridge and furrow remains **WA16-18**, bisected by a former field boundary (**WA17**), lie on the northern edge of the cluster around Earsdon Mill. These remains are considerably broader than those immediately to the south.

- 4.2.5 A further 100m to the north, the ridge and furrow remains to the west of Causey Park Bridge (**WA19-23**; **WA25**; **WA27**) display the same narrow, well-defined earthworks that can be seen at Earsdon Mill. The remains here cover an area of approximately 10 hectares. A ditch feature **WA20**, possibly representing a former field boundary, forms a division between **WA19** and **WA21**, while the ridges found in **WA22** and **WA23** lie perpendicular to one another despite lying in the same modern field.
- 4.2.6 Traces of possible ridge and furrow can also be seen to the east of Bridge House **WA31-33**, although the small extents of both **WA31** and **WA32** do not allow for clear identification.
- 4.2.7 Two blocks of possible ridge and furrow can also be seen between Longdike Burn and the A1 near Helm **WA40** and **WA42**, although the possible features are broad and not very well defined. The features may be associated with a series of earthworks, **WA41**, that will be described in section 4.3.
- 4.2.8 Areas of ridge and furrow are also visible to the south of Bockenfield Bridge, on either side of the Longdike Burn. The clearest examples, **WA43** and **WA47**, lie on the eastern side of the burn and cover approximately 4.5 hectares.
- 4.2.9 Any ridge and furrow remains from Bockenfield Bridge northwards to West Moor House are indistinct. These include **WA49** and **WA50** and **WA53**. The most well-defined blocks in this area of the Site can be found to the south-west of Thirston New Houses, **WA55** and **WA56**, where the narrow earthworks extend into the Site.
- 4.2.10 A large group of distinct ridge and furrow blocks, **WA60-64**, lies another 400m to the north of the remains near West Moor House, in an area to the south of the River Coquet and to the west of the farm buildings at Hemelspeth. Here, the remains are visible across a 13 hectare area, extending southwards beyond the Site. The remains are narrow and fairly well-defined, with the blocks in the east (**WA61** and **WA62**) appearing clearer in the LiDAR data than those to the west.
- 4.2.11 On the north side of the River Coquet, a further block of ridge and furrow has been bisected by the modern A1, **WA66**. As with those on the south side of the River Coquet, the earthworks are narrow in form.
- 4.2.12 Further to the north, to the east of the A1 on the other side of Park Wood, lie a number of blocks of ridge and furrow, extending northwards towards Back Burn and Minto's Dean (**WA67**, **WA68** and **WA70**). The earthworks here appear to form the last surviving remains of ridge and furrow to the west of Felton; although beyond the Site itself, remains are clearly visible extending eastwards towards the village. The remains here are narrow and generally display a shallow 'S'-shape, and at **WA68** include the remains of a former field boundary.
- 4.2.13 To the west of the A1, intersecting the Site in the south-east, lies an additional block of ridge and furrow **WA71**. As with those to the south-east, the remains are narrow and display a shallow 'S'-shape.

4.3 Possible enclosures

- 4.3.1 A small number of enclosures are visible within the LiDAR data, including one at Causey Park Hag **WA37** which corresponds approximately with the position of a cropmark site as recorded in the NHER.
- 4.3.2 The enclosure at Causey Park Hag appears sub-rectangular in form and is largely formed of two sections of ditch, approximately 0.5m in depth in places but generally shallower than

this, with the northern one almost right-angled and acting as the north and eastern boundary of the enclosure. In addition to the ditch sections, traces of a slight bank are visible on the western side. The enclosed area, covering 2.2 hectares, is defined by the top of a slope.

- 4.3.3 A number of earthworks to the west of Helm (**WA41**, see **Figure 9**), visible across a 12.6-hectare area, at least some possibly natural in origin and taking the form of ditches, banks and fairly well-defined slope tops, can be seen in the same two fields as an area of possible ridge and furrow remains **WA40**. The exact form and purpose of these earthworks is unclear, and as such they may also represent the remains of former field boundaries or plough headlands, although there does appear to be some division and enclosing of land here.
- 4.3.4 Even less distinct are the possible earthwork features to the east of Thirston New Houses **WA58**. The remains, consisting of banks, a ditch and a well-defined top of slope, lie in an area of ridge and furrow remains **WA55-57**, and as with **WA41** they may represent the remains in some part of a former enclosure, field boundaries or plough headlands.
- 4.3.5 Other remains taking on the form of enclosures are likely to have a recent origin, and are possibly related to agricultural activity; these are **WA39** at Causey Park Hag and **WA54** to the west of Eshott airfield.

4.4 Miscellaneous features

- 4.4.1 Additional features of potential archaeological interest are present across the Site. A number of other features visible within the LiDAR data can be attributed to recent activity.
- 4.4.2 A straight ditch **WA02** appearing to cut the possible ridge and furrow to the east of Bloom Plantation **WA01** appears to correspond with the location of a ditch feature visible as a cropmark, as recorded in the NHER (11405). Its function and relationship with other remains are unclear.
- 4.4.3 Immediately to the north lie a series of ditches that appear to represent a drainage system of post-medieval or modern origins **WA04**.
- 4.4.4 A long bank feature **WA05** runs approximately north-south for approximately 800m to the west of Earsdon Moor Farm, cutting across a number of blocks of ridge and furrow. The feature is likely to represent a modern track between adjacent fields.
- 4.4.5 A small number of rectilinear ditch features are visible to the north of Earsdon Burn **WA29**, on the opposite side of the burn to a number of blocks of ridge and furrow. The features may also be related to drainage.
- 4.4.6 North of the ridge and furrow remains at Causey Park Bridge, and west of the enclosure **WA37** lie a series of indistinct, parallel top of slope features **WA30**. Although possibly natural in origin, the features lie perpendicular to the topography of the area, and may represent further remains of agricultural activity in the area.
- 4.4.7 The former path of the Longdike Burn is suggested by a small number of features to the south of Bockenfield Bridge **WA44** and **WA46**.
- 4.4.8 A number of features to the north of Bockenfield Bridge that appear in the LiDAR data to represent the remains of former structures **WA48** can instead be attributed to recent activity in the field, as visible on aerial imagery from 2009.



- 4.4.9 A further linear bank feature, approximately 300m in length, is visible to the south of Blackwood Hall **WA51**. The bank is cut by a field boundary, and may represent the remains of an old path or track, particularly considering its alignment with the former path of the now A1, and its relationship with a junction to the west of Bockenfield Manor.

5 CONCLUSIONS

- 5.1.1 Investigation of the LiDAR data available across the Site has provided a means to rapidly record a number of archaeological features and sites of potential historical interest, in particular with regard to the remains earthworks associated with ridge and furrow cultivation in the landscape.
- 5.1.2 The PEIR draws attention to seven areas of ridge and furrow remains, and the assessment of LiDAR data has helped to identify the full extent of many of these earthworks.
- 5.1.3 Although the remains of ridge and furrow can be seen across the Site, concentrations of surviving earthworks can be seen at Earsdon Mill, Causey Park Bridge and to the south of the River Coquet. It is clear that the remains found within the Site formed part of a wider medieval to post-medieval agricultural landscape.
- 5.1.4 In some cases, the pattern of ridge and furrow and former field boundaries may help to illustrate the boundaries present within the post-medieval and possibly medieval field systems found across the Site, despite the lack of deserted or shruken settlement remains are recorded during the assessment.
- 5.1.5 A small number of recorded features appear to correspond with site recorded in the NHER, in particular **WA37**, which appears to correspond with the approximate location and form (an almost square enclosure) of a cropmark site.
- 5.1.6 Although recorded as being possibly sited within the Site, no remains associated with either the chapel, hermitage remains were visible within the data.
- 5.1.7 The lack of available data across sections of the Site means that a number of remains are likely to remain unmapped, particularly given the even distribution of archaeological features across the two areas of the Site in which LiDAR data is available.
- 5.1.8 Despite this, the assessment has provided a means to transcribe record a number of features.

6 COPYRIGHT

6.1 Archive and report copyright

- 6.1.1 The full copyright of the written/illustrative/digital archive relating to the project will be retained by Wessex Archaeology under the Copyright, Designs and Patents Act 1988 with all rights reserved. The client will be licenced to use each report for the purposes that it was produced in relation to the project as described in the specification. The museum, however, will be granted an exclusive licence for the use of the archive for educational purposes, including academic research, providing that such use shall be non-profitmaking, and conforms to the Copyright and Related Rights Regulations 2003. In some instances, certain regional museums may require absolute transfer of copyright, rather than a licence.



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7 REFERENCES

7.1 Bibliography

English Heritage 2010a. *National Mapping Programme Draft Monument Recording Guidelines*.

English Heritage 2010b. *National Mapping Programme Draft Transcription Guidelines*.

Highways England 2018. *A1 in Northumberland Morpeth to Felton scheme. Preliminary environmental information report*.

Historic England 2018. *Using Airborne Lidar in Archaeology Survey. The Light Fantastic*.

Kokalj, Ž., Zakšek, K. and Oštir, K. 2011. Application of Sky-View Factor for the Visualization of Historic Landscape Features in Lidar-Derived Relief Models. *Antiquity* 85, 327: 263-273

Kokalj, Ž. and Hesse, R. 2017. *Airborne laser scanning raster data visualization: A Guide to Good Practice*. Ljubljana, ArcLand International

Wessex Archaeology 2012. *Old Felton, Morpeth, Northumberland. Archaeological Desk-Based Assessment*.

Zakšek, K., Oštir, K. and Kokalj, Ž. 2011. Sky-View Factor as a Relief Visualization Technique. *Remote Sensing* 3: 398-415

7.2 Online Resources

<http://maps.nls.uk> – National Library of Scotland Map Images



APPENDICES

Appendix 1: Transcribed features

WA ID	Description	NHER number	Easting	Northing
01	Slight remains of probable ridge and furrow are visible across a 5.4 hectare area to the east of Broom Plantation. The remains are aligned SSW-NNE.		418694	592698
02	A shallow 125m long section of ditch is present within the same field as WA1 and lies on a SE-NW alignment. The feature appears to post-date the probable ridge and furrow remains. A ditch of unknown date is recorded within the HER in this approximate location, and it is possible that the two are the same.	11405	418743	592725
03	The remains of narrow ridge and furrow, clearly visible over an 8.1 hectare area, intersect the RLB in a field to the north of Portland House. The remains follow a broad N-S alignment, curving slightly to form a very shallow 'S'-shape.		419088	593003
04	A series of ditches in a field to the NW of Portland House appear to represent the remains of drainage features across a 3 hectare area.		418698	592925
05	A very slight linear bank feature is visible near Earsdon Moor Farm, extending for over 1km in an approximate N-S direction is visible in two sections, the northern over a 800m stretch and the southern over a 185m stretch. It appears to post-date a number of blocks of ridge and furrow (WA11-14). It may represent a recent track.		418744	593403
06	Traces of possible ridge and furrow are visible in the southern area of a field to the south of Earsdon Moor Farm. The features, visible across a 1.4 hectare area, are aligned N-S and may represent later agricultural remains.		418763	593195
07	Slight remains of possible ridge and furrow are visible across a 1 hectare area in a field to the west of Earsdon Moor Farm. The remains appear to extend westwards beyond the area of data coverage.		418376	593284
08	The remains of narrow ridge and furrow are visible to the west of Tindale Hall, to the north of WA7 . The features, visible across a 1.2 hectare area and split into three blocks by modern field boundaries, area aligned approximately ESE-WNW.		418496	593485



09	Narrow ridge and furrow remains are visible to the NE of Tindale Hall, immediately east of WA8 . The remains are aligned approximately N-S and cover a 1.1 hectare area.		418696	593554
10	A 1.6 hectare area of narrow ridge and furrow, lying within the same field as and immediately to the north of WA9 . The remains lie on a WSW-ENE alignment.		418653	593647
11	Traces of possible ridge and furrow are visible in a field to the south of Earsdon Mill, immediately to the east of WA9 and sharing a similar alignment. The remains are visible across a 1.4 hectare area.		418822	593555
12	Remains of narrow ridge and furrow are present in a field to the west of Earsdon Mill. The remains cover a 0.8 hectare area and lie between WA11 and WA13 .		418777	593676
13	Narrow ridge and furrow remains are present in a field to the north of Earsdon Mill, between WA12 and WA14 . They are visible across a 1.8 hectare area and lie on a SSW-NNE alignment.		418839	593793
14	The remains of narrow ridge and furrow are present in a field to the north of Earsdon Mill. They are visible across a 1.4 hectare and are aligned approximately WSW-ENE, curving slightly. The remains are separated from WA13 to the south by a probable former field boundary (WA15).		418803	593861
15	A 275m long bank feature forming a probable former field boundary between two blocks of ridge and furrow (WA13 and WA14) to the north of Earsdon Mill.		418808	593824
16	Traces of possible ridge and furrow are visible across two fields to the east of New Houses Farm. The remains, visible across a 11.5 hectare area, have a SSE-NNW alignment, and extend eastwards to a former field boundary recorded on historic mapping (WA17).		418560	593828
17	A 290m long, dog-legged bank feature representing a former field boundary recorded on historic OS mapping. The feature forms a boundary between two blocks of possible ridge and furrow: WA16 and WA18 .		418731	594032
18	Remains of possible ridge and furrow are visible in a field to the east of WA17 . the remains lie on a N-S alignment and are visible across a 2.2 hectare area of the field that they lie in.		418811	594056
19	The remains of narrow ridge and furrow are present in a field to the south of Causey Park Bridge. The features are visible across a 1.2 hectare area and are aligned approximately E-W. They are separated from another block of ridge and furrow to the east (WA21) by a ditch feature (WA20) that may represent the position of a firmer field boundary.		418807	594374
20	A 120m long ditch feature separating two blocks of ridge and furrow (WA19 and WA21) and possibly representing a former field boundary. The feature lies on an approximate N-S alignment.		418847	594426



21	A 1 hectare area of narrow ridge and furrow, aligned approximately N-S and displaying a very shallow 'S'-shaped alignment. The remains lie in the same field as WA21 .		418882	594412
22	Remains of narrow ridge and furrow are visible in a field to the south of Causey Park Bridge. Ridge and furrow also lies immediately to the east (WA23) and in the field to the south (WA19 and WA21). The remains are present across a 0.4 hectare area and lie on a SE-NW alignment.		418754	594440
23	A 0.9 hectare block of narrow ridge and furrow is visible in the same field as WA22 . The remains are visible immediately to the east of WA22 and lie on a SW-NE alignment.		418808	594508
24	A 190m long ditch feature, aligned approximately SW-NE, is visible to the west of WA19 and WA22 . The remains appear to represent a westwards extension of a present-day field boundary, and may present a former field boundary not recorded on historic OS mapping.		418664	594306
25	The remains of narrow ridge and furrow are visible across a 0.7 hectare area in a field to the south of Earsdon Burn. The remains lie on an approximate SSE-NNW alignment.		418583	594390
26	Two sinuous, parallel, bottom of slope features between two blocks of ridge and furrow (WA25 and WA27). The features may have a natural origin.		418629	594440
27	Remains of broad ridge and furrow are present across a 2.2 hectare area to the west of Causey Park Bridge. The features are aligned SSE-NNE and are broken into two blocks by a field boundary that is still in use, and which shares an alignment with the ridge and furrow remains.		418717	594539
28	A ditch feature, 40m in length and up to 8m in width, is located in the far eastern area of the same field as WA27 . The feature cuts the ridge and furrow remains. A former field boundary lies immediately to the west of the feature on historic OS mapping, and it is possible that the feature may be related.		418810	594608
29	A small number of rectilinear ditch features are visible across a 2300m ² area to the north of Earsdon Burn. The features may be related to drainage.		418572	594485
30	A series of indistinct features, possibly natural in origin, are present across a 3.6 hectare area within a field to the NW of Causey Park Bridge. They lie perpendicular to the topography of the area, and may represent vestigial remains of agricultural activity in the area.		418603	594775
31	A small area of narrow ridge and furrow appears to survive across a 475m ² area to the south of Bridge House. The remains lie on a SSE-NNW alignment.		418936	594614
32	Traces of possible narrow ridge and furrow are visible in a field to the north of Bridge House. The remains are present across a 400m ² area.		418902	594699



33	Remains of possible ridge and furrow are visible across a 0.5 hectare area in a field to the north of Bridge House. They share a similar SW-NE alignment to WA32 , located in the field to the west.		418962	594775
34	A sub-circular large cut feature, 22m along its longest axis, is visible in a field to the NE of Joiners Cottage.		418955	594870
35	A series of sinuous linear features are visible across a 1 hectare area in a field to the north of Joiners Cottage. The remains appear to result from recent agricultural activity.		418892	594895
36	A slight, 120m long ditch in the same field as WA35 and WA37 . The feature may be a product of recent agricultural activity.		418925	594941
37	Traces of an enclosure are visible in a field to the north of Joiners Cottage. An enclosure, identified from cropmarks on an aerial photograph, is recorded in the HER, and it is likely that the features transcribed here refer to the same site. The remains are formed of two sections of ditch, the northern one almost right-angled and measuring 240m in length, and the southern one forming the southern boundary and measuring 120m in length. Traces of a slight bank are visible on the western side, with the enclosed area defined by the top of a slope. The remains cover a 2.2 hectare area.	11367	418799	594899
38	The remains of a 40m long section of ditch are visible to the north of WA37 , and share an alignment with the northern arm of the enclosure. The feature may be related to the enclosure. It also appears to form an extension of a historic field boundary that remains in use.		418731	595020
39	A thin ditch can be traced intermittently for 420m, enclosing a 2.4 hectare area. The feature may be a result of recent agricultural activity.		418495	595036
40	Faint traces of possible ridge and furrow are visible across a 17 hectare area to the east of the Longdike Burn near Helm. It is possible that some of these features may relate to WA41 .		418299	596591
41	A number of slight earthworks are visible across a 12.6 hectare area in the same two fields as WA40 . The remains take the form of a series of rectilinear ditches, banks and indistinct slope tops. The earthworks may represent a series of enclosures, a former field system and/or plough headlands. Their location close to Longdike Burn also raises the possibility that some of the features have a drainage purpose.		418252	596654
42	Traces of possible ridge and furrow are visible to the west of WA41 , adjacent to the Longdike Burn. The remains can be traced across a 3400m ² area and are aligned ESE-WNW.		418104	596780
43	The remains of narrow ridge and furrow can be visible across a 2.2 hectare area to the east of the Longdike Burn. The features are aligned ESE-WNW.		418037	597002



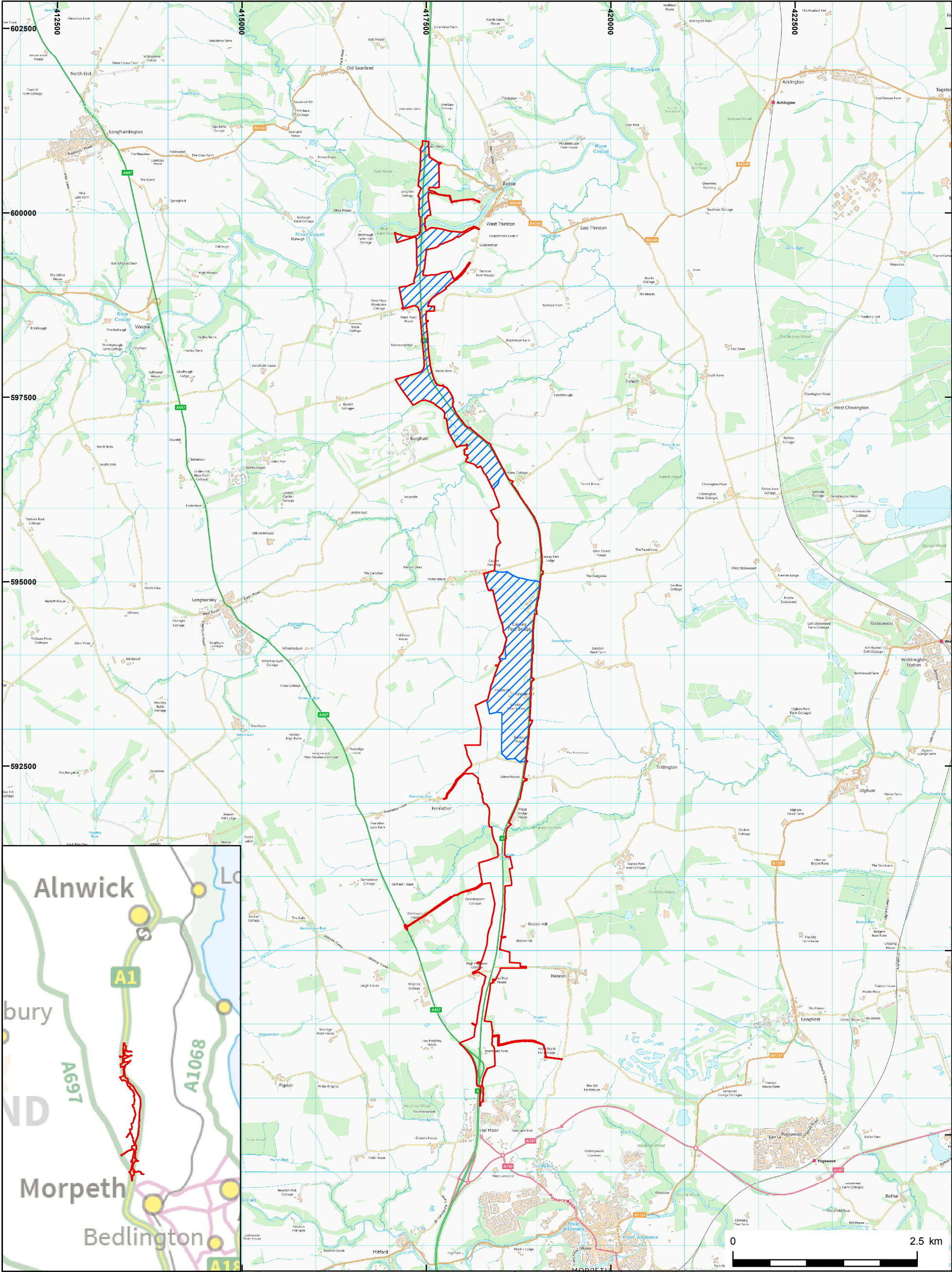
44	A 145m long bottom of slope lies immediately west of WA43 . It may represent the former path of the Longdike Burn.		417952	596996
45	Remains of possible narrow ridge and furrow are visible to the west of the Longdike Burn, separated by an area recorded on modern mapping as a pond.		417805	597110
46	The bottom of the slope to the west of the pond marked on modern mapping may represent the former path of the Longdike Burn.		417834	597112
47	The probable remains of narrow ridge and furrow, aligned ESE-WNW, are visible to the south of Bockenfield Bridge. The remains can be traced across a 2 hectare area. A 90m long section of bank in the centre of the field may represent a plough headland.		417887	597192
48	A series of features in a field to the north of Bockenfield Bridge appear to be the remains of recent activity, as seen on aerial imagery from 2009.		417651	597522
49	The possible remains of ridge and furrow are visible across a 6.3 hectare area in a field to the north of Bockenfield Bridge, separated by a 230m long bank that may represent a former field boundary or plough headland. The possible ridge and furrow remains are aligned WSW-ENE.		417327	597626
50	Traces of narrow ridge and furrow, aligned SW-NE, are present across a 0.9 hectare area to the SW of Bockenfield Manor.		417633	597728
51	A 305m long bank, aligned SE-NW and cut by a modern field boundary, can be seen in a field to the south of Blackwood Hall. It may represent a former path/track.		417372	597987
52	An area of narrow earthworks, possibly represent the remains of ridge and furrow, are visible across a 1.4 hectare area to the west of Eshott airfield.		417563	598105
53	Traces of ridge and furrow are visible across a 3.2 hectare area to the west of Eshott airfield. The remains are aligned N-S.		417577	598414
54	A ditch enclosing a 1.3 hectare area is visible within the same field as WA53 . The feature may be related to recent agricultural activity.		417547	598299
55	Remains of ridge and furrow are visible across a 4.4 hectare area to the east of West Moor House. The remains are aligned E-W.		417617	598776
56	The remains of N-S aligned ridge and furrow are visible across a 3 hectare area to the east of WA55 .		417876	598964
57	Traces of possible ridge and furrow, aligned SE-NW, are visible across a 3.3 hectare area to the NE of West Moor House.		417530	598982





58	A possible series of slight earthworks are visible in the field to the east of WA57 . They are formed of slight banks and a ditch, which form the western boundary of a small area enclosed by a slope top (approximately 80m by 50m in extent). The remains may form part of an enclosure.		417757	599109
59	A rectilinear bank may represent a former field boundary to the north of West Moor House. A small area of possible ridge and furrow lies immediately to the north.		417276	598876
60	Remains of ridge and furrow, aligned SSE-NNW, are visible within a field to the south of the River Coquet, on the east side of the A1. The features are visible across a 3.2 hectare area. Other remains lie outside of the RLB to the south, with other related remains to the north located within the RLB (WA61-64).		417599	599439
61	The remains of ridge and furrow, aligned SSE-NNW, area visible in a field to the south of the River Coquet. The remains can be traced across a 0.6 hectare area.		417982	599654
62	A 1.7 hectare area of ridge and furrow is visible to the east of WA61 . The remains are aligned WSW-ENE. A 85m long bank within the field appears to represent plough headland.		418104	599726
63	Remains of ridge and furrow, aligned SSE-NNW, are visible in a field to the north of WA63 .		417533	599644
64	A 4.5 hectare block of ridge and furrow is visible in the field to the east of WA63 . The remains are aligned N-S.		417709	599681
65	A right-angled bank, 55m in length, is visible within woodland to the north of the River Coquet. The feature may represent a former boundary, or be related to woodland management.		417487	599913
66	Remains of ridge and furrow are visible on either side of the A1 near Tile Kiln Rush. The features appear related, sharing a SSE-NNW alignment. The western block covers 1.1 hectares, whilst the eastern block covers 1.2 hectares. The eastern remains extend as far west as the cutting of the current road.		417452	600111
67	Remains of ridge and furrow are visible across a 2.6 hectare area to the north of Park Wood. The features follow an approximate SSE-NNW alignment.		417683	600397
68	Ridge and furrow remains are visible in the field to the north of WA67 . The western remains, covering 1.1 hectares, lie on a E-W alignment, extending as far as a 300m long bank feature that corresponds to a former field boundary recorded on historic OS mapping. The larger block to the east, visible across a 3.1 hectare area, lie on a SSE-NNW alignment, with a distinct bend towards the NE where it abuts the road. The eastern block is cut by a series of ditches to the south, which may represent the remains of a former boundary, or of recent agricultural activity.		417598	600594



69	A 70m long right-angled ditch feature is visible within North Pasture Rush. It may be related to woodland management.		417429	600549
70	Ridge and furrow remains are visible in a field to the south of Minto's Dean. The remains display a shallow 'S'-shape in places, and are aligned approximately SW-NE across a 1.4 hectare area.		417598	600825
71	The remains of ridge and furrow are visible across a 6.4 hectare area on the edge of the RLB. The features lie on an approximate N-S alignment, with a bend towards the SE on the edge of the RLB.		417308	601094



-  Red Line Boundary
-  Extent of LiDAR data coverage

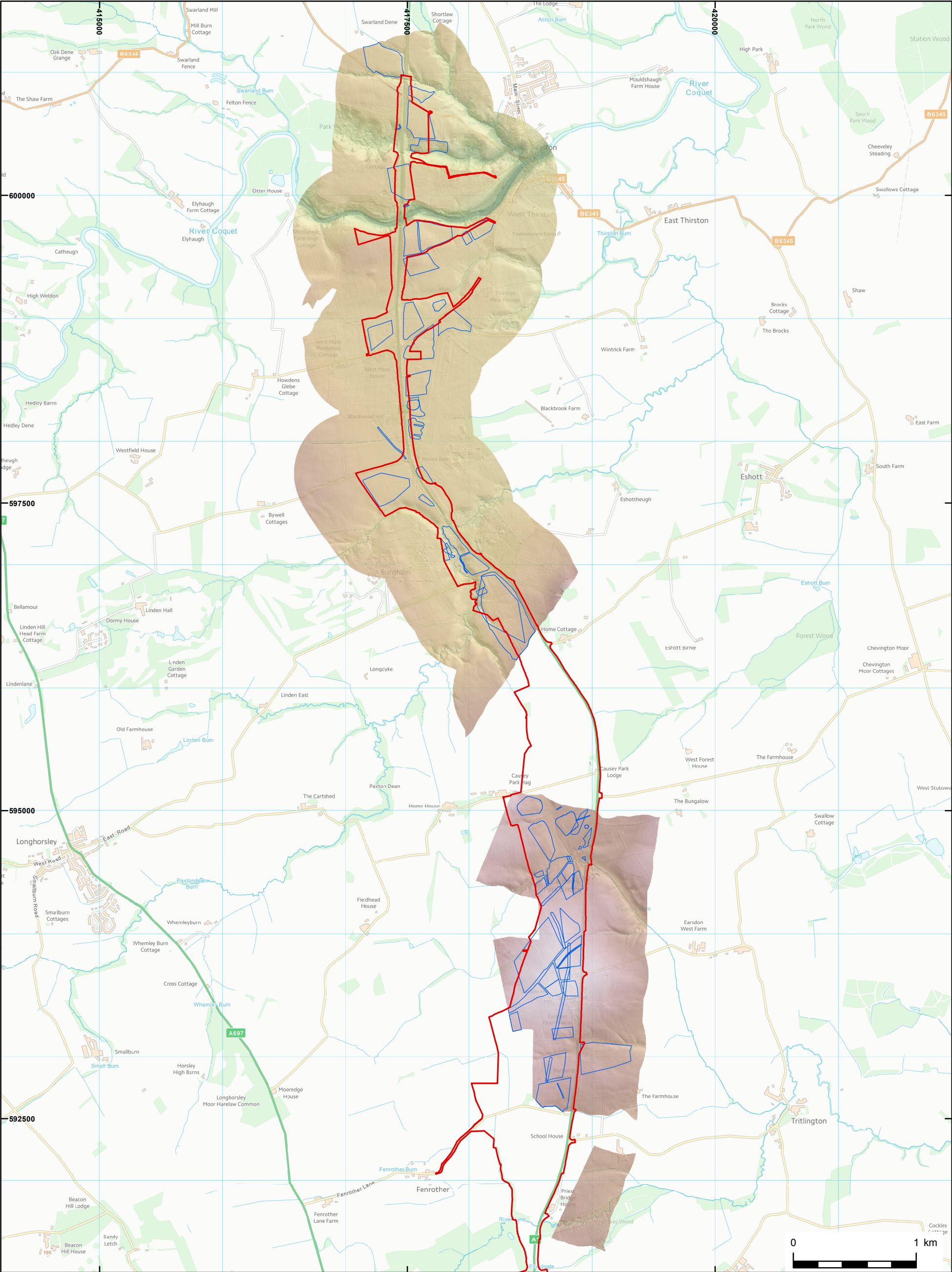



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Site location and extent of LiDAR data coverage

Figure 1





Red Line Boundary

Monument polygon

Elevation (mAOD)

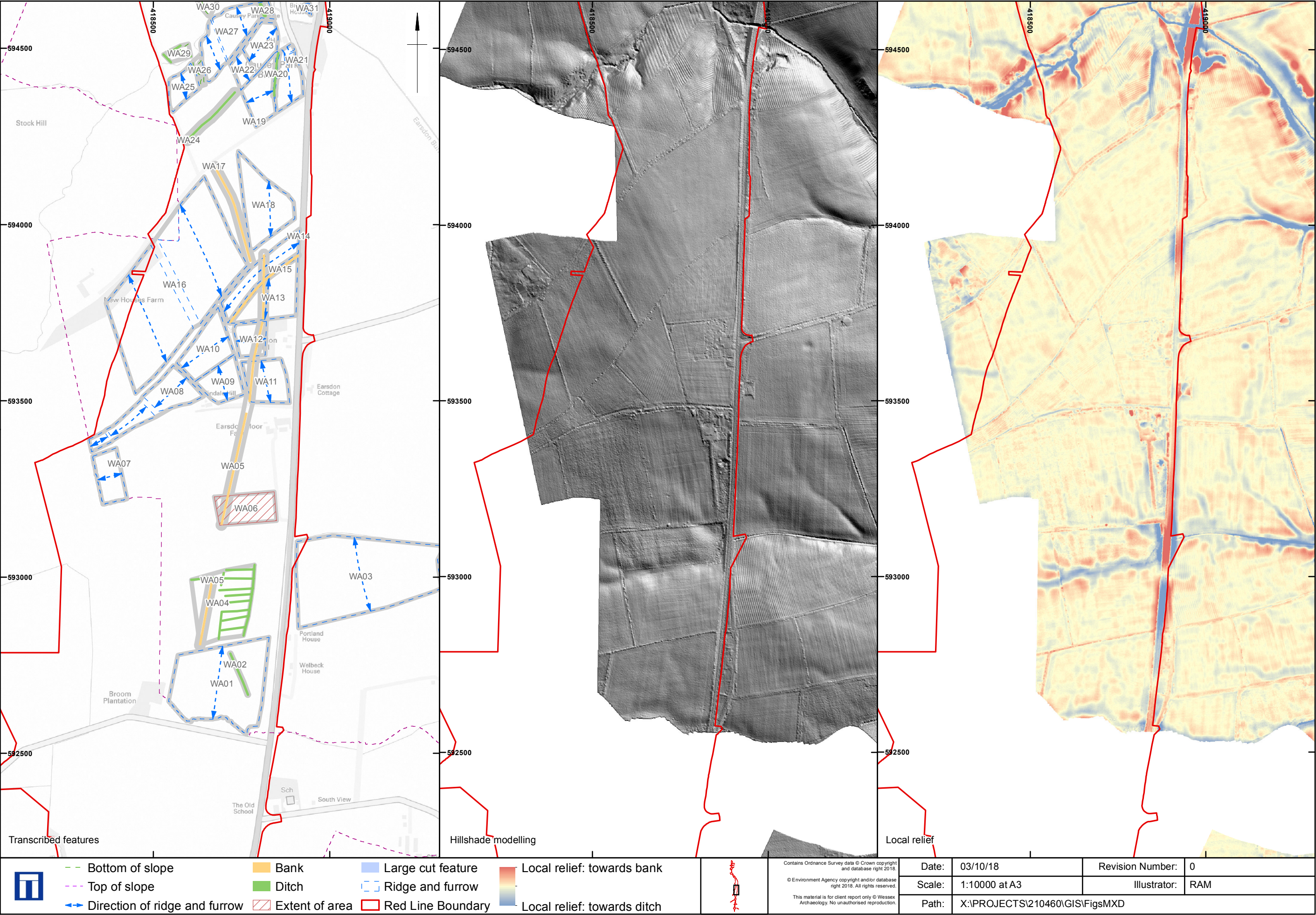
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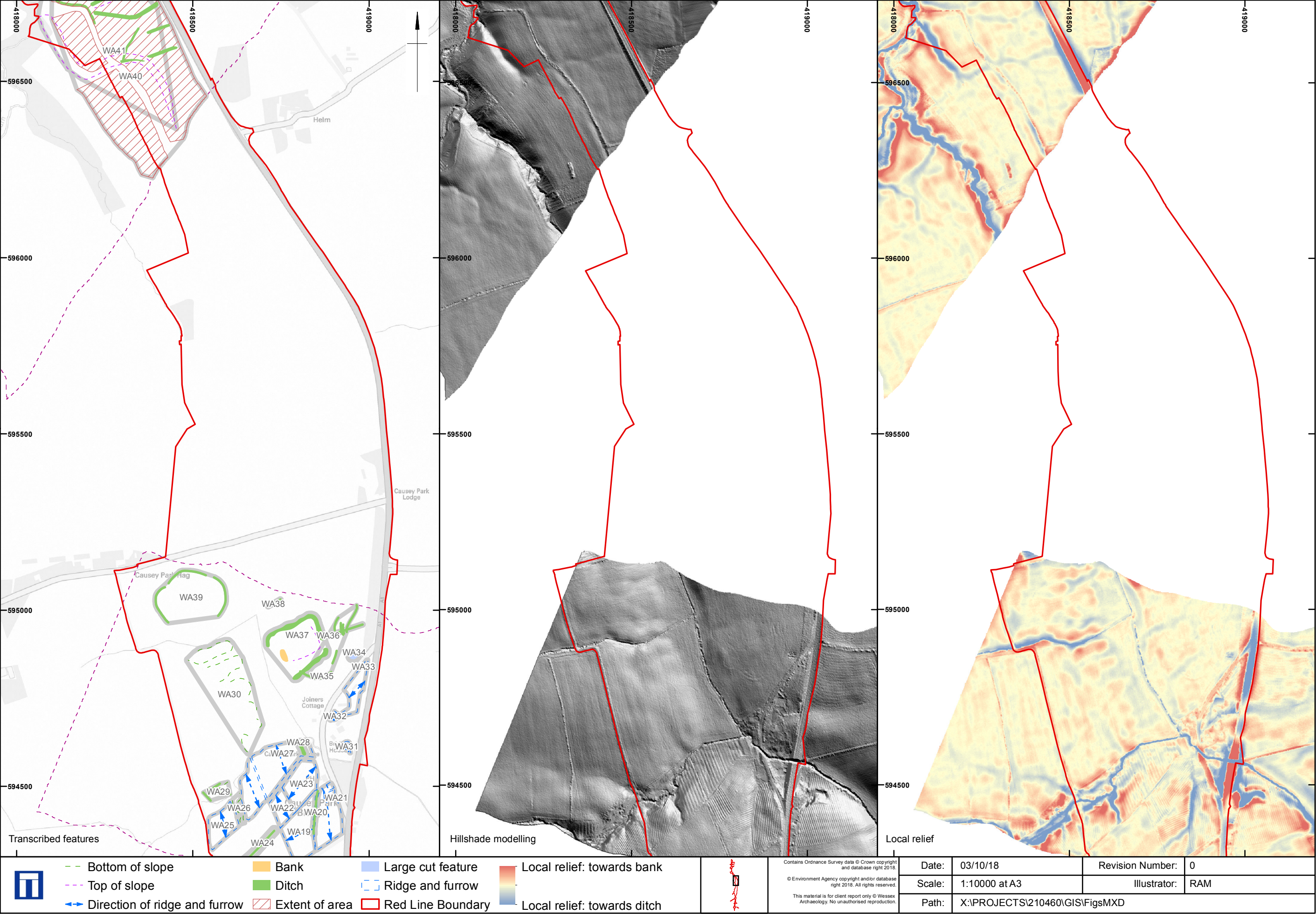
Topography and overview of transcribed features

Figure 2



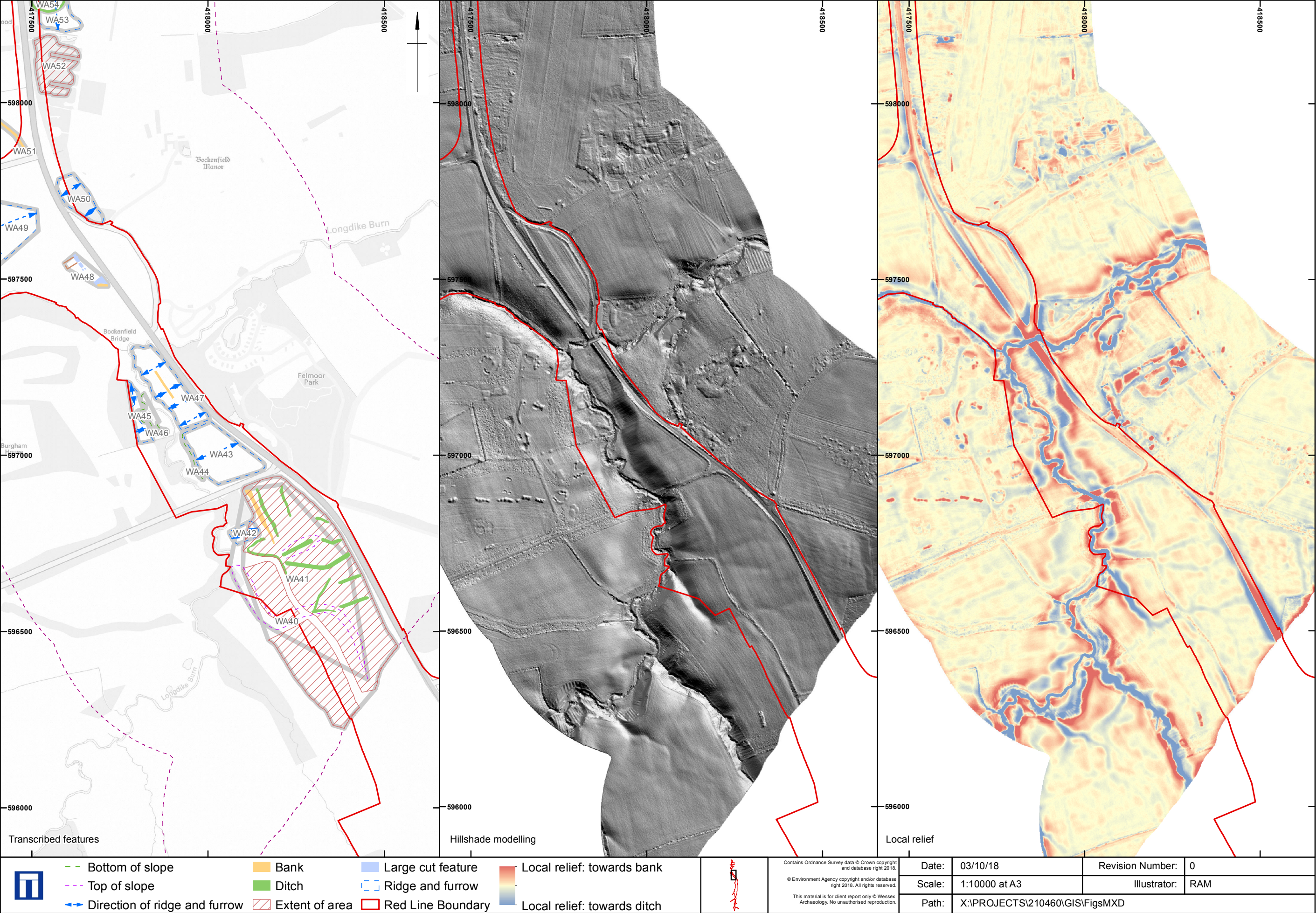
Transcribed features, hillshade modelling and local relief (A)

Figure 3



Transcribed features, hillshade modelling and local relief (B)

Figure 4



Transcribed features, hillshade modelling and local relief (C)

Figure 5

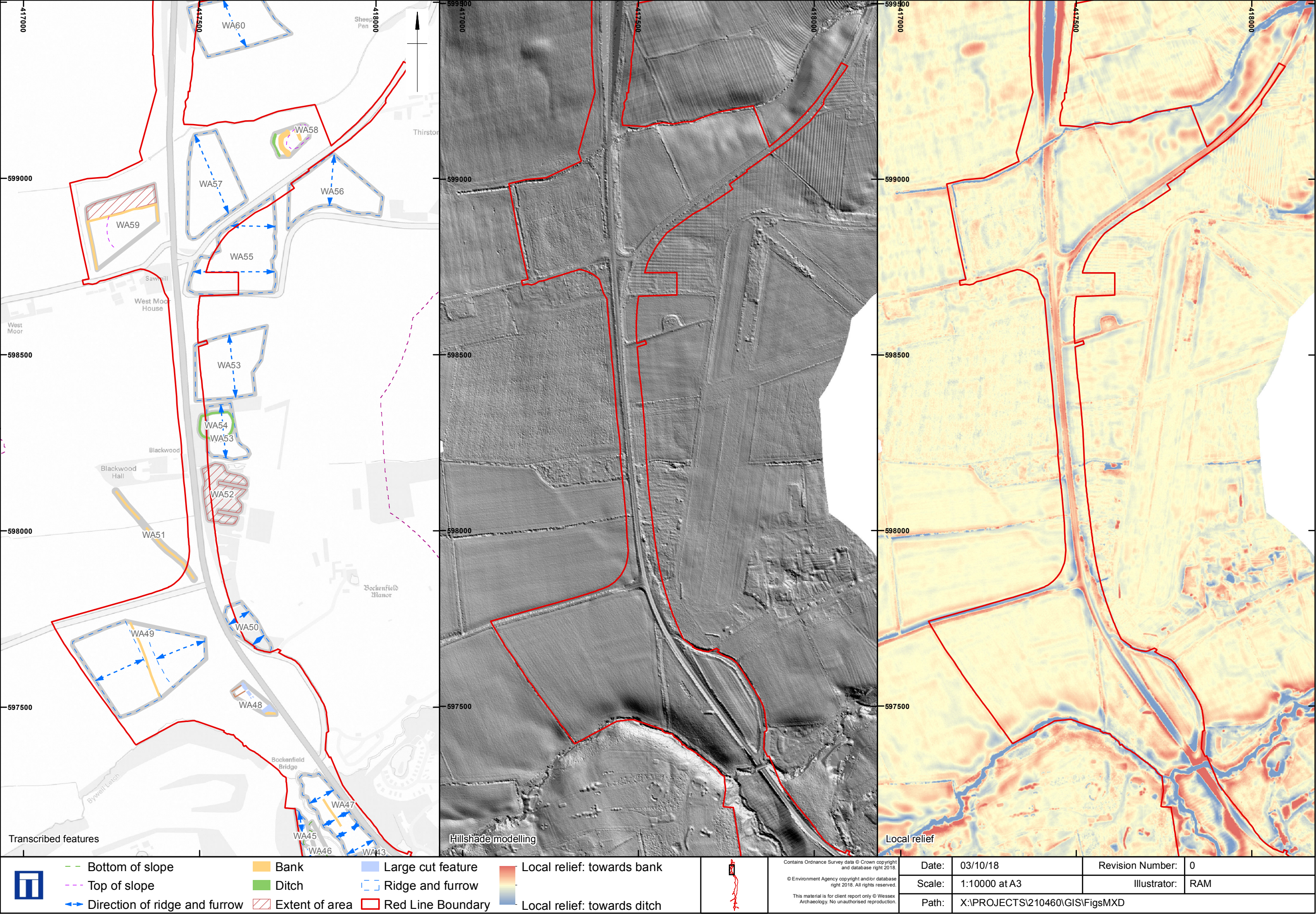
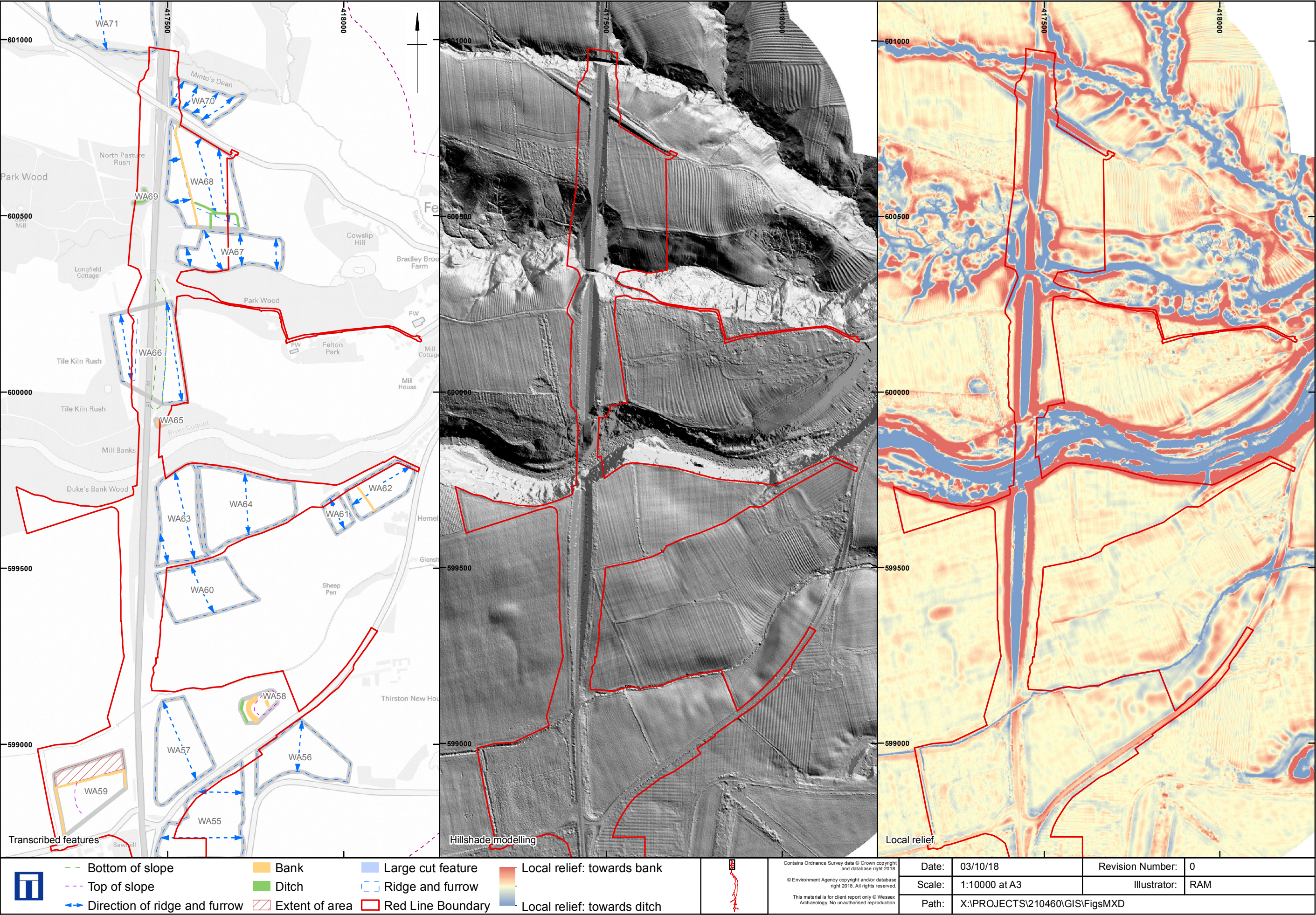
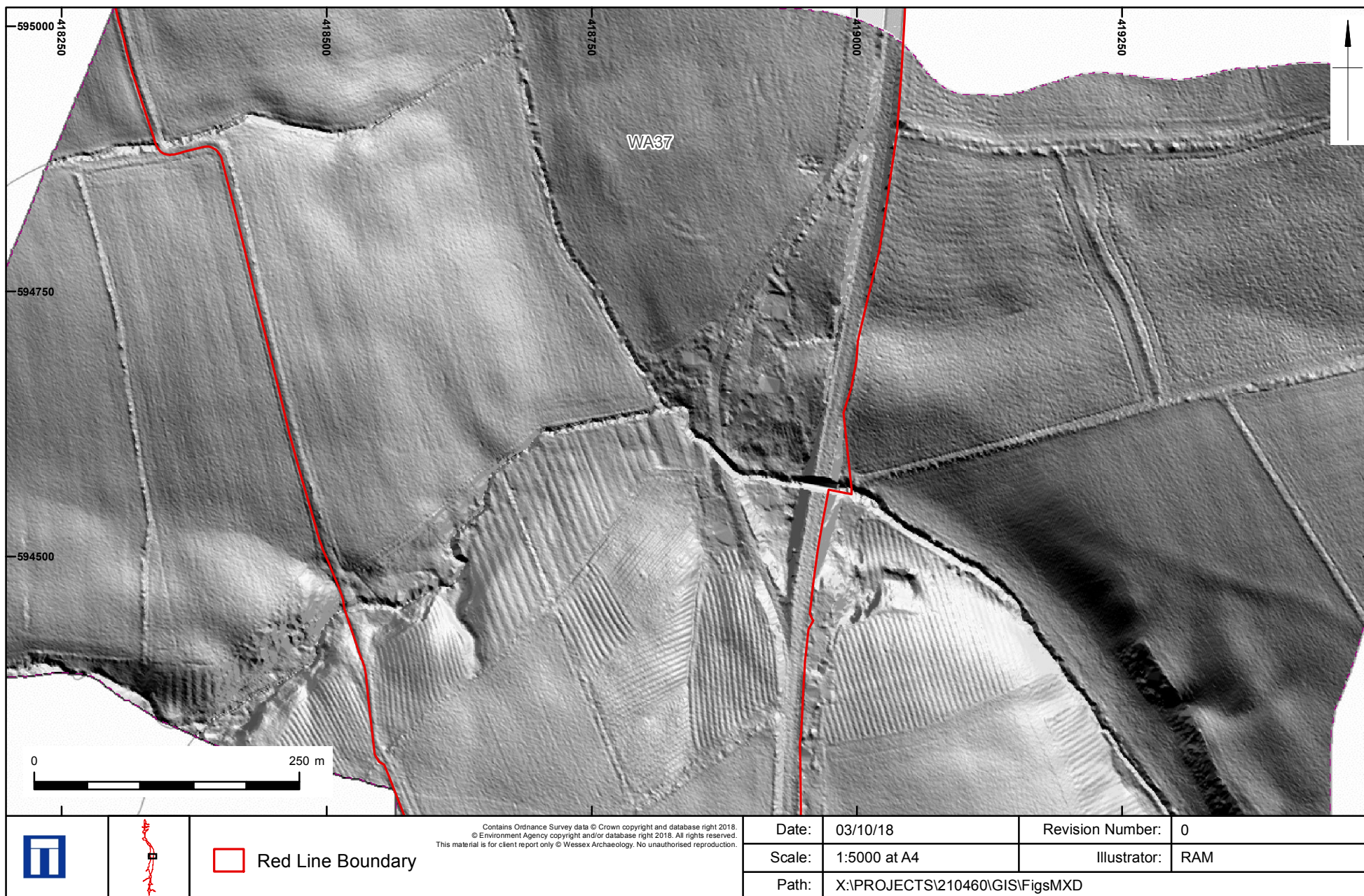


Figure 6



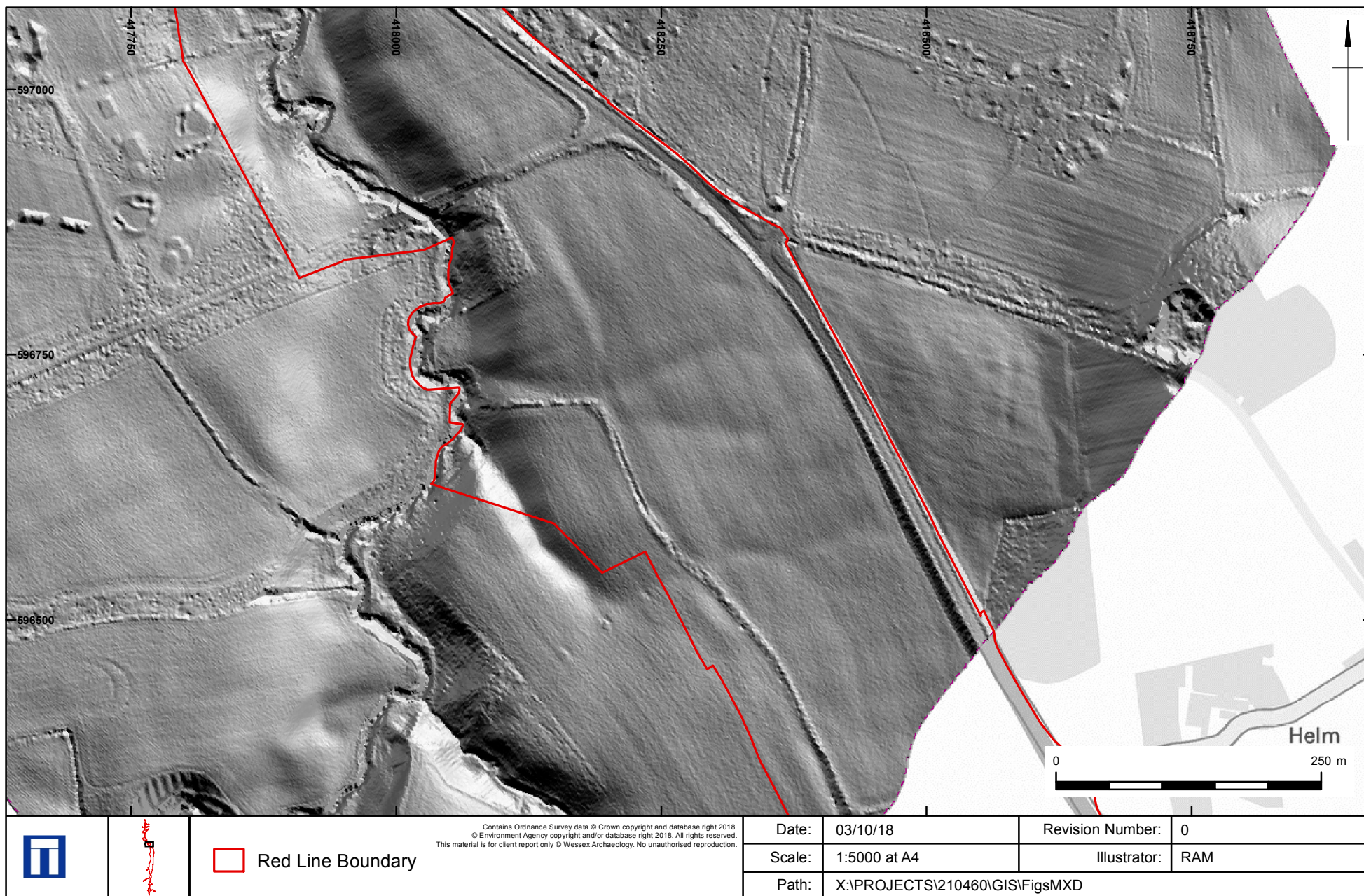
Transcribed features, hillshade modelling and local relief (E)

Figure 7



Hillshade model showing WA37 and ridge and furrow remains near Earsdon Mill

Figure 8



Hillshade model showing earthwork remains near Helm (WA41)

Figure 9



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